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P1. Pre-operative anaemia in elective total hip and knee arthroplasty, outcomes and a suggested new limit

Category: Arthroplasty

Presentation: Oral

Caterina Nicolaou (University of Witwatersrand, Charlotte Maxeke Johannesburg Academic Hospital), Richard Almeida (University of Witwatersrand , Charlotte Maxeke Johannesburg Academic Hospital), Nkhodiseni Sikhauli (University of Witwatersrand, Charlotte Maxeke Johannesburg Academic Hospital) , Lipalo Mokete (University of Witwatersrand, Charlotte Maxeke Johannesburg Academic Hospital) , Jurek Pietrzak (University of Witwatersrand, Charlotte Maxeke Johannesburg Academic Hospital) , Allan-Roy Sekeitto (University of Witwatersrand ,Charlotte Maxeke Johannesburg Academic Hospital) , Stuart Naysmith (University of Witwatersrand, Charlotte Maxeke Johannesburg Academic Hospital)

The fear of preoperative anaemia is its association to an increased peri- and postoperative complications. Preoperative anaemia has been linked to an increased rate of transfusions which in turn may increase the risk of sepsis, as well as potentially increase the length of stay and mortality rate . Guidelines recommend a preoperative haemoglobin of 13 and correction of anaemia in patients below this threshold.

A retrospective review was done of 400 patients presenting for total hip and knee arthroplasty at the Charlotte Maxeke Johannesburg Academic hospital. Assessment of the cohort's preoperative haemoglobin, causes of anaemia, need for postoperative transfusion, post- operative complications, length of stay and mortality rate was collected and analysed.

The average haemoglobin of this cohort was 12 with iron deficiency was the leading cause of anaemia. Most anaemic patients were optimized preoperatively to achieve a haemoglobin of ten or more. The transfusion rate postoperatively of the previously anaemic group was 5%. The average length of stay was not statistically significantly different for preoperative anaemic patients unless they were admitted for optimization preoperatively . The prosthetic joint infection rate and mortality rate was not solely associated with anemia as many confounding factors were noted in those patients.

Anaemia is prevalent in patients presenting for total joint arthroplasty however there is satisfactory postoperative outcomes and no significant increase in complications in patients with a preoperative anaemia. We suggest guidelines should be reviewed based on our local setting.

P2. A Retrospective analysis on the Efficacy of Oral Venous Thromboembolism Prophylaxis for Patients Undergoing Minimally Invasive Direct Anterior Approach Total Hip Arthroplasty

Category: Arthroplasty

Presentation: Oral

Dyllan Brett Geldenhuys (University of the Witwatersrand) , Jurek Rafal Tomasz Pietrzak (University of the Witwatersrand) , Nabila Goga (University of the Witwatersrand) , Josip Nenad Cacic (University of the Witwatersrand)

Venous Thromboembolism (VTE), comprising deep vein thrombosis (DVT) and pulmonary embolism (PE), remains a pertinent and preventable complication following Total Hip Arthroplasty (THA). However, the optimal duration of postoperative VTE prophylaxis remains controversial. This study aimed to compare the efficacy of two weeks versus four weeks of rivaroxaban as postoperative VTE prophylaxis in patients undergoing DAA THA.

We conducted a retrospective analysis on the medical records of 526 consecutive patients who underwent elective primary THA via the DAA between 01 January 2017 and 31 December 2022. We compared the incidence of symptomatic and asymptomatic VTE, and the rate of complications associated with VTE prophylaxis within six months postoperatively in patients who received either a two- or four-week course of rivaroxaban as VTE prophylaxis following DAA THA.

The study included 356 patients who received four weeks, and 170 patients who received two weeks of rivaroxaban as postoperative VTE prophylaxis. Both groups were well matched for age, gender, comorbidities, and preoperative VTE risk according to the Caprini Score. The overall incidence of VTE was 1.2% (n = 6), which included three DVTs and three PEs. The incidence of VTE was statistically significantly higher in the two-week group compared to the four-week group (p = 0.043), and all patients in whom a VTE occurred had a Body mass index (BMI) of > 30 kg/m² and a preoperative Caprini score of moderate or high risk. No statistically significant difference was noted in the rate of wound complications (p = 0.40) or the incidence of peri-prosthetic joint infections between the two cohorts (p = 0.56).

A four-week course of rivaroxaban demonstrated superior efficacy in reducing the incidence of VTE compared to a two-week regimen in patients undergoing DAA THA. Importantly, the extended duration of rivaroxaban prophylaxis did not result in a significant increase in the rate of complications associated with VTE prophylaxis. These findings underscore the potential benefits of a prolonged rivaroxaban regimen for optimising postoperative VTE prevention, particularly in obese patients and high-risk patients undergoing DAA THA.

P3. Prevalence and factors affecting return to work of patients post primary total joint arthroplasty.

Category: Arthroplasty

Presentation: Oral

Malesela Maphoto (University of Witwatersrand) , Jurek Pietrzak (University of Witwatersrand) ,Nkhodiseni Sikhauli (University of Witwatersrand) , Lipalo Mokete (University of Witwatersrand) ,Allan Sekeitto (University of Witwatersrand) , Wofhatwa Ndou (University of Witwatersrand)

Patients of working-age are required to generate an income for their livelihood. Return to work after total joint arthroplasty is an essential patient related outcome measure.

We retrospectively interviewed 196 patients from our local arthroplasty database between 2017 and 2022 to assess return to work percentage, timing and factors associated.

We selected patients aged 18 to 60 years, post total primary joint arthroplasty who were working within 2 years of their joint replacement.

The prevalence of return to work post primary total joint arthroplasty was 63% (n=123). The prevalence of return to work based on the type of total joint arthroplasty was 70% for total hip replacement (THR) ,69% for bilateral THR, 57% for total knee replacement (TKR), 42 % bilateral TK and 25% (n=1) for total hip and knee arthroplasty.

The mean time to return to work was 11,7 weeks.

Factors analysed for association with return to work included: sex, level of education, type of employment, marital status, type of pathology, job physicality, sick leave and number of physiotherapy sessions. It is statistically significant that male gender is associated with return to work. ($p < 0.05$). Other factors are still to be analysed.

We conclude that most patients will return to work after total joint arthroplasty. The expected duration to return to work is within 12 weeks. Male sex and total hip arthroplasty are likely to return to work.

P4. Comparison of outcomes in obese and non-obese patients undergoing robotic-assisted total knee arthroplasty using a handheld imageless system

Category: Arthroplasty

Presentation: Oral

Nabila Goga (University of the Witwatersrand), Michael De Buys (University of the Witwatersrand), Nkhodiseni Sikhauli (University of the Witwatersrand), Lipalo Mokete (University of the Witwatersrand), Jurek Rafal Tomasz Pietrzak (University of the Witwatersrand)

Obesity is a risk factor for inferior clinical and functional outcomes in total knee arthroplasty (TKA) due to both biomechanical and physiological mechanisms. Interest in robotic-assisted surgery has been growing in recent years however there is limited research on the use of this technology in obese patients. Morbid obesity is listed as a contraindication to the use of certain systems, likely due to the technical challenges of attaining accurate anatomical landmarks.

We conducted a prospective study of 201 patients who underwent handheld imageless, robotic-assisted total knee arthroplasty (RA-TKA) for symptomatic osteoarthritis over a two-year period. Patients were classified by BMI as either non-obese (BMI<30) or obese (BMI>30). The obese cohort was further stratified into class I/II obese (BMI 30-39.9) and morbidly obese (BMI>40). Outcomes were compared using baseline demographic and clinical data, intraoperative and inpatient records as well as postoperative outcomes with a minimum 1 year follow-up.

Cohorts were well-matched. Obese patients were more likely to have undergone a previous TKA ($p=0.007$) and tended to have more advanced osteoarthritis as per the Kellgren and Lawrence Classification ($p<0.001$). They were also more likely to have lower intraoperative MASTI scores ($p<0.001$), longer surgical duration ($p<0.001$), a greater drop in Haemoglobin postoperatively ($p=0.002$) and a longer length of stay (LOS) than non-obese patients (2.9 vs 2.14 days, $p<0.001$). There were no statistically significant differences in VAS ($p=0.153$), KSS ($p=0.781$) or TUG scores ($p=0.822$) between obese and non-obese groups. The satisfaction rates were similar between the groups ($p=0.890$). No patients required readmission or revision. Intraoperatively, morbidly obese patients were likely to require more soft tissues releases ($p=0.001$) and had greater variance between planned and final alignment ($p=0.004$). Morbidly obese patients required more time to achieve in-hospital physiotherapy-directed rehabilitation targets ($p=0.018$) and had a longer LOS ($p=0.002$).

We conclude that despite some peri-operative differences, clinical outcomes and satisfaction rates following RA-TKA in class I/II obese and morbidly obese patients are equivocal to non-obese patients at the one year mark making it a feasible option for high BMI patients

P5. Does HIV status on the outcomes following robot-assisted total knee arthroplasty using a handheld imageless system?

Category: Arthroplasty

Presentation: Oral

Nabila Goga (University of the Witwatersrand), Nkhodiseni Sikhauli (University of the Witwatersrand), Lipalo Mokete (University of the Witwatersrand), Allan Roy Sekeitto Sekeitto (University of the Witwatersrand), Jurek Rafal Tomasz Pietrzak (University of the Witwatersrand)

The interest in robotic-assisted (RA) surgery has been growing in recent years leading to its adoption in many areas of medicine. Total knee arthroplasty (TKA) is one of the most popular orthopaedic procedures utilising this technology. HIV, which has a high prevalence in South Africa is a risk factor for certain complications including venous thromboembolism, renal failure and increased length of stay. This study compared short-term intraoperative and postoperative outcomes in patients undergoing elective primary RA-TKA to assess the impact of HIV.

We conducted an analysis on the outcomes of 203 patients who underwent handheld imageless, RA-TKA for symptomatic osteoarthritis over a two-year period at a single institution. Patients were divided into groups based on HIV status and results compared using baseline demographic and clinical data, intraoperative and inpatient records as well as postoperative outcomes over a minimum one year follow-up. Cohorts were well-matched in terms of age ($p=0.570$) and sex ($p=0.06$). HIV positive patients were more likely to have asthma ($p=0.005$) and less likely to have hypertension ($p=0.005$) than the HIV negative group. HIV negative patients were more likely to have undergone previous joint replacement surgery ($p<0.001$). There were no differences in severity ($p=0.575$) or extent ($p=0.104$) of osteoarthritis however varus alignment was more common in HIV positive ($p=0.015$). Intraoperatively the MASTI scores and number of soft tissue releases were similar. There was no difference in mean surgical duration ($p=0.107$) or change in Haemoglobin between groups ($p=0.270$). There was no difference in planned versus achieved alignment between groups ($p=0.185$). Postoperatively, inpatient rehabilitation yielded similar outcomes between groups in terms of time to reach physiotherapy targets ($p=0.524$) and time to discharge ($p=0.845$). Outcomes were similar in groups when comparing change in VAS scores ($p=0.245$), change in KSS ($p=0.862$) and TUG scores ($p=0.175$), however satisfaction was higher in HIV positive patients than HIV negative patients ($p=0.021$).

At the minimum follow-up of one year there were no significant differences in outcomes between HIV positive and HIV negative patients, however, HIV positive patients had slightly higher satisfaction rates.

P6. The impact of preoperative alignment on outcomes following robot-assisted total knee arthroplasty

Category: Arthroplasty

Presentation: Oral

Nabila Goga (University of the Witwatersrand) , Nkhodiseni Sikhauli (University of the Witwatersrand), Lipalo Mokete (University of the Witwatersrand) , Allan Roy Sekeitto (University of the Witwatersrand) , Jurek Rafal Tomasz Pietrzak (University of the Witwatersrand)

While total knee arthroplasty is a popular procedure, satisfaction rates lag behind that of total hip arthroplasty emphasizing the need to improve. Kinematic alignment, is a popular philosophy which champions a more personalized approach, considering the individual's constitutional alignment and soft tissue balance. Robot-assisted TKA (RA-TKA) systems provide intraoperative feedback allowing for more precise analysis of the patient's alignment and soft tissue balance and leading to a more individualised and refined approach.

To analyse the effect of preoperative alignment on outcomes following primary RA-TKA, we conducted a prospective study on 203 patients undergoing elective handheld imageless, RA-TKA for symptomatic osteoarthritis at a single institution over a two year period. Patients were grouped based on their preoperative alignment, as either valgus or varus (including neutral), and were compared using baseline information, intraoperative and inpatient records and postoperative outcomes with a minimum one year follow-up. A total of 203 patients were included, 92 with varus and 111 with valgus/neutral alignment. Cohorts were well-matched in terms of age and sex. Patients in the valgus group had more comorbidities ($p=0.002$), were more likely to have diabetes ($p=0.004$) and be smokers ($p=0.011$). All of the 32 patients with rheumatoid arthritis had preoperative valgus ($p=0.000$). HIV was more common in the varus cohort ($p=0.024$). There was no difference in the incidence of previous arthroplasty, stage or extent of arthritis.

Cohorts demonstrated no major variance in the difference between planned and achieved alignment, number of soft tissue releases, decrease in haemoglobin, or mean MASTI score, however the mean surgical duration was lower for valgus patients ($p=0.005$). There were no significant differences in time to attain postoperative physiotherapy targets or duration of admission.

At one year, VAS, KSS and postoperative TUG scores were similar across groups. The valgus cohort had better preoperative ROM which persisted postoperatively ($p=0.009$). Satisfaction rate showed no significant difference with an average of 92.7% overall.

In conclusion, we found no major differences in outcomes following RA-TKA based on preoperative alignment.

P7. Can Ligament Laxity Between Different CPAK Types Of Knees Be Used To Enable Machine Learning For Robotic Knee Replacement Planning?

Category: Arthroplasty

Presentation: Oral

Allan van Zyl (SAOA) , Johan van der Merwe (SAOA)

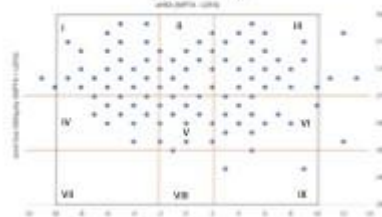
231 TKA (Persona PS – ROSA robotics) were done by a single surgeon, with the ROSA robotic assistant over a period of 20 months. Long leg x-rays were evaluated with calculation of LDFA (lateral distal femoral angle), MPTA (medial proximal tibia angle), aHKA (arithmetic hip knee angle) and aJLO (arithmetic joint line obliquity). These figures enabled classification of knee to one of the nine CPAK (Coronal Plane Alignment of the Knee) categories

Results

aHKA was 27,5% varus, 38,7% neutral and 33,7% valgus. Percentage of knees within the CPAK classification as well as the scatter plot of individual patients, see below.

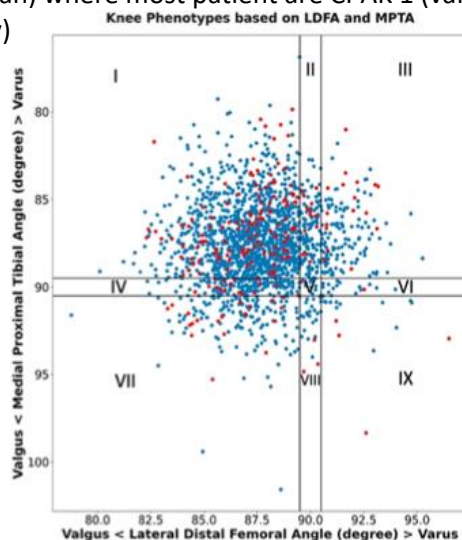
43 21,9%	43 21,9%	45 23%	66,8%
11 5,6%	33 16,8%	19 9,7%	32,1%
		2 1%	1%
27,5%	38,7%	33,7%	

CPAK (SA) – significant more Constitutional Valgus 33,7%



Conclusion

We have seen significant different constitutional alignment in our arthroplasty patients with significant more constitutional valgus in our patients compared to other countries (Belgium, Australia, USA, India, Japan, France, Taiwan) where most patient are CPAK 1 (varus) with very few valgus knees. (see scatter plot below from Germany)



Hirschmann et al

P73. Dislocation rate of dual mobility cups (DMC) compared to non-dual mobility cups (non-DMC) used in tumour prosthesis hip replacements.

Category: Oncology and Limb reconstruction

Presentation: Oral

Stephanus Raubenheimer (Registrar)

The problem with resecting the proximal femur in tumour resection cases is that all stabilisers of the hip joint, which attaches to this region, are lost, leading to higher risk for dislocation. Research pertaining to the use of DMC has shown decreased dislocation rates in primary- and revision cases in multiple studies.

We did a retrospective longitudinal cohort study to compare DMC to other cups, specifically in tumour prosthesis cases looking at dislocation- and re-operation rates over the past ten years in the settings of public and private hospitals. Other cups included large femoral heads and constraint liners.

We included all sequential patients that received tumour prosthesis implants from 25/11/2011 to 10/06/2022 who had a minimum of six months follow up and adequate records to detect dislocations.

From 150 identified cases, 89 (59.3%) cases satisfied the inclusion and exclusion criteria.

We considered gender, age over 65 as well as the causative pathology as additional factors, with the cup design, to accurately determine statistical significance using multivariate analysis (Cox- regression models) when comparing the groups.

There were significantly more dislocations in the non-DMC group than in the DMC group. (38.10% vs 16.18%, $p = 0.032$) Similarly, more re-operations in the non-DMC group than in the DMC group. (80.95% vs 35.29%, $p = <0.001$)

Survivorship of DMC implants also showed a statistically significant improvement to the non-DMC group.

Age over 65 was found to be independent risk factor for dislocation in tumour prosthesis cases with a 3.92-fold increased risk for dislocation.

This study shows statistically significant reductions in dislocations and re-operations when utilising DMC in patients with tumour prosthesis implants.

P93 : Evolution of TB spine surgery in the Paediatric patient

Category: Spine

Presentation: Oral

Hammaad Gamielien (UCT), Robert Dunn (UCT)

The immature and pliable paediatric spine is prone to rapid and severe deformities following vertebral collapse, particularly in spinal tuberculosis, progressing beyond the reach of conventional treatment methods compared to adults.

While medical treatment forms the cornerstone of spinal TB management, surgical intervention becomes necessary in cases of severe deformity or spinal instability. The key principles of management involve abscess drainage, deformity correction, and prevention of neurological complications. These objectives are typically achieved through anterior, posterior, or combined surgical approaches, with the anterior approach being the traditional choice. All these approaches carry potential significant morbidity with the risk of transthoracic pulmonary compromise and prolonged theatre time contributing to the drive towards posterior only vertebral column resection surgery.

A retrospective analysis of a cohort treated by a single surgeon at a specific facility involved 126 paediatric patients between 2001 and 2024, with an average age of 8 years and 5 months. Anterior approach surgery accounted for 40.9% of cases, while posterior-only approaches were used in 55% of cases. Mean blood loss in the anterior surgery was 562.5ml compared to 494.6ml in the posterior approach. Revision surgeries were required in 5.7% of anterior-based procedures and 1.4% of posterior-based procedures. The mean surgical duration was 2.83 hours for anterior approaches and 2.49 hours for posterior approaches. Notably, a shift was observed in surgical approaches over time, with 55% of surgeries being anterior-based from 2001 to 2014, decreasing to 33% from 2014 to 2024.

The global trend towards favouring posterior-only approaches, particularly with vertebral column resection, reflects concerns over potential adverse events associated with anterior-based surgeries, such as longer operative times, extended immobilization, progressive kyphosis, and graft failure. The decision-making process has thus shifted towards posterior-only approaches, leveraging lower revision rates, shorter surgical times, and less invasive techniques utilizing well-established posterior stabilization devices.

P43: Hip Arthroscopy in Africa: A survey exploring the experiences and beliefs of Orthopaedic Surgeons in Africa, Middle East and Turkey

Category: Hip Arthroscopy

Presentation: Oral

Caterina Nicolaou (University of Witwatersrand, Charlotte Maxeke Johannesburg Academic Hospital), Jurek Pietrzak (University of Witwatersrand, Charlotte Maxeke Johannesburg Academic Hospital), Josip Cakic (University of Witwatersrand, Life Fourways hospital), Barry Getz (University of Witwatersrand, Sandton Mediclinic)

Hip arthroscopy (HA) has become a highly popular procedure with varying indications and successful outcomes, however there is worldwide variation geographically of its use. HA also has its challenges, some of which can be attributed to a learning curve. The aim of this study was to evaluate the challenges that orthopaedic surgeons in African countries, the Middle East and Turkey experience in their Hip Arthroscopy practice. The paper also sought to explore which training and teaching strategies these surgeons believe may be most beneficial in reaching proficiency in HA.

An anonymous on-line survey was sent to all members of ISHA who currently practice as Orthopaedic surgeons on the African continent, in the Middle East and in Turkey. There were three components to this questionnaire; evaluating the demographics of the respondents, evaluating the challenges surgeons face in performing Hip Arthroscopy, and assessing the interventions to improve the training and performance of HA in these countries.

The majority of respondents were from the Southern African region (52.8%) mainly South Africa and the 2nd largest group from Egypt (22.2% of all countries). In terms of experience in HA, there were 2 peaks, with 36,1 % never having performed one or 30,6 % having performed them for more than 10 years. Availability of equipment to perform hip arthroscopy was the most significant challenge (44%) to performing HA. The most favoured suggested activities to improve the use and training of HA were a fellowship (72%), surgeon to surgeon visitations (78%) and cadver workshops (80%). Respondents were not in favour of telemedicine and virtual reality stimulator training.

The demand for HA is increasing and with this, the demand for teaching and training is great in this region. Support in all forms is required but in the opinion of surgeons the greatest support would be that of cadaver courses and expert surgeon visitations. Modalities for improvement exist and remain exciting in their potential to help surgeons improve their skills and limit the learning curve.

P31: Paediatric orthopaedic surgery: Impact of outreach on surgical management in rural communities

Category: Paediatrics

Presentation: Oral

Abraham Erasmus (Universitas Academic Hospital)

The Paediatric orthopaedic Outreach service in the Free State and Northern Cape provinces of South Africa has existed since 1994. Paediatric orthopaedic Outreach programs, Outreach influence on service delivery, and the effect on patient outcomes are rarely studied.

Our study aimed to evaluate Outreach in terms of the timely completion of surgical management of patients in rural communities. We calculated and compared the waiting time for paediatric patients in the Outreach catchment toward completed surgical management between January 2015 and December 2018.

Our study followed a retrospective descriptive analytical design. We analysed Outreach data and Academic Medical Centre (AMC) records of the patients of the Paediatric Orthopaedic Unit who underwent surgery between January 2015 and December 2018. The waiting time for surgery was calculated from the first consultation until surgery was performed. We compared the waiting time of patients from Outreach with patients directly referred to the AMC.

Patients from Outreach had a median waiting period of 121 to 240 days for surgery, while patients from the Central group had a median waiting period of 0-30 days. When all emergency and urgent cases were omitted from the statistics, the median waiting period for Outreach was 121-240 days (average 268.5 days), while the median waiting period for the Central Group was 61-120 days (average 170.4 days).

Considering the quarterly Outreach visits to each rural area and the number of patients, timeous completion of surgical management was acceptable for patients primarily assessed in Outreach. More than half of the patients who underwent surgery between January 2015 and December 2018 resided in the regions outside the direct catchment of the AMC. This is an indicator that there exists a large demand for specialist services in Outreach catchment areas. Outreach is dependent on budget regulation of the Department of Health and should be expanded considering these important findings.

P62: Early results of starting a fracture liaison service for fragility hip fractures in a regional hospital in South Africa

Category: Trauma

Presentation: Oral

Stefanus P Oosthuizen (Stellenbosch University), Jacobus D Jordaan (Stellenbosch University), Marilize C Burger (Stellenbosch University)

The burden of fragility hip fractures (FHF) is rising. We implemented a Fracture Liaison Service (FLS) in September 2021 in our regional hospital. This allowed us to conduct a retrospective cohort study of FHF before and after its introduction. The aim of this investigation was to determine whether the inpatient postoperative infusion of bisphosphonates reduced early mortality, refracture and readmission rates in elderly patients who presented with FHF to a regional hospital in South Africa.

Patients > 50 years who sustained hip fractures between January 2020 and June 2022 were considered; those with high energy injuries, pathological- and peri-prosthetic fractures were excluded. Patients were divided into two groups based on whether bisphosphonates were initiated.

Associations between treatment group and mortality, readmission and refracture rates within the first year after surgery were investigated. Subgroup analyses were also conducted for specific risk factors.

A total of 309 patients (mean age of 74.5 ± 10.9 , 67.6% female) were included of which 32.4% (n=100) received bisphosphonates. Time to surgery was shorter after the implementation of the FLS (median 30.8 hours, interquartile range 22.3-49.0) versus before (median 42.5 hours, interquartile range 23.4-70.8), $p=0.044$. The overall 30-day, 90-day and 1-year mortality rates were 6.8% (n=21), 11.0% (n=34) and 18.4% (n=57), while 23.6% (n=73) of patients were readmitted to hospital and 2.6% (n=8) had refractures within the first year after surgery. No statistical difference in 30-day, 90-day or 1-year mortality rate, refracture incidence or readmission incidence was observed between patient groups, or in the subgroup analyses.

In conclusion, we successfully implemented a FLS in our regional hospital. Although there was no statistical benefit in terms of early mortality, refractures or readmissions, it resulted in a decrease in time to surgery.

P76: Accurate planning of Total Hip Arthroplasty: Is there still a role for acetate templating?

Category: Arthroplasty

Presentation: Oral

Philip Coetzer (University of the Free State), Johan van der Merwe (University of the Free State) Cobus Erasmus (University of the Free State) Veruschka Rademan (University of the Free State)

Templating of radiographs as part of pre-operative planning can improve the accuracy of prosthesis placement and minimise intra and post-operative complications. Digital templating requires purchasing specific software for the prosthesis used.

We aimed to establish if using acetate-printed templates, superimposed on the computer screen, can accurately determine implant placement and sizes.

Eighty primary total hip Arthroplasty procedures met the inclusion criteria. A 20mm ball bearing was placed at the level of the greater trochanter to ensure accurate radiograph calibration. Templates from all companies were supplied and templating was completed by two consultants and two registrars. Acetabular size (AS), horizontal femur offset (HFO), femur stem size (FSS), LDD and vertical greater trochanter to prosthesis shoulder height (VGPH) were measured. This was done pre/postoperatively.

The mean difference in FSS templating and actual placement was within 1 size, usually smaller was placed than templated, with a median of 0.67 (-3 to 4). With regards to HFO, the median difference post-replacement was 2.78mm with a mean of 2 (-17 to 22). The LLD had a mean of 3.8mm difference post-operatively. The placement depth of the implant using the VGPH was placed at a mean of 0mm with an average implant placed of 1.24mm proud.

Our primary aim was to determine if accurate templating can still be done using acetate-printed templates for accurate prosthesis placement. We were able to accurately restore HFO to an average of within an average of 2mm. LLD is quoted as the largest reason for litigation post-hip arthroplasty, we were able to accurately restore LLD to within 3.8mm of the contralateral side. The FSS placement in our study was within 1 size of the templated size. However, the size of the stem can also be influenced by surgical technique. We believe that there is still a role for acetate templating as it is accurate, cheap and easily accessible.

P56: Knee Arthroscopic Virtual Simulation: A Possible Solution to Assess Arthroscopic Skills.

Category: Knees

Presentation: Oral

Bijou Salence (UCT), Michael Held (UCT)

Basic knee arthroscopy is an essential surgical skill and should be an integral part of Orthopaedic training. However, achieving and testing proficiency presents a challenge, particularly in South African academic hospitals

A prospective observational cohort study was conducted to assess the knee arthroscopic skill of Orthopaedic trainees using ViraMed ArthroS virtual simulation. Surgical proficiency was reported using Virtual simulated composite scores derived from procedure time, safety and economy. Two different diagnostic arthroscopy tasks were completed task1: inspecting meniscus and task 2: inspecting the entire knee. Following a practice attempt the final score was recorded. Trainee qualification level was used to determine construct validity and a post assessment questionnaire assessed face validity (realism), user friendliness and educational value.

25 trainee were included (20 male), median age was 33.5 years old (32-34.5), and included pre- registrar Medical Officers (13), registrars in the postgraduate program(11) and a fellow (1). During practice attempt of task 1 trainees scored a of median 28 (23-37). The final score was a median of 42 (41-47) which is an increase of 48 percent. Task 2 had a median practice attempt score of 16 (0-37) and the final score median was 44 (42-46) with an increase of 155 percent.

There was no evidence of construct validity between level of qualification and median test score. Trainees confirmed good face validity for the outer and intra-articular joint appearance with median score 10 (8-10) and 8 (8-9) respectively. User friendliness was rated 9 (8-10) and 89 percent of trainees agreed that the simulator had educational value.

We conclude that assessment and training experience of knee arthroscopy with Virtual simulation can be achieved. The ViraMed ArthroS had high perceived face validity and educational value.

Repeated utilization contributed to enhanced scores which supports its usefulness as a tool for training in our cohort. Level of qualification did not correlate to increased scores which might highlight inadequacies in exposure or training. Additional research is necessary to evaluate the effectiveness of Virtual simulation in work-based assessments and establish a definitive passing or failing score threshold.

P40: The Epidemiology of Bacterial Hand infections at a Large Tertiary Hospital in the Western Cape.

Category: Hands

Presentation: Oral

Ridwaan Aboobaker (Tygerberg Hospital), Marilize Burger (Stellenbosch University), Hentas Van Zyl (Tygerberg Hospital)

Hand infections are commonly treated conditions that can cause serious morbidity and financial implications to patients and healthcare systems. This study aimed to investigate the epidemiology of hand infections treated at a tertiary institution over a one-year period with specific focus on how host factors, disease factors and system factors modify the risk for complications.

A retrospective, analytical cross-sectional study was conducted and included patients with hand, wrist or forearm infections. Demographics, clinical information, timeframes of patients' pathway from symptom onset to discharge was collected, including development of complications or systemic involvement. Risk factors for complications, defined as i) amputation, ii) needing >1 surgical procedure, or iii) requiring soft tissue cover, was investigated statistically.

A total of 529 patients, mean age of 33.0 ± 15.6 (95% CI 31.6 – 34.3) years, were included with *Staphylococcus aureus* (MSSA) being most frequently cultured (68.7%, n=281). A total of 23.6% (125) of cases had at least one complication. Only 2.6% (14) had systemic involvement. All patients with complications required more than one surgery, which resulted in the need for an amputation 8.8% (11), soft tissue cover 53.6% (67) or for relook-debridement alone 37.6% (39). No difference in risk for developing complications was observed for other patient-related risk factors (diabetes, substance users or those with delayed presentation) Smokers showed a trend of developing more complications than non-smokers ($p=0.050$). Patients with necrotizing fasciitis had increased percentage of complications with almost all cases having complications ($p<0.001$), whilst less severe diagnosis showed no difference in complication rates such as for felon ($p=0.100$) and webspace abscesses ($p=0.635$).

The findings highlight certain risk factors that can influence the risk of complications in patients with hand infections. These results can guide future research, but also be used practically to guide patient education, healthcare provider understanding, resources and standard practice guidelines.

P32: A case series of chronic displaced radial neck fractures and their outcomes post fixation.

Category: Paediatrics

Presentation: Oral

Bernard Steyn (Wits), Dina Simmons (Wits), Troye Joseph (Wits), Curran Hitge (Wits)

Radial neck fractures are a common injury in children and more prevalent between ages 9 and 10 years. There is a paucity in literature around the treatment of late presenting radial neck fractures with most sources stating they should be treated on a case-by-case basis. Literature pertaining to this topic is limited to case reports. We conducted a retrospective review of late presenting radial neck fractures. Inclusion criteria were patients over age 5 years and patients who underwent the procedure at our facility. Exclusion criteria were patients older than 18 and injuries presenting less than two weeks after injury.

We identified four cases of chronic radial neck fractures in a 6 month period and reviewed the clinical and radiological outcomes. All were treated with open reduction and internal fixation using k-wires, which were later removed. Minimum follow up was one year.

Mean age was 9 years (range 6-13 years). Mean days from injury 79.5 days (36-157). Using the Judet Classification, 3 cases were Judet IVa and 1 was Judet III. The mean pre-operative elbow range of motion was 25.5°, with the mean fixed flexion deformity of 72.5°. Mean pronation and supination were 30° and 3.75° respectively. At one year follow up the mean improvement in flexion was 26.25°, in fixed flexion was 54°, and supination and pronation improved by a mean of 32.5 and 16.25 respectively. None of the follow up radiographs demonstrated any evidence of avascular necrosis. There were no surgical or wound complications noted.

This is the largest cohort of these injuries reported that the authors are aware of. We demonstrated good outcomes of open reduction and k-wires with an improvement of function in elbow and forearm range of motion as well as decreasing the fixed flexion deformities, with no complications at one year follow up.

P84: Radiographic Predictors of Hip Abductor Tears.

Category: Arthroplasty

Presentation: Oral

Johann Groenewald (State Health), Marc Nortje (State Health), Derik Du Toit (State Health)

Hip abductor tears (AT) have long been under-recognized, under-reported and under-treated. There is a paucity of data on the prevalence, morphology and associated factors. Patients with “rotator cuff tears of the hip” that are recognized and repaired during total hip arthroplasty (THA) report comparable outcomes to patients with intact abductor tendons at THA.

The study was a retrospective review of 997 primary THA done by a single surgeon from 2012–2022. Incidental findings of AT identified during the anterolateral approach to the hip were documented with patient name, gender, age and diagnosis. The extent and size of the tears of the gluteus medius and - minimus were recorded. Xrays and MRI's (magnetic resonance imaging) were collected for the 140 patients who had AT and matched 1:1 with respect to age and gender against 140 patients that had documented good muscle quality and integrity. Radiographic measurements (Neck shaft angle, inter-teardrop distance, Pelvis width, trochanteric width and irregularities, bodyweight moment arm and abductor moment arm) were compared between the 2 groups in an effort to determine if any radiographic feature would predict an AT. The prevalence of AT were 14%. Females had statistically more tears than males (18% vs 10%), while patients over the age of 70y had statistically more tears overall (19,7 vs 10,4%), but also more Gluteus Medius tears specifically (13,9 vs 5,3%). Radiographic measurements did not statistically differ between the tear and control group, except for the presence of trochanteric irregularities. MRI's showed that 50% of AT were missed and subsequently identified during surgery.

Abductor tears are still underrecognized and undertreated during THA which can result in inferior outcomes. The surgeon should have a high index of suspicion in elderly females with trochanteric irregularities and although an MRI for every patient won't be feasible, one should always be prepared and equipped to repair the abductor tendons during THA.

P54: Compliance with rehabilitation and return to play assessments in patients after anterior cruciate ligament reconstruction.

Category: Knees

Presentation: Oral

Laine Alexander (University of Witwatersrand), Brad Gelbart (University of Witwatersrand), Brenda Milner (University of Witwatersrand)

Anterior cruciate ligament reconstructions (ACLR) are commonly performed but there is no evidence available on compliance with rehabilitation protocols or the completion of an objective return to sports assessments prior to return to play (RTP) and whether this may influence ACLR outcomes in our environment.

The aim of this retrospective record review and prospective questionnaire was to assess patient compliance with a rehabilitation programme and return to sports assessment in patients who underwent ACLR. The objectives were to: 1) determine the level of compliance with a rehabilitation programme and return to sports assessment, 2) identify the barriers to compliance and motivating factors for increased compliance in these patients, 3) analyse whether certain patient characteristics affect compliance level, 4) describe and compare the RTP rates, re-injury rates and secondary surgery rates between completion of rehabilitation programme and return to play assessment groups.

A total of 100 participants completed the survey. Eighty percent of our participants completed their rehabilitation programme. Only sixty percent completed a RTP assessment. Sixty-five percent of our participants were motivated by their own desire to reach pre-injury level of activity and 12% were motivated by their physiotherapist. Time constraints and lack of funding were cited as the most frequent barriers. Younger individuals, females and those who had a higher pre-injury Tegner score were more likely to complete more months of their rehabilitation programme. Similarly, younger, and competitive athletes have a higher chance of completing their RTP assessment. We found that RTP rates, re-injury and secondary surgery were not associated with completion of the rehabilitation programme.

Our study identified barriers to compliance and motivating factors for increased compliance in ACLR patients. The study reviewed multiple return to play variables and identified factors which predict increased compliance.

P39: Surgery of the hand using WALANT anaesthesia: What are patients' pain scores and complications within 6 weeks?

Category: Hands

Presentation: Oral

Sumeet Baitchu (Tygerberg Hospital/ Stellenbosch University)

Surgeries involving the hand assume a considerable proportion of theatre time in orthopaedic units with a variety of anaesthetic options. The study aimed to investigate pain scores in patients undergoing Wide Awake Local Anaesthesia No Tourniquet (WALANT) pre-, peri and postoperatively, as well as to describe any complications that may occur. Risk factors for complications were also investigated.

A prospective observational study included all consenting adult patients undergoing hand surgery under WALANT anaesthesia. Patients with signs of sepsis, allergy to local anaesthetic medication, compromised peripheral circulation or ischaemia were excluded. Demographic, clinical and outcome data was collected and analysed.

A total of 52 patients (mean age 42.2 ± 15.8 years, 54% female) were included of which 33 were trauma related and 19 were elective. The median visual analogue score (VAS) for pain during the injection of WALANT solution was 3.0 (interquartile range, IQR 2.0-4.0); intra-operative VAS was 1.0 (1.0 – 1.0) with an immediate post-op VAS of 1.0 (1.0-1.0). Complications at two weeks follow-up included persistent pain (5.8%, n=3), wound dehiscence (1.9%, n=1) and superficial sepsis (3.8%, n=2) whilst at six weeks, 9.6% (n=5) continued to report pain with 3.8% (n=2) of patients being investigated for systemic causes. Of these two, one patient required formal debridement with a skin graft.

No association between requiring adjuvant sedation (p=0.450), opioids (p=0.473) or using cautery during surgery (p=0.091) and the type of surgery that was performed, as observed.

WALANT provided adequate anaesthesia during and after surgery with minimal pain during administration with expected complications, similar to what is reported in the literature. Therefore, WALANT could be considered as a viable anaesthetic option for use in hand surgeries, especially in high-volume settings.

P66: Does Fixator-assisted tibial nailing outperform conventional tibial nailing: A Multicentre Comparative Study

Category: Trauma

Presentation: Oral

Saul Kaplan (Orthopaedic Surgery Department, Stellenbosch University), Nando Ferreira (Orthopaedic Surgery Department, Stellenbosch University), Marilize Burger (Orthopaedic Surgery Department, Stellenbosch University), Mathew Alexander (Orthopaedic Surgery Department, Stellenbosch University), Danie Hugo (Orthopaedic Surgery Department, Stellenbosch University), Craig Brown (Orthopaedic Surgery Department, Stellenbosch University), Francois Muller (Khayalitsha Hospital), Jeandre Kotze (Paarl Provincial Hospital)

There is no local literature evaluating the outcomes of external fixator-assisted tibial nailing. This study aimed to investigate the peri- and postoperative outcomes of tibial nailing using either an unassisted or an external fixator-assisted nailing method, in patients with tibial fractures.

A prospective cohort study, including skeletally mature (>18 years) patients with tibial fractures, presenting to one of three different hospitals within the Western Cape province of South Africa, and treated with intramedullary nailing, was conducted. and considered. Participant demographic, clinical and surgical characteristics were documented perioperatively up until 6 weeks post-surgery.

Differences in operative time, fluoroscopy time, adequacy of reduction and short-term complications in patients treated with external fixator-assisted versus unassisted tibial nailing were investigated.

A total of 154 patients with tibial fractures (n=74 fixator-assisted tibial nails; n=80 unassisted nails) enrolled in the study. Fixator-assisted tibial nailing was associated with significantly longer operation- (median 80.0, interquartile range (IQR) 60.0 – 95.0 minutes) and fluoroscopy times (median 140.0, IQR 96.0 – 214.0 seconds) compared to the unassisted group (60.0, IQR 50.0 – 90.0 minutes and 82.5, IQR 63.0 – 121.0 seconds, respectively) (p<0.001 and p<0.001, respectively). No differences were observed in the adequacy of reduction, or prevalence of complications, between groups.

Comparing fixator-assisted tibial nailing to unassisted tibial nailing, this prospective cohort study suggests that both techniques are comparable when managing tibia fractures in terms of adequacy of reduction and the prevalence of short-term complications. The benefits of fixator-assisted tibial nailing include being relatively easy to apply by all orthopaedic surgeons regardless of surgical experience, maintaining reduction during all steps of tibial nail insertion, reduced need for open fracture reduction, reduced radiation exposure to the surgeon and assistant, and no added risk to the patient. Further long-term large-sized prospective randomized trials are needed to better evaluate the benefits of fixator-assisted nailing vs unassisted tibial nailing.

P77: The Neglected Angle: Exploring the Significance of Femoral Neck Shaft Angle in Hip Biomechanics and Surgical Planning

Category: Arthroplasty

Presentation: Oral

Niel Bruwer (WSU), Norrie Gibson (WSU), Marilize Burger (SUN)

This study investigates the femoral neck shaft angle (FNSA) and its association with osteoarthritis (OA) classifications, aiming to emphasize the significance of FNSA in surgical planning and biomechanics. Clinical and radiographic records of adult patients undergoing total hip arthroplasty at the selected arthroplasty unit between the years 2015-2020 were assessed. Patients over the age of 18 years with adequate templating radiographs, and no evidence of inflammatory arthropathies or significant flexion contractures were included in the analysis. FNSA measurements were obtained using specialized templating software. Descriptive statistics were applied, and associations between FNSA and OA classifications were examined.

Analysis of 285 hips revealed a mean FNSA of $129.4^{\circ} \pm 5.1^{\circ}$ (95% CI 128.8-129.9), which differs from other international and local population groups' FNSA. Males exhibited a statistically significant smaller FNSA bilaterally compared to females. No significant relationship between FNSA and age or anatomical side was observed. However, significant differences in FNSA were noted across various architectural categories as described by Kase et al, suggesting specific patterns of degeneration associated with different FNSA values. Patients with a proximalised and proximo-lateralised degenerative pattern exhibited the highest FNSA, followed by the centred, lateralised, and medialised degenerative patterns.

This study highlights two important concepts; firstly the notion that FNSA differs between population groups but also between individuals and secondly that FNSA has an important influence on hip biomechanics and patterns of degeneration. Selecting a hip prosthesis with the most suitable FNSA for a population, and individual, may allow for more satisfactory clinical outcomes following hip arthroplasty. This underscores the importance of considering FNSA in surgical decision-making and templating process. Prioritizing FNSA as the initial and pivotal step in templating and selecting the appropriate implant is crucial, as it serves as the foundation for accurate surgical planning and optimal patient outcomes.

P22: Functional and patient-reported outcomes of terrible triad elbow fracture-dislocations

Category: Trauma

Presentation: Oral

JP Strydom (Stellenbosch University)

The elbow ranks second only to the shoulder as the most commonly dislocated large joint in the human body. Terrible Triad Elbow Injuries (TTEI) involve an elbow dislocation coupled with a radial head and coronoid fracture. This study aimed to assess functional and patient-reported outcomes for surgically managed TTEI patients. An ambi-directional observational study included all adults who underwent surgical treatment for TTEI over a 6 year period. Demographic data, elbow range of motion (ROM), and quickDASH scores were collected. Elbow ROM range of motion data was used in a preferential order of a participation goniometer measurement followed by a photographic measurement and lastly recorded values within the patient's file. Of the 49 eligible patients (mean age 37.5 ± 12.3 years), 39 patients followed up post-operatively at a median of 2.0 months (1.0 – 4.7). Only 17 of the 49 patients were successfully recruited to participate. Mean flexion and extension endpoints were $118.65^\circ \pm 19.38^\circ$ and $39.88^\circ \pm 19.34^\circ$ respectively, while mean flexion-extension arc (FEA) was $77.44^\circ \pm 28.47^\circ$ (n=36). Pronation and supination had mean endpoints of $58.36^\circ \pm 26.37^\circ$ (n=32) and $54.91^\circ \pm 32.50^\circ$ (n=30) respectively, with mean prosupination arc (PSA) at $111.17^\circ \pm 52.28^\circ$ (n=30). Median (interquartile range) quickDASH score among participants was 31.8 (9.1 – 47.7), with 7 participants scoring <25 [9.1 (8.0 – 10.2)] and 8 participants between 25 and 50 [40.9 (35.2 – 48.3)]. Functional flexion-extension ROM, accepted as 130° flexion and 30° extension with a FEA of 100° , was not met, but prosupination functional ROM (50° prosupination and 100° PSA) was retained. The discrepancies that exist between the measured ROM and the subjective patient reported outcomes suggest that further investigation is needed to understand the clinical impact on patient experience and functionality.

P8: Microbiology of unresolved bone infection: is it recurrence or recalcitrance?

Category: General

Presentation: Oral

Adrian Jansen van Rensburg (University of Stellenbosch), Jerry Tsang (University of Edinburgh), Rudolph Venter (University of Stellenbosch), Gadi Epstein (University of Stellenbosch), Nando Ferreira (University of Stellenbosch)

Bone infections are dreaded complications and remain a challenge for orthopaedic surgeons. Unresolved bone infection is caused by a broad spectrum of microorganisms however, few persist while others re-emerge. This study reviewed the recurrence and recalcitrance of microorganisms in unresolved bone infection in the setting of South Africa. Recalcitrance of bone infection was defined as the persistence of the same species of pathogen isolated at the time of index eradication surgery for bone infection. Recurrence was defined as a change in pathogen profile at the time of revision infection eradication surgery.

A single-centre retrospective cohort study reviews patients who underwent revision eradication surgery for unresolved bone infection between June 2016 to March 2023. A total of eleven patients had unresolved bone infections following eradication surgery, with a mean age of 43.27 years (± 12.64 SD, range 25 – 58). The median time between surgeries was 281.63 days (IQR 11.2 – 552.05, range 42 – 914).

The microorganisms isolated at index surgery was compared to microorganisms isolated at secondary surgery. There is no statistically significant difference in the number of single species yielded ($p=0.586$), polymicrobial species yielded ($p=1.0$) or negative yield ($p=0.635$) at secondary surgery. There is no similarity in the distribution of microorganisms at index surgery and secondary surgery. The causative pathogen of unresolved bone infection was most likely to be different from the initial isolate obtained at the time of index surgery (73%), representing recurrence rather than persistence of the original infection.

This study reported a higher probability of encountering different species of microorganisms at secondary surgery as opposed to the recurrence of similar species. The culture obtained at index surgery is not a reliable predictor of microorganisms involved in recurrent bone infection. Therefore, new deep specimens are always required to determine the causative microorganism of unresolved bone infection.

P9: Fracture Detection in Wrist Trauma X-ray: Optimising Algorithm Performance Using Transfer Learning

Category: General

Presentation: Oral

Andrew Boyes (Stellenbosch University), Andries Engelbrecht (Stellenbosch University), Franz Birkholtz (Institute of Orthopaedics and Rheumatology and Stellenbosch University), Maaïke Eken (Institute of Orthopaedics and Rheumatology)

With advances in artificial intelligence, the use of computer-aided detection and diagnosis in clinical imaging is gaining traction. Typically, very large datasets are required to train machine-learning models, potentially limiting use of this technology when only small datasets are available. This study involved machine-learning-based models for wrist fracture detection. Specifically, it investigated whether pretraining of fracture detection models on large, existing datasets could improve the performance of the model when locating and classifying fractures in a small X-ray image dataset. This concept is termed “transfer learning”.

Firstly, three detection models, namely, the faster region-based convolutional neural network (faster R-CNN), you only look once version eight (YOLOv8), and RetinaNet, were pretrained using the large, freely available dataset, common objects in context (COCO)(330 000 images). Secondly, these models were pretrained using an open-source wrist X-ray dataset called “Graz Paediatric Wrist Digital X-rays” (GRAZPEDWRI-DX) on a (1) fracture detection dataset (20 327 images) and a (2) fracture location and classification dataset (14 390 images). An orthopaedic surgeon classified the small available dataset of 776 distal radius X-rays (Arbeitsgemeinschaft für Osteosynthesefragen Foundation / Orthopaedic Trauma Association; AO/OTA), on which the models were tested.

Detection models without pre-training on the large datasets were the least precise when tested on the small distal radius dataset. The model with the best accuracy to detect and classify wrist fractures was the YOLOv8 model pretrained on the GRAZPEDWRI-DX fracture detection dataset (mean average precision at intersection over union of 50=59.7%). This model showed up to 33.6% improved detection precision compared to the same models with no pre-training.

Optimisation of machine-learning models can be challenging when only relatively small datasets are available. The findings of this study support the potential of transfer learning from large datasets to improve model performance in smaller datasets. This is encouraging for wider application of machine-learning technology in medical imaging evaluation, including less common orthopaedic pathologies.

P10: Implant Detection and Classification from a Small Dataset of Lower Limb X-rays: Performance of Deep Learning Models Pre-trained on Larger Datasets

Category: General

Presentation: Oral

Matt Swanevelder (Stellenbosch University), Andries Engelbrecht (Stellenbosch University), Franz Birkholtz (Institute of Orthopaedics and Rheumatology and Stellenbosch University), Maaïke Eken (Institute of Orthopaedics and Rheumatology)

Inaccurate identification of implants on X-rays may lead to prolonged surgical duration, increased complexity, and costs during implant removal. Deep learning models may help to address this problem, although they typically require large datasets to effectively train models in detecting and classifying objects, e.g. implants. This can limit applicability for instances when only smaller datasets are available. Transfer learning can be used to overcome this limitation by leveraging large, publicly available datasets to pre-train detection and classification models, and thereby enhancing accuracy and performance. The aim of this study was to assess the effectiveness of deep learning models in implant localisation and classification on a lower limb X-ray dataset.

Firstly, detection models were evaluated on their ability to localise four categories of implants, e.g. plates, screws, pins, and intramedullary nails. Detection models (Faster R-CNN, YOLOv5, EfficientDet) were pre-trained on the large, freely available COCO dataset (330000 images).

Secondly, classification models (DenseNet121, Inception V3, ResNet18, ResNet101) were evaluated on their ability to classify five types of intramedullary nails. Localisation and classification accuracy were evaluated on a smaller image dataset (204 images).

The YOLOv5s model showed the best capacity to detect and distinguish between the different types of implants (accuracy: plate=82.1%, screw=72.3%, intramedullary nail=86.9%, pin=79.9%). Screw implants were the most difficult implant to detect, likely due to overlapping screw implants visible in the image dataset. The DenseNet121 classification model showed the best performance in classifying different types of intramedullary nails (accuracy=73.7%). Therefore, a deep learning model pipeline with the YOLOv5s and DenseNet121 was proposed for the most optimal performance of automating implants localisation and classification for a relatively small dataset.

These findings support the potential of deep learning techniques in enhancing implant detection accuracy. With further development, AI-based implant identification may benefit patients, surgeons and hospitals through improved surgical planning and efficient use of theatre time.

P11. A survey of orthopaedic injuries in South African adult jiu-jitsu athletes

Category: General

Presentation: Oral

Aderonke Ojewole (Stellenbosch University), Cameron Anley (Stellenbosch University), Marilize Burger (Stellenbosch University)

Jiu-Jitsu originated from Japanese Kodokan judo and evolved in Brazil where “Vale Tudo” (anything goes) matches gained popularity. It is now referred to as Brazilian Jiu-Jitsu (BJJ) and has become internationally commercialised with the growth of Mixed Martial Arts. The common goal of BJJ is to force the opponent into submission with the threat of joint manipulation out of physiological range or alternatively threaten strangulation.

This cross-sectional, descriptive study aimed to investigate the 12-month period-prevalence of injuries sustained in South African BJJ athletes above 18 years of age and analyse their epidemiological characteristics, help-seeking behaviour and orthopaedic surgical interventions.

Participants were by means of purposive sampling via the Jiu-Jitsu and Grappling Association of South Africa, recruited through an online survey consisting of 12 to 41 questions, depending on the responses given. Data was analysed and reported descriptively.

A total of 234 completed surveys were received. The mean age of the participants was 33.9 ± 9.3 years. The prevalence of injuries was 75.2% (176/234) with 176 athletes reporting 264 injuries.

Injuries were most common around the knee 20.1% (53/264) and 89.8% (237/264) of injuries occurred during training. The positions where most injuries occurred were during a scramble 31.1% (82/264) or submission 28.4% (75/264). There was no significant difference in injury rates between males and females, different weight categories or belt ranks. An orthopaedic consultation was sought in only 13.6% of injuries (36/264) of which 50% (18/36) required surgical intervention primarily involving the knee 50% (9/18).

P12: Safety, Efficacy and Patient experience of Orthopaedic Day Case Surgery in South Africa

Category: General

Presentation: Oral

Edgar Majirija (University of Cape Town), Michael Held (University of Cape Town)

Orthopaedic day case surgery (ODCS) is a key cost saving measure in our increasingly constrained healthcare system. However, no studies exist on its safety and acceptance by patients in the South African context. We set out to determine hospital experience, efficiency and perioperative safety for patients undergoing ODCS at a state hospital and private facilities in South Africa.

This was a prospective descriptive study of patients scheduled for ODCS from January 2023 to December 2024. Telephonic follow-up was 24-hours and thirty days post-operatively. We assessed the incidence of perioperative adverse outcomes, pain, patients' hospital experience and unplanned overnight stays.

91 patients (median age 32) were operated during the study period, 49 in private facilities. Top procedures were Anterior Cruciate Ligament (ACL) reconstruction, Meniscus repair and Ankle ligament repair. 83.5% were American Society of Anaesthesiologist score (ASA) I, 90% received General Anaesthetic. 70 (78.6%) were discharged post-operatively. All 19 unplanned admissions occurred at the state hospital. 84 patients (94.4%) reported acceptable post-operative pain. Nausea was reported in 1.9%, bleeding and swelling in 3.4%, dizziness 9.0% during first 24-hours post-operative. 4 (4.5%) reported surgical-site infection, 2 needed unplanned readmission post-operatively, 6 (6.7%) needed unplanned access to care. 86.5% reported good to excellent hospital experience, 4.5% would not want to have the same experience again.

Day case orthopaedic surgery is safe. Patients were comfortable in both a state and private hospital setting. Yet, unplanned overnight stays and readmissions suggest inefficiencies or resource restrictions in the state hospital.

P13: Communication in orthopaedics: What are the challenges and could technology improve communication skills?

Category: General

Presentation: Oral

Muhammed Abader (Wits University and Charlotte Maxeke Johannesburg Academic Hospital), Khodi Sikhauli (Wits University and Charlotte Maxeke Johannesburg Academic Hospital), Jurek Pietrzak (Wits University and Charlotte Maxeke Johannesburg Academic Hospital), Allan Roy Sekeitto (Wits University and Charlotte Maxeke Johannesburg Academic Hospital), Lipalo Mokete (Wits University and Charlotte Maxeke Johannesburg Academic Hospital), Caterina Nicolaou (Wits University and Charlotte Maxeke Johannesburg Academic Hospital), Bayanda Ndindwa (Wits University and Charlotte Maxeke Johannesburg Academic Hospital)

Communication is an essential component of a good healthcare system. Historically, orthopaedic surgeons' bedside manner and communication skills have always been of concern. The aim of this narrative review is to identify areas of communication failure and possible ways in which these can be improved. The review assesses inter-physician, physician and nurse, physician and patient communication challenges, as well as how newer technology has affected the way in which healthcare workers communicate with colleagues and patients alike. This review also discusses the pros and cons of smartphones in the workplace, and looks at the newer challenges of navigating data in the technological era. Lastly, this review will discuss the Protection of Personal Information Act 4 of 2013 or POPIA and how it has affected the way South African health professionals communicate and share or store patient information. With the world entering the fourth industrial revolution, effective, safe and reliable communication is vital to ensure the best outcomes for patients and orthopaedic surgeons alike.

P14: Comparison of patient reported outcomes (MOXFQ) and surgical complications following Total Ankle Replacement in rheumatoid arthritis versus osteoarthritis

Category: Foot and Ankle

Presentation: Oral

Jun Min Leow (Edinburgh Orthopaedics), Robert Kay (Edinburgh Orthopaedics), Hisham Shalaby (Edinburgh Orthopaedics), John McKinley (Edinburgh Orthopaedics)

Introduction

Total ankle replacement (TAR) is a surgical alternative to ankle fusion for treatment of end stage arthritis. It has been hypothesized that rheumatoid arthritis patients may experience worse outcomes due to altered immunomodulation, systemic disease modifying anti-rheumatic drugs (DMARDs) and low bone quality. Previous work using the American Orthopaedic Foot & Ankle Society (AOFAS) score suggests patient reported outcomes following TAR for osteoarthritis (OA) versus rheumatoid arthritis (RA) are indifferent, however the AOFAS score has limitations and has largely been superseded by the Manchester-Oxford Foot Questionnaire (MOXFQ) score, which demonstrates favourable data characteristics. Therefore, the aims of the present study were to compare outcomes in RA versus OA following TAR using the MOXFQ and describe associated complication rates.

Methods

This single-centred cohort study included all patients who underwent primary total ankle replacement between October 2010 and April 2023 (n=143 ankles, 114 patients). Data included patient demographics, comorbidities and patient reported outcome measured using MOXFQ. Multivariate logistic regression was used to assess differences in outcomes between OA vs RA after adjusting for significant co-variables. Cox-regression was used to investigate factors associated with revision operation. Subgroup analysis of RA patients was undertaken to assess the influence of pre-operative drug regime on outcomes.

Results

Change in MOXFQ score following TAR was equal between the RA and OA group after adjusting for demographic co-variables (OR, 1.01 [95% CI, 0.99-10.3], p=0.283). RA status was associated with increased risk of wound healing complications (OR 11.75 [95% CI, 1.06 – 130.32], p=0.045), whilst all other complications showed no difference. Preoperative methotrexate may be associated with inferior patient reported outcome following TAR with a trend towards significance (p=0.073).

Conclusion

RA status was not demonstrated to significantly affect change in MOXFQ score following TAR. Wound healing complications were higher in RA patients, while other surgical and medical complications rates were equivalent. Preoperative DMARD therapy may influence outcomes, however insufficient data were available to confirm this trend.

P15: A Prospective Evaluation for a Possible Safe Skin Bridge in Elective Foot Surgery

Category: Foot and Ankle

Presentation: Oral

Graeme Moore (University of the Witwatersrand), Nikiforos Saragas (University of the Witwatersrand), Paulo Ferrao (University of the Witwatersrand)

ABSTRACT

In foot and ankle surgery adequate surgical exposure often requires multiple incisions to be used near one another thus creating a skin bridge. As the skin bridge becomes narrower, the wound edge vitality is potentially compromised and therefore the wound's ability to heal. The impact of local, host and surgical factors on wound healing are well documented in the literature, however little is known about the role of the skin bridge. The aim of this study is to determine if there is a recommendable safe skin bridge in elective foot and ankle surgery.

A prospective study was performed on 56 patients with 60 feet who had elective foot surgery. The length of each incision and distance between the incisions were recorded. The wounds were assessed for complications at 2, 4 and 6 weeks after surgery. Patient demographics and host risk factors were documented.

The average incision length was 5.5 (range: 3 to 8.5) cm. The average skin bridge was 3.9 (range: 2 to 6.8) cm. Five (8.3%) of the 60 feet developed a wound complication. Four (80%) of these patients had a known comorbidity. Two patients had diabetes and two were smokers. The incidence of relevant comorbidities was 5.5% ($n = 3$) for patients without a wound complication ($p < 0.001$). Age did not differ significantly between patients with and without a wound complication. Patients with a wound complication had significantly longer incision lengths ($p = 0.047$). There was no significant independent association between skin bridge width and risk of wound complications ($p > 0.05$) with skin bridge widths of 2cm or larger.

In this cohort of 60 elective operative foot surgeries we did not find increased wound complications in skin bridges 2cm or larger. When meticulous surgical technique is practiced and host risk factors optimised a skin bridge width of 2cm is safe in elective foot surgery.

P16: Integrating quadrimalleolar fractures of the ankle in a Johannesburg academic centre: A new classification

Category: Foot and Ankle

Presentation: Oral

Collen Nkosi (University of the Witwatersrand), Papa Kyei (University of the Witwatersrand)

Introduction: Quadrimalleolar ankle fractures, which consist of trimalleolar fractures with additional anterior fractures, were initially described in a case report. We present a limited series of unusual fractures in the four malleoli ankles, together with demographic variables, to create a comprehensive quadrimalleolar ankle fracture classification system.

Methods: A retrospective review of computed tomographic (CT) scans of patients who sustained ankle fractures that were done at our academic hospital over three years. We included patients who had sustained quadrimalleolar ankle fractures. We classified all fractures based on preoperative CT scans.

Results: A total of 145 CT scans were reviewed, demonstrating quadrimalleolar ankle fractures in just eight cases. Out of the eight cases included, 75% were male, and the mean age at the time of injury was 39 years (range 21–59 years). We integrated quadrimalleolar ankle fractures into four classifications based on the fracture pattern.

Conclusion: Recognising these unique fracture patterns as distinct entities would contribute to more comprehensive knowledge and improve the classification system for quadrimalleolar ankle fractures and patient care.

P17: A case series on the devastating simultaneous bilateral fracture of ankles that remains under-reported: Can we address the career-ending injuries?

Category: Foot and Ankle

Presentation: Oral

Leonard Muhango (Wits), Thandile Cordes (Wits), Collen Nkosi (Wits), Mmampapatla Ramokgopa (Wits)

A case series on the devastating simultaneous bilateral fracture of ankles that remains under- reported:
Can we address the career-ending injuries?

Bilateral simultaneous rotational ankle fractures are an unusual phenomenon that remains unreported in the English literature, and to our knowledge, about ten cases have been reported. The aim of the study was to evaluate and report clinical outcomes of bilateral simultaneous ankle fractures in our institution.

We conducted a review of our two-year experience with patients who had simultaneous bilateral fractures of the ankles and were treated at our institution. The included patients underwent surgical treatment using open reduction and internal fixation. Patients' functional outcomes were assessed using PROMs (patient-reported outcome measures), namely the Short Form-36 questionnaire and the OMAS (Olerud and Molander Ankle Outcome Score).

Two cases (four ankles) of simultaneous bilateral rotational ankle fractures were identified in our institution's records. Both cases were involved in a pedestrian motor vehicle accident. They were both female and had an average age of 22.5 years. Due to an open injury, one ankle underwent staging procedure, and the other three underwent open reduction and internal fixation with better clinical outcomes. Functional outcomes were measured with PROMs.

In conclusion, simultaneous bilateral ankle fractures, while uncommon, can have a substantial impact on an individual's mobility and health related quality of life. Early surgical intervention and effective rehabilitation enhance functional results in this devastating journey.

P18: Patient reported outcomes comparing resection of Morton Neuroma in the 3rd vs. 2nd web space

Category: Foot and Ankle

Presentation: Oral

Dr.med. Ricarda Luise Conle (né Gaudin) (Groote Schuur Hospital, Charité Berlin), Prof. Graham McCollum (Groote Schuur Hospital)

Introduction: “Morton’s neuroma” (interdigital neuroma) is a common cause of forefoot pain. It is located most frequently at the 3rd intermetatarsal space (66%) but can also be found at the 2nd (32%) and sometimes the 4th intermetatarsal space (2%).

Excision of interdigital Neuroma can make an improvement in the quality of life of the affected patient. The aim of the study was to compare patient reported outcomes of resection of 3rd space neuromas with 2nd web space neuroma resections.

Methods: In a retrospective review of prospectively collected data, 92 neuromas in 89 patients that received surgical resection of 2nd and 3rd webspace neuromas between 2013 and 2022 were included in the study. 78 patients were contactable for a 1 year or longer follow up. Outcomes were evaluated using the Visual Analogue Scale (VAS),Foot Function Index(FFI) and Short form (SF-36) scores. Revision surgeries and complications were recorded.

Results: 57 patients had resection of a 3rd interdigital space neuroma and 21 resection of 2nd web space neuromas. SF-36 scores were 67.77(+25.7) in the 3rd space group and 60.4(+19.8) in the 2nd space group ($p=0.005$). FFI scores were 66.8(+19.2) in the 3rd space group and 57.8 (+22) in the 2nd space group.($P=0.13$).

VAS scores were 2(+4) in 3rd web space group and 4(+3) in the 2nd web space group. ($P=0.19$). There were 2(2.5%) revision resections and 3 wound complications.

Conclusion: Surgical resection of interdigital neuroma is an effective method of treatment with improvement in function and pain relief. Patients who had resection of 3rd webspace neuromas tended to have better PROMS, but only statistically significant in the SF-36 scores.

P19: The relationship between the morphology of the incisura fibularis tibiae and the pattern of posterior malleolus fractures

Category: Foot and Ankle

Presentation: Oral

Papa Kyei (University of Witwatersrand), Collen Nkosi (University of Witwatersrand), Richard Paterson (University of Witwatersrand), Abdirashid Aden (University of Witwatersrand)

The science regarding the posterior malleolus (PM) of the distal tibia has grown and certainly the approach has evolved in recent years regarding a fracture in this region. A particular area of importance at the distal tibia is called the Incisura fibularis tibiae. Advanced imaging has aided in identifying fractures that involve the incisura. Studies have shown that the anatomy of the incisura is variable and that there are different patterns of PM fractures. This study aimed at evaluating the relationship between the anatomy of the incisura and pattern of PM fractures

A retrospective review was done of patients who sustained PM fractures at an academic hospital over a period of three years. The demographic characteristics, Incisura and PM characteristics of preoperative bilateral ankle computed tomography (CT) scans were analysed. The relationship of the anatomy of the incisura on the unaffected ankle and the pattern of PM fracture on the injured ankle was evaluated. Incisura fibularis tibiae morphologies were measured using axial CT images from 5mm proximal to the tibial plafond. The PM fractures were categorized according to the PM classification systems.

A total of 145 cases who sustained PM fractures were included. The data revealed that females were the majority, accounting for 61% while the right ankle was the most commonly injured.

We analysed the incisura depth, incisura rotation, incisura width, and incisura shape, and the data revealed statistical significance ($p < 0.001$). There was a statistical difference with the types of PM fractures and the incisura pattern ($p\text{-value} = 0.0131$). A statistically significant relationship was observed between the fibula engagement and PM fractures ($p = 0.049$).

In conclusion certain fractures of the posterior malleolus were more prevalent in individuals with particular anatomical configurations of the tibia incisura and fibula.

P20. Management of Middle Third Clavicle Fractures: should we plate or brace?

Category: Trauma

Presentation: Oral

Hanan Wilson (Wits) , Aftab Younus (Wits) , Jason Du Plessis (Wits)

Few fractures pose more therapeutic controversy than middle third clavicle fractures. The historic notion that these fractures heal well with non-operative management popularized by Neer in 1960 has been repeatedly disproven by subsequent literature, especially when measuring patient satisfaction and functional outcome. Nonetheless, non-operative management still remains the mainstay of treatment in the South African public sector with cost and lack of theatre time the major quandaries to the surgical alternative.

We compared patient reported outcomes measures (PROM) using American Shoulder and Elbow Surgeon (ASES) score of 44 adult patients treated at a public institution between 2018 and 2023 for middle third clavicle fractures with immobilisation only (27) or plating (17).

Our preliminary results showed an average age 36 years, male predominance of 69% and the most common mechanisms of injury motor vehicle accidents (MVA) and fall from standing height. The average follow up period was 35 months.

The non-operative cohort had an average ASES score of 75 compared to 88 for the surgical cohort. This was not statistically different. Of the surgical cohort, 82% were happy with the result compared to only 55% of the non-operative cohort, with the most common complaints being persistent pain and weakness. Grading of pain for the non-operative operatively managed patients averaged 3.0 compared to 1.3 for the operative group.

We conclude that middle third clavicle fractures occurred secondary to a fall or MVA in young males and are treated predominantly non-operatively. Patients report superior outcomes with less pain and more function with operative management, although marginal.

P21. Reviewing our institutional experience of percutaneous versus open plating of proximal humeral fractures

Category: Shoulder and Elbow

Presentation: Oral

Aftab Younus (Helen Joseph Hospital) , Mohammad Aftab (Helen Joseph Hospital) , Jana Dreyer (Helen Joseph Hospital) , Tshepo Sebeko (Helen Joseph Hospital)

Background: Fractures of the proximal humeral are a common referral to orthopaedic centres. While undisplaced fractures can be managed conservatively with a plaster U-slab, the Neer criteria define the requirements for operative intervention. Pre-countoured titanium locking plates are the mainstay of operative intervention in these patients however several studies report the advantages of percutaneous humeral plating in 2-part proximal humeral fractures.

Objectives: To compare the operative parameters, and post-operative outcome, of 23 patients who underwent open plating of their 2-part proximal humerus fractures, to those of 26 patients with the same fracture site and configuration, who underwent percutaneous plating.

Methods: We performed a retrospective chart review of 49 patients who presented to our unit with proximal 2-part humeral fractures over a 6-year period from the 1st January 2014 to 29th November 2019, 23 of which underwent open plating and 26 of which underwent percutaneous plating. The data captured and analysed in this study included patient's age; gender; mechanism of injury; fracture pattern; indication for surgery; whether an open plating or minimally invasive percutaneous plating was performed; time from injury to operative intervention; length of operative procedure; volume of intra-operative blood loss; complications; amount of early post-operative surgical site pain assessed by the Visual Analogue Pain Scale score; range of shoulder movement at the 3-week follow-up appointment; length of hospital stay; and patient satisfaction at a 1-year follow-up end point.

Results: The findings were that when comparing open humeral plating versus percutaneous humeral plating, in the management of 2-part humeral fractures, a significant reduction was demonstrated in; length of surgery; volume of intra-operative blood loss; length of hospital stay; three-week functional recovery; one-year patient satisfaction, all of which favoured the percutaneous humeral plating group.

Conclusion: Percutaneous humeral plating offers significant advantages over open plating in 2-part proximal humeral fractures. We recommend that this should be the primary operative procedure considered by orthopaedic surgeons who manage this form of fracture configuration

P22. Functional and patient-reported outcomes of terrible triad elbow fracture-dislocations

Category: Trauma

Presentation: Oral

JP Strydom (Stellenbosch University)

The elbow ranks second only to the shoulder as the most commonly dislocated large joint in the human body. Terrible Triad Elbow Injuries (TTEI) involve an elbow dislocation coupled with a radial head and coronoid fracture. This study aimed to assess functional and patient-reported outcomes for surgically managed TTEI patients. An ambi-directional observational study included all adults who underwent surgical treatment for TTEI over a 6 year period. Demographic data, elbow range of motion (ROM), and quickDASH scores were collected. Elbow ROM range of motion data was used in a preferential order of a participation goniometer measurement followed by a photographic measurement and lastly recorded values within the patient's file. Of the 49 eligible patients (mean age 37.5 ± 12.3 years), 39 patients followed up post-operatively at a median of 2.0 months (1.0 – 4.7). Only 17 of the 49 patients were successfully recruited to participate. Mean flexion and extension endpoints were $118.65^\circ \pm 19.38^\circ$ and $39.88^\circ \pm 19.34^\circ$ respectively, while mean flexion-extension arc (FEA) was $77.44^\circ \pm 28.47^\circ$ (n=36). Pronation and supination had mean endpoints of $58.36^\circ \pm 26.37^\circ$ (n=32) and $54.91^\circ \pm 32.50^\circ$ (n=30) respectively, with mean prosupination arc (PSA) at $111.17^\circ \pm 52.28^\circ$ (n=30). Median (interquartile range) quickDASH score among participants was 31.8 (9.1 – 47.7), with 7 participants scoring <25 [9.1 (8.0 – 10.2)] and 8 participants between 25 and 50 [40.9 (35.2 – 48.3)]. Functional flexion-extension ROM, accepted as 130° flexion and 30° extension with a FEA of 100° , was not met, but prosupination functional ROM (50° prosupination and 100° PSA) was retained. The discrepancies that exist between the measured ROM and the subjective patient reported outcomes suggest that further investigation is needed to understand the clinical impact on patient experience and functionality.

P23: Access to reverse shoulder arthroplasty in South African public hospitals and strategies used by surgeons to plan for structural glenoid defects

Category: Shoulder and Elbow

Presentation: Oral

Pududu Rachuene (University of Pretoria), Roopam Dey (University of Cape Town), Sudesh Sivasu (University of Cape Town), Steve Roche (University of Cape Town)

Background: This study aims to assess the current status of access to reverse shoulder arthroplasty (RSA) in South Africa, focusing on geographical distribution, healthcare facility characteristics, surgeon demographics, and barriers to implementation.

Methods: This study included a combination of methodologies to assess the availability and ease of access to reverse shoulder arthroplasty in the public healthcare sector of South Africa. A survey questionnaire was administered to sixty individuals employed in public institutions at the secondary and tertiary levels in all nine provinces of South Africa, in order to assess the level of availability. We received feedback from 33 respondents (55%). Using a conceptual framework, we examined the capacity and utilisation of healthcare institutions, the geographical and timely accessibility of reverse shoulder arthroplasty, and the availability of competent people and operating facilities.

Results: Of those surveyed, almost 52% worked in tertiary or quaternary level hospitals, and 55% of those facilities had an operating room specifically reserved for elective orthopaedic procedures.

Urban locations largely hosted tertiary level hospitals, which accounted for 94% of the institutions equipped to execute RSA. Conversely, rural areas saw a significant scarcity of these services. The country had around 0.5 sub-specialist shoulder surgeons per 1,000,000 residents. The main obstacles identified for the limited availability of the procedure were a scarcity of skilled individuals (48.5%), insufficient allocation of operating room time (45.5%), and inadequate operating room facilities (33.3%). In addition, 21.6% of respondents mentioned that RSA prosthesis was not included in the provincial tender system, while 45.5% pointed out the lack of a proper referral facility.

Conclusion: This study highlights the inequalities in access to RSA in South Africa, emphasising the necessity for targeted initiatives to tackle regional disparities, improve surgical skills, and overcome obstacles that impede the successful delivery of this crucial treatment.

P25: Prevalence of second victim experiences and baseline resilience of South African shoulder and elbow surgeons.

Category: Shoulder and Elbow

Presentation: Oral

Megan O'Connor (University of KwaZulu-Natal), Cameron Anley (Stellenbosch University), Stephen Roche (University of Cape Town), Charl van den Berg (Private), Michael Mulder (Private), Leon Rajah (Private)

The second victim experience, the emotional and psychological distress experienced by healthcare workers following adverse medical events, can impair healthcare workers' ability to care for patients or themselves. This study aims to explore the second victim experience among the shoulder and elbow surgeons of South Africa, delineating its prevalence, and determining its relationship to resilience.

This cross-sectional study comprised a survey, conducted in either paper-based or online versions, over a six-week period around the South African Shoulder and Elbow Surgeons Society (SASES) annual meeting in May 2023. The survey captured demographic details of the surgeons, their second victim experience utilising the Second Victim Experience and Support Tool, and their baseline resilience using the 25 item Connor-Davidson Resilience Scale. The prevalence of the second victim experience and mean resilience were evaluated. Statistical analysis was conducted to test for correlation between the second victim experience and the baseline level of resilience.

There were 53 respondents, of a total 77 SASES members, accounting for a response rate of 69%. All respondents were male (100%) with a median age of 54 years. The majority of respondents reported working in the private sector (77%) and had been in practice for a median of 18 years.

Twenty-five percent of respondents reported having faced a second victim experience. The predominant features of the second victim experience in all respondents were psychological distress (77%) and physical distress (67%). The median score for resilience was 73 (out of 100), where respondents scored highest in the 'hardiness' subgroup. Resilience had a significant but weak negative correlation to the second victim experience, the greater the resilience in respondents the less likely they were to report a second victim experience.

This study elucidated that one quarter of a cohort of South African orthopaedic surgeon respondents have had

a second victim experience, most of whom encounter physical and psychological distress as a result. Positively, it seems that more resilient surgeons are less likely to suffer a second victim experience. Further research to develop tailored interventions aimed at improving resilience may benefit surgeons in coping with adverse medical events.

P26: The incidence of Coracoid Fracture in patients with Recurrent Anterior Shoulder Dislocations and their Impact on Treatment Decision Making

Category: Shoulder and Elbow

Presentation: Oral

Rory Schanknecht (University of Pretoria) , Allyson Adams (University of Pretoria) , Lindiwe Kolotsi (University of Pretoria) , Marumo Moloto (University of Pretoria) , Mashupse Phala (Lenmed Kathu Private Hospital) , Pududu Rachuene (University of Pretoria)

Coracoid fractures are rare. The incidence of associated recurrent shoulder dislocations is poorly addressed in literature. The implication of these concurrent pathologies is not well described. It remains unclear if the occurrence of this dual pathology should alter decision making when addressing shoulder instability.

The study investigates how the presence of a coracoid fracture impacts the treatment decision-making process in patients with recurrent shoulder dislocations and aims to clarify the incidence of this condition.

This retrospective observational study involves analysing medical records from a selected cohort of patients diagnosed with recurrent shoulder dislocations.

All patients who underwent shoulder stabilisation for anterior shoulder instability during our study period will be included in our results. Exclusion criteria are as follows: patients with shoulder instability other than anterior shoulder instability, previous surgery to the shoulder, patients with anterior shoulder instability not treated with shoulder stabilisation procedure, patients with shoulder instability treated with shoulder arthroplasty, patients with shoulder instability following shoulder arthroplasty and patients with chronic shoulder dislocations.

Descriptive statistics will be employed to analyse demographic data of the sample groups, with measures reported as mean and range. Chi-square tests or logistic regression, will be used to determine associations between coracoid fractures and treatment choices, adjusting for potential confounders.

Three of the forty-two patients in our sample group were found with coracoid fractures. Two patients had concomitant greater tuberosity fractures that needed to be addressed. The third patient had a malunited coracoid fracture that was incorporated into a Latarjet procedure.

We conclude that coracoid fractures in shoulder instability are not as rare as previously thought, with an incidence of 7.14%. A larger study would be able to provide more clarity on this previously underreported injury.

P27: Magnetic resonance imaging (MRI) findings in water polo players with shoulder pain.

Category: Shoulder and Elbow

Presentation: Oral

Pieter Venter (Groote Schuur Hospital), Stephen Roche (Groote Schuur Hospital), Jean-Pierre du Plessis (New Somerset Hospital), Ntambue Kauta (Mitchell's Plain Hospital)

This paper aims to describe abnormalities found on magnetic resonance imaging (MRI) of the shoulders of water polo players who presented with shoulder pain.

A Retrospective review was done of MRI reports of competitive water polo players younger than 25 years that presented to the practices of the senior authors with the complaint of shoulder pain, between 1 January 2012 and 31 January 2020. The cohort was divided into two groups (younger than 18 years and older than 18 years) to assess whether there is a difference in the pattern of injuries. The abnormal MRI findings were tabulated and compared with clinically suspected pre-scan diagnoses noted in clinical notes, as well as with findings of a limited series published in the literature.

A total of 34 MRI reports of water polo players were included in the study. The mean age was 17 years and 4 months ($17,4 \pm 2,7$). Two of the MRI scans (2/34; 5,9%) did not show abnormalities. Eighty abnormalities were reported, the most common pathology involving the labrum (19/80; 23,8%) followed by rotator cuff pathology (18/80; 22,5%). There was a 73,5% positive correlation ($p = 0,0061$) between the MRI and suspected pre-scan diagnosis. The presence of abnormalities was also dependent on age group. Uncommon pathologies (coracoid avulsion fracture, lesser tuberosity fracture, acromial apophysiolysis) were found in the group younger than 18.

Labral pathology was the most common finding, followed by rotator cuff abnormalities. A strong correlation was found between clinical examination and MRI findings.

P28: Short term outcomes of a loop and tack intra-articular long head of biceps tenodesis

Category: Shoulder and Elbow

Presentation: Oral

Praval Dawadi (University of the Witwatersrand) , Jason du Plessis (University of the Witwatersrand)

Long head of biceps tendon (LHBT) is often a significant pain generator in the shoulder, where various pathologies are common and typically treated at the time of arthroscopy. Surgical treatment options typically include tenodesis or a tenotomy. Both have shown favourable results in literature.

Tenotomy has the advantages of being simple; having low surgical morbidity; quick and having good, predictive pain relief. Tenodesis has shown to avoid cosmetic deformity, avoids cramping and maintains supination strength when compared to tenotomy, and as a result is often favoured in younger individuals.

Most systemic review and meta-analysis found no functional differences between tenodesis and tenotomy, although Vajda et al found superiority in tenodesis.

In our unit we employ an intra-articular knotless long head of biceps tendon tenodesis.

The aim of the study was to determine our short-term results of this ‘loop ‘n tack’ technique of LHBT tenodesis, helping us to determine whether we should continue with our practice or amend to doing a simple tenotomy.

This was a cross-sectional study, with data collected over a period of six months.

Patients who underwent an arthroscopic LHBT tenodesis and were at least three months post- surgery formed the study population. Patients were seen at their routine follow-up appointments and the following was noted: pain, biceps weakness, presence of a ‘‘Popeye sign’’, Speed’s test, an ultra- sound evaluation to check whether the tendon was still in the bicipital groove and the ASES score was noted.

We found that most patients had minimal pain, weakness, no Popeye sign, Speeds test negative and excellent ASES scores.

We conclude that this is an easy, reproducible arthroscopic technique that is giving us good results. We will continue to monitor our patient’s progress.

P29: Metallosis In Upper Limb Arthroplasty

Category: Shoulder and Elbow

Presentation: Oral

Hammaad Gamieldien (UCT) , Stephen Roche (UCT), Pududu Rachuene (UP)

The investigation of metallosis in upper limb arthroplasty is particularly crucial given the paucity of literature in this area. Titanium (Ti), chromium (Cr) and cobalt (Co) are often measured in the monitoring and evaluation for local metal ion release from metal-on-metal joint arthroplasty. Ti is the ninth most common element in the earth's crust and 99% of daily exposure can be accounted for through food intake. Elevated serum Ti levels have been noted in patients with Ti-alloy joint replacements, suggesting its potential as a marker for implant degradation. Chromium has garnered attention due to its release from metal-on-metal (MoM) implants, often associated with physical symptoms preceding elevated serum levels. Co is widely distributed in the environment and an essential cofactor for Vitamin B12, with 85% of Cobalt in the body found in the form of cyanocobalamin. The addition of Co in MoM prosthetics adds resistance to surfaced undergoing heavy wear, and the release of Co from these prosthetics is of high concern. Co toxicity can cause pulmonary oedema, skin irritation nausea, thyroid abnormalities and cardiomyopathy. Several cases of severe neurological and cardiac abnormalities have been described in patients with failing MoM prosthetics due to Co toxicity.

Four patients undergoing revision surgery for looseing were suspected of having metallosis. Heavy metal bloods were done pre-operatively. These patients were followed up clinically and 2 out of the 4 patients had follow up bloods done at 6 weeks. A simple descriptive analysis of the trend of the blood results were done due to the small cohort.

In all the patients the suspicion of metallosis was confirmed clinically with the presence of pseudotumor, synovitis and implant loosening. None of the patients displayed the clinical manifestations of heavy metal poisoning despite raised blood levels. In 2 out of the 4 patients the heavy metal blood levels had decreased by greater than 40% following removal of the implants.

Serum or plasma titanium, mylebdirum, cobalt and chromium may be used to support a diagnosis of metallosis based on clinical suspicion. However the main disadvantage of these test remain the risk of contamination and costly analysis.

P30: An assessment of the correlation between patient-reported outcome measures (PROMs), subjective patient satisfaction, and clinico-radiographic outcomes among several shoulder surgical procedures in a broad demographic group

Category: Shoulder and Elbow

Presentation: Oral

Pududu Rachuene (University of Pretoria) , Allyson Adams (University of Pretoria)

Over the last decade Patient Reported Outcome Measures (PROMs) have been used with increasing frequency to augment the conventional methods of measuring the success of surgical procedures (1). Various methods of obtaining PROMs in the busy clinic have been advocated, with technology being used more and more to elicit patient responses (1). The South African population is unique, in that only 1/3rd of adults in South Africa have access to a smart phone (2). This makes the administration of electronically based surveys, as is done in first world countries, challenging. While we are moving towards electronically based radiological outcomes and electronic record-keeping of objective clinical outcomes, PROMs remains difficult in our setting. The purpose of this study is to look at all three aspects of post-operative patient assessment in our low resourced setting with a diverse patient population group. The potential impact will be identification of barriers with the intention of modification of future practice.

We electronically recorded clinical information regarding the patients' objective outcomes. We included all adult patients who had had shoulder or humerus surgery, including arthroplasty, fracture fixation and arthroscopy. We then sent each patient a questionnaire encompassing the Simple Shoulder Test (SST) and American Shoulder and Elbow Surgeon's (ASES) Shoulder Score and documented their response at the final follow-up.

The study is currently on-going, but the findings suggest that our patient population faces challenges with access to electronically based information and interactions. While anonymity is essential to ensure accurate and sincere responses, this process may require modification in future.

P31: Paediatric orthopaedic surgery: Impact of outreach on surgical management in rural communities

Category: Paediatrics

Presentation: Oral

Abraham Erasmus (Universitas Academic Hospital)

The Paediatric orthopaedic Outreach service in the Free State and Northern Cape provinces of South Africa has existed since 1994. Paediatric orthopaedic Outreach programs, Outreach influence on service delivery, and the effect on patient outcomes are rarely studied.

Our study aimed to evaluate Outreach in terms of the timely completion of surgical management of patients in rural communities. We calculated and compared the waiting time for paediatric patients in the Outreach catchment toward completed surgical management between January 2015 and December 2018.

Our study followed a retrospective descriptive analytical design. We analysed Outreach data and Academic Medical Centre (AMC) records of the patients of the Paediatric Orthopaedic Unit who underwent surgery between January 2015 and December 2018. The waiting time for surgery was calculated from the first consultation until surgery was performed. We compared the waiting time of patients from Outreach with patients directly referred to the AMC.

Patients from Outreach had a median waiting period of 121 to 240 days for surgery, while patients from the Central group had a median waiting period of 0-30 days. When all emergency and urgent cases were omitted from the statistics, the median waiting period for Outreach was 121-240 days (average 268.5 days), while the median waiting period for the Central Group was 61-120 days (average 170.4 days).

Considering the quarterly Outreach visits to each rural area and the number of patients, timely completion of surgical management was acceptable for patients primarily assessed in Outreach. More than half of the patients who underwent surgery between January 2015 and December 2018 resided in the regions outside the direct catchment of the AMC. This is an indicator that there exists a large demand for specialist services in Outreach catchment areas. Outreach is dependent on budget regulation of the Department of Health and should be expanded considering these important findings.

P32: A case series of chronic displaced radial neck fractures and their outcomes post fixation

Category: Paediatrics

Presentation: Oral

Bernard Steyn (Wits), Dina Simmons (Wits), Troye Joseph (Wits), Curran Hitge (Wits)

Radial neck fractures are a common injury in children and more prevalent between ages 9 and 10 years. There is a paucity in literature around the treatment of late presenting radial neck fractures with most sources stating they should be treated on a case-by-case basis. Literature pertaining to this topic is limited to case reports. We conducted a retrospective review of late presenting radial neck fractures. Inclusion criteria were patients over age 5 years and patients who underwent the procedure at our facility. Exclusion criteria were patients older than 18 and injuries presenting less than two weeks after injury.

We identified four cases of chronic radial neck fractures in a 6 month period and reviewed the clinical and radiological outcomes. All were treated with open reduction and internal fixation using k-wires, which were later removed. Minimum follow up was one year.

Mean age was 9 years (range 6-13 years). Mean days from injury 79.5 days (36-157). Using the Judet Classification, 3 cases were Judet IVa and 1 was Judet III. The mean pre-operative elbow range of motion was 25.5°, with the mean fixed flexion deformity of 72.5°. Mean pronation and supination were 30° and 3.75° respectively. At one year follow up the mean improvement in flexion was 26.25°, in fixed flexion was 54°, and supination and pronation improved by a mean of 32.5 and 16.25 respectively. None of the follow up radiographs demonstrated any evidence of avascular necrosis. There were no surgical or wound complications noted.

This is the largest cohort of these injuries reported that the authors are aware of. We demonstrated good outcomes of open reduction and k-wires with an improvement of function in elbow and forearm range of motion as well as decreasing the fixed flexion deformities, with no complications at one year follow up.

P33: Application of Artificial Intelligence for Diagnosing Paediatric Elbow Injuries: Preliminary Findings from Red Cross Children's Hospital Orthopaedic Unit

Category: Paediatrics

Presentation: Oral

Le Roux Viljoen (The Surgical Assistant), Nicholas Kruger (Groote Schuur Hospital), Bilal Aslan (UCT)

Interpreting pediatric x-rays is challenging. In resource constrained areas such as South Africa, radiology reporting is seldom available and the responsibility of interpreting falls on the shoulders of the attending physician. Interpretational errors can lead to serious consequences and this is compounded by the fact that Emergency Rooms (ERs) are regularly staffed with junior doctors.

With the development of Artificial Intelligence (AI) and the strides it has made over the past decade, we made use of retrospective cohort study to determine if AI can be an adjunct to clinical decision making. We retrospectively extracted 2378 AP and lateral elbow radiographs with/without pathology from "the hospital" that were performed in a 5 year period. Inclusion criteria was set to anteroposterior (AP) and lateral elbow radiographs done in the trauma setting, both in private and state practice which have been reported in writing by a radiologist. Exclusion criteria included AP and lateral elbow radiographs which had no radiologist report, radiographs that had pre-existing implanted orthopedic hardware, as well as radiographs of patients over the age of 16 years.

For our study we utilized a pre trained- Zen-NAS AI system. 2378 radiographs were used to train our AI model on 13 set parameters of abnormal findings on pediatric AP and Lateral X-ray, as reported by the radiologist. 193 radiographs were used for validation and 169 were used to test the validation.

Findings from our AI dataset had a sensitivity of 87% and specificity of 94% returned on the 13 parameters. By looking at other comparable research and our results, and taking limitations into account, we came to the conclusion that AI can, and most likely will, form a cornerstone of interpreting pediatric elbow x-rays and ultimately become a clinical adjunct in the management of patients.

P34: Paediatric Civilian gunshot injuries: A 10-year epidemiological study and Review of Orthopaedic Management

Category: Paediatrics

Presentation: Oral

Frances Verfuss (UCT), Khameela Leyland (UCT), Kim Laubscher (UCT), Stewart Dix Peek (UCT), Nisha Jacob (UCT), Sithombo Maungo (UCT)

In South Africa, the prevalence of violent crime, especially involving firearms, poses a significant public health challenge, particularly when it affects children. Previous studies showed a decrease in paediatric civilian gunshot injuries following the introduction of the 2004 Firearms Control Act. This study examines the epidemiological trends of gunshot injuries in children from 2011 to 2020.

A descriptive cross-sectional study was performed on children aged 0-12 years presenting to a tertiary paediatric trauma center with gunshot injuries from January 2011 to December 2020. The data was drawn from a local database and hospital records. We evaluated demographics, injury specifics, and orthopaedic outcomes.

The number of gunshot patients showed an increasing trend of +2.69 (95%CI 1.05 – 4.33) patients per year with a total of 236 patients affected. Males predominated (56.8%), with the largest age group affected being children aged 5-9 years (44%). Orthopaedic injuries were present in 67 cases (28.3%). A total of 71 fractures were recorded, with 54 occurring in the extremities and 17 involving the spine or pelvis. The lower extremities were most affected, necessitating surgical interventions such as external fixators and/or femur nails. Peripheral nerve injuries and spinal cord injuries resulted in significant long-term morbidities. The severity and complexity of all assessed injuries often required multiple surgical procedures and extended hospital stays, with an admission length of ~10 days, with some patients requiring intensive care (17.37% of cases). Morbidity included complications like wound infections and long-term disabilities such as paralysis and traumatic brain injuries.

Gunshot injuries remain a significant and increasing public health challenge among this paediatric population, with profound implications for morbidity, mortality, and healthcare resource utilization. Addressing this issue requires a comprehensive and multi-sectoral approach that prioritizes prevention, early intervention, and addressing the underlying social determinants of violence.

P35: Direct medical costs of paediatric diaphyseal femoral fracture treatment in a public academic hospital in South Africa

Category: Paediatrics

Presentation: Oral

Charles Theron (University of Witwatersrand), Collen Nkosi (University of Witwatersrand), Nangamso Mkombe (University of Witwatersrand), Yammesh Ramguthy (University of Witwatersrand), Gwyneth Wilmot (University of Witwatersrand)

Abstract

Introduction

Femoral diaphyseal fractures are among the most common lower extremity fractures in the paediatric population. There is relatively little literature into the cost of treating diaphyseal femur fractures in paediatric population. This study aims to determine the cost of managing paediatric diaphyseal femur fractures in a South African Academic Hospital.

Methods

We conducted a retrospective study using prospectively collected data on paediatric diaphyseal femoral fracture treatment at our public academic hospital over a four-month duration. The study included patients who were between 2 years and 14 years of age and excluded those with femur fractures caused by pathological or atypical factors. The following costs were reviewed: emergency department, inpatient admission, anaesthesia and theatre, allied department, and radiology department.

Results

Data from 31 patients (80.6% males) with diaphyseal femoral fractures were included in the study; falls accounted for 64.5% of the injuries. There were a total of 10 patients treated operatively and 21 patients treated non-operatively. The patients who underwent surgery had a mean hospital stay of 7.4 days (range:3 to 22 days), while the group that did not have surgery had a mean hospital stay of 24.1 days (range:17 to 34 days). The factors that had a greater impact on cost were the duration of the hospital stay, the cost of the implant, and the cost of the theatre. There was no statistically significant variation in the cost of emergency unit services among this group.

Conclusion

The data showed that orthopaedic surgeons need to be cognizant of the cost of treating paediatric diaphyseal femoral fractures in the current state of the economy. Furthermore, the patients who did not undergo surgery

experienced a longer duration of hospitalization. On the contrary, the patients who underwent surgery required a second-stage procedure for implant removal.

P36: Operative vs Non Operative management of pelvic fractures in paediatric patients

Category: Paediatrics

Presentation: Oral

Tamsanqa Mazibuko (Witwatersrand University South Africa)

Background: Pelvic fractures in children are rare and result from high energy trauma. Associated injuries remain high especially in relation to pelvic ring injuries.

We sought to assess short to midterm the clinical outcomes following pelvic and acetabulum fractures in the paediatric patient.

Hypothesis:

Operative and non-operative management of pelvic injuries in children can produce good outcomes.

Methods:

Prospectively collected data, retrospective review of 12 skeletally immature patients who sustained vertically unstable and stable fractures of the pelvic ring. The comparison group comprised of 5 children who were treated non operatively following pelvic and acetabular fractures. Out of a total of 469 patients with pelvis and acetabulum injuries. 12 patients met the inclusion criteria, in total. Mean age is 8 years(4 to 13) 8 males and 4 female patients. All closed injuries. 6 patients sustained pelvic ring injuries. 3 sustained isolated acetabulum fractures 3 sustained combined injuries. In the control group 5 patients were treated non operatively. Selection criteria for surgery were based on fracture patterns, general condition of the child, injury severity.

Results

12 children with high velocity trauma. 9 Motor vehicle accidents, one fall from height. 1 fall off swing. 1 bicycle motor accident. Acetabular fractures were present in 25% (3/12) of of the patients. 62 % of the Acetabular fracture patients were treated non operatively. of the 7 patients who presented with pelvic ring injuries. 6 were treated surgically. All did well at midterm follow up (12 to 19 months). 5 children presented with Acetabulum fractures. There was 12% complication rate related to trauma (including Neurological fall out/ soft tissue injuries (Morel Lavalle Lesions). 1 out of 12 children had residual nerve fall out following treatment at 19 months. Average duration from injury to return to school was 10weeks (6 to 16). Iowa Pelvic score utilised telephonically and in person at 19 months. Surgical group scores averaged good (84 to 70) to excellent (100 to 85).

Conclusion

When selection criteria utilised for operative vs non-operative treatment of pelvic fractures in children, results are encouraging.

P37: Recurrence of congenital talipes equinovarus following treatment with the Ponseti technique

Category: Paediatrics

Presentation: Oral

Nangamso Mkombe (Wits) , Yammesh Ramguthy (Wits) , Collen Nkosi (wits)

Introduction

Congenital Talipes Equinovarus (CTEV) is the most common musculoskeletal deformity with between 1-5.2 cases per 1000 live births. The Ponseti technique is a gold standard treatment with a high success rate. However, the recurrence is a common challenge in managing this condition. This study aims to determine the recurrence rate of CTEV in patients treated with the Ponseti technique at Chris Hani Baragwanath Academic Hospital (CHBAH).

Methods

This was a retrospective review of all outpatient department files of CTEV patients attending at CHBAH from January 2024 to June 2024. This study included all patients treated for CTEV during this period. Patients more than 10 years old, patients treated with surgical technique and patients with no clear records were excluded.

The aim was to determine the recurrence rate of CTEV at CHBAH. Recurrence was defined as CTEV that was in the maintenance phase of treatment (foot abduction braces) and now requires manipulation and casting. The objective was to determine the demographic characteristics of CTEV recurrence.

Results

210 patients were treated for CTEV (till submission of this abstract). 176 patients had idiopathic CTEV. 19 patients had recurrent clubfoot (16 males). The recurrence was more common in patients younger than 4 years (14 patients). 5 patients with recurrence were syndromic CTEV. 15 patients with recurrence had mothers with high school level of education (grade 8-12). 15 patients with recurrence had unemployed parents. 18 of the patients with recurrence had typical CTEV. 9 patients with recurrence were not compliant with foot abduction brace. 5 patients with recurrence defaulted to follow-up due to transport problems

Conclusion

High level of unemployment and low level of education are the high risk of recurrence of CTEV at CHBAH.

P38: Epidemiology and antibiotic choice in hand infections requiring surgical drainage: a retrospective study of 414 cases

Category: Hands

Presentation: Oral

Luhan Weideman (University of Pretoria), Waldo Scheepers (University of Pretoria), Lizelle Fletcher (University of Pretoria), Eugene Elliot (University of Freestate)

Hand infections are exceedingly common conditions that are associated with significant morbidity. The cornerstones of treatment remain surgical drainage of pus collections, judicious use of antimicrobial agents, and rehabilitation. Empiric antibiotic guidelines should target common organisms based on regional etiological patterns, with strong consideration of host factors. Therefore, the aim of this study was to evaluate the epidemiology and suitability of empiric antibiotics in hand infections requiring surgical drainage at a centre in the Northern Cape province of South Africa.

A retrospective chart review of patients with hand infections requiring surgical drainage was conducted over a 24-month period between January 2018 and December 2019. Results were obtained from the specimens collected during surgical drainage and debridement and were accessed from the National Health Laboratory Service (NHLS) website.

Staphylococcus was the most common organism isolated in 368 cases out of 388 with positive cultures. Eighty four percent of these were methicillin-sensitive Staphylococcus aureus (MSSA), and six percent were methicillin-resistant Staphylococcus aureus (MRSA). The mean age of patients was 31 years 10 months (standard deviation 14 years 5 months) with a four to one ratio of males to females, and the most common site of infection was the webspace (27%).

Staphylococcus is still overwhelmingly the most common causative organism in hand infections in this population. Low numbers of MRSA were detected, but this still represents a five-fold increase in the region over the past decade. Urgent surgical drainage and bacteriological sampling before empiric antibiotics that target local common organisms remains the mainstay of treatment.

Consultation with an infectious disease specialist to maximise efficacy of antibiotic selection and dosing can limit the growing problem of antibiotic resistance. In this setting, the use of cloxacillin as a single empiric agent is still recommended, though the increasing prevalence of MRSA needs to be monitored.

P39: Surgery of the hand using WALANT anaesthesia: What are patients' pain scores and complications within 6 weeks?

Category: Hands

Presentation: Oral

Sumeet Baitchu (Tygerberg Hospital/ Stellenbosch University)

Surgeries involving the hand assume a considerable proportion of theatre time in orthopaedic units with a variety of anaesthetic options. The study aimed to investigate pain scores in patients undergoing Wide Awake Local Anaesthesia No Tourniquet (WALANT) pre-, peri and postoperatively, as well as to describe any complications that may occur. Risk factors for complications were also investigated.

A prospective observational study included all consenting adult patients undergoing hand surgery under WALANT anaesthesia. Patients with signs of sepsis, allergy to local anaesthetic medication, compromised peripheral circulation or ischaemia were excluded. Demographic, clinical and outcome data was collected and analysed.

A total of 52 patients (mean age 42.2 ± 15.8 years, 54% female) were included of which 33 were trauma related and 19 were elective. The median visual analogue score (VAS) for pain during the injection of WALANT solution was 3.0 (interquartile range, IQR 2.0-4.0); intra-operative VAS was 1.0 (1.0 – 1.0) with an immediate post-op VAS of 1.0 (1.0-1.0). Complications at two weeks follow-up included persistent pain (5.8%, n=3), wound dehiscence (1.9%, n=1) and superficial sepsis (3.8%, n=2) whilst at six weeks, 9.6% (n=5) continued to report pain with 3.8% (n=2) of patients being investigated for systemic causes. Of these two, one patient required formal debridement with a skin graft.

No association between requiring adjuvant sedation ($p=0.450$), opioids ($p=0.473$) or using cautery during surgery ($p=0.091$) and the type of surgery that was performed, as observed.

WALANT provided adequate anaesthesia during and after surgery with minimal pain during administration with expected complications, similar to what is reported in the literature. Therefore, WALANT could be considered as a viable anaesthetic option for use in hand surgeries, especially in high-volume settings.

P40: The Epidemiology of Bacterial Hand infections at a Large Tertiary Hospital in the Western Cape

Category: Hands

Presentation: Oral

Ridwaan Aboobaker (Tygerberg Hospital), Marilize Burger (Stellenbosch University), Hentas Van Zyl (Tygerberg Hospital)

Hand infections are commonly treated conditions that can cause serious morbidity and financial implications to patients and healthcare systems. This study aimed to investigate the epidemiology of hand infections treated at a tertiary institution over a one-year period with specific focus on how host factors, disease factors and system factors modify the risk for complications.

A retrospective, analytical cross-sectional study was conducted and included patients with hand, wrist or forearm infections. Demographics, clinical information, timeframes of patients' pathway from symptom onset to discharge was collected, including development of complications or systemic involvement. Risk factors for complications, defined as i) amputation, ii) needing >1 surgical procedure, or iii) requiring soft tissue cover, was investigated statistically.

A total of 529 patients, mean age of 33.0 ± 15.6 (95% CI 31.6 – 34.3) years, were included with *Staphylococcus aureus* (MSSA) being most frequently cultured (68.7%, n=281). A total of 23.6% (125) of cases had at least one complication. Only 2.6% (14) had systemic involvement. All patients with complications required more than one surgery, which resulted in the need for an amputation 8.8% (11), soft tissue cover 53.6% (67) or for relook-debridement alone 37.6% (39). No difference in risk for developing complications was observed for other patient-related risk factors (diabetes, substance users or those with delayed presentation) Smokers showed a trend of developing more complications than non-smokers ($p=0.050$). Patients with necrotizing fasciitis had increased percentage of complications with almost all cases having complications ($p<0.001$), whilst less severe diagnosis showed no difference in complication rates such as for felon ($p=0.100$) and webspace abscesses ($p=0.635$).

The findings highlights certain risk factors that can influence the risk of complications in patients with hand infections. These results can guide future research, but also be used practically to guide patient education, healthcare provider understanding, resources and standard practice guidelines.

P41: Functional outcomes following fixation of distal radius fractures with a Volar locking plate at a tertiary hospital.

Category: Hands

Presentation: Oral

Obakeng Monareng (University Of Pretoria) , Thabane Ncwane (T Ncwane Occupational Therapist Inc) , Tshifhiwa Nkwenika (MRC) , Maketo Molepo (University Of Pretoria) , Erik Hohman (University Of Pretoria)

This study aimed to investigate the clinical and functional outcomes of distal radius fractures following surgical treatment with a distal radius volar locking plate (VLP).

A retrospective, quantitative review study was conducted over a period of one year (February 2018 to February 2019). Skeletally mature patients who were surgically treated for distal radius fractures with VLP were included. Patients were excluded if having previous injury over the ipsilateral or contralateral wrist, were poly-traumatized, or had a previous distal radius fracture. We used the patient-rated wrist evaluation questionnaire (PRWE) questionnaire, wrist range of motion (ROM) and hand grip strength to evaluate the functional outcomes. Descriptive statistics was employed for demographic variables and PRWE score. The grip strength and wrist range of motion between affected and unaffected hands were compared using unpaired t-test. The Wilcoxon rank sum test compared the PRWE total scores between the affected hands.

The mean PRWE score was 21.5 ± 19 . There were no statistically significant differences in wrist ROM between the operated and the uninjured side. The difference in the mean grip strength was statistically significant (p -value <0.05) between the injured and the uninjured wrist.

The results of this study confirm our hypothesis that fixation with a distal radius volar locking plate (VLP) results in good clinical and functional outcomes. There was no difference in the range of motion between the injured and uninjured wrists. The study demonstrated good patient-rated wrist evaluation (PRWE) score outcomes at least one year post-operation. However, we found a reduced grip strength on the injured wrist compared to the unaffected sides.

P42: The efficacy of local anaesthesia for incision and drainage in the septic hand

Category: Hands

Presentation: Oral

Heinrich Hesse (WITS university), Grant Biddulph (WITS university)

Hand sepsis poses a significant burden on individuals and healthcare systems due to its potential complications and impact on quality of life.

The management of hand sepsis requires prompt diagnosis and appropriate interventions such as early incision and drainage. However, delayed time to the theatre is a real and significant problem encountered daily in our overburdened state-sector healthcare system. Furthermore, classical practice usually dictates incision and drainage with specimen collection before administering antimicrobial therapy. Thus, time to surgery becomes a significant rate-limiting step before implementing antimicrobial treatment against hand sepsis.

Despite the belief that local block anaesthesia may be ineffective when implemented in or near an area of sepsis, we have had great success with this technique in treating hand infections at CHBAH by implementing a dedicated minor operation theatre in our casualty department. With this, we can provide early and effective care to our patients with this condition.

We propose a prospective analysis of the efficacy of incision and drainage in hand sepsis patients under local anaesthesia at CHBAH.

A questionnaire-based assessment will be completed for every patient who undergoes this procedure, and the outcomes will be analysed.

We propose that the data will show that I&D under local anaesthesia will provide an effective means to implement early appropriate care for our hand sepsis patients without undue patient discomfort.

P43: Hip Arthroscopy in Africa: A survey exploring the experiences and beliefs of Orthopaedic Surgeons

Category: Hip Arthroscopy

Presentation: Oral

Caterina Nicolaou (University of Witwatersrand, Charlotte Maxeke Johannesburg Academic Hospital), Jurek Pietrzak (University of Witwatersrand, Charlotte Maxeke Johannesburg Academic Hospital), Josip Cacic (University of Witwatersrand, Life Fourways hospital), Barry Getz (University of Witwatersrand, Sandton Mediclinic)

Hip arthroscopy (HA) has become a highly popular procedure with varying indications and successful outcomes, however there is worldwide variation geographically of its use. HA also has its challenges, some of which can be attributed to a learning curve. The aim of this study was to evaluate the challenges that orthopaedic surgeons in African countries, the Middle East and Turkey experience in their Hip Arthroscopy practice. The paper also sought to explore which training and teaching strategies these surgeons believe may be most beneficial in reaching proficiency in HA.

An anonymous on-line survey was sent to all members of ISHA who currently practice as Orthopaedic surgeons on the African continent, in the Middle East and in Turkey. There were three components to this questionnaire; evaluating the demographics of the respondents, evaluating the challenges surgeons face in performing Hip Arthroscopy, and assessing the interventions to improve the training and performance of HA in these countries.

The majority of respondents were from the Southern African region (52.8%) mainly South Africa and the 2nd largest group from Egypt (22.2% of all countries). In terms of experience in HA, there were 2 peaks, with 36,1 % never having performed one or 30,6 % having performed them for more than 10 years. Availability of equipment to perform hip arthroscopy was the most significant challenge (44%) to performing HA. The most favoured suggested activities to improve the use and training of HA were a fellowship (72%), surgeon to surgeon visitations (78%) and cadver workshops (80%). Respondents were not in favour of telemedicine and virtual reality stimulator training.

The demand for HA is increasing and with this, the demand for teaching and training is great in this region. Support in all forms is required but in the opinion of surgeons the greatest support would be that of cadaver courses and expert surgeon visitations. Modalities for improvement exist and remain exciting in their potential to help surgeons improve their skills and limit the learning curve.

P44: Radiological Evaluation of the Articular Cartilage in Perthes Disease of the Hip Joint: Insights

Category: Hip Arthroscopy

Presentation: Oral

Ahmed Saad (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Jonathan Vogel (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Edward Bache (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Nathan Jenko (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Kapil Shirodkar (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Rajesh Botchu (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom)

Legg-Calvé-Perthes disease (LCPD) poses a significant challenge in paediatric orthopaedics. Despite extensive research, its etiology remains elusive. Therapeutic goals focus on preventing femoral head deformity and preserving hip congruence to deter early-onset coxarthrosis. Some authors have advocated for the arthroscopic management of these patients with a view to improving symptoms and prolonging hip survival with mixed results.

This study aims to elucidate the impact of Perthes disease on skeletally mature femoral head articular cartilage and assess the pattern of cartilage thinning via Magnetic Resonance Imaging (MRI).

We conducted a retrospective study on 25 patients with Perthes disease attending our Young Adult Hip unit. Articular cartilage thickness was measured on axial, sagittal and coronal MRI images.

Overall, we found reduced articular cartilage thickness in Perthes disease, with the postero-medial aspect of both the femoral head and acetabulum exhibiting the greatest degeneration.

This study highlights the specific area of articular cartilage predominantly affected in adults who have had previous Perthes disease. The wear pattern seen is not in keeping with the classic impingement pattern of articular wear. This study contributes to our understanding of the progression of this condition to early onset cox-arthrosis.

P45: The Birmingham Interlocking Pelvic Osteotomy for Acetabular Dysplasia - Minimum 24 year follow-up

Category: Hip Arthroscopy

Presentation: Oral

Inderpaul Samra (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Jonathan Vogel (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), John O'Hara (BMI The Priory Hospital. Birmingham, United Kingdom), Callum McBryde (The Royal Orthopaedic Hospital NHS trust and BMI The Priory Hospital, Birmingham. United Kingdom)

Acetabular dysplasia is characterized by a deficient superior and anterior coverage of the femoral head. This results in a reduction in the acetabular volume and if left untreated, symptomatic acetabular dysplasia can precipitate early onset osteoarthritis of the hip. Multiple osteotomies have been developed to address acetabular dysplasia including the Peri-Acetabular Osteotomy (PAO) by Ganz and the Triple Pelvic Osteotomy (TPO) by Tonnis. The PAO is a technically demanding procedure with higher risk of complications in the surgeons learning curve, while the TPO lacks sufficient stability to allow early weight bearing. The Birmingham Interlocking Pelvic Osteotomy (BIPO) was developed to address concerns with existing procedures.

The aim of this study was to describe the technique and evaluate the long-term (minimum 24 years) clinical and radiographic outcomes of the BIPO.

In this prospective study, we report the long-term clinical outcomes of the first 100 consecutive patients (116 hips; 88 in women, 28 in men) undergoing BIPO, reflecting the surgeon's learning curve. Failure was defined as conversion to hip arthroplasty. The mean age at operation was 31 years (7 to 57). Survivorship was 76% at ten years, 57% at a mean of 17 years and half of the patients had undergone hip arthroplasty at 24 years.

Younger patients (< 20 years) had the best survivorship. Post-operative complications occurred after 12 operations (10.4%) over the duration of the study. Increasing patient age and hip arthritis grade were primary determinants of surgical failure.

BIPO provides good to excellent survivorship in appropriately selected patients, with a relatively low rate of complications. Our results are comparable with other established methods of peri-acetabular osteotomy.

P46: Surgical fixation of distal radius fractures. Are we CT scanning too many?

Category: Trauma

Presentation: Oral

Rimon du Plessis (UCT), Marco Saieva (UCT), Sithombo Maqungo (UCT), Ntambue Kauta (UCT)

Computed tomography (CT) scans are regularly ordered pre-operatively to assist in planning complex distal radius fracture fixation. A CT scan allows better delineation of the fracture fragments compared to X-rays. However, its routine use can be questioned as most fracture configurations are still amenable to modern angle-stable volar locking plates and come at an economical and radiation burden.

We conducted a retrospective review of all patients who have had a pre-operative CT scan for a distal radius fracture at a quaternary hospital in South Africa between 2018 and 2024. We excluded open fractures and patients without a 6-week follow-up X-ray. The type of fixation and X-ray parameters were assessed at 1 and 6 weeks respectively. Standardized measuring techniques were utilized to determine whether X-rays were acceptable based on parameters shown to provide acceptable functional outcomes. A senior orthopaedic registrar reviewed these X-rays in a single sitting and was blinded to patient details.

Thirty-four of the 170 (20%) closed distal radius fractures treated surgically met our inclusion criteria. The median age was $42 \pm 14,3$ years. Twenty-three patients had fixation with an angle-stable volar locking plate. Three of these had unacceptable X-ray parameters both at 1 week and at 6 weeks post-surgery. There was no loss of reduction at 6-week X-rays when using a volar locking plate. The remainder had wrist-spanning external fixators (n=6), Kirschner wires (n=4), and manipulation with below-elbow casting (n=1).

We conclude that most patients who had a pre-operative CT scan were still treated with a volar locking plate with no fragment-specific fixation performed. The value of doing a routine pre-operative CT scan for a distal radius fracture when it does not change our practice is brought into question, especially in a challenging economic climate.

P47: The Radiographic Union Score for ulnar fractures (RUSU) predicts ulnar shaft nonunion

Category: Trauma

Presentation: Oral

Jun Min Leow (Edinburgh Orthopaedics), William Oliver (Edinburgh Orthopaedics), Katrina Bell (Edinburgh Orthopaedics), Samuel Molyneux (Edinburgh Orthopaedics), Nicholas Clement (Edinburgh Orthopaedics), Andrew Duckworth (Edinburgh Orthopaedics)

Aims: To develop a reliable and effective radiological score to assess the healing of isolated ulnar shaft fractures (IUSF), the Radiographic Union Score for Ulna fractures (RUSU).

Methods: Initially, 20 patients with radiographs six weeks following a non-operatively managed ulnar shaft fracture were selected and scored by three blinded observers. After intraclass correlation (ICC) analysis, a second group of 54 patients with radiographs six weeks after injury (18 who developed a nonunion and 36 who united) were scored by the same observers.

Results: In the initial study, interobserver and intraobserver ICC were 0.89 and 0.93, respectively. In the validation study, the interobserver ICC was 0.85. The median score for patients who united was significantly higher than those who developed a nonunion (11 vs. 7, $p < 0.001$). A ROC curve demonstrated that a $RUSU \leq 8$ had a sensitivity of 88.9% and specificity of 86.1% in identifying patients at risk of nonunion. Patients with a $RUSU \leq 8$ ($n = 21$) were more likely to develop a nonunion ($n = 16/21$) than those with a $RUSU \geq 9$ ($n = 2/33$; OR 49.6, 95% CI 8.6-284.7). Based on a PPV of 76%, if all patients with a $RUSU \leq 8$ underwent fixation at 6 weeks, the number of procedures needed to avoid one nonunion would be 1.3.

Conclusion: The RUSU shows good interobserver and intraobserver reliability and is effective in identifying patients at risk of nonunion six weeks after fracture. This tool requires external validation but may enhance the management of patients with isolated ulnar shaft fractures.

P48: Outcome Of Single Stage Surgical Treatment Of Diaphyseal Non-Union Of The Humerus

Category: Trauma

Presentation: Oral

Dane Maimin (UCT Dept of Orthopaedic Surgery), Sheldon Moss (UCT Dept of Orthopaedic Surgery), Maritz Laubscher (UCT Dept of Orthopaedic Surgery)

Diaphyseal fractures of the humerus are a common injury accounting for between 1 and 5% of all fractures. These fractures can be successfully managed non-operatively with a variety of splinting techniques, most commonly a cylindrical brace popularised by Sarmiento in 1977. Plate osteosynthesis is the gold standard of surgical treatment of diaphyseal humerus fractures.

Non unions of the diaphysis of the humerus present a challenging problem. Those that were attempted to be treated non-operatively are often allowed to continue with bracing for prolonged periods in the hope that the fracture may unite resulting in muscle atrophy, pseudo-arthrooses and shoulder and elbow stiffness. This is compared to surgically treated fractures were the very indication for surgery as well as the required surgical dissection may predispose to non-union

In this article the authors describe the experiences, surgical techniques and outcomes when treating diaphyseal humerus fracture non-unions in a limb reconstruction unit at a tertiary level orthopaedic service in South Africa. We reviewed 32 diaphyseal humerus fracture non unions identified over a 5 year period. 40% were female patients. 40% were sustained in MVAs and 15% were GSWs. 28% were smokers. 37% were open fractures. Vitamin D and albumin levels were taken and analysed.

Single stage revision and plating were performed and our standardised technique is described.

P49: Non-Invasive Circumferential Pelvis Compression: A Cadaveric Study of Pelvic Binders in Unstable Fracture Patterns

Category: Trauma

Presentation: Oral

Jonathan Vogel (The Royal Orthopaedic Hospital NHS trust, Birmingham, United Kingdom), Norrie Gibson (Frere Hospital, East London.), Sithombo Maqungo (Groote Schuur Hospital, Faculty of Medicine and Health Sciences, University of Cape Town.), Koshy Daniel (Frere Hospital, East London.)

Unstable pelvic fractures require urgent management in order to prevent ongoing blood loss and thus avoid the lethal triad of hypothermia, acidosis and coagulopathy. One of the interventions at our disposal is the use of circumferential pelvic compression. There are many commercially available pelvic binders available for this purpose, however in some institutions these devices are not readily available. Often a simple folded bed sheet is used instead, but the evidence to support or negate its use is lacking.

Two fresh frozen cadavers were used in this biomechanical study. A standardized method was used to recreate an unstable pelvic fracture (AO/OTA type 6.1.C.1 / Young and Burgess APC III). The pelvis was reduced using a bed sheet, or a pelvic binder (SAM-sling, Sam Medical Products, Wilsonville, OR, USA) and intra-pelvic pressure recordings were made at baseline, and at set points after reduction. Each intervention was performed twice on each cadaver in an alternating fashion.

The bed sheet and the SAM-sling both resulted in statistically significant increases in intra-pelvic pressure above baseline, with the mean increase after sheet application being 11.78cm/water, ($p=0.002$) (C/I: 8.10 – 15.46) and the mean increase after SAM-sling application being 15.53cm/water, ($p=0.0053$) (C/I: 8.75 - 22.30). The difference in the mean change in intra-pelvic pressure between the sheet and the SAM-sling was not significant however ($p=0.33$) (C/I: -13.95 – 6.45).

This novel study design shows that although there is a trend to higher intra-pelvic pressures generated by the SAM-sling, the difference between this and the bed sheet was not statistically significant. This data serves to reinforce the notion that the use of the simple bed sheet in unstable pelvic fracture reduction and stabilization is not biomechanically inferior to expensive and often unavailable commercial pelvic binders.

P50: Open Reduction Internal fixation of unstable sacral fractures

Category: Trauma

Presentation: Oral

Tamsanqa Mazibuko (Witwatersrand University South Africa)

Background

Sacral fractures are often underdiagnosed, but are frequent in the setting of pelvic ring injuries. They are mostly caused by high velocity injuries or they can be pathological in etiology.

We sought to assess the clinical outcomes of the surgically treated unstable sacral fractures, with or without neurological deficits. unstable sacral fractures were included in the study.

Hypothesis

Surgical treatment of sacral fractures can offer satisfactory outcomes. Methods:

Single centre, prospectively collected data, retrospective review of patients who sustained vertically unstable fractures of the sacrum who underwent surgical fixation. out of a total of 532 patients with pelvis and acetabulum injuries. eighty-six patients met the inclusion criteria. 18 patients had sustained zone one injuries . 14 patients had zone 2 injuries and 10 patients had zone 3 injuries. Operative fixation was performed percutaneously using cannulated screws in 18 patients. Open fixation of the sacrum using the anterior approach in 6 patients. Posterior approach was indicated in all 10 of the zone 3 injuries of the sacrum. While in 4 patients , combined approaches were used. 3 patients had decompression and spinopelvic fixation.

Results

Neurological deficits were present in 16% of the patients. 2 patients presented with neurogenic bladder. Of the 4 patients who had neurological fall out, 3 resolved with posterior decompression and posterior fixation. All 4 neurological deficits were due to traction or compression of the nerve roots. No hardware failures or non unions observed.

Conclusion

The rate of neurological deficit was related more to the degree of pelvic ring instability than to a particular fracture pattern. Low rates of complications and successful surgical treatment of sacral fractures is achievable. Timeous accurate diagnosis mandatory.

P51: Tension band plating versus Percutaneous screws in surgical management of unstable sacral fractures

Category: Trauma

Presentation: Oral

Tamsanqa Mazibuko (Witwatersrand University South Africa)

Background

While there is a plethora of literature addressing pelvic ring injuries, there is paucity of literature addressing open reduction methods on treatment of sacral fractures. Much less, methods comparing open fracture fixation techniques related to the management of sacral fractures.

We sought to compare the clinical outcomes of the surgically treated unstable sacral fractures, using Open reduction in particular, plating versus Percutaneous fixation, with or without neurological deficits.

Hypothesis

Tension band plating versus open reduction and percutaneous screw fixation of unstable sacral fractures can both offer satisfactory outcomes.

Methods

Single centre, prospectively collected data, retrospective review of patients who sustained vertically and rotationally unstable fractures of the sacrum who underwent surgical fixation either with open reduction and percutaneous screw fixation or Open reduction and tension band wiring of the sacrum. 12 male and 6 female patients. Mean age 43 (18 to 86) Out of a total of 543 patients with pelvic injuries. 78 patients had been diagnosed with sacral fractures. 18 patients met the inclusion criteria. Operative fixation was performed percutaneously using cannulated screws in 10 patients. Open fixation of the sacrum using the posterior approach with plate fixation in 8 patients. Open posterior approach was indicated in all 10 of the zone 3 injuries of the sacrum. While in 4 patients , .

Results

Neurological deficits were present in 16% of the patients. 2 patients presented with neurogenic bladder. Of the 4 patients who had neurological fall out, 3 resolved with posterior decompression and posterior fixation. All 4 neurological deficits were due to traction or compression of the nerve roots.

Conclusion

Percutaneous fixation of the Sacral fractures following open reduction as well as tension band plating can both produce good to excellent outcomes for sacral fractures . The choice of fixation and is based mainly on the pattern of the fracture, neurological deficit and amount of initial displacement.

P52: A review of knee pathologies referred to a secondary hospital in the Western Cape via a mobile health referral platform

Category: Knees

Presentation: Oral

Zachary Amod (Worcester Provincial Hospital), Brad Bonner (University of Cape Town), Michael Held (University of Cape Town)

While knee pathologies cause significant morbidity, the nature of these conditions has never been investigated in South Africa. Curricula of orthopaedic registrar and lower limb/knee fellowship training programmes are therefore not needs-based, but rather driven by expert opinion. The Vula smartphone app is a mobile health (m-Health) referral system that is widely used for referral to orthopaedic services within the Western Cape.

In this retrospective cross-sectional study, we described the knee pathologies referred to an urban secondary hospital in the Western Cape. De-identified Vula referrals received by a secondary-level orthopaedic service were obtained. All referrals to the department between 1st January 2022 and 31 December 2023 were reviewed. Referrals for patients below the age of 13, not pertaining to knee pathology and incomplete referrals were excluded. Operational outcomes included number of referrals, referral pathway and referral response times. Referral analysis included patient demographics and diagnostic category.

A total of 1998 referrals were received during the study period, of which a third met the inclusion criteria. The highest number of referrals came from primary-level facilities (51%). The average age of patients referred was 52 ± 16.65 and 76% were female. The top three indications for referral were osteoarthritis (56%), ligamentous injury (13%) and meniscal injuries (10%). The commonest outcome was patient being accepted for outpatient follow-up (92%).

The large volume of referrals involving knee pathology indicates that this is an important area of competency for current and future orthopaedic surgeons intending to practice in the Western Cape. Training programmes should ensure competency in total knee arthroplasty and arthroscopic interventional procedures.

P53: Anterior Cruciate Deficiency in Unicompartamental Knee Arthroplasty Surgery: To reconstruct or not to reconstruct?

Category: Knees

Presentation: Oral

Hanan Wilson (Wits), Christiaan Rudolf Oosthuizen (Private), Sebastian Mogabotha (Wits)

Being a key static stabiliser of the knee, Anterior Cruciate Ligament (ACL) deficiency in the arthritic knee poses a unique therapeutic challenge. The aim of this study was to assess the clinical and implant survival outcomes of mobile bearing unicompartamental knee arthroplasty (UKA) performed in ACL deficient knees (ACL-D) with and without same setting ACL reconstruction.

This retrospective review with prospective data collection, studied 123 UKAs (115 medial and 8 lateral) performed by a single surgeon over a 13-year period, of which 96 had no ACL reconstruction (ACL-R) and 27 had a same setting ACL-R. The surgeon used patient age less than 60 years, high functional demand, posterior tibial wear pattern and intra-operative anterior tibial translation of more than 5mm as indicators for ACL-R. Complications or revisions (Revision partial knee replacement classification system) and function (Oxford knee score) were measured. Implant failure was defined as PR3 or 4 revisions.

The ACL-R cohort achieved a 100% 13-year implant survival rate, 11.3% minor complication rate and mean improvement of Oxford Knee Score (OKS) from 27 to 40. The no ACL-R cohort achieved a 99% implant survival rate, 9.4% minor complication rate and mean improvement of OKS from 23 to

39. Two patients (2.1%) had a bearing dislocation in the no ACL-R group.

We conclude that excellent implant survival and patient function can be achieved with mobile bearing UKA in ACL deficiency, with same setting reconstruction in selected patients based on historical and intra-operative indicators.

P54: Compliance with rehabilitation and return to play assessments in patients after anterior cruciate ligament reconstruction

Category: Knees

Presentation: Oral

Laine Alexander (University of Witwatersrand), Brad Gelbart (University of Witwatersrand), Brenda Milner (University of Witwatersrand)

Anterior cruciate ligament reconstructions (ACLR) are commonly performed but there is no evidence available on compliance with rehabilitation protocols or the completion of an objective return to sports assessments prior to return to play (RTP) and whether this may influence ACLR outcomes in our environment.

The aim of this retrospective record review and prospective questionnaire was to assess patient compliance with a rehabilitation programme and return to sports assessment in patients who underwent ACLR. The objectives were to: 1) determine the level of compliance with a rehabilitation programme and return to sports assessment, 2) identify the barriers to compliance and motivating factors for increased compliance in these patients, 3) analyse whether certain patient characteristics affect compliance level, 4) describe and compare the RTP rates, re-injury rates and secondary surgery rates between completion of rehabilitation programme and return to play assessment groups.

A total of 100 participants completed the survey. Eighty percent of our participants completed their rehabilitation programme. Only sixty percent completed a RTP assessment. Sixty-five percent of our participants were motivated by their own desire to reach pre-injury level of activity and 12% were motivated by their physiotherapist. Time constraints and lack of funding were cited as the most frequent barriers. Younger individuals, females and those who had a higher pre-injury Tegner score were more likely to complete more months of their rehabilitation programme. Similarly, younger, and competitive athletes have a higher chance of completing their RTP assessment. We found that RTP rates, re-injury and secondary surgery were not associated with completion of the rehabilitation programme.

Our study identified barriers to compliance and motivating factors for increased compliance in ACLR patients. The study reviewed multiple return to play variables and identified factors which predict increased compliance.

P55: Consensus on the most important surgical knee procedures for South African orthopaedic surgery training curriculums

Category: Knees

Presentation: Oral

Michael Held (University of Cape Town, Orthopaedic Surgery) , Waldo Scheepers (University of Cape Town, Orthopaedic Surgery)

Training hospitals for orthopaedic surgeons in South Africa are massively overburdened by trauma. This results in orthopaedic curriculums that largely place focus on teaching registrars to cope with the heavy burden of trauma, and their exposure to other aspects of orthopaedics like sports medicine and non-fracture related knee surgery may be limited compared to orthopaedic trainees in first world countries. The aim of this study is therefore to determine the most important surgical knee procedures that orthopaedic registrars should be taught during their training through a national consensus study.

20 orthopaedic surgeons who were head of department (HOD) of orthopaedic surgery in South African training hospitals, or who were academic knee surgeons or early career surgeons, were asked to generate a list of the most important surgical knee procedures that orthopaedic registrars should be taught. This list was subsequently prioritized by a smaller group of 8 heads of orthopaedic departments and early career surgeons. Consensus was taken as 70% agreement amongst participants.

The most important surgical knee procedures that South African orthopaedic registrars should be taught are anterior cruciate ligament surgeries (including reconstruction, avulsion repair and extra-articular tenodesis) with 88% agreement, high tibial osteotomies (one and two plane) with 88% agreement, simple primary knee arthroplasty using manual techniques with 88% agreement, patella stabilization techniques (including medial patellofemoral ligament reconstruction and lateral release) with 75% agreement, simple arthroscopic procedures (including diagnostic arthroscopy, partial meniscal debridement and microfracture techniques) with 75% agreement, and simple meniscus repair with 75% agreement.

More emphasis should be placed on these procedures in orthopaedic training programmes, as early career surgeons may be inadequately prepared to perform these surgeries independently and at a high standard once they have completed their training.

P56: Knee Arthroscopic Virtual Simulation: A Possible Solution to Assess Arthroscopic Skills

Category: Knees

Presentation: Oral

Bijou Salence (UCT), Michael Held (UCT)

Basic knee arthroscopy is an essential surgical skill and should be an integral part of Orthopaedic training. However, achieving and testing proficiency presents a challenge, particularly in South African academic hospitals

A prospective observational cohort study was conducted to assess the knee arthroscopic skill of Orthopaedic trainees using ViraMed ArthroS virtual simulation. Surgical proficiency was reported using Virtual simulated composite scores derived from procedure time, safety and economy. Two different diagnostic arthroscopy tasks were completed task1: inspecting meniscus and task 2: inspecting the entire knee. Following a practice attempt the final score was recorded. Trainee qualification level was used to determine construct validity and a post assessment questionnaire assessed face validity (realism), user friendliness and educational value.

25 trainees were included (20 male), median age was 33.5 years old (32-34.5), and included pre- registrar Medical Officers (13), registrars in the postgraduate program(11) and a fellow (1). During practice attempt of task 1 trainees scored a of median 28 (23-37). The final score was a median of 42 (41-47) which is an increase of 48 percent. Task 2 had a median practice attempt score of 16 (0-37) and the final score median was 44 (42-46) with an increase of 155 percent.

There was no evidence of construct validity between level of qualification and median test score. Trainees confirmed good face validity for the outer and intra-articular joint appearance with median score 10 (8-10) and 8 (8-9) respectively. User friendliness was rated 9 (8-10) and 89 percent of trainees agreed that the simulator had educational value.

We conclude that assessment and training experience of knee arthroscopy with Virtual simulation can be achieved. The ViraMed ArthroS had high perceived face validity and educational value.

Repeated utilization contributed to enhanced scores which supports its usefulness as a tool for training in our cohort. Level of qualification did not correlate to increased scores which might highlight inadequacies in exposure or training. Additional research is necessary to evaluate the effectiveness of Virtual simulation in work-based assessments and establish a definitive passing or failing score threshold.

P57: Posterior tibial slope in a South African population. A morphometric study comparing sex and ethnicity

Category: Knees

Presentation: Oral

Adri Nel (University of Pretoria), Reinette van Zyl (University of Pretoria), Maketo Molepo (University of Pretoria), Natalie Keough (University of Pretoria), Nkhensani Mogale (University of Pretoria), Erik Erik (University of Pretoria)

It is widely acknowledged that posterior tibial slope (PTS) influences knee kinetics and kinematics. This study, therefore, investigated the morphology and variation within a sample of black and white male and female participants.

Four hundred eighty randomly selected lateral knee radiographs were included. The anterior tibial cortex angle (ATC), proximal anatomical tibial axis angle (PTAA) and the posterior tibial cortex angle (PTC) were measured using ImageJ 1.53e software. Between group differences (black males and females, white males and females) were analysed using one-way ANOVA. The relationships between PTC, ATC, and PTAA were analysed using a linear regression model, and ATC and PTAA were selected as the predictor variables.

One-way ANOVA revealed that there were significant differences between the three different angles ($p=0.0001$, $F=50.68$). There were no between-group differences for the individual angle measurements (ATC, PTAA, PTC) between ethnicity and sex. For ATC, the angles between groups ranged from 14.20+2.81 degrees (Females Black), 14.62+3.6 degrees (Male Black), 15.18+3.68 degrees (Male White) to 15.54+3.21 degrees (Females White). For PTAA, the angles between groups ranged from 10.37+2.59 degrees (Females Black), 10.61+3.27 degrees (Male Black), 10.68+3.27 degrees (Male White) to 10.83+3.27 degrees (Females White). For PTC, the angles between groups ranged from 6.07+3.13 degrees (Females White), 6.13+3.7 degrees (Male White),

6.35+2.67 degrees (Females Black) to 6.62+3.16 degrees (Male Black). The linear regression model revealed that ATC and PTAA were predictors of the PTC angle (adjusted R-Square=0.893; $pp=0.0001$).

This study could not establish differences in posterior tibial slope angles between males and females and ethnicity. Significant differences between ATC, PTAA, and PTC angles were observed, and PTC angles were smaller than PTAA and ATC angles. The ATC angles ranged between 13.18 and 16.57 degrees, the PTAA angles ranged from 9.38 to 11.87 degrees, and the PTC angles ranged between

5.03 and 7.62 degrees for all groups. The regression analysis revealed a linear relationship and showed that both ATC and PTAA were predictors of the PTC.

P58: Total knee arthroplasty in the management of multiligament knee injuries: our experience

Category: Knees

Presentation: Oral

Collen Nkosi (University of the Witwatersrand), Nyiko Chauke (University of the Witwatersrand), Sebastian Magombotha (University of the Witwatersrand)

Introduction

Traumatic knee dislocations are extremely uncommon and have been associated with long-term knee instability and posttraumatic knee osteoarthritis. The literature on multiligament management is substantial, covering nonoperative management, ligament repair, and reconstruction. There has been limited research on total knee arthroplasty as an alternative surgical option for dislocated knees. The purpose of this study was to evaluate outcomes among patients with multiligament knee injuries treated with primary total knee arthroplasty.

Methods

A single-center retrospective review of all our patients with multiligament knee injuries treated with total knee arthroplasty over the past eight years. Patient demographics and functional outcomes were assessed using the Knee Injury and Osteoarthritis Outcome Score for Joint Replacement (KOOS, JR) and the Hospital for Special Surgery Knee-Rating Scale (HSS).

Results

We identified a total of 15 cases and included eleven of them in the analysis. All patients were female, with a median age of 53 years (range: 29–68 years). All cases had unilateral knee dislocations due to trauma. There were significant differences between postoperative knee range of motion (ROM) improvement and the need for revision surgery. Our data show better results for KOOS-JR and HSS.

Conclusion

Total knee arthroplasty (TKA) for chronic knee dislocation is a complex surgical procedure. With a thorough pre-operative evaluation, a constraint knee prosthesis is a reliable procedure for correcting a chronic knee dislocation in a single sitting. Effective post-operative rehabilitation over an extended period is necessary to attain optimal range of motion.

P59: X-ray measurement of posterior tibial slope: Correlation between mechanical axis measurement and short film measurement methods

Category: Knees

Presentation: Oral

Praval Dawadi (University of the Witwatersrand) , Brad Gelbart (Linksfild Sports and Rehab Centre, University of the Witwatersrand) , Ponky Firer (Linksfild Sports and Rehab Centre, University of the Witwatersrand) , Matt ew Street (Linksfild Sports and Rehab Centre, University of the Witwatersrand)

The posterior tibial slope (PTS) is the angle formed between the tibial plateau and a line perpendicular to the axis of the tibia. Literature has reaffirmed the importance of the PTS. Orthopaedic surgeons typically obtain an Antero-posterior (AP) and lateral view of the knee together with a standing AP for pre-operative planning. Long leg lateral views are seldomly requested. The use of the standard lateral view has shown to overestimate the PTS by approximately 3° when compared to a full-length lateral view. Different methods of measuring the PTS have shown to have a high degree of interobserver variability. The aim of the study was to determine which method of measuring the PTS is best adopted in clinical practice.

This was a prospective study where the PTS was measured using three different methods on a long leg lateral x-ray using the mechanical axis, anterior and posterior cortex. The PTS was also calculated using the “MPA” method as described by Utzschneider. The tibial plateau line remained constant in the measurements. Measurements were performed and data collected by the primary investigator. Statistical analysis was performed, one sample t-test and Bland-Altman plots were calculated to determine whether there was agreement in these different methods.

The one-sample t-tests for the difference in scores between posterior and anterior tibial cortex and MPA with the mechanical axis were statistically significant (all p-values < 0.001). The mean difference of the one sample t-test indicated that the MPA method was closest in agreement of the three methods to the mechanical axis.

Results indicate that the three different measurement methods of PTS are statistically different to the mechanical axis measurement. Even though the posterior tibial cortex, anterior tibial cortex and MPA measurements do not agree with the mechanical axis measurements, the MPA method is closest in agreement. The recommendation is that if it is not feasible to use long leg lateral x-rays in your setting, to use the MPA method for measurement of the PTS.

P60: Acute Kidney Injury Post Hip Fracture Surgery

Category: Trauma

Presentation: Oral

Arsany Metry (University Hospitals Sussex NHS Foundation Trust), Shilpi AWASTHI (University Hospitals Sussex NHS Foundation Trust), Arnab Sain (University Hospitals Sussex NHS Foundation Trust), Ali Abdulkarim (University Hospitals Sussex NHS Foundation Trust)

Acute kidney injury (AKI) could be a significant risk factor for chronic kidney disease. As per NICE guidance, one of the cornerstones of management of AKI is risk assessment. Aim of the study is to identify the potential risk factors for postoperative AKI in hip fracture patients.

Using local hip fractures registration data, Patient details were selected using inclusion and exclusion criteria. Electronic records of patients were assessed retrospectively including blood results, radiological investigations, clinical documentation and drug chart. Inclusion Criteria: All patients > 50 years old with hip fractures underwent operative management from January 2022 to June 2022 Exclusion Criteria: 1- Pathological fractures. 2- Non-operative management. 3- Died directly postoperative.

250 patients underwent hip fracture surgery at our Hospital in 6 months (January 2022-June 2022) (Cemented Procedures were 133 (53 %) while Fixation procedures were 117 (47%).

Female patients were 174 (70%), and male were 76 patient. Average age was 83.4 years and number of operations done over Weekend (Friday-Sunday) = 123 (49%).

The incidence of Postoperative AKI was 56 (22.4%). Forty-five from fifty-six cases were stage 1 (80.4%) while 7 cases (12.5%) were stage 2.

The studied risk factors for Postoperative AKI were: cemented procedures (61% of postoperative AKI incidence), female Gender (66%), time from admission to operation (>24 hours =33 %), day of operation (operations done Friday/Saturday/Sunday = 55%) and Postoperative antibiotics (71%)

We need strategies to reduce incidence of postoperative AKI like: AKI alert on laboratory results, IV fluid prescription preoperative since arrival of patients to ED, avoid/stop nephrotoxic medications on admission, regular review of postoperative bloods and fluid balance especially in high risk patients, increase nursing staff and junior doctors on wards over weekends and we need to review our policy of giving postoperative IV antibiotics.

P61: Back Front Back Surgical technique for the treatment of Associated Both Column acetabular fractures

Category: Trauma

Presentation: Oral

Tamsanqa Mazibuko (Witwatersrand University South Africa)

Background

Complex both-column acetabulum fractures are severe injuries, often with associated injuries and complications with uncertain clinical and functional outcome. The results of treatment with complications, associated injuries and functional outcome. Modern traumatological protocols point to early surgical treatment, with anatomical reduction and stable internal fixation of fragments as a prerequisite for achieving a good treatment outcome.

Hypothesis

Front back Front Approach and sequence is a good method for treating ABC Objective: We sought to assess the viability and usefulness of front back front approach in treating ABC fractures of the acetabulum

Methods

This retrospective-prospective single centre cohort study was conducted during the 2015 to 2024 period and included 36 cases that met the input parameters. Using the Letournel and Judet classification, and application of a combined surgical approach, a modified Stoppa and or Lateral Window of the Iliioinguinal approach and Kocher-Langenbeck approach. Mean surgical time 243 minutes (186 min to 280 minutes) Mean age is 39.8 (18 to 64 years) males 29 Females 7. All surgeries done single stage. Average blood loss 742 mLs 400 to 1200 mLs

Results

The results of treatment with complications, associated injuries and functional outcome are described. Fractures were caused by high kinetic energy trauma, and the cause was traffic accident in 27/36(74.84%), fall from a height in 5/36 (20.83%) and crash injuries in 3/36 (8.33%) cases. The sample included 29 (75.00%) male and 7(25.00%) female, with 10/24 (41.67%) right sided and 14/24 (58.33%) left sided fractures. Their mean age was 45.06 (range, 24-62) years. The mean follow-up time was 2.8 (range, 1-5) years.

Conclusions

Back Front back surgical technique is a well sequenced and reasonable approach for the surgical treatment of associated both column fractures of the acetabulum. Blood loss and surgical time are comparable to the figures noted in the literature.

P62: Early results of starting a fracture liaison service for fragility hip fractures in a regional hospital in South Africa

Category: Trauma

Presentation: Oral

Stefanus P Oosthuizen (Stellenbosch Unniversity), Jacobus D Jordaan (Stellenbosch University), Marilize C Burger (Stellenbosch University)

The burden of fragility hip fractures (FHF) is rising. We implemented a Fracture Liaison Service (FLS) in September 2021 in our regional hospital. This allowed us to conduct a retrospective cohort study of FHF before and after its introduction. The aim of this investigation was to determine whether the inpatient postoperative infusion of bisphosphonates reduced early mortality, refracture and readmission rates in elderly patients who presented with FHF to a regional hospital in South Africa.

Patients > 50 years who sustained hip fractures between January 2020 and June 2022 were considered; those with high energy injuries, pathological- and peri-prosthetic fractures were excluded. Patients were divided into two groups based on whether bisphosphonates were initiated.

Associations between treatment group and mortality, readmission and refracture rates within the first year after surgery were investigated. Subgroup analyses were also conducted for specific risk factors.

A total of 309 patients (mean age of 74.5 ± 10.9 , 67.6% female) were included of which 32.4% (n=100) received bisphosphonates. Time to surgery was shorter after the implementation of the FLS (median 30.8 hours, interquartile range 22.3-49.0) versus before (median 42.5 hours, interquartile range 23.4-70.8), $p=0.044$. The overall 30-day, 90-day and 1-year mortality rates were 6.8% (n=21), 11.0% (n=34) and 18.4% (n=57), while 23.6% (n=73) of patients were readmitted to hospital and 2.6% (n=8) had refractures within the first year after surgery. No statistical difference in 30-day, 90-day or 1-year mortality rate, refracture incidence or readmission incidence was observed between patient groups, or in the subgroup analyses.

In conclusion, we successfully implemented a FLS in our regional hospital. Although there was no statistical benefit in terms of early mortality, refractures or readmissions, it resulted in a decrease in time to surgery.

P63: Impact Evaluation of our teaching hospital “Fast Track Femur Admission Pathway” on Patient Outcomes

Category: Trauma

Presentation: Oral

The implementation of the "Fast Track Femur Admission Pathway" at our hospital represents a substantial innovation, triggering a system similar to trauma-alert for the prompt orthopaedic assessment and admission to ring-fenced beds of patients diagnosed with femur fractures, bypassing conventional emergency department assessment and referral system. This strategic shift aims to expedite specialised care, reduce triage delays, and enhance clinical outcomes such as treatment timeliness and hospital stay duration. This study evaluates the pathway's impact on these outcomes using a retrospective observational design.

Patient outcomes from the National Hip Fracture Database (NHFD) over a 23-month period, encompassing twelve months before and eleven months following the pathway's activation on 1st of May 2023. This analysis aimed to ascertain the pathway's efficacy in enhancing care delivery for patients suffering from hip fractures. Statistical analysis of the data was conducted using SPSS software.

Following the implementation of the pathway, several statistically significant improvements were observed. The proportion of patients receiving timely orthogeriatric evaluations increased from an average of 87% to 92%, while the mean percentage of admissions to specialist wards, also known as Key Performance Indicator 0 (KPI0) on the NHFD, increased from 1.97% to 25.2%. Post operative prompt mobilisation increased from 74% to 80% and hospital stay duration decreased from an average of 36 days to 34 days. Furthermore, our hospital has risen to fifth place in overall KPI0 inter - hospital rankings in 2023 compared to 152nd place in 2022.

The "Fast Track Femur Admission Pathway" significantly enhanced patient outcomes by reducing hospital stays and expediting admissions to specialist wards and orthogeriatric care. These results underscore the pathway's effectiveness in shortening hospital stays and providing quicker access to specialised treatment, thereby improving overall clinical outcomes for hip fracture patients

P64: Incidence and causes of mortality in orthopaedic patients with lower extremity fractures at Chris Hani Baragwanath Academic Hospital, South Africa.

Category: Trauma

Presentation: Oral

Putso Motubatse (Wits University) , Leonard Muhango (Wits University) , Yenziwe Ngema (WitsUniversity) , Mmampapatla Ramokgopa (Wits University)

Incidence and causes of mortality in orthopaedic patients with lower extremity fractures at Chris Hani Baragwanath Academic Hospital, South Africa.

Lower extremity fractures are prevalent in orthopaedics and are associated with significant morbidity and mortality, particularly in the elderly population and those with comorbidities. Understanding the incidence, causes and risk factors associated with mortality in these patients is crucial for improving management strategies and patient outcomes. Mortality in orthopaedic patients is not uncommon but there are few studies addressing mortality associated with lower extremity fractures, particularly in developing countries.

This study aims to analyse the causes and incidence of mortality among admitted orthopaedic patients with lower extremity fractures, identifying risk factors such as age, length of stay, comorbid conditions and causes of mortality and thus potential areas for intervention.

We conducted a retrospective study over 5 years (January 2019 – December 2023) in a single tertiary academic centre in Soweto, South Africa.

Patient demographics, length of stay, orthopaedic diagnoses, comorbid conditions, surgical interventions, and mortality causes were collected. Statistical analyses were performed to determine mortality rates, frequency, proportion reports and identify significant predictors of mortality. Patients with polytrauma injuries, and foot and ankle fractures were excluded.

Over the study period, 3809 patients were admitted with orthopaedic lower extremity fractures. For all lower extremity fractures, the overall mortality rate was 2,94 %. Mortality was higher in older patients over 65 (78.8%), in females (65 %) and in patients with femur fractures (92,4%). 84.8 % of the deceased patients had associated comorbid conditions.

Mortality in orthopaedic patients with lower extremity fractures is significantly affected by age, comorbidities, and the length of stay. Sepsis, cardiovascular events and thromboembolic complications were the leading causes of mortality in this population. Early intervention and comprehensive management of comorbidities are essential to improve patient outcomes.

P65: Intramedullary nailing of open tibia and femur fractures through the supra & infrapatellar approach. Is septic arthritis a real concern?

Category: Trauma

Presentation: Oral

Selma Armas (university of Cape Town), Maritz Laubscher (university of Cape town), Michael Held (university of Cape town), Simon Graham (university of Oxford) , Nando Ferreira (university of Stellenbosch), Sithombo Maqungo (University of Cape Town)

A theoretical risk persists concerning the development of septic arthritis in the knee following the employment of intramedullary nailing techniques. These techniques encompass the

supra/infrapatellar approach during tibial nailing and the retrograde approach during femoral

nailing respectively. This potential risk stems from the mechanical bridging of the knee joint inherent in both methodologies. The susceptibility to this risk escalates notably in cases involving open fractures, as all associated wounds are inherently considered contaminated. Consequently, the

potential introduction of infection into the knee joint consistently remains a pertinent concern for the surgeon performing these procedures.

All instances of open fractures involving the tibia and femur, categorized according to the Gustillo Anderson classification as grades 1 through 3C, from January 2017 to December 2018, were identified. Inclusion criteria encompassed cases wherein fracture fixation was accomplished utilizing both the retrograde femur intramedullary nail (IMN) approach and the suprapatellar approach for tibial fractures. There after subjects were subjected to a comprehensive 12-month follow-up period, during which clinical evaluation for evidence of union and any indications of infection at both the surgical and fracture wound sites was conducted.

A total of 116 cases met the established inclusion criteria, comprising 34 femur fractures and 82 tibia fractures. Notably, no instances of septic knee arthritis were detected within this cohort.

Within both the open femur and tibia fracture groups treated with intramedullary nails via a “through- the-knee” surgical approach, the investigation did not yield any reported septic knee arthritis

cases. Revealing that septic arthritis of the knee post retrograde femur nailing and/or suprapatellar tibia nail fixation for open fractures may not be a real concern.

P66: Does Fixator-assisted tibial nailing outperform conventional tibial nailing: A Multicentre Comparative Study

Category: Trauma

Presentation: Oral

Saul Kaplan (Orthopaedic Surgery Department, Stellenbosch University), Nando Ferreira (Orthopaedic Surgery Department, Stellenbosch University), Marilize Burger (Orthopaedic Surgery Department, Stellenbosch University), Mathew Alexander (Orthopaedic Surgery Department, Stellenbosch University), Danie Hugo (Orthopaedic Surgery Department, Stellenbosch University), Craig Brown (Orthopaedic Surgery Department, Stellenbosch University), Francois Muller (Khayalitsha Hospital), Jeandre Kotze (Paarl Provincial Hospital)

There is no local literature evaluating the outcomes of external fixator-assisted tibial nailing. This study aimed to investigate the peri- and postoperative outcomes of tibial nailing using either an unassisted or an external fixator-assisted nailing method, in patients with tibial fractures.

A prospective cohort study, including skeletally mature (>18 years) patients with tibial fractures, presenting to one of three different hospitals within the Western Cape province of South Africa, and treated with intramedullary nailing, was conducted. and considered. Participant demographic, clinical and surgical characteristics were documented perioperatively up until 6 weeks post-surgery.

Differences in operative time, fluoroscopy time, adequacy of reduction and short-term complications in patients treated with external fixator-assisted versus unassisted tibial nailing were investigated.

A total of 154 patients with tibial fractures (n=74 fixator-assisted tibial nails; n=80 unassisted nails) enrolled in the study. Fixator-assisted tibial nailing was associated with significantly longer operation- (median 80.0, interquartile range (IQR) 60.0 – 95.0 minutes) and fluoroscopy times (median 140.0, IQR 96.0 – 214.0 seconds) compared to the unassisted group (60.0, IQR 50.0 – 90.0 minutes and 82.5, IQR 63.0 – 121.0 seconds, respectively) ($p<0.001$ and $p<0.001$, respectively). No differences were observed in the adequacy of reduction, or prevalence of complications, between groups.

Comparing fixator-assisted tibial nailing to unassisted tibial nailing, this prospective cohort study suggests that both techniques are comparable when managing tibia fractures in terms of adequacy of reduction and the prevalence of short-term complications. The benefits of fixator-assisted tibial nailing include being relatively easy to apply by all orthopaedic surgeons regardless of surgical experience, maintaining reduction during all steps of tibial nail insertion, reduced need for open fracture reduction, reduced radiation exposure to the surgeon and assistant, and

no added risk to the patient. Further long-term large-sized prospective randomized trials are needed to better evaluate the benefits of fixator-assisted nailing vs unassisted tibial nailing.

P67: What are the clinical and radiological outcomes of circular all wire external fixators for complex tibia fractures in a District hospital setting in South Africa?

Category: Trauma

Presentation: Oral

Louw Naude (Khayelitsha hospital), James Warren (Khayelitsha hospital), Craig Brown (Khayelitsha hospital)

What are the clinical and radiological outcomes of circular all wire external fixators for complex tibial fractures in a District Hospital setting in South Africa?

Circular all wire external fixators (CAWEF) are a key tool in managing complex tibia fractures where severe soft tissue injury cannot be managed by Plastic Surgery due to resource constraints.

The primary objective was to assess the clinical and radiological union of patients managed with CAWEF. Secondary outcomes assessed were patient factors (HIV status, smoking and medical comorbidities) and complications including fracture-related infection, wound sepsis, pin site infections and reoperations.

A retrospective study design of prospectively collected data was performed. All patients who underwent CAWEF for complex tibial fractures at a District Hospital over 3 years were included. Demographic data, fracture type, surgical interventions, complications, radiological and clinical union, and time to union were assessed.

33 patients (20 male, 13 female) had CAWEF with a mean age of 36 years. Injury mechanisms included pedestrian vehicle accidents (54%), assault (21%), sports injuries, falls, and gunshot injuries. Union was achieved in 85% of cases, with an average time of 23 weeks. 7 patients had fracture-related infections (FRI), 7 developed pin tract sepsis, and 2 required reoperation. There were 5 cases of non-union, one requiring autogenous bone grafting at three months. 2 cases were lost to follow-up.

All FRI cases were debrided in theatre and received antibiotic therapy based on cultures of *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii*. Nine patients were HIV positive, with HIV status unknown in two patients; 22 patients were HIV negative.

The findings of this retrospective study highlight the efficacy of CAWEF in managing complex tibia fractures at the District Hospital level. The overall union rate of 85% achieved at an average of 23 weeks is acceptable when considering CAWEF in these injuries.

P68: Outcomes and Complications of Knee Arthrodesis in Complex Knee Pathologies: A Multi-Centre Case Series

Category: Trauma

Presentation: Oral

Schalk Klopper (University of Cape Town), Maritz Laubscher (University of Cape Town), Nando Ferreira (University of Stellenbosch), Michael Held (University of Cape Town), Alastair Robertson (University Hospitals Sussex NHS Foundation Trust)

Knee arthrodesis surgery has re-emerged as a salvage treatment option in the management of complex knee joint pathologies. Various techniques are currently employed to achieve arthrodesis, with literature reporting adequate infection control rates and low revision rates to above-knee amputation (AKA). This study aims to describe the outcomes and complications of a series of knee arthrodesis procedures performed for various aetiologies.

A retrospective multi-centre review of the medical records and serial radiographs of 17 patients who underwent knee arthrodesis across three limb reconstruction units over seven years was conducted. Patients were followed up until functional and radiological union (minimum six months). The arthrodesis technique and preoperative planning were surgeon/patient-specific. The primary outcome variable was time to clinical and radiological union, and the secondary outcome variable was complications associated with arthrodesis.

Seventeen patients were reviewed, with 13 completing follow-up over an average period of 10.2 months. Indications for arthrodesis included periprosthetic joint infection, extensor mechanism disruption, chronic knee instability or dislocation, chronic osteitis, post-infective arthropathy, and post-traumatic deformity. Intramedullary nails were used in 11 patients and external frame fixators in 6. No patients required revision surgery to achieve union. Infection was successfully eradicated in all sepsis cases. The average time to functional union was 193 days (range 50-376) and radiological union was 210 days (range 65-376). One complication occurred: a patient developed compartment syndrome postoperatively, which was followed by sepsis requiring amputation.

Knee arthrodesis surgery, while technically demanding, is a reliable treatment option for complex knee pathology with acceptable clinical outcomes and complication rates. The use of nails or external fixation is a viable option for arthrodesis and is largely surgeon and patient-dependent with similar results.

P69: The mental health impact Major Lower Limb Amputation versus Revascularisation

Category: Trauma

Presentation: Oral

Matthew How Saw Keng (Derriford Hospital, Plymouth), Ahmed Abdel Rahim (Derriford Hospital, Plymouth), Curtis Dundas (Derriford Hospital, Plymouth), Sagaurav Shrestha (Derriford Hospital, Plymouth), Devender Mittapalli (Derriford Hospital, Plymouth)

This study aims to compare the impact of major lower limb amputation (MLLA) and revascularization on anxiety and depression levels in patients with chronic limb ischemia using the Hospital Anxiety and Depression Score (HADS). A prospective observational study was conducted from January to June 2021 on patients undergoing either MLLA or infra-inguinal bypass/endovascular procedures at Derriford Hospital, United Kingdom. Patients were included if they had non-traumatic pathologies requiring amputation or revascularization for critical limb ischemia. Exclusion criteria included traumatic amputations, revision amputations, toe or metatarsal amputations, inability to give informed consent, or inability to complete the questionnaire. Data collected included demographics, length of stay, co-morbidities, previous psychological issues, previous revascularization or amputation, presence of peri-operative pain, and re-hospitalization. HADS assessments were conducted one week prior to and six to eight weeks post-operatively.

A total of 122 patients participated, with 73 undergoing revascularization (Group R) and 49 undergoing MLLA (Group A). Pre-operative HADS scores indicated higher anxiety and depression in Group A. Post-operatively, Group A continued to exhibit higher scores, with a significant increase in depression (median increase of 2 points, $p=0.002$) compared to Group R, which showed no significant change in depression scores. Anxiety levels did not significantly differ post-operatively between the groups. Group A experienced longer hospital stays and required fewer post-operative analgesics than Group R.

The study concludes that MLLA is associated with a greater increase in depression levels compared to revascularization, highlighting the need for tailored peri-operative care to address the psychological impacts of these procedures. These findings suggest the importance of multidisciplinary approaches in managing both the physical and emotional needs of patients undergoing these interventions. Future research should explore strategies to mitigate the psychological impact of MLLA, such as cognitive-behavioural therapy or mindfulness-based approaches.

P70: Early major fracture care in polytrauma - priorities in the context of concomitant injuries: A Delphi consensus process and systematic review

Category: Trauma

Presentation: Oral

Roman Pfeifer (University Hospital Zurich), Felix Klingebiel (University Hospital Zurich), Zsolt Balogh (John Hunter Hospital and University of Newcastle), Frank Beerers (Lucerne Cantonal Hospital), Raul Coimra (Riverside University Health System Medical Center and Loma Linda University), Christian Fang (Li Ka Shing Faculty of Medicine, The University of Hong Kong), Peter Giannoudis (University of Leeds), Falco Hietbrink (University Medical Centre Utrecht), Frank Hildebrand (RWTH Aachen University Hospital), Hayato Kurihara (Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan), Thomas Lustenberger (Aarau Cantonal Hospital), Ingo Marzi (University Hospital Frankfurt), Markus Oertel (University Hospital Zurich), Ruben Peralta (Hamad Medical Corporation, Doha), Shanmuganathan Rajasekaran (Ganga Hospital, Coimbatore), Emil Schemitsch (University of Western Ontario), Heather Vallier (Case Western Reserve University, Cleveland), Boris Zelle (UT Health San Antonio), Yannik Kalbas (University Hospital Zurich), Hans- Christoph Pape (University Hospital Zurich)

Timing of major fracture care in polytrauma patients has a relevant impact on systemic outcomes. Yet, standardized treatment strategies with respect to concomitant injuries are rare. This study aims to provide expert recommendation regarding the timing of major fracture care in the presence of concomitant injuries to brain, thorax, abdomen, spine/spinal cord, and vasculature as well as multiple fractures and utilized the Delphi method supported by a systematic review. The review was conducted in the Medline and EMBASE databases to identify relevant literature on the timing of fracture care for patients with the aforementioned injury patterns. Then, consensus statements were developed by 17 international multidisciplinary experts, based on the available evidence. The statements underwent repeated adjustments in online- and in-person meetings and were finally voted on. An agreement of $\geq 75\%$ was set as the threshold for consensus. The level of evidence of the identified publications was rated using the GRADE approach.

A total 12,476 publications were identified and 73 were included. The majority of publications recommended early surgery (47/73). The threshold for early surgery was set within 24 hours in 45 publications. The expert panel developed 20 consensus statements and consensus $>90\%$ was achieved for all of them, with 15 reaching 100%. These statements define conditions and exceptions for early definitive fracture care in the presence of traumatic brain injury (n=5), abdominal trauma (n=4), thoracic trauma (n=3), multiple extremity fractures (n=3), spinal (cord) injuries (n=3), and vascular injuries (n=2). A total of 20 statements were developed on the timing of fracture fixation in

patients with associated injuries. All statements agree that major fracture care should be initiated within 24 hours of admission and completed within that timeframe unless the clinical status or severe associated issues prevent the patient from going to the operating room.

This study was conducted by the **IMPACT group** - International **Multidisciplinary** Consensus panel on polytrauma.

P71: Systemic lipidomic profile changes align with injury severity and outcomes in polytraumatized patients

Category: Trauma

Presentation: Oral

Yannik Kalbas (University Hospital Zurich), Felix Klingebiel (University Hospital Zurich), Michel Teuben (University Hospital Zurich), Sascha Halvachizadeh (University Hospital Zurich), Valentin Neuhaus (University Hospital Zurich), Roman Pfeifer (University Hospital Zurich), Paolo Cinelli (University Hospital Zurich), Hans-Christoph Pape (University Hospital Zurich).

Recent advances in analytic technology allow for characterization of lipid profile dynamics on a molecular level. Experimental models suggest individual lipid profiles based on injury severity. The aim of this study was to characterize the lipidomic response in a cohort of polytrauma patients.

Lipidomic analysis was performed on plasma samples from a prospective biobank of polytrauma patients. Patients were included upon arrival at the trauma bay and venous sampling was performed at 6 timepoints (Arrival, 8h, 24h, 48h, 5d and 10d). Inclusion criteria were an ISS > 25, survival > 24h and an age > 18 years. Plasma samples were analyzed using liquid chromatography mass spectrometry (LC-MS). Lipid profiles were characterized using bioinformatic approaches and dimensionality reduction. Linear mixed models were programmed to analyze lipid class dynamics over time. Demographics, injury characteristics, outcomes (e.g. LOS, mortality, complications) and laboratory markers were exported from our clinical information system. Lipid profile dynamics were then collated with clinical data.

66 patients were included in the final analyses. Mean ISS was 31.7 and mean NISS 38.4. Overall, 633 individual lipids were identified. Principle component analysis (PCA) revealed clustering of lipids with similar molecular characteristics, thus lipids were organized into 19 functional subgroups (classes). K-means clustering based on lipid profile revealed 2 specific patient groups, which differed in injury pattern and – severity (especially the presence of hemorrhagic shock). In more severely injured patients, we detected a significant decrease of the majority of lipid classes over the early timepoints (0-48h). Restoration of lipid concentration aligned with recovery and levels of Acylcarnitines were significantly higher at 24h in patients, who went on to develop major complications ($p < 0.001$). Our data suggests that the lipid profile in polytraumatized patients is closely collated with the trauma load and that the lipid dynamics over time align with the clinical outcomes.

AcCa as a marker of mitochondrial damage seems to be a promising clinical marker for point of care resuscitation.

P72: The clinical relevance of chest trauma revisited – a review based on the 2023 clinical expert meeting and preparative systematic literature review

Category: Trauma

Presentation: Oral

Basil Hatz (University Hospital Zurich/Traumatology Department), Felix Klingebiel (University Hospital Zurich/Traumatology Department), Yannik Kalbas (University Hospital Zurich / Traumatology Department), Roman Pfeifer (University Hospital Zurich/Traumatology Department), Emil Schemitsch (University Hospital Zurich/Traumatology Department), Hans-Christoph Pape (University Hospital Zurich/Traumatology Department), IMPACT Group (IMPACT group - International Multidisciplinary Consensus Panel on PolyTrauma)

Chest trauma has long been respected as an important entity in trauma patients, which affects surgical decision-making. With respect to the “IMPACT” group’s recommendations for multiple injured patients with thorax trauma, the aim of our study was to point out differences in surgical strategies and timing of fracture fixation in patients with concomitant thoracic injuries in the literature published before and after the change of the millennium.

A systematic review on Medline and EMBASE was performed focusing the timeframe from 1980 – 2023. Articles were included if they compared different treatment strategies or timing of fracture fixation in multiple injured patients with a special focus on the influence of thoracic trauma. Exclusion criteria: Non-original studies, reviews, case-reports, isolated trauma, experimental studies, pediatric trauma, no control group.

Of the 9,682 studies that were identified, 20 studies were included. Of those, 9 studies were published before and 11 studies after the year 2000. Most studies do not report specific injury pattern of the thorax and mostly use the AIS. Especially, the extension of thoracic injuries are rarely documented (i.e. uni/bilateral injuries). Before the change of the millennium, the literature has mainly focused on the timing of surgery, whereas after the millennium, the surgical strategy (DCO vs. ETC vs. SDS) appears to be in focus. The amount of complications seem to not have changed over time.

We could demonstrate that the available literature dealing with chest trauma focuses on its presence or absence rather than on the injury morphology. Overall, there seems to be a trend to perform early definitive surgical care also in the presence with thoracic trauma if the patient’s physiology allows it.

P73: Dislocation rate of dual mobility cups (DMC) compared to non-dual mobility cups (non-DMC) used in tumour prosthesis hip replacements

Category: Oncology and Limb reconstruction

Presentation: Oral

Stephanus Raubenheimer (Registrar)

The problem with resecting the proximal femur in tumour resection cases is that all stabilisers of the hip joint, which attaches to this region, are lost, leading to higher risk for dislocation. Research pertaining to the use of DMC has shown decreased dislocation rates in primary- and revision cases in multiple studies.

We did a retrospective longitudinal cohort study to compare DMC to other cups, specifically in tumour prosthesis cases looking at dislocation- and re-operation rates over the past ten years in the settings of public and private hospitals. Other cups included large femoral heads and constraint liners.

We included all sequential patients that received tumour prosthesis implants from 25/11/2011 to 10/06/2022 who had a minimum of six months follow up and adequate records to detect dislocations.

From 150 identified cases, 89 (59.3%) cases satisfied the inclusion and exclusion criteria.

We considered gender, age over 65 as well as the causative pathology as additional factors, with the cup design, to accurately determine statistical significance using multivariate analysis (Cox- regression models) when comparing the groups.

There were significantly more dislocations in the non-DMC group than in the DMC group. (38.10% vs 16.18%, $p = 0.032$) Similarly, more re-operations in the non-DMC group than in the DMC group. (80.95% vs 35.29%, $p = <0.001$)

Survivorship of DMC implants also showed a statistically significant improvement to the non-DMC group.

Age over 65 was found to be independent risk factor for dislocation in tumour prosthesis cases with a 3.92-fold increased risk for dislocation.

This study shows statistically significant reductions in dislocations and re-operations when utilising DMC in patients with tumour prosthesis implants.

P74: Scoops of success: outcomes in a series of 13 patients using a cone cup prosthesis for acetabular reconstruction

Category: Oncology and Limb reconstruction

Presentation: Oral

Schalk Klopper (University of Cape Town), Thomas Hilton (University of Cape Town), Henrik Bauer (Department of Molecular Medicine and Surgery, Karolinska Institute, Stockholm, Sweden)

Endoprosthetic reconstruction of major pelvic bone loss in oncology and revision arthroplasty surgery is associated with high complication rates. However, comparative data for reconstructive methods are limited. We present short-term clinical, radiological and functional outcomes of the Implantcast MUTARS® LUMiC® prosthesis for acetabular reconstruction after major pelvic bone resection or loss.

A retrospective folder review was performed from December 2019 to June 2022. The minimum follow-up period was 12 months. The inclusion criterion was all patients who underwent acetabular reconstruction with the Implantcast MUTARS® LUMiC® cone cup prosthesis.

Thirteen patients were included in the study. The indication for pelvic resection was a primary bone tumour in seven patients, metastatic bone disease in three and failed arthroplasty in three.

Complications, as classified by the Henderson classification, occurred in 38% and included two patients with dislocation, three with infection, and one of whom had both. Other complications included sciatic nerve neuropraxia, iatrogenic fracture of the greater trochanter, and vascular injury. The median Musculoskeletal Tumor Society Score (MSTS) scores at 12 months assessed in eight patients were 21 of 30 points.

Our results are in agreement with other series, and highlight the problems of instability and deep infection. Patients without complications had an acceptable functional outcome.

P75: First data from a South African Registry of Soft Tissue Sarcomas

Category: Oncology and Limb reconstruction

Presentation: Oral

Dane Maimin (UCT Dept of Orthopaedic Surgery), Thomas Hilton (UCT Dept of Orthopaedic Surgery), Henrick Bauer (UCT Dept of Orthopaedic Surgery), Robyn Waters (UCT Dept of Orthopaedic Surgery), Nicholas Kruger (UCT Dept of Orthopaedic Surgery)

Generating clinical data through a prospective and consecutive accrual of patients into a Registry is paramount for assessment of quality of care and for clinical research. We present first data of soft tissue sarcoma patients treated in the Western Cape, South Africa.

A sarcoma register was established in 2021. A total of 93 soft tissue sarcoma patients were identified. Follow-up in South Africa is difficult for many reasons, but we could assess overall survival by application to the Department of Home Affairs and/or the South African Medical Research Council for verification of death status.

Median age was 52 (10-90) years and 58 % were female. Most common location was the thigh 39 %, followed by lower leg 14 % and shoulder/upper arm 14 %. 33 % of lesions were subcutaneous, 20 % intramuscular and 47 % deep, extracompartmental. The median size was 12 (1-50) cm. Grading according to the FNCLCC system revealed 33 % low-grade, 18 % Grade II and 49 % Grade III tumours. Half of the low-grade sarcomas were well-differentiated liposarcomas.

47 % were referred to a sarcoma centre without previous biopsy or surgery. 33 % were referred after core biopsy and 19 % after excision or local recurrence. Metastases at diagnosis were evident in 15

%. Local excision was feasible in 85 %, only 3 % were amputated, but 12 % were not operated at all. The surgical margin was intralesional in 30 % and marginal or wide in 70 %. Adjuvant chemotherapy and/or radiotherapy was given to 61 % of the patients.

Median time from referral to start of treatment (surgery or oncological) was 46 (5-488) days and time from diagnosis to start of treatment was 33 (1-420) days. Overall Kaplan-Meier survival, excluding patients with well-differentiated liposarcomas, was 78 % at two years.

The presented data provides a bench mark for comparison with clinical data from other regions and for assessment of improvement in care of sarcoma patients. Compared to population based data from Scandinavia, the tumours were larger and more patients had metastases at diagnosis which are the strongest risk factors in soft tissue sarcoma.

P76: Accurate planning of Total Hip Arthroplasty: Is there still a role for acetate templating?

Category: Arthroplasty

Presentation: Oral

Philip Coetzer (University of the Free State), Johan van der Merwe (University of the Free State), Cobus Erasmus (University of the Free State), Veruschka Rademan (University of the Free State)

Templating of radiographs as part of pre-operative planning can improve the accuracy of prosthesis placement and minimise intra and post-operative complications. Digital templating requires purchasing specific software for the prosthesis used.

We aimed to establish if using acetate-printed templates, superimposed on the computer screen, can accurately determine implant placement and sizes.

Eighty primary total hip Arthroplasty procedures met the inclusion criteria. A 20mm ball bearing was placed at the level of the greater trochanter to ensure accurate radiograph calibration. Templates from all companies were supplied and templating was completed by two consultants and two registrars. Acetabular size (AS), horizontal femur offset (HFO), femur stem size (FSS), LDD and vertical greater trochanter to prosthesis shoulder height (VGPH) were measured. This was done pre/postoperatively.

The mean difference in FSS templating and actual placement was within 1 size, usually smaller was placed than templated, with a median of 0.67 (-3 to 4). With regards to HFO, the median difference post-replacement was 2.78mm with a mean of 2 (-17 to 22). The LLD had a mean of 3.8mm difference post-operatively. The placement depth of the implant using the VGPH was placed at a mean of 0mm with an average implant placed of 1.24mm proud.

Our primary aim was to determine if accurate templating can still be done using acetate-printed templates for accurate prosthesis placement. We were able to accurately restore HFO to an average of within an average of 2mm. LLD is quoted as the largest reason for litigation post-hip arthroplasty, we were able to accurately restore LLD to within 3.8mm of the contralateral side. The FSS placement in our study was within 1 size of the templated size. However, the size of the stem can also be influenced by surgical technique. We believe that there is still a role for acetate templating as it is accurate, cheap and easily accessible.

P77: The Neglected Angle: Exploring the Significance of Femoral Neck Shaft Angle in Hip Biomechanics and Surgical Planning

Category: Arthroplasty

Presentation: Oral

Niel Bruwer (WSU), Norrie Gibson (WSU), Marilize Burger (SUN)

This study investigates the femoral neck shaft angle (FNSA) and its association with osteoarthritis (OA) classifications, aiming to emphasize the significance of FNSA in surgical planning and biomechanics. Clinical and radiographic records of adult patients undergoing total hip arthroplasty at the selected arthroplasty unit between the years 2015-2020 were assessed. Patients over the age of 18 years with adequate templating radiographs, and no evidence of inflammatory arthropathies or significant flexion contractures were included in the analysis. FNSA measurements were obtained using specialized templating software. Descriptive statistics were applied, and associations between FNSA and OA classifications were examined.

Analysis of 285 hips revealed a mean FNSA of $129.4^{\circ} \pm 5.1^{\circ}$ (95% CI 128.8-129.9), which differs from other international and local population groups' FNSA. Males exhibited a statistically significant smaller FNSA bilaterally compared to females. No significant relationship between FNSA and age or anatomical side was observed. However, significant differences in FNSA were noted across various architectural categories as described by Kase et al, suggesting specific patterns of degeneration associated with different FNSA values. Patients with a proximalised and proximo-lateralised degenerative pattern exhibited the highest FNSA, followed by the centred, lateralised, and medialised degenerative patterns.

This study highlights two important concepts; firstly the notion that FNSA differs between population groups but also between individuals and secondly that FNSA has an important influence on hip biomechanics and patterns of degeneration. Selecting a hip prosthesis with the most suitable FNSA for a population, and individual, may allow for more satisfactory clinical outcomes following hip arthroplasty. This underscores the importance of considering FNSA in surgical decision-making and templating process. Prioritizing FNSA as the initial and pivotal step in templating and selecting the appropriate implant is crucial, as it serves as the foundation for accurate surgical planning and optimal patient outcomes.

P78: Femoral Stem Design Influences Post Operative Periprosthetic Femoral Fracture (POPFF) and Dislocation Risk – A Multi-Centre Study

Category: Arthroplasty

Presentation: Oral

Gareth Turnbull (Royal Infirmary of Edinburgh), Chloe Scott (Royal Infirmary of Edinburgh), Nick Clement (Royal Infirmary of Edinburgh), Bin Chen (Royal Infirmary of Edinburgh), Adeel Akhtar (NHS Fife), James Ballantyne (NHS Fife), Edward Dunstan (NHS Fife)

As the clinical burden of post operative periprosthetic femoral fractures (POPFF) continues to grow, interest is increasing in the role different femoral stems play in modifying long-term POPFF risk. The primary aim of this multi-centre study was to compare the long-term survivorship and POPFF rate of a composite beam (CB) stem with a polished taper slip (PTS) stem.

Between 2008 and 2013, 3198 consecutive THAs were performed using either the Exeter V40 (PTS) femoral stem or the Lubinus SP II (CB) femoral stem. Basic patient demographics and operative details were collected at time of surgery. Patient records and national radiographic archives were reviewed at minimum 10-years following surgery to identify occurrence of subsequent revision surgery, dislocation or periprosthetic fracture.

At mean 10.2-year follow-up (SD 2.9), 2214 patients (984/3198) remained alive. Mean patient age at surgery was 67.6 years (SD 11.2, 15 - 94 years). There were 1993 women (62%). Analysis of all- cause THA failure demonstrated CB stem survivorship of 97.3 % (95.3%-99.2%) and PTS stem survivorship of 95.8% (94.8%– 96.8%) at 13 years. Risk of POPFF was significantly higher in the PTS group (RR 5.2, CI 1.9 to 14.3, P = 0.0016), where POPFF accounted for 49% of major reoperations (36/73), although risk of Vancouver type A and C fractures was not significantly different between stem types. Older age at operation was associated with increased POPFF risk (P =0.007), whilst ASA class and sex had no impact. Risk of dislocation was higher in the CB group (RR 2.1, CI 1.0 – 4.3, P = 0.03).

Patients may be counselled that PTS stems come with increased risk of Vancouver type B POPFFs, and that this is their main cause of requiring revision surgery. However, overall long-term survivorship remains excellent in both CB and PTS stems and other factors such as patient age and dislocation risk profile may also influence choice of femoral stem.

P79: Challenges and Solutions for Total Hip Arthroplasty in Legg-Calve-Perthes Disease

Category: Arthroplasty

Presentation: Oral

Jonathan Vogel (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Inderpaul Samra (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Peter Wall (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Callum McBryde (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Angelos Politis (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom)

Painful hip osteoarthritis is a potential sequelae of Legg-Calve-Perthes disease. This condition can pose a unique set of challenges to the arthroplasty surgeon managing these young adults. The abnormal femoral head, femoral neck and acetabular contour are readily apparent on plain film antero-posterior radiographs, however there may be a number of anatomical abnormalities not as easily detected.

These less apparent anatomical abnormalities are potential stumbling blocks for the unsuspecting surgeon. Previous authors have reported on few of the abnormalities in isolation. This study aims to describe and quantify the deformities that may be encountered at arthroplasty in Perthes disease.

We conducted a retrospective study on 30 patients with Perthes disease who underwent hip arthroplasty after axial imaging and advanced deformity analysis using a Computed Tomography based protocol.

Significant anatomical abnormalities were found throughout the cohort, including segmental leg length discrepancy, acetabular dysplasia, proximal femoral metaphyseal / diaphyseal mismatch, as well as versional abnormalities of both the proximal femur and acetabulum.

The findings highlight the challenges faced at surgery in these patients. Axial imaging of the entire lower limb is recommended to fully assess and prepare for these abnormalities.

P80: Custom made implants for the management of complex primary hip arthroplasty in young adults. Indications, complications and survivorship.

Category: Arthroplasty

Presentation: Oral

Jonathan Vogel (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Peter Wall (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Angelos Politis (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Edward Dickenson (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom), Callum McBryde (The Royal Orthopaedic Hospital NHS trust. Birmingham. United Kingdom)

Total hip arthroplasty is increasingly being used as a management tool for the treatment of the painful sequelae of young adult hip conditions. These conditions occasionally are not amenable to the use of standard arthroplasty implants due to the severity of anatomical variations. Multiple arthroplasty solutions exist in this regard, one of which is the use of custom made prostheses.

The aim of this study was to report the indications, survivorship and complications of hip arthroplasty using the Symbios custom made femoral stem. Electronic records were used to identify patients undergoing custom made femoral stem as part of their total hip replacement. Episodes of revision surgery and complications were recorded.

148 Symbios stems were implanted at our center over 10 years. Indications included hip dysplasia (43), Perthes disease (35), multiple epiphyseal dysplasia (10), short stature (6), neuromuscular disorders (8), previous osteotomy to femur and or pelvis (19) and other (27). The median patient age was 33, median follow up was 1 year. Complications include 1 dislocation, 1 major neurovascular injury, 1 sciatic nerve palsy, 2 calcar cracks and 1 infection. 1 hip required revision surgery during follow up.

The Symbios custom made stem is a useful aid to surgeons faced with complex proximal femoral anatomy. The complication profile and survivorship are comparable to other forms of total hip arthroplasty in these complex cases.

P81: Nut and Bolt Fixation of acetabular components in Total Hip Replacement as treatment for both column acetabular fractures

Category: Arthroplasty

Presentation: Oral

Johan van der Merwe (Dept Orthopaedics UFS), Allan van Zyl (Mediclinic Bloemfontein), Lourens Erasmus (Dept Orthopaedics UFS)

Total Hip Replacement (THR), combined with Open Reduction and Internal Fixation (ORIF), can be used to treat acetabular fractures.

Adequate fixation of these fractures can be difficult due to associated osteopenic bone. Fractures involving both columns frequently requires fixation of both columns.

We developed a new operative technique for the management of these fractures while performing osteosynthesis of the posterior column of the acetabulum. The screws for the reconstruction plate are placed such that they also penetrate the wall of the trabecular metal acetabular prosthesis. The acetabular bone is then sandwiched between the plate and the cup similar to a Nut and Bolt Fixation (NBF).

The aim of this study was to see if this NBF, combined with conventional screws placed through the revision shell into both columns, is strong enough to avoid additional anterior column exposure and fixation.

A retrospective, case series of patients treated with this NBF technique was used in the study. The Harris Hip Scores (HHS) were determined pre and post operatively. Post-operative X-rays were evaluated for failure of fixation and fracture union. Technical intra- and post- operative complications were noted

Eight patients were treated from 2017 to 2024. Four had sustained peri-prosthetic acetabular fractures and the remainder had acetabular fractures without previous THR.

The mean HHS improved from 28.5 pre-operatively, to 88.9 post-operatively (follow up; 3 months to 6 years). No failures of the construct were observed on post-operative X-rays. One patient died within three months of her surgery. The other seven patients progressed to union of their fractures after six months.

In this small series, this NBC technique was shown to be a successful treatment option to treat acetabulum fractures involving both columns, thus avoiding additional anterior column exposure and fixation.

P82: Change in Hip Centre of Rotation post Total Hip Replacement for osteoarthritis

Category: Arthroplasty

Presentation: Oral

Fidelis Munetsi (University of Cape Town), Marc Nortje (University of Cape Town)

During Total Hip Replacement (THR), restoration of hip biomechanics is important for good clinical outcomes and longevity of the implants. One of the parameters that should be restored is hip centre of rotation (COR), which is determined by the acetabular component and can be altered from the native position by reaming. We aim to find out how much we are changing the Hip COR after THR for osteoarthritis.

Forty patients undergoing total hip replacement surgery for osteoarthritis with appropriate pre and postoperative radiographs were analysed. The COR was measured from the teardrop by two independent observers and the difference calculated.

The post-operative COR was raised on average by 2.2mm ($p < 0.05$). There were nine (9) patients where on average the COR raised more than 4mm. The average horizontal change was 1.3 mm medial and was not statistically significant. The intra class coefficient (ICC) for the two observers was 0.81.

We concluded that using free hand reaming techniques during THR for osteoarthritis the change in COR is minimal with a raised COR of 2.2mm and this should be included in leg length discrepancy pre operation planning.

P83: One-year mortality rate post delayed operation Neck of Femur Fracture

Category: Arthroplasty

Presentation: Oral

KHANYISO NDZAMELA (Registrar)

Neck of femur fractures (NOF) are common injuries associated with an increased risk of avascular necrosis (AVN) and high levels of patient morbidity and mortality. The purpose of this cross-sectional study is to examine effects of delayed surgical management of NOF. To determine the effect of delayed operative management on mortality rate with NOF. Objectives: firstly, to determine the mortality rate post-surgical treatment of NOF. Secondly, to determine whether time of operation influences mortality. The research approach used in this study is a quantitative method. The study will be a cross-sectional study which is a type of study where record review and questionnaire will be utilized for data collection. A conservative sampling method was used to select participants who had undergone neck of femur fractures surgery between a given period (July 2022- June 2023). A sample size of 129 patients was used. The data collection method that was used in the current study was through use of patient records. The researcher recorded all the participants' information including their phone numbers and informed consent telephonically was obtained before the participant is recruited for the study this will be after 1 year post operation. Statistical Package Social Sciences (SPSS) program was used to compute the descriptive statistics frequencies, mean, and standard deviations. The data was presented using a frequency table and will aid in describing the participants. The results found can also be generalized to patients with NOF to maximize their health and well-being.

Most patients that were involved in this study fell between ages (66-70) years, predominantly females, most being operated just after 2 weeks. There was no association or correlations between time of surgery and patient status a year post operation. But there is association between patient status and gender, comorbidities a year post-surgery. Study showed that delayed surgery does not lead to increase in 1 year mortality post neck of femur fractures.

P84: Radiographic Predictors of Hip Abductor Tears

Category: Arthroplasty

Presentation: Oral

Johann Groenewald (State Health) , Marc Nortje (State Health) , Derik Du Toit (State Health)

Hip abductor tears (AT) have long been under-recognized, under-reported and under-treated. There is a paucity of data on the prevalence, morphology and associated factors. Patients with “rotator cuff tears of the hip” that are recognized and repaired during total hip arthroplasty (THA) report comparable outcomes to patients with intact abductor tendons at THA.

The study was a retrospective review of 997 primary THA done by a single surgeon from 2012–2022. Incidental findings of AT identified during the anterolateral approach to the hip were documented with patient name, gender, age and diagnosis. The extent and size of the tears of the gluteus medius and

- minimus were recorded. Xrays and MRI's (magnetic resonance imaging) were collected for the 140 patients who had AT and matched 1:1 with respect to age and gender against 140 patients that had documented good muscle quality and integrity. Radiographic measurements (Neck shaft angle, inter-teardrop distance, Pelvis width, trochanteric width and irregularities, bodyweight moment arm and abductor moment arm) were compared between the 2 groups in an effort to determine if any radiographic feature would predict an AT.

The prevalence of AT were 14%. Females had statistically more tears than males (18% vs 10%), while patients over the age of 70y had statistically more tears overall (19,7 vs 10,4%), but also more Gluteus Medius tears specifically (13,9 vs 5,3%). Radiographic measurements did not statistically differ between the tear and control group, except for the presence of trochanteric irregularities. MRI's showed that 50% of AT were missed and subsequently identified during surgery.

Abductor tears are still underrecognized and undertreated during THA which can result in inferior outcomes. The surgeon should have a high index of suspicion in elderly females with trochanteric irregularities and although an MRI for every patient won't be feasible, one should always be prepared and equipped to repair the abductor tendons during THA.

P85: South African knee arthroplasty patients have significant different constitutional alignment (CPAK) compared to other countries

Category: Arthroplasty










Presentation: Oral

Allan van Zyl (SAOA), Johan van der Merwe (SAOA)

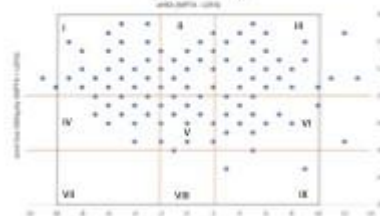
231 TKA (Persona PS – ROSA robotics) were done by a single surgeon, with the ROSA robotic assistant over a period of 20 months. Long leg x-rays were evaluated with calculation of LDFA (lateral distal femoral angle), MPTA (medial proximal tibia angle), aHKA (arithmetic hip knee angle) and aJLO (arithmetic joint line obliquity). These figures enabled classification of knee to one of the nine CPAK (Coronal Plane Alignment of the Knee) categories.

Results

aHKA was 27,5% varus, 38,7% neutral and 33,7% valgus. Percentage of knees within the CPAK classification as well as the scatter plot of individual patients, see below.

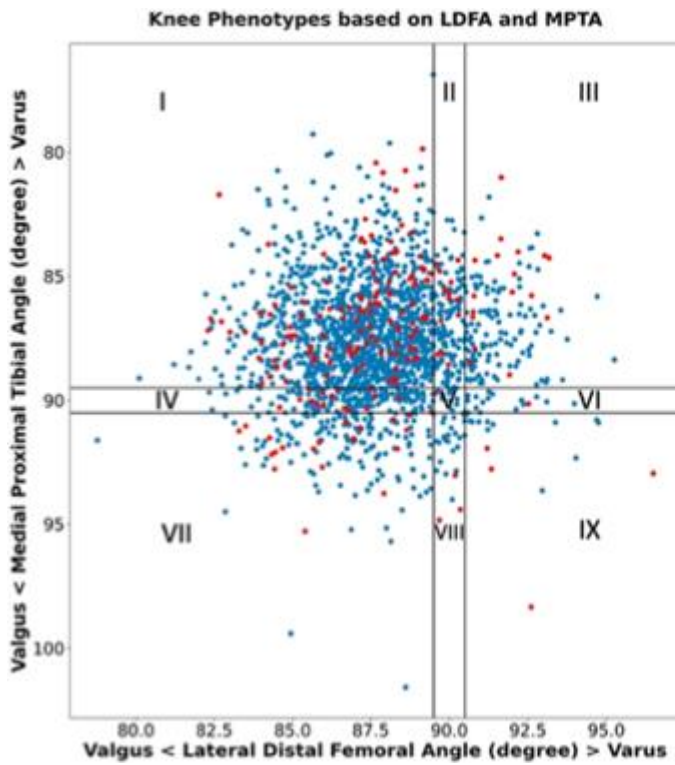
43 21,9%		43 21,9%		45 23%		66,8%
11 5,6%		33 16,8%		19 9,7%		32,1%
				2 1%		1%
27,5%		38,7%		33,7%		

CPAK (SA) – significant more Constitutional Valgus 33,7%



Conclusion

We have seen significant different constitutional alignment in our arthroplasty patients with significant more constitutional valgus in our patients compared to other countries (Belgium, Australia, USA, India, Japan, France, Taiwan) where most patient are CPAK 1 (varus) with very few valgus knees. (see scatter plot below from Germany)



Hirschmann et al

P86: The magic number is SIXTY

Category: Arthroplasty

Presentation: Oral

Johan van der Merwe (Department of Orthopaedics, UFS), Mareza Brink (Department of Orthopaedics, UFS)

Current alignment strategies for Total Knee Arthroplasty require various techniques of cutting the proximal tibia at angles other than 90 degrees to the long axis. These cuts are difficult to perform accurately without robotic surgery or navigation.

We describe a simple mathematical formula to adjust the proximal tibial cutting guide incrementally, using conventional knee replacement instruments, and performed a study to validate this method.

This technique was evaluated by simulating a Total Knee Arthroplasty on Synthetic bone combining the CORI robotic system and conventional instruments from Smith & Nephew. According to the formula, adjustments of 1, 5 and 10 degrees of varus and valgus were made to the tibial jig. The angular deflections at the proximal tibial cutting guide were recorded by the robot. This was performed at tibial lengths of 300, 360 and 420mm.

For varus and valgus adjustments of 1 degree the verification values by the robot were the same. For adjustments of 5 and 10 degrees there was an average difference of 0,2 degrees between the adjusted values and the robot values.

This mathematical formula was accurate when used with synthetic bone modules and can be useful to adjust proximal tibial cuts when using conventional Total Knee Replacement instruments.

P87: Intracapsular neck of femur fractures secondary to civilian gunshot injuries: An inter- and intra-observer agreement study on classification and treatment using the AO/OTA classification

Category: Trauma

Presentation: Oral

Sithombo Maqungo (University of Cape Town), Andrew Nicol (University of Cape Town), [Kaylin Williams \(University of Cape Town\)](#), Simon Graham (Oxford University), Michelle Henry (University of Cape Town), Ntambue Kauta (University of Cape Town), Kirsty Berry (University of Cape Town)

Numerous classification systems have been developed for neck of femur fractures, but none have been tested for reliability in gunshot injuries.

Our primary objective was to assess the interobserver and interobserver reliability of the AO/OTA classification system when applied to intracapsular neck of femur fractures secondary to low velocity civilian gunshot wounds (GSW).

Our secondary objective was to test the reliability of the AO/OTA classification system in guiding surgeon treatment choices for these fractures.

Eighteen reviewers (6 orthopaedic traumatologists, 6 general orthopaedic surgeons, 6 junior orthopaedic fellows) were given a set of 25 plain radiographs and CT scans of femur neck fractures secondary to GSW. For each clinical case all reviewers selected a classification as well as treatment option from a list of given options.

Inter-observer reliability was measured at the initial classification. The exercise was repeated 10 - 12 weeks later by the same 18 reviewers to test intra-observer reliability.

The Fleiss kappa values indicate only slight agreement amongst raters, across all experience levels, for both injury classification and treatment. Intra-observer agreement was fair across all experience levels for both injury classification and treatment.

The AO/OTA classification showed only slight reliability in classification of gunshot fractures of the femur neck. With only fair reliability, it also failed to guide surgical treatment thus rendering its routine use in daily clinical practice of questionable value.

P88: Management of pertrochanteric femur fractures secondary to gunshot injuries in a tertiary institution of a developing country in young patients

Category: Trauma

Presentation: Oral

Yenziwe Ngema (Witwatersrand Univesity) , Tamsanqa Mazibuko (Witwatersrand University)

Background : There is an increase in gunshot injuries resulting in proximal femur fractures including neck of femur fractures, intertrochanteric fractures and subtrochanteric fractures in younger patients. The management of these injuries currently remains controversial.

Aims: To assess the management of pertrochanteric femur fractures secondary to gunshot injuries and the outcomes thereof.

Hypothesis: Internal Fixation of civilian gunshot injuries is safe and offers good outcomes

Methods: Twenty-five consecutive cases of fractures to the proximal femur secondary to low velocity civilian gunshot wounds, with ages ranging from 23 to 54 years were retrospectively reviewed.

Debridement, Open reduction Internal fixation and expectant or exploratory management of nerve injuries.

Inclusion Criteria: All gunshot pertrochanteric femur fractures

Exclusion Criteria: Fractures of the femur not caused by gunshot injuries.

Data Collection and analysis: Prospectively entered data was retrospectively reviewed using our electronic database. Patients soft tissue status at presentation as well as fracture type and location in the femur were reviewed. Fracture treatment method was chosen according to the fracture type, location and the condition of the soft tissues at presentations.

Results:

Twenty-five patients met the inclusion criteria for this study. The average age was 37 years (mean 23-54). Seven patients presented with neck of femur fracture fractures. Subtrochanteric fractures accounted for eleven of the cases. Seven patients had intertrochanteric femur fractures. All the patients were treated surgically. Cepahlomedullary nails were performed in 18 patients, whilst seven patients underwent internal fixation.

Fracture fixation can offer satisfactory functional outcomes. This study supports the view that surgical fixation of the pertrochanteric femur fracture following low velocity civilian injuries is safe.

P89: Orthopaedic management of pelvic fractures: A literature review

Category: Trauma

Presentation: Oral

Aftab Younus (Helen Joseph Hospital) , Mohammad Aftab (Helen Joseph Hospital) , Michael Mojapelo (Helen Joseph Hospital)

Background: The incidence of pelvic fractures is increasing in many countries secondary to motor vehicle accidents and falls. It is important that the attending orthopaedic surgeon have a working system by which to classify these injuries and the Young and Burgess classification is commonly used. The orthopaedic management of these injuries is conceptually divided into emergency room measures, interim measures, and definitive measures.

Data source: We conducted a PubMed search using keywords “Orthopaedic pelvic fractures”; “Pelvic fracture management”; “Stable pelvic fractures”; “Unstable pelvic fractures”; “External fixation pelvic fractures”; “Internal fixation pelvic fractures”; “Infix pelvic fractures”. The selection of articles included was subjective based on the discretion of the researchers. In total 36 articles were selected for inclusion in this review which is intended to assist orthopaedic surgeons involved in the management of these injuries.

Results: The mechanistic classification of Young and Burgess is not only useful to describe a pelvic fracture pattern, but furthermore reliably predicts associated intra-pelvic and extra-pelvic injuries.

Regarding emergency room management circumferential pelvic sheeting, pelvic C-clamp, and the external pelvic fixation device, are all still useful in modern emergency room pelvic fracture management. Regarding interim measures the pelvic sling, external pelvic fixation device, and more recently the in-fix, are commonly used. In terms of definitive management complications from pin tract sepsis from prolonged application of an external pelvic fixation device, and the complexities of open pelvic plating, have resulted in new interest in the in-fix as a definitive measure.

Conclusion: While definitive open pelvic plating will always have an established role, the in-fix, with/without sacroiliac screws, is growing in popularity as an easier to perform definitive measure. Our review provides a

concise overview of all the modalities currently in use, and as such is invaluable to trauma orthopaedic surgeons who will frequently need to manage this common problem.

P90: Total hip arthroplasty for neck of femur fractures secondary to civilian gunshot injuries

Category: Trauma

Presentation: Oral

Sithombo Maqungo (University of Cape Town), Andrew Nicol (University of Cape Town), Marc Nortje (University of Cape Town), Wafiq Gamieldien (University of Cape Town), Simon Graham (Oxford University), Maritz Laubscher (University of Cape Town), Kirsty Berry (University of Cape Town)

The optimal treatment for intracapsular neck of femur fractures secondary to civilian gunshot injuries (GSI) remains a challenge. Surgical fixation is associated with a high failure rate due to avascular necrosis and non-union.

We report on the largest series of patients who underwent total hip arthroplasty (THA) for civilian GSI involving the hip joint. The objectives are to assess clinical outcomes and to report on complications as well as associated injuries.

We included all patients who had undergone THA for a GSI to the hip joint at our institution from 2009

-2022. We identified 14 patients, and all were males with an average age of 32 years (range 18-49). The mean follow-up time was 18 months (range 2 – 84).

Ten of these patients received acute primary THA, whilst 4 had delayed THA for failed open reduction and internal fixation. The average time to surgery for the acute group was 7,6 days (range 3 – 14) and for the delayed group it was 154 months (range 10 – 120).

Visceral injuries, mostly bowel and bladder, and other pelvis ring fractures, were the most commonly encountered associated injuries.

One patient (7%) developed prosthetic joint infection within 2 weeks of acute primary THA, despite negative samples at index THA. He had associated large bowel injury, caused by a different projectile with no direct communication with the hip joint.

In the delayed THA cohort, the mean pre-operative Harris Hip Score (HHS) was 53.2 points, and the mean postoperative HHS at 6 months was 85.5 points.

We have shown that total hip arthroplasty is a safe and feasible option for these complex injuries that carry poor surgical fixation outcomes. THA can be performed in the acute setting without the need for an antibiotic spacer and staged surgery if there is no bowel contamination of the hip joint.

P91: Intra-articular Hematoma Block for Closed Reduction of Displaced Ankle Fractures

Category: Trauma

Presentation: Oral

Stefan Swanepoel (Mitchells plain Hospital), Heinrich Jansen van Rensburg (Mitchells plain Hospital), Chanel Robinson (Mitchells plain Hospital), Puyeipawa Kafita (Mitchells plain Hospital), Conan Harris (Mitchells plain Hospital), Ntambue Kauta (Mitchells plain Hospital)

Displaced ankle fractures should undergo urgent manipulation to release tension from the bony structures on the overlying soft tissue envelope. The intra-articular hematoma block (IAHB) offers an alternative to procedural sedation for the reduction of displaced ankle fractures.

The purpose of this study was to evaluate the efficacy of the IAHB in patients presenting with a displaced ankle fracture to a primary level hospital. Secondary aims were to determine the incidence of complications associated with the IAHB and to assess the quality of reduction.

A retrospective review of 50 consecutive patients, treated between November 2022 and October 2023, undergoing manipulation of a displaced ankle fracture with an IAHB was performed.

The mean age was 40 years (range 20 – 82 years) and 76% of patients were female. The average delay from injury to presentation was 7 days (range 1 – 25 days). The median Numeric Pain Rating Score (NPRS) reduced by 4 (95% CI, 3.16 – 4.84) after the IAHB was administered. The median Visual Pain Scale and Verbal Pain Scale decreased by 2 (95% CI, 1.71 – 2.30) and 3 (95% CI, 2.67 – 3.33) respectively. The median reduction in the NPRS between the initial presentation and during the manipulation was 4 (95% CI, 3.16 – 4.84). The median Visual Pain Scale and Verbal Pain Scale both decreased by 2 (95% CI, 1.54– 2.46). An acceptable reduction was achieved in 90% of patients.

There were no complications reported.

The IAHB provides sufficient pain relief for closed manipulation of ankle fractures with no complications in our cohort. Larger prospective studies are required to validate our findings.

P92: Comminuted posterior wall fractures: the role of Autologous bone grafts and midterm results

Category: Trauma

Presentation: Oral

Tamsanqa Mazibuko (Witwatersrand University South Africa)

Background:

Reconstructing late **posterior** acetabular **wall fractures** is challenging. This study evaluates the use of the iliac crest strut graft for **posterior** acetabular **wall** reconstruction.

Hypothesis: Autologous bone grafting from the ilium is a viable option for treatment of highly comminuted posterior acetabular wall fractures.

Objective: To evaluate the functional and radiological outcome of complex posterior wall acetabular fractures with high comminution treated with cancellous autograft and internal fixation.

Methods:

A total of 149 posterior wall fractures were analysed out of a database comprising of 438 acetabulum injuries. 98 of these patients met the inclusion criteria of the study, regarding high comminution. We analysed the subset of these patients where adequate bone coverage of the femoral head was lacking or inadequate. 38 patients were selected. Mean age at time of injury 37.9 years. 88% males, 12% females. 6 patients had bilateral isolated acetabulum injuries. Mean follow up was 36 months (14 to 38 months). Autologous bone grafting performed in 32 out of 38 patients. Internal fixation of the acetabulum performed in all patients. Average size donor iliac crest bone 44mm(37mm to 53mm) by 32mm.

Results:

The quality of the reduction was anatomical in 22 patients. Imperfect in 11 patients and poor in 6 patients. The radiological outcome with regards to graft uptake was excellent in 28 patients (74%) good in 6 patients (15%) and poor in 4 patients

Conclusion:

Autologous bone grafting is a viable option for the treatment of highly comminuted posterior acetabular wall fractures. The use of cancellous autograft to fill the bone void provides good mechanical stability without any

secondary loss of reduction. This surgical technique seems to be effective and safe in treating comminuted posterior wall fractures with high comminution with very minimal any donor site.

P93: Evolution of TB spine surgery in the paediatric patient

Category: Spine

Presentation: Oral

Hammaad Gamieldien (UCT) , Robert Dunn (UCT)

The immature and pliable paediatric spine is prone to rapid and severe deformities following vertebral collapse, particularly in spinal tuberculosis, progressing beyond the reach of conventional treatment methods compared to adults.

While medical treatment forms the cornerstone of spinal TB management, surgical intervention becomes necessary in cases of severe deformity or spinal instability. The key principles of management involve abscess drainage, deformity correction, and prevention of neurological complications. These objectives are typically achieved through anterior, posterior, or combined surgical approaches, with the anterior approach being the traditional choice. All these approaches carry potential significant morbidity with the risk of transthoracic pulmonary compromise and prolonged theatre time contributing to the drive towards posterior only vertebral column resection surgery.

A retrospective analysis of a cohort treated by a single surgeon at a specific facility involved 126 paediatric patients between 2001 and 2024, with an average age of 8 years and 5 months. Anterior approach surgery accounted for 40.9% of cases, while posterior-only approaches were used in 55% of cases. Mean blood loss in the anterior surgery was 562.5ml compared to 494.6ml in the posterior approach. Revision surgeries were required in 5.7% of anterior-based procedures and 1.4% of posterior-based procedures. The mean surgical duration was 2.83 hours for anterior approaches and

2.49 hours for posterior approaches. Notably, a shift was observed in surgical approaches over time, with 55% of surgeries being anterior-based from 2001 to 2014, decreasing to 33% from 2014 to

2024.

The global trend towards favouring posterior-only approaches, particularly with vertebral column resection, reflects concerns over potential adverse events associated with anterior-based surgeries, such as longer operative times, extended immobilization, progressive kyphosis, and graft failure. The decision-making process has thus shifted towards posterior-only approaches, leveraging lower revision rates, shorter surgical times, and less invasive techniques utilizing well-established posterior stabilization devices.

P94: Symptomatic and aggressive vertebral haemangiomas in the paediatric population: presenting a series of three cases and review of literature

Category: Spine

Presentation: Oral

Shivam Bhikha (Wits CMJAH) , Freddy Ukunda (Wits CMJAH) , Morake Tlhabane (Wits CMJAH)

Aggressive vertebral haemangiomas (VH) are a rare neoplasm in children and may lead to severe back pain, significant neurological morbidity and or deformity. They are technically challenging to treat with significant risk of complications during surgery. Various treatment modalities have been proposed including embolisation, radiation therapy, ethanol injection, surgical

decompression with stabilisation and vertebroplasty; however no international consensus or treatment algorithm exists.

We describe 3 paediatric cases of aggressive VH managed in our institution. All 3 cases presented as teenagers with new onset neurology and were managed surgically, however with different and individualised treatment strategies. We performed a literature review of reported cases of aggressive VH in the paediatric population with an aim to discuss treatment strategies of these lesions.

Although technically challenging, aggressive VH have a satisfactory outcome after treatment. Treatment should be tailored to the individual patient. Further studies are required to devise the optimum treatment algorithm.

P95: Whole-body 18FDG-PET/CT findings in patients with spinal tuberculosis: preliminary results from the Spinal TB X cohort

Category: Spine

Presentation: Oral

Julian Scherer (University of Cape Town), Maritz Laubscher (University of Cape Town), Tessa Kotze (University of Cape Town), Sandra Mukasa (University of Cape Town), Ferdinand Oompie (University of Cape Town), Karen Wolmarans (University of Cape Town), Reto Guler (University of Cape Town), Robert Dunn (University of Cape Town), Michael Held (University of Cape Town), Friedrich Thienemann (University of Cape Town)

Spinal tuberculosis (STB) accounts for up to 10% of Extrapulmonary tuberculosis (EPTB) and often leads to lifelong debilitating disease. Whole-body 18FDG-PET/CT (PET/CT) has been shown to be able to detect sites of infection and monitor treatment success. In this preliminary analysis we assessed the PET/CT findings of 14 participants, with definite STB, enrolled in Spinal TB X (clinicaltrials.gov: NCT05610098).

The Spinal TB X cohort is an ongoing cohort study describing the clinical phenotype of STB using PET/CT and MRI at baseline with repeated PET/CT at six- and 12-months to monitor treatment response. Sputum, urine and tissue samples undergo GeneXpert Ultra (XP), MGIT culture (CX) investigations and histological (HX) workup, respectively.

At the time of submission, 64 patients were screened for eligibility. 14/19 patients (82.4%) showed proven STB. Of these, 42.9% were female and 35.7% were HIV-infected. The median age was 45.5 years (IQR 19.25). Additional pulmonary lesions on PET/CT were found in six (42.9%) patients with no difference by HIV status and only half of these had a positive Sputum XP. Spinal skip lesions occurred in three patients (21.4%) who were all HIV-uninfected. The mean lesion count was 1.3 on PET/CT compared to MRI 1.1. The mean count of affected vertebrae per lesion was 2.7 on PET/CT compared to MRI 2.3. Nine (64.3%) showed psoas abscesses with no influence by HIV-status. The median Total Lesion Glycolysis (TLG) on PET/CT was 241.8 (IQR 527.9) and median SUV max was 17.4 (IQR 6.8) with no difference by HIV status.

We conclude, that in our preliminary analysis, isolated STB appeared to be the dominant entity on PET/CT. Spinal skip lesions were uncommon. HIV infection did not play a role in the distributional pattern and PET/CT parameters.

P96: Adverse intra-operative neuromonitoring alerts in AIS surgery: Our local experience

Category: Spine

Presentation: Oral

Rihangwele Tshisikule (WITS University), Fred Ukunda (WITS University), Morake Tlhabane (WITS University)

Posterior deformity correction surgery for Adolescent Idiopathic Scoliosis (AIS) has 0.5-1 % risk of neural damage. Intra-operative neuromonitoring (IONM) is used to assess neural injury/irritation that may occur during; instrumentation, distraction, or due to cord ischemia. The efficacy of IONM depends on patient's physiology, neuro-physician's level of training, anesthetist/drugs, and the surgeon. The purpose of this study is to discuss challenges of adverse IONM alerts in AIS surgery and correlate to post-operative neurology.

This is a retrospective study of patients who underwent AIS surgery in year 2023 at Charlotte Maxeke Johannesburg Academic Hospital. A single company was used for IONM, surgical implants were from two companies, all cases done by a single surgeon.

Twenty-one patients who had normal pre-operative neurology were operated. Three patients developed post-operative neurological fallout. The 1st patient had adverse IONM alerts; surgical steps were reversed without any IONM improvement, surgery was abandoned, patient had post-operative left monoplegia, post-operative MRI showed no spinal cord injury/haematoma, patient became paraplegic after four days due to instability and was taken back to theatre for deformity correction plus instrumented fusion the following day. By week 3, patient had recovered sufficiently to mobilise with a walking frame, then discharged to a rehabilitation centre. The 2nd patient had adverse IONM alerts without an identifiable cause, the operation was continued without IONM, she woke up with left L2 nerve root neuropraxia which fully resolved in two weeks. The 3rd patient had no adverse IONM alerts but had post-operative left leg monoparesis which fully resolved within three weeks.

Adverse IONM alerts can be multi-factorial during deformity correction in AIS surgery and should be used to aid and guide the surgeon. The surgeon should make a clinical decision taking into account all factors that may cause changes to IONM readings.

P97: MRI yield in AIS: Our local experience

Category: Spine

Presentation: Oral

Rihangwele Tshisikule (WITS University), Fred Ukunda (WITS University), Morake Tlhabane (WITS University)

There are no absolute indications for pre-operative magnetic resonance imaging (MRI) in patients with Adolescent Idiopathic Scoliosis (AIS). Roughly 10% of patients with AIS have Neural axis abnormalities (NAAs), however, the presence of NAAs has no direct correlation with intra-/post- operative neurological complications. Clinical features such as thoracic hyper kyphosis, asymmetrical abdominal reflex, atypical curves, and male gender amongst others have been associated with increased risk for NAAs. The purpose of this study is to determine the yield of MRI scan on patients who presented with AIS to our institution and their neurological outcomes during/post-surgery.

This is a retrospective study of patients who presented with AIS at Charlotte Maxeke Johannesburg Academic hospital between November 2019 to December 2023. Only patients with a presumed diagnosis of AIS were included.

A total of 70 patients (age 10-24 years) with AIS were seen during this period. Pre-operative MRI scan was done in 52/70 patients, 36/70 patients were operated, and 10/36 patients were operated without a pre-operative MRI scan. Three patients had NAAs (4.3 %), two of them had uneventful posterior scoliosis surgery whilst the other one refused surgery. All ten patients without MRI scans had uneventful operations. Two of the patients who had normal pre-operative MRI had adverse intra- operative neuromonitoring alerts with subsequent post-operative neurology.

The incidence of NAAs in our setting is low and there is no correlation between the presence of NAAs and post-/intra- operative adverse neurological outcomes. We recommend that MRI should not be done routinely for AIS especially in resource constrained facilities.

P98: Prevalence of depression among chronic back pain patients attending a spine clinic at a tertiary institution

Category: Spine

Presentation: Oral

BM Khumalo (Wits)

Low back pain (LBP) is one of the most common musculoskeletal conditions worldwide, with a lifetime prevalence of 84.1%. LBP is the leading cause of years lived with disability and is associated with worse health-related quality of life. Chronic LBP (CLBP) in particular is of comorbid with depression a main cause of disability worldwide. Depression is common in patients with CLBP and is associated with increased pain intensity, increased physical and psychosocial disability, increased medication use and increased likelihood of unemployment.

The aim of the study is to determine the prevalence of depression among CLBP patients attending treatment at a spine clinic at a tertiary institution. Patients older than 18 years old and attending spine clinic for more than 6 months for LBP treatment were included and excluded patients that were not willing to be part of the study.

111 patients were recruited in this study, 17 (15.3%) males and 94 (84.7%). Using Beck's Depression Index, 27 patients displaced normal moods, 19 had mild mood disturbance, 10 displaced borderline clinical depression, 29 had moderate depression, 16 had severe depression and 10 patients had extreme depression.

This study revealed that there's a significant number of patients treated for CLBP with mood disturbance. Depression should be evaluated when investigating disability among patients with CLBP.

P99: Gunshot versus blunt trauma in spinal cord injuries: analysis of injury characteristics and neurological outcomes

Category: Spine

Presentation: Oral

Alina Jacob (AOSpine), Robert Dunn (University of Cape Town), Nick Kruger (University of Cape Town)

Background Spinal cord injury due to civilian gunshot wounds (GSW) compared to blunt trauma (BT) may have different presentation, management, and outcomes. The aim of this study was to evaluate clinical characteristics and functional outcomes associated with GSW to the spine versus BT.

Methods Retrospective single-centre analysis 2003–2022, included all patients with spinal cord injuries due to GSW or BT. Clinical characteristics were compared followed by age-matched analysis of neurological injury, neurological improvement, defined as change in ASIA Score, and outcomes, the need for surgery, and mortality.

Results 1939 patients with spinal cord injury were included, 566 in GSW group, and 1373 patients in BT group. Most patients in the GSW group were males (94.9% GSW vs. 83.5% BT; $p < 0.001$) and younger (28 years GSW vs. 38 years BT; $p < 0.001$). Age-matched subgroups analysis (< 45 years) included 1536 patients (540 in GSW, 996 in BT group). GSW caused significantly more complete neurological injuries at admission than BT (complete injury 63.5% GSW vs. 34.4% BT, $p < 0.001$). ASIA Score at admission was significantly lower in GSW group (42.0 ± 24.6 GSW vs. 53.6 ± 36.2 BT; $p < 0.001$) and changed in both groups from admission to discharge without significant difference (change of ASIA Score 4.0 ± 10.1 GSW vs. 5.7 ± 14.5 BT; $p = 0.376$). There was no significant difference in mortality rates ($p = 0.289$). Most GSW patients were managed non-operatively (non-operative 83.0% vs. 23.3.8%, $p < 0.001$) with decreased incidence rate of surgery after 2005. There was no significant difference in ASIA score improvement between bullet removal vs. others ($p = 0.199$).

Conclusion This dataset represents the largest single-centre record of GSW to the spine. GSW affect mostly young males and result in significantly more complete neurologic injuries compared with BT at similar mortality rates. GSW patients undergo surgery less frequently, and patients with bullet removals did not show better outcomes. These findings may be useful in decision-making, patient care and management of expectations.

P100: Neurological outcomes of patients with cervical spinal cord injury treated by closed reduction and surgical stabilization at a tertiary hospital: a retrospective longitudinal study.

Category: Spine

Presentation: Oral

Silas Batjana Mabitsela (University of Pretoria), Maleho Michael Maku (University of Pretoria), Mthunzi Victor Ngcelwane (University of Pretoria)

The severity of cervical spinal cord injuries (CSIs) in sub-axial C-spine fracture/dislocations, can result in significant, disabling neurological and physical outcomes. Research shows that early decompression of the spinal cord may impact the neurological recovery of patients with such injuries. This study aims to evaluate the neurological outcomes of patients who sustained sub-axial C-spine fracture/dislocations with CSI who were treated with closed reduction before surgical stabilization at a tertiary hospital in South Africa by evaluating the relationship between closed reduction and neurological outcomes.

We conducted a retrospective review of the medical records of patients who sustained sub-axial C- spine fracture/dislocation and treated by closed reduction prior surgical stabilization at the hospital from January 2015 to December 2020 by analysing the American Spinal Injury Association (ASIA) grades that were recorded preoperatively and postoperatively. Exclusions from the study included patients younger than 12 years, a history of prior C-spine surgery, penetrating injuries, or whose neurological symptoms could not be evaluated.

The findings of this study indicated that most (70%) of the patients were male, and motor vehicle accidents (64.5%) were the primary cause of injuries. Closed reduction was achieved (82%) in less than 24 hours from injury and definitive surgery was performed within 6 days from injury. The average ASIA score on admission was D (62%) and improved to E (75%) by the final follow-up. Most (90%) patients who were reduced within 24 hours (between injury and closed reduction) showed improved neurological outcomes with neurological function restored to varying degrees, which was statistically significant ($p < 0.001$). Furthermore, post-surgical stabilization the overall neurological status remained constant.