



SAOA 2022

PODIUM PRESENTATION ABSTRACTS

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P1. Medium-term outcomes of reconstructive hip surgery in a cohort of South African children with cerebral palsy.

Category: GT du TOIT TOP5

Presentation: Podium Presentation

Scott C J Tink (University of the Witwatersrand) , Faith M Bischof (University of the Witwatersrand) , Anthony J F Robertson (University of the Witwatersrand) , Gregory B Firth (Bart's Health Trust, Royal London Hospital)

Aim:

To establish medium-term outcomes of reconstructive hip surgery in a cohort of non-ambulatory patients with CP.

Study design:

Retrospective cohort, with prospective recall.

Participants:

Forty-one of 142 individuals (24 GMFCS level IV, 17 level V) who had undergone reconstructive surgery at a tertiary hospital in South Africa, were available for recall. Participants included 18 females, 23 males.

Age at surgery ranged from 3.3 – 16.3 years (mean 8.7 years). Follow-up ranged from 3.2 – 8.4 years (mean 6.3 years). Surgery was bilateral in 31 cases. Varus derotation osteotomy (VDRO) and adductor tenotomy were performed on 75 hips, with simultaneous pelvic osteotomy performed on 11 hips.

Method:

Participants underwent clinical examination & repeat anteroposterior pelvic X-ray, while accompanying caregivers were interviewed regarding pain, frequency and difficulty performing activities of daily living. Limited by sample sizes, Wilcoxon signed rank and Spearman Rho non-parametric tests were used, along with descriptive statistics.

Results:

Incidence of significant, frequent pain decreased from 87.8% pre-operatively, to 31.7% post-operatively. Perineal cleaning, changing of diapers, dressing and undressing were the most common activities causing pain. Using Chailey levels of box sitting, GMFCS level V patients showed no difference in pre- versus post-operative sitting abilities. Level IV patients showed minimal, but statistically insignificant improvement. ($P > 0.05$).

Using Reimer's migration index to assess hip containment, both GMFCS groups displayed improved hip enlocation. Significant reductions in hip dislocations and subluxations were noted at follow-up. GMFCS level V patients experienced more radiological complications (61.3%), compared to level IV

patients (36.4%), including avascular necrosis (3 hips), heterotopic ossification (6 hips) and hardware failure. Sixteen hips were subluxed and 9 dislocated at follow-up.

Conclusion:

Although majority of patients experienced pain relief and better post-operative hip enlocation, the high incidence of complications emphasises the importance of close follow-up in patients living with CP.

P2. Assessing the impact of surgery in degenerative spine patients by means of pre and post operative health and functional scores

Category: GT du TOIT TOP5

Presentation: Podium Presentation

Benjamin Blankson (University Of Cape Town/ Groote Schuur Hospital) , Robert Dunn (University Of Cape Town/ Groote Schuur Hospital)

Background

Degenerative spinal disease (DSD) causes pain and disability for the individual leading to reduced productivity. Surgical intervention is exponentially driving health care costs and needs to be justified with supportive outcome data. This data in SA is not readily available.

We studied the patient report outcome measures (PROMs) of degenerative spinal surgery by a single surgeon across private and public platforms.

Method

The senior authors prospectively maintained database was retrospectively analysed in terms of pre- and 6-month post-operative PROMs in degenerative spinal surgery patients operated on between 2003 to 2020. PROMs included EQ5D, Oswestry Disability Index, Roland Morris and VAS.

921 patients were identified, all undergoing decompression, 689 fusions of which 316 were TLIFs. 287 were revisions and 153 associated deformity.

Results

Overall EQ5D slider improved from 54 to 71, ODI 49 to 28, RM 11.9 to 7.6 and VAS 6.3 to 3.7 (all $p < 0.001$). The preop scores were worse for public compared to private patients ($p < 0.001$).

In lumbar stenosis, females predominated with average age at surgery at 62.8 years. Those undergoing primary, non-deformity surgery had a poorer baseline score but improved EQ5D from 45 to 73, ODI 44 to 31, RM 12.5 to 7.3 and VAS 6.1 to 3.5 (all $p < 0.001$). The fusion technique did not influence outcome levels.

The deformity group improved EQ5D 52 to 69, ODI 47 to 30, RM 12.8 to 7.8 and VAS 6.4 to 3.5 (all $p < 0.001$).

Conclusion

This first South African Degenerative spine PROMS study supports the value of surgical intervention with significant gains in all domains of EQ5D, ODI, RM scores as well as the VAS at 6 months post-operative, both overall and in diagnostic sub-groups.

P3. Filling the gap – A series of 3D-printed Titanium truss cages for the management of large bone-defects

Category: GT du TOIT TOP5

Presentation: Podium Presentation

Hammaad Gamielien (GSH) , Maritz Laubscher (GSH) , Nando Ferreira (TBH) , Franz Birkjoltz (PVT) , Tom Hilton (GSH)

Introduction: Large segmental long bone defects are notoriously difficult to manage. Treatment is resource-intensive due to the complexity, cost, and specialized skills required. Truss designs are known for their triangular shapes organized in web configurations. This allows for maximal mechanical strength, the least mass, and a lattice that can be filled with bone graft. Using a truss cage combined with contemporary internal fixation provides immediate stability and eventual bony union. The implant is designed according to virtual 3D modelling of the patient's bone defect on a CT scan. The truss cage can be used in a staged procedure combined with Masquelet's induced membrane technique. This study aims to review the outcome of patient-specific, locally designed 3D Titanium Truss cages packed with cancellous autograft in treating segmental, long bone defects in the lower limb in a resource-constrained environment.

Methods: This retrospective series reviewed cases performed at various institutions between January 2019 and March 2022. Parameters assessed include size and location of the defect, time to clinical and radiological union and complications experienced.

Results: Nine cases were included for review, with a mean age of 36 years (range 19-52). Co-morbidities included HIV and smoking in 2 cases. Defects ranged from 60mm to 205mm, and eight cases were staged procedures. Eight cases used intramedullary reamings as bone graft.

Contemporary intramedullary nails were used for fixation in all cases. No peri- or postoperative complications occurred.

Conclusion: 3D printed titanium truss cages combined with bone graft appear to be an effective treatment of large bone defects in the lower limb in a resource-constrained environment. No short term complications were encountered, but longer follow up is needed before definitive recommendations can be made.

P4. Comparison of the success and patient outcomes of medial patellofemoral ligament reconstruction techniques

Category: GT du TOIT TOP5

Presentation: Podium Presentation

Richard Almeida (University of the Witwatersrand, Johannesburg) , Ponky Firer (University of the Witwatersrand, Johannesburg) , Bradley Gelbart (University of the Witwatersrand, Johannesburg)

Introduction

Recurrent lateral patella instability is multifactorial, with emphasis of treatment in restoring the medial stabilising structures to prevent further dislocations and complications. Many treatment options have been documented and Medial Patella Femoral Ligament (MPFL) reconstruction has become the most common surgical method. There is a heterogenicity of MPFL reconstruction techniques described with no gold standard reported. The aim of this study was to determine the difference in success of MPFL reconstruction with emphasis comparing double bundle versus single bundle reconstruction techniques.

Methods

A retrospective review was conducted of patients that underwent MPFL reconstructions performed over a 10 year period. Patient demographic details including BMI and the surgical technique used including double bundle or single bundle, graft choice and graft fixation were recorded. Outcome measures included redislocation rate, Kujala knee questionnaire, Tegner activity scale and visual analogue scale assessing satisfaction.

Results

133 patients underwent MPFL reconstruction, 17 patients were excluded. 31 patients were lost to follow up. A total of 85 (73.28% follow up) patients were assessed. Average age was 23.9 years and 63.53% (n=54) were female. The average follow up was 80.5 months, with the 3.5% (n=3) patients redislocated requiring revision surgery. The mean Kujala knee score was 85, the mean Tegner activity scale was 5.6 and 9 was the mean VAS score. 45.9% (n=39) patients underwent double bundle reconstruction and 54.1% (n=46) single bundle reconstruction. The difference between the double bundle and single bundle groups for dislocation requiring revision surgery was 5.1% (n=2) and 2.2% (n=1) respectively.

Conclusion

When comparing Kujala knee scores, Tegner activity scales and redislocations requiring revision surgery, the two groups showed similar results. This follows the trend reported in the literature. Other factors such as post operative rehabilitation may influence outcomes. Higher powered prospective studies are required to better determine which techniques are superior.

P5. An audit of extracapsular hip fracture related mortality in elderly patients treated at a tertiary hospital in central South Africa

Category: GT du TOIT TOP5

Presentation: Podium Presentation

Keagakgotla Rabodietso (University of Free State) , Steven Matshidza (University of Free State) , Johan Van der Merwe (University of Free State)

Elderly patients often fall and sustain hip fractures that considerably affect their quality of life, often associated with increased mortality. A mortality rate of up to 30% has been reported, even in developed countries. Some pre-operative risk factors that are associated with increased mortality after hip fractures in the elderly include abnormal blood results on admission, delay in surgery by more than 48 hours, 3 or more comorbidities and gender. The aim of our study was to perform an audit of the prevalence of mortality and the factors associated with an increased mortality in elderly patients treated for hip fractures in our setting.

This retrospective study of patients ≥ 65 years of age with extracapsular hip fractures treated between January 2017 and December 2019. The national identity numbers of the cohorts were checked in the national death register. We investigated time to operation, gender, number of comorbidities, blood results on admission, and post-operative mortality at 30 days, six months and one year.

A total of 138 patients were included, with median age of 77 years (65–101 years) . Forty-eight (34.8%) patients died within the first year following surgery. Despite the female predominance (n=86; 62.3%), the difference in mortality between male and female patients was not statistically significant (p=0.3518). Most patients (n=125; 90.6%) were operated after 48 hours of admission, with a median waiting time of 5 days (range 1–25 days) in the group that died. Most (n=102; 73.9%) patients had normal blood results on admission, with a Monte Carlo estimate of 0.1964 in relation to mortality. Twenty-one (15.2%) patients had three or more comorbidities.

The 1-year mortality rate in this study was higher than in most previously reported findings. Pre-operative factors assessed did not influence the mortality in this study.

Keywords: hip fracture; extracapsular; elderly; mortality; risk factors

P6. Gender diversity in Orthopaedic surgery: A scoping review

Category: SAFOSS

Presentation: Podium Presentation

Julia Bertie (Greys Hospital, Pietermaritzburg) , Megan O'Connor (Inkosi Albert Luthuli Central Hospital, Durban) , Leonard Marais (Head of Department: Orthopaedics, School of Clinical Medicine, UKZN)

Background: Orthopaedic surgery remains a male-dominated field. Interventions to improve representation of women in orthopaedic surgery have increased the number, but it remains one of the least representative of female surgeons amongst the surgical disciplines. A scoping review was performed to identify challenges related to gender diversity specific to orthopaedic surgery.

Methods: A search of four online medical databases was performed, using the terms 'women physicians', 'gender bias' and 'orthopaedic surgeons', for articles prior to March 16th 2022. Articles eligible for inclusion addressed diversity or bias related to female gender in orthopaedic surgery. Inclusion was refined to specific themes, namely: current representation of women in orthopedics and its sub-specialities (as compared to other surgical disciplines), reasons for underrepresentation and attrition, disparities in academia and career progression, occupational hazards, and maternity- related issues.

Results: Sixty-nine eligible articles were identified, originating largely from the United States of America and the United Kingdom. Ten articles quantified the underrepresentation of women in orthopaedics and 15 presented perceived reasons, the majority citing poor work-life balance and lack of mentorship as chief causes. No articles focused primarily on attrition rates. Six articles reported the subspecialities commonly pursued by women, predominantly paediatric, upper limb, and sports medicine subdisciplines. Six articles compared representation of women in orthopaedics to other surgical disciplines, finding that representativity in orthopaedic surgery lags behind other surgical disciplines. Eight articles discussed malignancy and occupational exposure risks, four discussed maternity matters and 20 referred to disparities in academia, including research and career progression.

Conclusion: This review identified issues related to gender diversity in orthopaedic surgery. Many publications investigated underrepresentation of women in orthopedics and the reasons therefore, but few investigated maternity issues or attrition rates. Future research should investigate these underreported topics to improve the representation of women in orthopaedics.

P7. A qualitative study: women's lived experience of training and working in orthopaedic surgery in South Africa

Category: SAFOSS

Presentation: Podium Presentation

Mari Thiar (Stellenbosch) , Megan O'Connor (UKZN) , Jana Muller (Stellenbosch) , Jason Bantjes (SAMRC)

Background: Globally medicine is rapidly feminized, yet orthopaedic surgery in South Africa continues to be male dominated, with women currently constituting less than 5% of the profession. Reasons for the lack of gender transformation in orthopaedics are not well understood. We explored women's lived experience of training and working in orthopaedic surgery in South Africa, with the aim of understanding factors that may impede gender transformation in Orthopaedics.

Methods: This descriptive qualitative study was grounded in phenomenology and followed a data-driven inductive approach. Data were collected via facilitated informal focus groups, in which discussion was directed at understanding both the collective and individual experiences of the participants and analysed using thematic content analysis.

Results: Participants describe working in a dynamic environment which is being visibly transformed, yet they identified several practices which contributed to their experience of thwarted belonging. They described the additional labour imposed by their active participation in disrupting the established gender order and how the labour of this transformative work was not always seen or acknowledged by male colleagues. They described the challenge of negotiating the competing roles of mother and surgeon and how this contributed to feeling alienated. They described incessantly confronting restrictive gender norms and their experience of internalised sexism which resulted in women perpetuating gender discrimination. Participants described how they resisted the restrictive hegemony and pushed back against marginalisation. Finally, they identified strategies that could be helpful to promote transformation.

Conclusion: The gender imbalance in orthopaedic surgery is a function of broader historic and socio-cultural factors in South Africa including traditional gender norms and expectations. Nonetheless, both men and women contribute to reproducing a culture which hinders gender diversity. Men and women have an important role to play in promoting gender inclusion and diversity in orthopaedic surgery in South Africa.

P8. Short-term clinical, functional and biomechanical outcomes are equivalent in middle-aged patients undergoing Hip Arthroscopy and Direct Anterior Approach Total Hip Arthroplasty

Category: Hip Arthroscopy

Presentation: Podium Presentation

Jurek Pietrzak (Charlotte Maxeke Johannesburg Academic Hospital) , Josip Nenad Cakic (Charlotte Maxeke Johannesburg Academic Hospital)

Introduction:

Middle-aged patients aged 40 – 55 years with hip pain represent a unique challenge as often they are perceived as too young for THA but too old for HA and subsequent treatment decisions may be controversial. This study sought to compare the early clinical, functional and biomechanical outcomes of HA and THA in young patients.

Materials and Methods

A prospective comparative analysis was performed of patients aged 40 – 55 undergoing Direct Anterior Approach (DAA) THA or HA by a single, high volume hip surgeon. All patients underwent identical PROM, clinical and BioDEX™ isokinetic muscle strength evaluation at 6 weeks, 3 months and 6 months.

Results:

There were 193 consecutive patients who underwent HA and 175 DAA THA from 2014 to 2019. Patients undergoing HA had pre-operative Mahorn Score of 35.11 ± 17.31 while those undergoing THA 22.52 ± 13.24 ($p = 0.00$). At 6 months post-operatively the Δ change in Mahorn Scores for HA and THA was 23.84 and 44.73 respectively ($p = 0.00$). The Δ change of Harris Hip Score at 6 months in HA and THA was 28.2 and 47.4 ($p < 0.05$). Patients undergoing THA were 2.1 times more likely to have FMS ≥ 10 at 6 weeks post-operatively. No statistical difference in Body Weight (BW)/Torque Extension, BW/Torque Abduction and BW/Torque Adduction (90d/s) between HA and THA was found at 3 or 6 months ($p = 0.89$). An absolute Δ change of $> 50\%$ of the Peak Torque (Newton-Meters - Average Value) of both hip abductors and adductors was achieved at 6 months in all cases of HA and THA. However, ideal values peak torque and power per repetition was achieved 2.7 weeks earlier in THA patients.

Conclusions:

Early outcomes show significant equivalent functional, biomechanical and clinical improvements for both HA and DAA THA in middle-aged patients

P9. Survivorship of arthroscopic hip surgery for FAIS at 8-10 years and factors predicting reoperation

Category: Hip Arthroscopy

Presentation: Podium Presentation

Cobus Erasmus (UFS) , Paul Gaston (Royal Infirmary of Edinburgh) , Patrick Robinson (Royal Infirmary of Edinburgh)

Hip arthroscopy (HA) is now established for the treatment of non-arthroplasty hip pathology. Good to excellent outcomes have been noted in most patients undergoing this procedure for femoroacetabular impingement syndrome (FAIS). Despite this, some will require revision HA or conversion to total hip arthroplasty (THA). Data on survivorship and risk factors for secondary surgery are limited.

72 patients who had HA for FAIS between 2012 and 2013 were studied retrospectively. Electronic patient records and national radiology archives were used to obtain data. GP practices of patients from outside the region were contacted to confirm additional hip procedures. Follow-up ended November 2021 (minimum follow-up of 8 years). 42 surgeries were performed on the left hip (58.3%) and 44 patients were female (61.1%). 54 patients (75%) had labral repair at primary HA and 18 (25%) had labrectomy.

4 patients had revision HA (5.6%). 8 patients had THA (11.1%). Survivorship for primary HA was 83.3% at a minimum of 8 years follow-up. Reoperated patients were older than primary only patients (mean age 38.7 years vs. 31.6 years). There was no difference in social deprivation rankings between the groups. On preoperative radiographs of reoperated patients, the lateral centre-edge angle (LCEA) was on average 38.9°, and 5/12 patients (41.7%) had early radiographic signs of osteoarthritis. The primary only group had an average LCEA of 36.9° and 13/60 patients (21.7%) had early signs of osteoarthritis. 7/54 patients (13%) with labral repair had reoperation vs. 5/18 patients (27.8%) with labrectomy.

Survivorship at a minimum of 8 years was good. The reoperated group had a greater mean age, a higher proportion of early radiographic changes of osteoarthritis and were more likely to have had a labrectomy as opposed to a labral repair as compared to those who didn't have another operation.

P10. Distal Third Clavicle Fracture: A Review of Injury Mechanism and Treatment Outcome

Category: Shoulder and Elbow

Presentation: Podium Presentation

zakhele Khoza (Department of Orthopaedic Surgery, University of Sefako Makgatho) , Pududu Archie Rachuene (Department of Orthopaedic Surgery, University of Sefako Makgatho) , Roopam Dey (Department of Orthopaedic Surgery, University of Cape Town) , Nkosiphendule Mzayiya (Department of Orthopaedic Surgery, University of Sefako Makgatho) , Makgabo John Tladi (Orthopaedic surgeon)

ABSTRACT

Background

Distal clavicle fractures make up 12 to 15% of all clavicle fractures, and they can be either stable or unstable. The literature on treatment selection and decision-making is underwhelming. This study compared clinical, radiographic, and functional outcomes of patients treated at a tertiary level hospital for distal third clavicle fractures.

Methodology

A retrospective review of 54 patients treated at our hospital for distal third clavicle fractures was carried out. The patients in this study were all over the age of 13 and had a minimum of 3 months of follow-up. Clinical records were used to obtain information about the fracture treatment options. Plain radiographs were used to examine fracture morphology. Fracture Healing and loss of reduction, clinical outcomes and Patient Reported Outcome Measures (PROMS) were evaluated at regular intervals.

Results

The cohort had 41 (76%) male and 13 (24%) females with median (IQR) age of 21 (16.5) years and 38 (28.5) years respectively. Conservative treatment for clavicle fracture was performed on 18 (33.3%) of the patients and 36 (66.7%) of the patients were subjected to surgical treatment. Fixed locking plate was used for 33%, 63%, 70%, and 100% of the Neer Type I, Type IIA, Type IIB, and Type V fractures respectively. Patients' DASH scores and Oxford Shoulder Scores significantly ($p < 0.05$) varied between the patients who were conservatively treated vs the ones who were surgically treated. This variation was only observed up to 6-month follow-up. No significant changes were observed between these groups' post-operative radiological reports

Conclusion

Both surgery and non-surgical treatment methods for distal third fractures produce excellent clinical and radiological results in carefully selected patients. Only in the first six months did surgically treated patients outperform the non-surgical group.

P11. How does mechanism of injury influences scapula fracture pattern?

Category: Shoulder and Elbow

Presentation: Podium Presentation

Roopam Dey (University of Cape Town) , Habtamu Yimam (University of Cape Town) , Sudesh Sivarasu (University of Cape Town) , Stephen Roche (University of Cape Town)

Background

Scapula fractures are uncommon, and surgery may be challenging due to fracture patterns and anatomy. Literature has shown that current anatomic designed reconstruction plates do not always fit recurring fracture patterns of the scapula. Research also highlights that there are specific mechanisms of injury that are more likely to fracture the scapula. Identifying scapula fracture patterns according to their mechanism of injury may advance clinical decision making and improve anatomical fracture plate designs.

Methods

After receiving institutional ethics, CT scans of 41 fractured scapulae were reconstructed in MIMICS. These scapulae were grouped according to their mechanism of injuries, such as motor vehicle accident (MVA), pedestrian vehicle accident (PVA), and fall from height (FFH). Post-reconstruction these scapulae were reduced in-silico under the guidance from a senior shoulder surgeon. Fracture patterns for each mechanism of injury was created and analysed.

Results

In our dataset there were 32 males and 9 females with a combined mean \pm std. dev. age of 39.8 years (21 years – 66 years). FFH, PVA and MVA accounted for 15%, 32%, and 54% respectively. FFH exhibited highest glenoid (50%), spino-glenoid notch (33%), acromion (17%), and coracoid (33%) fractures. All (100%) the PVA fractures traversed through the scapula body. PVA exhibited highest superior border (85%) and spinal process fractures (69%). Highest medial border (82%) and lateral border (86%) fractures were observed for MVA.

Conclusion

This study highlights that mechanism of injury results in differing fracture patterns of the scapula.

P12. A New Hinged Spacer for the Revision of an Infected Total Elbow Replacement: A case report and review of the literature.

Category: Shoulder and Elbow

Presentation: Podium Presentation

Cameron Anley (Division of Orthopaedics, Tygerberg Hospital, Stellenbosch University) , Hentas Van Zyl (Division of Orthopaedics, Tygerberg Hospital, Stellenbosch University) , Marcus Van Heukelum (Division of Orthopaedics, Tygerberg Hospital, Stellenbosch University) , Ajmal Ikram (Division of Orthopaedics, Tygerberg Hospital, Stellenbosch University) , Nando Ferreira (Division of Orthopaedics, Tygerberg Hospital, Stellenbosch University)

Background:

An infected Total Elbow Replacement (TER) remains a devastating and challenging condition to manage. The current gold standard treatment is a 2 stage revision with an interim hinged spacer to manage the dead space. To simplify the construct and improve the stability of the hinge, we present a case using an inline hinge from the Truelok ring fixation system (Orthofix SLR, Verna, Italy) and a review of the literature.

Methods:

A 69-year-old female, known with Rheumatoid Arthritis developed a confirmed infected TER, 3 years after her primary surgery. The patient was subsequently prepared for a two-stage revision. After the prosthesis was removed and a thorough debridement was performed, a hinged spacer was made with a Truelok inline hinge with 100mm and 60mm threaded rods for the humerus and ulna, respectively covered in Gentamycin loaded Palacos cement.

Results:

At six weeks post-surgery, the wound was healed with no signs of sepsis and the elbow displayed ROM of 45° to 90°. The second stage revision was delayed due to Covid and was done 5 months after the initial surgery. The patient remained asymptomatic and satisfied with the functional ROM with the hinged spacer. At the second stage, there were no signs of sepsis and only a one of multiple intraoperative biopsies cultured *Staphylococcus Warneri* (STRAWA) which was most likely a contaminant and not related to the initial culture results, the patient was treated with oral Bactrim for six weeks.

At nine months, her wound was healed, her ROM was 30-100° and she had regained complete independence with pain-free activities of daily living.

Conclusion:

This hinged spacer provides a simple, modular solution to manage the dead space while providing stability, maintaining soft tissue tension and mobility between the first and second stages of the revision for an infected TER.

P13. Post-surgical coracobrachialis kinematics in RTSA and Latarjet models

Category: Shoulder and Elbow

Presentation: Podium Presentation

Roopam Dey (University Of Cape Town) , Jonathan Glenday (Hospital for Special Surgery) , Jean- Pierre du Plessis (University of Cape Town) , Sudesh Sivarasu (University of Cape Town) , Stephen Roche (University of Cape Town)

Background

The coracobrachialis (CBR) muscle is a strong adductor and forward flexor for the healthy glenohumeral joint (GHJ). Its role in post-surgical GHJ biomechanics has not extensively researched. This study aims to improve the understanding of CBR kinematics in post-operative motions in reverse total shoulder arthroplasty (RTSA) and Latarjet GHJ.

Methods

Ten cadaver thoraxes without any visible anterior glenoid defect were obtained from SICAS repository and reconstructed using MIMCS. Virtual RTSA and Latarjet surgeries were performed. Models of the healthy, RTSA, and Latarjet GH shoulder were constructed in OpenSim. Using OpenSim's kinematic analysis tool, abduction and forward flexion motions were simulated for all the models and the CBR muscle moment arm was calculated throughout the motions.

Results

In a healthy GHJ the CBR contributed to abduction after 95.8° of arm elevation with the muscle exhibiting high adduction moment arms until then. In the RTSA models, the CBR contributed to abduction after 47.5° of arm elevation. In Latarjet shoulders, the CBR did not contribute to abduction and remained an adductor, with its highest moment arm being at 37.5° of arm elevation. In healthy GHJ, the CBR was a forward flexor until 92.5° of arm elevation with highest moment arm being observed at a mean flexion of 28°. In RTSA, the CBR acts as a stronger flexor, as it contributed to the motion until an average of 144.1° of arm elevation with its peak moment arms being at a 42° of flexion. Post-Latarjet, the CBR loses its ability to contribute towards forward flexion and only contributes to GHJ extension in a flexed arm.

Conclusion

This in-silico comparative analysis of CBR kinematics suggests that in RTSA GHJ the CBR contributes towards the abduction and forward flexion motion along with the deltoids. Whereas post- Latarjet the CBR loses its ability to forward flex the joint.

P14. Horizontal stability of the acromioclavicular joint for intact, disrupted and reconstructed coracoclavicular ligaments.

Category: Shoulder and Elbow

Presentation: Podium Presentation

Maketo Molepo (University of Pretoria (UP)) , Natalie Keough (Khalifa University, Abu Dhabi, United Arab Emirates) , Abrie Oberholster (University of Pretoria (UP)) , Erik Hohmann (Burjeel Hospital, Dubai, United Arab Emirates)

TITLE:

Horizontal stability of the acromioclavicular joint for intact, disrupted and reconstructed coracoclavicular ligaments.

BACKGROUND:

The study aimed to investigate the effect of the position of the coracoid tunnel on horizontal (anterior) displacement during the arthroscopic assisted reconstruction of the coracoclavicular (CC) ligaments.

METHODS:

Fifteen fresh frozen shoulder specimens were included. Shoulders with visible AC joint pathology and/or surgery were excluded. Horizontal displacement was performed determined with a Universal Testing Machine (Hydropuls UTS, 100 kN) and an IDT NX8-S2 camera was used to capture displacement during testing. 2D motion analysis was then performed on the captured images using the TEMA motion analysis. The following conditions were tested: intact and disrupted CC ligaments; repair with Tightrope single tunnel coracoid and clavicle (ST); repair with double tunnel clavicle and single tunnel coracoid (DT). For all repair test occasions the coracoid tunnel was placed at base (0), 1/5 and 1/9 anterior to the base. One way ANOVA with post hoc comparisons were used for within and between group differences.

RESULTS:

The displacement for intact CC ligaments was 1.4 ± 0.8 mm and 3.1 ± 1.0 mm for the disrupted ligament. The mean AC joint horizontal (anterior) displacement for ST-0 was 1.6 ± 0.8 mm, while the ST-5 and ST-9 demonstrated 18% and 30% more displacement than the native state. The mean AC joint horizontal (anterior) displacement for DT-0, DT-5 and DT-9 were 1.0 ± 0.7 , 1.5 ± 1.0 mm and 1.5 ± 1.1 mm.

CONCLUSION: There was no statistically significant difference in the horizontal (anterior) displacement between the three tunnel positions for both ST and DT surgical techniques. However, DT-0(Base) demonstrated the least horizontal (anterior) displacement of the tested tunnel positions. The position of the coracoid tunnel has no effect on the horizontal stability during AC joint reconstruction.

P15. Age related changes in shoulder musculoskeletal profiles of adolescent male provincial water polo players

Category: Shoulder and Elbow

Presentation: Podium Presentation

JJ de Wet (UCT) , L Verwey (UCT) , R Dey (UCT) , B Vrettos (UCT) , J-P du Plessis (UCT) , S Roche (UCT) , J Gray (UCT)

Background: Shoulder injuries are common in overhead throwing athletes, especially amongst water polo players. Glenohumeral (GH) joint hypermobility, alterations in range of motion (ROM) and GH internal rotation deficit (GIRD) have been described. Pre-season musculoskeletal screening, aimed at documenting age related differences in musculoskeletal profile was performed as part of an ongoing injury prevention study investigating range of motion.

Methods: This study is a prospective quantitative cohort design. All adolescent males selected to represent provincial U14 to U19 teams were invited to participate in the study. Pre-season screening and performance testing were conducted at an indoor testing venue and indoor swimming pool.

Demographic and anthropometric data were collected. Musculoskeletal screening to identify possible intrinsic risk factors, included pain provocative tests, glenohumeral internal and external rotation (GHIR and GHER) range of motion and upward scapula rotation (USR) of the glenohumeral rotators and scapular stabilisers were performed.

Results: The median body mass of U15 (70.2kg) players was significantly ($p<0.05$) lower than U16 (80.3kg) and U19 (82.8kg) players. The U14 cohort had significantly lower median mass (73.5kg), median standing height (177cm), and median sitting height (134.5cm) compared to the U19 (82.8kg; 187.4cm; 138.4cm) cohort. U19 players had significantly lower median GHIR (49.3), in the dominant arm, compared to U16 players (59.5). U14 and U15 players exhibited significantly lower median USR at 135 degrees (12.7; 14.2), in the dominant arm, compared to U16 (26.2) and U19 (29.8) players.

Conclusion:

Age related differences in internal and external rotation and upward shoulder rotation were documented in the dominant arm in adolescent male provincial water polo players.

P16. Anatomical assessment of coracobrachialis, the short head of biceps brachii, pectoralis major and anterior deltoid: An observational morphometric study.

Category: Shoulder and Elbow

Presentation: Podium Presentation

Marischka Ford (UCT) , Adhil Bhagwandin (UCT) , Japie De Wet (UCT) , Roopam Dey (UCT) , Stephen Roche (UCT)

Background: The range of motion of the shoulder relies on a shallow glenohumeral joint, the labrum, and complex musculotendinous stabilizers (static and dynamic). Although this allows for a large range of motion instability and subsequent surgery (Latajet procedure) is common. Osteoarthritis and rotator cuff disease of the shoulder is also common with Reverse Total Shoulder Arthroplasty being used exponentially over the last 2 decades. Both of these procedures alter the biomechanics and dimensions of the shoulder musculature. Improving the understanding the anatomy of the muscles of the shoulder may improve these surgical techniques.

Aim: To investigate the morphometric data of coracobrachialis, the short head of biceps brachii, anterior deltoid, and pectoralis major in a South African cohort.

Method: A cohort of 87 embalmed arms (right and left) were included in this study. The length of the coracobrachialis, the short head of biceps brachii, and the anterior deltoid were measured from origin to insertion with the arm in anatomical position. The length of the footprint of the insertion site of coracobrachialis, short head of the biceps brachii, and pectoralis major were also measured.

Results: The median length of the short head of biceps brachii was 35.4 cm, anterior deltoid 17.9 cm, and coracobrachialis 17.5 cm. The insertion of biceps brachii had an average length of 2 cm. The median length of insertion of coracobrachialis and pectoralis major was 3.9 cm and 7.4 cm. There was a statistically significant difference between males and females for all 6 measurements.

However, this difference was no longer significant when variation in arm length was accounted for.

Conclusion: These results indicate there is an anatomical differences within our population when compared to current literature. These surgical techniques and the current in silico models used in biomechanical testing shoulder take these differences into account when using them.

P17. The spectrum of surgical management of chronic anterior shoulder dislocations at a tertiary orthopaedic unit

Category: Shoulder and Elbow

Presentation: Podium Presentation

Melkamu Shoge (Government hospital)

BACKGROUND: chronic anterior shoulder dislocations are rare accounting for 2 to 5% of all shoulder dislocations. Various treatment options are available ranging from nonsurgical to different surgical interventions. In our area which is a rural tertiary orthopaedic unit, South Africa, it is encountered relatively frequently which draws attention for further study.

METHODS: A retrospective descriptive study all patients with chronic irreducible anterior shoulder dislocations over a period of three years were reviewed and analysed. Information was gathered from patient's files and secure electronic data base. All the available radiographs, CT scan and MRI were reviewed. The study focused on the associated pathology and the types of surgical procedures performed for each patient and their associated complications.

RESULTS: 28 patients were included in the study. The average duration of dislocation was 20 weeks (ranges from 8 to 24 weeks). Simultaneous presence of both Hill-Sachs and Bankart lesions were the most common associated pathology (19 patients, 68%). Most patients were treated with Latarjet (43%), followed by single stage reverse total shoulder arthroplasty (25%) and Eden-Hybinette (11%) & Latarjet with hemiarthroplasty (11%). Majority of patients didn't have procedure related complications.

CONCLUSION: Chronic anterior shoulder dislocation is a frequently encountered condition in our setup. Most patients are treated surgically.

- Key words: chronic, irreducible, recurrent, shoulder dislocation, treatment

P18. Epidemiological and clinicopathological profile of primary malignant bone tumors in children and adolescents attending an academic hospital

Category: Oncology and Limb preservation

Presentation: Podium Presentation

Chuene Solly Mathiba (Sefako Makgatho Health Sciences University) , Pududu Archie Rachuene (Dr George Mukhari Academic Hospital, Sefako Makgatho Health Sciences University) , Moshawa Khaba (Dr George Mukhari Academic Hospital, Sefako Makgatho Health Sciences University) , Alice Morule (Dr George Mukhari Academic Hospital, Sefako Makgatho Health Sciences University)

Background: The prevalence and distribution of primary bone tumours in African population is a poorly documented subject. The commonest bone tumours in adults are secondary metastasis arising from tumours elsewhere in the body. This is different in children and adolescents. In these age groups primary malignant bone tumours are far more common than metastatic bone diseases. The aim of the study was to evaluate the epidemiological and clinicopathological profile of primary malignant bone tumours in children and adolescent treated at a tertiary level hospital in South Africa.

Methodology: We conducted retrospective review of 46 patients with primary malignant bone tumours that were treated from 01 January 2014 to 30th June 2020. Ethical clearance was sourced from our institution.

Results: The mean age of patients was 11.9 years, with a standard deviation 3.6 years. All cases were African black patients (n=46), with more males (67,39%) affected than females (32.61%). The majority of patients were diagnosed with osteosarcoma 95.65%(n=44), followed by chondrosarcoma 2.17%(n=1) and fibrosarcoma 2.17%(n=1). This was statistically with p-value 0.001. The patients presented either with local 40%(n=10) or distant 40% n=10 metastasis, and with only 20%(n=6) presenting early without evidence of metastasis. The results show femur 44%(n=11), tibia 24%(n=6), humerus 16%(n=4), fibula 12%(n=3), mandible 4%(n=1) as most affected anatomical sites, this is statistically significant p-value 0.026. The cases reviewed were predominantly coming from province of Limpopo 48%(n=12), followed by Gauteng 32%(n=8) and North West 20%(n=5).

Conclusions: Primary malignant bone tumours are rare in children and adolescent; however, osteosarcoma remain predominantly common. The epidemiology and distribution of our findings is similar, and parallel that reported in international literature.

P19. Genetic Instability Patterns Responsible for Multidrug Chemoresistance in Conventional Osteosarcoma.

Category: Oncology and Limb preservation

Presentation: Podium Presentation

Phakamani Goodman Mthethwa (University of KwaZulu-Natal) , Leonard Charles Marais (University of KwaZulu-Natal) , Veron Ramsuran (University of KwaZulu-Natal) , Collen Michelle Aldous (University of KwaZulu-Natal)

Background

Multidrug chemoresistance (MDR) remains the most significant obstacle to improving survival in osteosarcoma patients. A complex array of genetic alterations characterises the tumour microenvironment, and host molecular markers have been associated with MDR. This systematic review examines the genetic alterations of molecular biomarkers associated with multidrug chemotherapy resistance in genome-wide analysis of central high-grade conventional osteosarcoma (COS).

Methods

Eligible studies were identified through a systematic search of MEDLINE, Web of Science, The Cochrane Library and Scopus. Only human studies involving genome-wide analysis were included, while candidate gene, in-vitro and animal studies were excluded. Two reviewers independently assessed eligibility and risk of bias of studies using the Newcastle-Ottawa Quality Assessment Scale. Prospero registration no: CRD42021241510.

Results

The systematic search identified 774 records. Following the screening, seven studies were included in the qualitative analysis. There were 473 differentially expressed genes (DEGs) responsible for chemotherapy response in COS. Fifty-seven of these were associated with MDR in osteosarcoma. The genetic instabilities of the genes were related to the mechanism of MDR in osteosarcoma. The mechanisms include drug-related sensitivity genes, bone remodelling and signal transduction.

Conclusions

Multidrug resistance in osteosarcoma is underpinned by a complex, variable and heterogenous range of genetic instability patterns. Further research is needed to identify the most relevant alterations in terms of prognostication and to guide the development of possible therapeutic targets.

P20. Yield of percutaneous core needle biopsies in musculoskeletal tumours

Category: Oncology and Limb preservation

Presentation: Podium Presentation

Mabua Chuene (University of Witwatersrand) , Maxwell Jingo (University of Witwatersrand) , Paul Kgagudi (University of Witwatersrand)

Yield of Percutaneous Core Needle Biopsies in Musculoskeletal Tumours

Division of Orthopaedic surgery, Tumour and Sepsis Unit (T&S)

A biopsy is a fundamental step in the diagnosis of musculoskeletal tumours. As an alternative technique to open biopsy, percutaneous core needle biopsy (PCNB) was developed. The results regarding the diagnostic yield and accuracy of this technique in literature are conflicting. We hypothesised that PCNB is an effective diagnostic tool and that the diagnostic yield is comparable to that of an open biopsy. Our study aimed to establish the diagnostic strength of PCNB in musculoskeletal tumours at our institution.

We retrospectively reviewed clinical records of patients who underwent PCNB for a musculoskeletal tumour in our T&S unit between 01 January 2016 and 31 January 2022. Patients with incomplete clinical records and those with the diagnosis of infection alone were excluded. Histopathological findings were used to establish diagnostic potential of PCNB. These findings were compared to a final resection specimen or an alternate tissue biopsy result when available. Procedure-related complications were documented when present. Statistical analysis of data was performed using STATA software version 11.

Overall diagnostic yield was 81.6% (40 of 49). When distinguished, the yield was 81.3% (39 of 48) and 100% (1 of 1) for bone and soft tissue tumours, respectively. Of the 49 PCNB, 22 had a comparative specimen with a diagnostic accuracy of 86.4%. Sensitivity and specificity were 89.5% (17 of 19) and 100% (3 of 3), respectively. The commonest musculoskeletal tumour diagnosed was osteosarcoma (n = 20). Complication rate was 2.0% (1 of 49), consisting of post-biopsy haematoma formation.

We concluded that PCNB technique is effective, safe and accurate in bone tumours. It is associated with low complication rates and osteosarcoma remains the commonest bone sarcoma.

P21. Profile of Lower Limb Amputations for Malignancies at a Tertiary Hospital in South Africa

Category: Oncology and Limb preservation

Presentation: Podium Presentation

Mamputi Mokoena (University of Free State) , Steven Matshidza (University of Free State)

Aim and objectives: This study aimed to determine the profile of patients who underwent lower limb amputation for malignancies in a tertiary hospital in the Free State Province. And to describe the stage and location of lower limb amputation for malignancies.

Methods: A retrospective study of all patients who underwent lower limb amputation for malignancies in a tertiary hospital of the Free State Province, over two years from 1 January 2017 to 31 December 2018.

Results: A total of thirty-four malignancy-related lower limb amputees were included in the study. Their median age was 33 years with an interquartile of 15-53 years and 59% were males. More than two-thirds (85%) of the patients were from Free State Province and only 12% from Northern Cape Province. Twenty (59%) amputations were performed on stage IIB and 59% were above the knee. The common malignant-related amputations were osteoblastic osteosarcoma, spindle cell sarcoma, squamous cell sarcoma and melanoma.

MRI findings indicated that 85% of amputations were extensive soft tissue, a CT scan for the chest showed pulmonary metastasis in 4% of the cases, while a CT scan for the abdomen showed no lesions. Bone scan showed metastasis and metastasis pelvic and humerus in 6% and 3% of the patients, respectively. Most (82%) of the amputees were on chemotherapy post-amputation. Complications were observed in 4% of the patients, of which patients present with wound sepsis and pleural effusion gaping wound.

Conclusion: The demographic profile of malignant-related lower limb is not very different from what is seen in other studies, however, the surgical procedures were different.

Keywords: Lower limb amputation, Amputation, Malignancy, Free State Province

P22. Periprosthetic joint infection: A South African perspective

Category: Infection

Presentation: Podium Presentation

Jan Hiddema (WITS) , Allan Sekeitto (WITS) , Jacques du Toit (Sandton Mediclinic) , Dick Van der Jagt (WITS)

Background: Our aim is to determine the characteristics of periprosthetic joint infection in a South African clinical setting by identifying the most common organisms cultured and establishing their antibiotic sensitivities in order to propose the most appropriate antibiotic treatment regimen. In the case of two-stage revision procedures with positive cultures during the second stage, we aim to compare the organisms cultured during the first-stage versus the second stage. Furthermore, we aim to correlate the bacterial culture during the second stage with the erythrocyte sedimentation rate/ C-reactive protein result.

Patients and Methods: We performed a retrospective cross-sectional study looking at all hip and knee periprosthetic joint infections in patients 18 years and older, treated at a government institution and a private revision practice in Johannesburg, South Africa between January 2015 and March 2020.

Results: We included 69 patients that underwent 101 procedures relating to periprosthetic joint infection, yielding 63 positive cultures and a total of 81 organisms cultured. The most common organisms cultured were Staphylococcus Aureus (n = 16, 19.8%) and Coagulase negative Staphylococcus (n = 16, 19.8%), followed by Streptococci species (n = 11, 13.6%). The positive yield in our cohort was 62.4% (n = 63). Nineteen percent (n = 12) of the culture positive specimens displayed a polymicrobial growth. 9.2% (n = 48) of organisms were Gram-positive versus 35.8% (n = 29) Gram-negative. The remainder were fungal and anaerobic organisms at 2.5% (n = 2) each. Gram-positive cultures displayed 100% sensitivity to Vancomycin and Linezolid, whereas Gram-negative organisms displayed 82% sensitivity towards Gentamycin and 89% sensitivity towards Meropenem respectively.

Conclusion: We recommend that empiric antibiotic-loaded cement spacers and systemic antibiotic regimens should consist of Meropenem or Gentamycin; Vancomycin and Rifampicin to achieve the broadest spectrum of coverage and most likely success in eradicating periprosthetic joint infection in South Africa.

P23. Dead space management strategies in the treatment of chronic osteomyelitis

Category: Infection

Presentation: Podium Presentation

Gadi Epstein (Tygerberg Hospital (Stellenbosch University)) , Nando Ferreira (Tygerberg Hospital (Stellenbosch University))

Background

Dead space management is an integral part of the treatment of chronic osteomyelitis. Failure to address dead space after surgery may lead to recurrence of infection. Several strategies have been employed to manage dead space including cement spacers, collagen fleece, irrigation systems, synthetic bone substitutes, and bioactive glass. Currently there is no gold standard strategy for dead space management and the assignment of the most appropriate strategy to patients is challenging.

Methods

We performed a retrospective review (Jan 2016 – Feb 2022) on the outcomes of the dead space management strategies performed at a tertiary level reconstruction unit. All patients treated for chronic osteomyelitis with a minimum follow up of 6 months were included in the study. Dead space management strategies were implemented as per a comprehensive integrated approach. Data was collected with regards to patient demographics, dead space strategy employed, and outcome in terms of resolution of infection.

Results

A Total of 174 patients were included in the study. Cause of infection included AHO(16%), FRI (82%), and PJI (2%). Resolution of infection was achieved in 92% of patients. A total recurrence rate of 6.3% was noted. The recurrence rate per strategy was 2% for the Lautenbach group, 4% for the Bioactive glass group, 4% for the Ceramant group, 0% for the Osteoset bead group, and 12% for the cement spacer group. Failure rates were highest for groups that required segmental bone resection. Outcomes were in keeping with international reports.

Conclusion

Dead space management strategies are an integral part of the management of chronic osteomyelitis. We noted a 92% success rate in the treatment of chronic osteomyelitis when using a comprehensive integrated approach, however recurrence rates are higher in patients requiring segmental bone resections. Careful patient selection and judicious dead space strategies are vital in achieving resolution of infection.

P24. Debridement, Antibiotics, and Implant Retention (DAIR) in HIV Positive Patients.

Category: Arthroplasty

Presentation: Podium Presentation

Nkhodiseni Sikhauli (Wits) , Jurek Pietrzak (Wits) , Allan Sekeitto (Wits) , Lipalo Mokete (Wits)

Introduction

Periprosthetic joint infection (PJI) is a devastating complication following total joint replacement. Early publications on hip and knee arthroplasty in HIV positive patients reported high complications rates, but more recent publications demonstrate acceptable outcomes. Although DAIR has become a commonly performed procedure, there is paucity in the literature regarding the outcome of DAIR in HIV positive patients.

Material and Method

HIV positive patients who underwent DAIR procedures between 2016-2020 for hip and knee PJI were reviewed. Medical records were assessed for demographics, BMI, approach used, time from initial surgery to DAIR, infective markers, biochemical markers, Viral load, CD4 count, number of DAIR procedures, microbiology, and outcome.

Results

23 HIV positive patients underwent DAIR procedures, 15 females and 8 males. There were 17 hips and 6 knees, 82% patients were diagnosed with early post-operative PJI and 18% were late onset acute haematogenous spread. 9 (39%) patients underwent repeat DAIRs, 5 early post-operative and 4 haematogenous spread. There was 100% failure rate in the late onset group and 16% in the early onset group.

Conclusion

DAIR is a plausible procedure with reasonable success in early post-operative PJI patient with HIV. Acute haematogenous spread PJI was associated with high failure rate.

P25. The microbiology of acute and chronic, non-spinal orthopaedic infections in adult patients at a tertiary orthopaedic unit

Category: Infection

Presentation: Podium Presentation

Ashley Arakkal (Groote Schuur Hospital/University of CPT) , Chad Centner (Groote Schuur Hospital/University of CPT) , Thomas Hilton (Groote Schuur Hospital/University of CPT) , Marc Nortje (Groote Schuur Hospital/University of CPT) , Michael Held (Groote Schuur Hospital/University of CPT) , Marc Mendelson (Groote Schuur Hospital/University of CPT) , Maritz Laubscher (Groote Schuur Hospital/University of CPT)

Background

Empirical antibiotic strategies in the treatment of fracture related infections (FRI), chronic osteomyelitis (COM), prosthetic joint infection (PJI), and septic arthritis should be based on local microbiological antibiograms. Data on local microorganism prevalence and sensitivity patterns is often lacking especially in the developing world and empiric antibiotic choices are guided by international guidelines. The study aim was to review the antibiogram profiles of bacterial isolates of patients undergoing surgical treatment for FRI, COM, PJI and septic arthritis to identify the ideal empirical antibiotic strategy.

Methods

A retrospective review was performed of non-spinal orthopedic infections treated surgically from 1 January 2018 to 31 December 2018. The National Health Laboratory Service (NHLS) microbiology database was used to identify all intra operative microbiological specimens and data was correlated with the orthopedic database. Cases were divided into different infection categories namely FRI, COM, PJI and septic arthritis. Antibiotic susceptibility data was used to predict the efficacy of different empirical antibiotic regimens.

Results

A total number of 107 patients were included in the study. 48 patients had a FRI, 36 patients had COM, 15 patients had PJI and 8 patients had septic arthritis. 209 different organisms were cultured from all the patients. Overall the most common organism cultured was *Staphylococcus aureus* (23% of samples) followed by *Acinetobacter baumannii* (9%), *Enterococcus faecalis*(7%) and *Enterobacter cloaca*(6%). Within each category of infection *S. aureus* was the most common pathogen. Across all categories the oral antibiotic combination with the highest effectiveness would have been Co-trimoxazole/Ciprofloxacin with a sensitivity to tested isolates of 83%. The most effective intravenous antibiotic combination would have been Piperacillin-Tazobactam/Amikacin/Vancomycin with a 91% sensitivity to tested isolates.

Conclusion

The data within this study on antibiogram profiles can serve as a guide to empirical antibiotic choices in the management of FRI, COM, PJI and septic arthritis.

P26. Time to first negative culture following debridement reaming and irrigation (DRI) for chronic osteomyelitis: a look at the Lautenbach method.

Category: Infection

Presentation: Podium Presentation

Philani Ntombela (University of the Witwatersrand) , Zweli Linda (University of the Witwatersrand)

Background: Chronic osteomyelitis poses a challenge for the patient and the treating surgeon. No level I evidence-based guidelines exist to guide management and treatment differs between centres. A failure rate as high as 60% is reported by some authors. Lautenbach described debridement, intramedullary reaming and the insertion of double-lumen tubes for local antibiotic delivery system. Aim: The aim of the study was to establish the time it takes to achieve the first negative culture after the Lautenbach procedure for the treatment of chronic osteomyelitis.

Methods: We undertook a retrospective record review of patients who underwent the Lautenbach procedure from 2018 to 2022. The inclusion criteria was patients older than 5 years, complete/adequate medical records, at least 3 cultures available post-operatively. The primary outcome was time to the first negative cultures after the procedure. Secondary outcomes were wound/sinus status, pain visual analogue scale (VAS), recurrence rate and prevalence of methicillin resistant staphylococcus aureus (MRSA).

Results: Thirty three (33) procedures were performed in 27 patients that met the inclusion criteria, 20 () males and 7 () females. The mean age was 32.89 (6 – 72) years. There were 16 femurs, 5 tibias, 3 humerii, 1 clavicle, 1 fibula and 1 ulna. The mean time to the first negative culture was 13.23 (1 – 161) days. Seventy four percent (20/27) of patients went on to healed wounds/sinuses, 1 had a non-draining sinus and 6 remained with a draining sinus. The mean pain VAS was 2.55 (0 – 6) points and the recurrence rate was 22%. There were three (11%) occurrences of MRSA.

Conclusion: The Lautenbach procedure is still an effective option. However, the recurrence rate remains relatively high but, majority of patients achieve symptom resolution (pain and draining sinus). Treating surgeons should still be vigilant of MRSA and the treatment thereof.

P27. Habitual Patella Dislocation

Category: Knees

Presentation: Podium Presentation

Pieter Erasmus (Kneeclinic), S Erasmus

Background:

Habitual patella dislocation is a relative rare condition that should not be confused with congenital and traumatic patella dislocations.

It is characterized by pain free patella dislocation and relocation either with flexion or extension of the knee.

Method:

On the hand of three cases each of habitual patella dislocation in flexion and extension the pathology and treatment is discussed.

Results:

In all three cases of patella dislocation in extension, the patella could be stabilized.

In the three dislocations in flexion, one could be restored to near normal, in one patella tracking was improved but not fully corrected and in one the surgery failed.

Conclusion:

Confusing habitual dislocation with traumatic dislocation and failure to distinguish between habitual dislocation in flexion and extension will lead to failure of corrective surgery.

In treating these the focus in patella dislocation in flexion should be proximal and lateral while with dislocation in extension the focus should be distal and medial.

P28. Including open injuries into the classification of knee dislocations - a consensus study

Category: Knees

Presentation: Podium Presentation

Waldo Scheepers (University of Cape Town, Orthopaedic Surgery) , Michael Held (University of Cape Town, Orthopaedic Surgery) , Richard von Bormann (University of Cape Town, Cape Town Sports & Orthopaedic Clinic) , Daniel Wascher (University of New Mexico School of Medicine, Orthopaedics) , Dustin Richter (University of New Mexico Health Sciences Center, Department of Orthopaedics & Rehabilitation) , Robert Schenck (University of New Mexico School of Medicine, Orthopaedics) , Christopher Harner (University of Texas Health Sciences Center Houston, Orthopaedics)

Objectives: Knee dislocations (KDs) are complex injuries defined as incongruity of the tibiofemoral joint which leads to tears of two or more of the main stabilizing knee ligaments, and they are often associated with damage to surrounding soft tissue or neurovascular structures. A classification system for these injuries should be simple, reproducible, and allow communication among surgeons for surgical planning and outcome prediction. The aim of this study was to formulate a list of factors, prioritized by high-volume knee surgeons, that should be included in a KD classification system.

Methods: A global panel of orthopaedic knee surgery specialists participated in a Delphi process. The first survey employed 91 orthopaedic surgeons to generate a list of patient and system-specific factors that should be included in a knee dislocation classification system that may affect surgical planning and outcomes. This list was subsequently prioritized by 27 experts from 6 countries. Consensus for inclusion of factors was taken at 70 % agreement.

Results: Of the 12 factors identified, four (33%) achieved at least 70% consensus for inclusion in a classification system. The factors deemed critical for inclusion in a classification system included: vascular injuries (89%), common peroneal nerve injuries (78%), number of torn ligaments (78%), and open injuries (70%).

Conclusion: The wide geographic distribution of participants provides diverse insight and makes the results of the study globally applicable. The most important factors to include in a classification system were vascular injuries, common peroneal nerve injuries, number of torn ligaments, and open injuries. To date, the Schenck anatomic classification system most accurately identifies these patient variables with the addition of open injury classification. The authors propose to update the Schenck classification system with the inclusion of open injuries as an additional modifier. Further studies should evaluate the inclusion of more advanced imaging modalities.

P29. Skills and knowledge which should be acquired in a one year knee fellowship program

Category: Knees

Presentation: Podium Presentation

Bradley Bonner (State Health) , Dave North (State Health) , Michael Barrow (State Health) , Ponky Firer (State Health) , Jon Vogel (State Health) , Johan Le Roux (State Health) , Richard von Bormann (State Health) , Michael Held (State Health)

Background

South Africa has an unique medical environment with contrasting state and private medical systems. A structured knee fellowship curriculum can help to navigate an array of complex topics and techniques to allow the most efficient path to competency for these settings. Our primary aim was therefore to investigate which conditions, surgical procedures and knowledge topics should be covered during a one year fellowship.

Methods

A Delphi consensus study design was used with multiple, iterative rounds of feedback. Executive members of the South African Knee Society as well as current knee fellows in South Africa were contacted and all respondents were included. Consensus studies do not have a specific minimum number to achieve statistical power. Between 5 and 50 participants are considered to be adequate.

Results

Six of 10 participants responded. For surgical skills, agreement was reached for primary and revision arthroplasty, knee arthroscopy, ligament surgery, patellofemoral stabilization procedures and osteotomies. Important knowledge topics were anatomy, biomechanics, common non-traumatic knee conditions as well as injury of meniscus, ligaments and cartilage, clinical and radiological assessment of knee conditions, and developing a management plan. Non-clinical competencies were practice management, coding and billing, ethical practice, self-assessment and continuous learning, as well as basic research skills.

Conclusion

We established a focused curriculum for a one year knee fellowship. These findings will help to standardize competencies and surgical skills required from a knee fellowship in South Africa. This can be used to prepare fellows for their future practice and help program directors to plan and design adequate fellowships.

P30. Evaluating Basic Knee Arthroscopy Skills in Orthopaedic Trainees

Category: Knees

Presentation: Podium Presentation

Kirsty Berry (University of Cape Town) , Richard von Bormann (University of Cape Town) , Stephen Roche (University of Cape Town) , Maritz Laubscher (University of Cape Town) , Graham McCollum (University of Cape Town) , Michael Held (University of Cape Town)

Background: Orthopaedic training in Southern Africa is largely focused on trauma, although elective procedures, such as knee arthroscopy are increasing. This is especially true in the private sector where most trainees will practice. The primary aim of this study was to assess the arthroscopic competency of orthopaedic trainees in a setting of limited resources in Southern Africa.

Methods: A prospective observational cohort study was carried out. Orthopaedic trainees of a Southern African university hospital performed basic arthroscopy on a knee model. Their surgical competency was assessed by two surgeons proficient in arthroscopy using the modified Basic Knee Arthroscopy Skill Scoring System (mBAKSSS).

Results: A total of 16 trainees (12 male) were included (6 junior and 10 senior trainees). The median age of participants was 36 (IQR 2.25). There was no difference in mean score between junior trainees (26.56, range 20.5 - 42.5) and senior trainees 27.31 (12.0 to 38.0, $p=0.1$). The overall interrater reliability of the surgeons rating the trainees was excellent with Cronbach's Alpha of 0.91 and interclass correlation of 0.914 (95% CI=0.97).

Conclusions:

Knee arthroscopy skills of our trainees are comparable to those of international training programs, but there appear to be no progression of arthroscopy skills when comparing surgeons in their early years of training to colleagues in their final years. This calls for improved arthroscopy training and skills transfer, exposure to procedures and ongoing assessment.

P31. Prioritised challenges in the management of acute knee dislocations

Category: Knees

Presentation: Podium Presentation

Michael Held (University of Cape Town) , Robert Schenck (University of New Mexico) , Vikas Kanduja (Cambridge University) , Pieter Venter (University of Cape Town) , Chris Harner (University of Pittsburg)

Objectives

Heterogeneous patient factors and injury mechanisms result in a great variety of injury patterns encountered in knee dislocations (KD). Attempts to improve outcome can focus on a wide range of challenges. The aim of this study was to establish and prioritise a list of challenges encountered when treating patients with acute KD.

Methods

A modified Delphi consensus study was conducted with international knee specialists who generated a prioritised list of challenges. Selected priorities were limited to half of the possible items. Agreement of more than 70% was defined as consensus on each of these items a priori.

Results

Ninety-one international surgeons participated in the first round. The majority worked in public hospitals and treated patients from low-income and middle-income households. Their propositions were prioritised by 27 knee surgeons from Europe, Africa, Asia, as well as North and South America, with a mean of 15.3 years of experience in knee surgery (SD 17.8). Consensus was reached for postoperative stiffness, obesity, delay to presentation and associated common peroneal nerve injuries. Challenges such as vascular injuries, ipsilateral fractures, open injuries as well as residual laxity were also rated high. Most of these topics with high priority are key during the initial management of a patient with KD, at presentation. Topics with lower priority were postsurgical challenges, such as patient insight, expectations and compliance, rehabilitation programme, and pain management.

Conclusion

This consensus study has a wide geographical footprint of experts around the world practising in various settings. These participants prioritised stiffness, obesity, treatment delays and associated limb-threatening injuries as the most important challenges when managing a patient with acute KD. This list calls for applicable and feasible solutions for these challenges in a global setting. It should be used to prioritise research efforts and discuss treatment guidelines.

P32. The windswept knee deformity: our experience at a single, large tertiary hospital in South Africa

Category: Arthroplasty

Presentation: Podium Presentation

Muhammad Manjra (Division of Surgical Sciences and Orthopaedic Surgery, Stellenbosch University, Tygerberg hospital) , Shafique Jakoet (Division of Surgical Sciences and Orthopaedic Surgery, Stellenbosch University, Tygerberg hospital) , Johan Charilaou (Division of Surgical Sciences and Orthopaedic Surgery, Stellenbosch University, Tygerberg hospital) , Marilize Burger (Division of Surgical Sciences and Orthopaedic Surgery, Stellenbosch University, Tygerberg hospital) , Jacobus Jordaan (Division of Surgical Sciences and Orthopaedic Surgery, Stellenbosch University, Tygerberg hospital)

Background:

The windswept knee deformity (WKD), in which one knee is in varus and the contralateral knee in valgus, represents a unique problem that can be difficult to treat. In the South African context, as a result of lengthy waiting lists for surgery, these patients often present with severe deformities that are difficult to treat. The aim of this study was to review our experience in the management of WKD, at a single large tertiary hospital in South Africa.

Methods:

A retrospective record review of all patients who underwent TKA at our institution between January 2015 and December 2019 was conducted. For limb alignment we used the 180°-system; a valgus knee alignment was recorded as $> 185^\circ$ and a varus knee alignment as $< 180^\circ$. The degree of deformity reflects the numerical value of the knee deformity outside the normal range as stipulated above.

Results:

A total of 28 patients (56 knees) were included in this study. The mean age was 68.5 ± 8.5 years at the time of index TKR and includes 82% (n=23) females and 18% (n=5) males. The primary pathology in the majority of knees was primary osteoarthritis 75.0% (n=42), followed by secondary post-traumatic osteoarthritis (PTOA) 16.1% (n=9) while the remainder were due to rheumatoid arthritis 9.0% (n=5). In 82% (n=23) we could find no radiographic proof of concurrent hip and or femoral pathology. The mean preoperative valgus deformity was $24.5 \pm 14.1^\circ$ (range 11.0-72.4) and mean varus deformity was $9.7 \pm 10.4^\circ$ (range 1.0-42.6). The mean valgus correction was $18.6^\circ \pm 12.9$ (range 1.3-6) and varus correction was $9.2^\circ \pm 0.8$ (range 0.7-12.0).

Conclusion:

WKD are a unique group of patients that present with atypical deformities that need to be individualized and preferably treated in a specialized unit.

P33. Arthrodesis of the knee using a vascularised patella autograft and biplanar external fixation.

Category: Arthroplasty

Presentation: Podium Presentation

Johan van der Merwe (UFS) , Lourens Erasmus (UFS)

Introduction

Fusion of the knee joint, for the management of end stage infection, extensor mechanism dysfunction or severe bone loss, can be obtained by a multitude of surgical techniques.

The success rate is reported to be between 50 and 100 percent.

We report a novel technique of utilising the patella as a vascularised autologous bone graft combined with a bi-planar external fixator.

Methods

We performed an arthrodesis of the knee on 7 consecutive patients from 2015-2022 using the same technique.

During the procedure the patella was not detached from its lateral retinacular pedicle but used as an anterior auto-graft crossing the tibio-femoral joint.

Skeletal fixation was achieved with a biplanar external fixator technique using a short and long fixator applied at 90 degrees to each other.

Union was assessed at 6 weeks intervals for a period of 24 weeks. Radiographs were assessed with specific attention to the union of the patellofemoral and patellotibial junctions. Complications other than non-union were noted.

Results

In six of the 7 knees union was obtained at 18 weeks and in one patient at 24 weeks. In 4 cases the union of the femur to the tibia was preceded with union of the patella to the femur and the tibia.

In one case the patient developed severe pin site infection that required intra venous antibiotics for two weeks

Conclusion

The described technique was successful in this small series.

Using the patella as a vascularised graft could add to the success rate of this operation, as suggested by the union of the patella to the femur and tibia preceding the fusion of the knee joint.

P35. Robot-Assisted TKR in obese patients

Category: Arthroplasty

Presentation: Podium Presentation

Jurek Pietrzak (Charlotte Maxeke Johannesburg Academic Hospital) , Nkodiseni Sikhauli (Charlotte Maxeke Johannesburg Academic Hospital) , Lipalo Mokete (Charlotte Maxeke Johannesburg Academic Hospital)

Background:

Globally, obesity is a growing pandemic with the prevalence of morbid obesity (BMI >40kg/m²) increasing at the greatest rate worldwide. Obese patients undergoing Total Knee Arthroplasty (TKA) have been linked with inferior peri- and post-operative outcomes.

Universally, Robot-assisted TKA (RA-TKA) is evolving with many reports showing early promise of improved surgical precision and positive impact on short-term clinical outcomes. However, little has been reported on the use of this technology in obese patients.

Objectives:

This study aimed to compare the peri-operative and short-term outcomes of obese and non-obese patients undergoing (RA-TKA) in a referral academic institution in South Africa.

Materials and Methods:

We conducted a prospective analysis of 127 patients undergoing imageless, robot-assisted TKA from January 2019 to March 2020. We compared the clinical, functional and radiological outcomes of non-obese (BMI <29kg/m²) with obese (>30kg/m²) patients at a minimum of 12 months follow-up.

Results:

There were 82 (64.5%) obese patients and 45 (35.5%) non-obese patients at an average age of 65.37 ± 12.38 years. There were 47 (37%) morbidly obese patients and 6 (4.7%) super-obese patients. Obese patients were 2.1 times more likely to have a valgus knee deformity. There were 3 poorly sized tibial trays (2 in obese; 1 in non-obese group). There was no difference in the number of intra-operative soft-tissue releases (p=1), achieved intra-operative planned alignment (p=0.9) or length of hospital stay (p=0.89) between obese and non-obese patients. No patients required peri-operative blood transfusion. There were 2 wound oozes in the obese group and 1 DVT in the non-obese group with no infective complications at mean follow-up of 13.32 months. The 30-day readmission rate was 1.21% and 2.22% in the obese and non-obese group respectively.

Conclusion

RA-TKA is safe and effective in obese patients with equivalent radiological and short-term clinical and functional outcomes with non-obese patients.

P37. The Use and Outcomes of Titanium Elastic Intramedullary Nails (TENs) in unstable femoral diaphysial fractures in children.

Category: Paediatrics

Presentation: Podium Presentation

Bongani Socutshana (Sefako Makgatho Healthsciences University) , Pududu Archie Rachuene (Sefako Makgatho Healthsciences University) , Solly Bila (Sefako Makgatho Healthsciences University) , Mashupse Petrus Phala (Sefako Makgatho Healthsciences University) , Roopam Dey (University of Cape Town)

BACKGROUND: Diaphysial femoral fractures in children account for less than 2% of all paediatric fractures. Literature suggests that children aged 5 to 11 years who weigh < 49kg with femoral diaphysial fractures may be the best candidates for fixation with TENs. TENs have gained popularity as they provide good post-surgical outcomes with minimal complications in stable femoral diaphysial fractures. However, there is little evidence that is available to elicit the effectiveness of TENs for the management of unstable paediatric femur fracture.

The aim was to study the effectiveness of TENs in children with unstable femoral diaphysial fractures.

METHODOLOGY: A retrospective study of 67 children aged 2 to 11 years with unstable femoral shaft fractures and were treated with TENs at a tertiary care hospital from January 2017 to December 2020. For the purpose of our study the inclusion criterion were cases of unstable (spiral, comminuted or long oblique) femoral shaft fracture that were treated with TENs and that had at least six months of follow-up, regardless of associated injuries or multiple trauma. Final follow-up evaluated for radiographic union, leg-length inequality and any obvious implant related complications. The final results are evaluated using Flynn outcome scoring system.

RESULTS: The overall median (IQR) age and weight of the cohort was 6 (3) years and 18.9 (8.3) kgs respectively. We observed 43.3% comminuted fractures, 31.3% long oblique fractures, and 25.4% spiral fractures. Children with comminuted fractures were significantly ($p<0.05$) older and heavier than children with spiral and long oblique fractures. The Flynn Scores suggested excellent post-operative outcomes in 74.6% of the patients, satisfactory outcomes in 20.9% and 4.5% revealed poor outcomes.

CONCLUSION: Retrograde TENs can be indicated for the management of unstable paediatric femoral fractures when supplemented by post-operative immobilisation with skin traction in the initial two weeks.

P38. The Atraumatic Slipped Proximal Tibial Epiphysis in Blount's disease

Category: Paediatrics

Presentation: Podium Presentation

David Thompson (Greys Hospital UKZN Pietermaritzburg) , Pieter Mare (Greys Hospital UKZN)

Background

The classification of Blount's disease into 'Infantile', starting before the age of 4, and 'Late onset' with 'juvenile' (4-10) and 'adolescent' (11+) is well established. We reviewed all 225 children with Blount's disease presenting to our institution over an 11-year period. 11 did not fit the typical descriptive categories but matched the radiological features of the atraumatic slipped proximal tibial epiphysis (SPTe). We aimed to describe the clinical and radiological features of these children.

Methods

225 children that presented to our clinic between July 2010 and June 2021 with Blount's disease were included. Clinical assessment included history and examination, clinical photographs, age, BMI, and standing radiographs.

160 children were recognized as having infantile Blount's disease, 44 were recognized as having late-onset Blount's disease, and we were unable to classify three with certainty.

11 children were classified as having an SPTe. The radiological features of the SPTe are a dome-shaped metaphysis, an open physis with dissociation of the lateral borders of the epiphysis and metaphysis, and inferior and medial epiphyseal displacement with maintained medial epiphyseal height.

Results

We studied 11 children with SPTe under the age of ten. Eight were female with ages ranging from 6 to 9. Eight had bilateral disease (19 limbs). All were obese. BMI was above 95% in 9 children and not documented in the other two. All had severe deformities of genu varum, internal tibial rotation, and procurvatum with minimal medial joint depression. Two children (four limbs) had lateral instability from attenuation of the lateral knee structures.

Conclusions

We describe the atraumatic slip of the proximal tibial epiphysis (SPTe) in 11 children with Blount's disease. The differences between this condition and 'infantile' and 'late onset' disease are shown, and an etiological pathway is proposed. A novel method for correcting bilateral disease is also suggested.

P39. Severity of clubfoot in South Africa according to the Pirani score

Category: Paediatrics

Presentation: Podium Presentation

Thornton Ford (Edenvale), Philani Ntombela (University of the Witwatersrand), Anati Ngcakani (University of the Witwatersrand)

Background:

Clubfoot is common in orthopaedic paediatric patients. It is a congenital condition that can be diagnosed as early as the third trimester of pregnancy. The Pirani score is used to determine the severity of clubfoot and monitor its treatment.

Aim: To evaluate the severity of clubfoot in a South African tertiary institution using the Pirani score.

Methods:

This was a retrospective study based on prospectively collected data. Records were kept over a 6-month period in 2018. Demographic data, family history, associated clinical syndrome and the Pirani score were documented. Primary outcome was the mean Pirani score. Secondary outcome was the association between the Pirani score and gender, gender, and bilateral involvement.

Results:

Sixty-two (98 feet) patients were included. 44 males and 18 females. Thirty-six (58%) patients had bilateral clubfoot, 27 males and 9 females. Twenty-six (42%) patients had unilateral clubfoot, 17 males and 9 females. The mean Pirani score for the total number of feet was 1.80 (0 – 6). The mean score in patients with bilateral involvement was 1.88 (0 - 6). The mean score for patients with unilateral involvement was 1.58 (0 – 4). Mean score for the right unilateral foot involvement was 1.38 (0 – 3.8) and overall right foot involvement was 1.75 (0 – 6). For the left unilateral foot, it was 1.94 (0 – 4), and overall left foot involvement was 1.85 (0 – 6). Males had a mean score of 1.82 (0 – 6) while females had a mean of 1.74 (0 – 4). 8% (5/62) had a positive family history and 13% (8/62) had an associated clinical syndrome/disorder.

Conclusion:

The overall spectrum of clubfoot treated was relatively mild. Bilateral involvement is associated with worse scores. The left foot is worse affected than the right and males have worse scores than females.

P40. Radiographic assessment of lower limb alignment in South African children.

Category: Paediatrics

Presentation: Podium Presentation

Donnavan Foxcroft (Stellenbosch University) , Jaques Du Toit (Stellenbosch University) , Nando Ferreira (Stellenbosch University) , Mari Thiar (Stellenbosch University) , Aaron Saini (Stellenbosch University) , Marilize Burger (Stellenbosch University)

Background:

Radiographic measurements on full length standing lower limb views are the standard for lower limb deformity analysis. Published measurements of Paley et al. on lower limb alignment is the gold standard. There are no radiographic measurements reported exclusively of children of South African descent. The study aimed to establish normal values of lower limb alignment and joint orientation angles in South African children, and to compare these measurements to the values as derived from Paley et al.

Methods:

A cross-sectional radiographic study including all 5-18 year old children who underwent full-length anteroposterior radiographs between 2012 and 2020 was conducted. Radiographic measurements were done as described by Paley. Differences in measurements obtained and those reported by Paley et al. were investigated using a T-test for a single mean against a reference constant, using an alpha level of 0.05.

Results:

A total of 190 patients were included. The median MAD across age groups was -2.2 mm (IQR -6.4 – 1.5) with all subgroups showing a lateral MAD (valgus alignment), compared to the median MAD of +9.7mm (varus alignment) from Paley et al. The MNSA had a mean of 135.7°, compared to 129.7° from Paley. The mean MPTA was 89.7°, compared to Paley's 87.2.

Conclusion:

Significant differences between Paley's published values and our cohort were observed for the mechanical axis deviation (MAD), medial neck-shaft angle (MNSA) and medial proximal tibia angle (MPTA).

Our MAD have a sustained valgus tibio-femoral angulation throughout our population. Our MNSA have more pronounced valgus with minimal change throughout growth. The increasing MPTA leads to a more valgus joint line when compared to other studies. Other measured values are comparable with previously published results.

We were able to develop set values that could be the norm for paediatric joint orientation angles in the South African population.

P41. Open reduction with or without subcapital osteotomy for the treatment of moderate to severe SCFE: A Case Series

Category: Paediatrics

Presentation: Podium Presentation

Kim Laubscher (University of Cape Town) , Maritz Laubscher (University of Cape Town) , Anria Horn (University of Cape Town)

Background: The gold standard for the management of mild slipped capital femoral epiphysis (SCFE) is in-situ pinning, however the ideal management of moderate to severe slips remains controversial. Reduction of moderate to severe slips has been advocated to prevent the degenerative changes associated with an unreduced slip, but complication rates are high. The aim of our study was to evaluate the efficacy of open reduction, with or without sub-capital osteotomy, utilising the anterior approach for moderate to severe SCFE.

Methods: Radiographic and clinical data were retrospectively collected for all patients that underwent open reduction, +/- sub-capital osteotomy and screw fixation for moderate to severe SCFE in our unit from November 2015 to October 2021. Minimum follow up was 6 months. Pre- and post-operative radiographic measures included the AP- and lateral Southwick angles and the alpha-angle. Incidence of common complications such AVN, intra-articular deformity and the development of leg length discrepancy were documented. Outcomes were assessed using descriptive statistics.

Results: Fourteen patients, with a median age of 12-years, were included. Most patients had acute or acute-on-chronic severe slips. The median follow-up was 232 days. The lateral Southwick angle improved from 53° to 5° and the alpha-angle at final follow-up was 58°. Six patients developed complications including three cases of AVN. Two patients developed cam lesions, and 1 developed degenerative changes in the absence of AVN. Four patients required further surgical intervention for screw removal or to address a leg length discrepancy.

Conclusions: Open reduction and osteotomy for moderate to severe SCFE reliably corrects the intra-articular deformity. Complication rates in our series are comparable to what is published. Further research will be needed to evaluate the long-term outcomes of this technique in our setting.

P42. Bacteriology and antimicrobial susceptibility of osteo- articular infections at a regional paediatric unit in South Africa.

Category: Paediatrics

Presentation: Podium Presentation

Hafsah Tootlah (University of Cape Town) , Anria Horn (University of Cape Town) , Chad Centner (University of Cape Town) , Maritz Laubscher (University of Cape Town)

Background

Osteoarticular infections (OAI) are a common cause of morbidity in children, and as opposed to adults is usually caused by haematogenous spread. The bacteriology of OAI in children is not well described in the South African context, therefore this study was designed to determine the bacteriology of OAI in our population.

Methods

All patients that underwent surgery for the treatment of OAI over a 3-year period were identified and those with positive cultures where organisms were identified from tissue, pus, fluid or blood were included. Duplicate cultures from the same patient were excluded if the organism and antibiotic susceptibility profile was the same. Patients were categorised according to age and class of infection (Septic arthritis, acute osteomyelitis, fracture related infection, post-operative sepsis and chronic osteomyelitis) and organisms were stratified according to these categories.

Results

We identified 132 organisms from 123 samples collected from 86 patients. A single organism was identified in 115 samples and 32 patients cultured more than one organism. Most cultured organisms were from children older than 3-years with acute haematogenous septic arthritis, osteomyelitis or both. Methicillin sensitive *Staphylococcus aureus* accounted for 56% (74/132) of organisms cultured. There were no cases of MRSA. The Enterobacterales accounted for 17% (22/132) of organisms cultured, mostly in the fracture related and post-operative infection groups. Of these, 6 each were extended spectrum B-lactamase producers and AmpC producers. There were no carbapenemase producing Enterobacterales. *Kingella kingae* was not isolated in any patient.

Conclusion

Methicillin sensitive *S. aureus* is the most common infecting organism in paediatric OAI and an anti-staphylococcal penicillin such as cloxacillin or flucloxacillin is the most appropriate empiric treatment for haematogenous OAI in our environment. In fracture related or post-operative infections, Enterobacterales were more frequently cultured, and treatment should be guided by culture and susceptibility results.

P43. Surgical management of failed paediatric deformity surgery

Category: Paediatrics

Presentation: Podium Presentation

Joseph Seritsane (University of Cape Town) , Sean Tromp (University of Cape Town) , Robert Dunn (University of Cape Town)

Background: Paediatric spinal deformity surgery that results in pseudarthrosis and crankshaft puts young patients at risk of progressive deformity and cardiopulmonary compromise.

Revision surgery may be required which is complex and high risk due to abnormal anatomy and severe, rigid curves.

This study reviews a small cohort of children with failed deformity surgery and severe kyphoscoliotic progression in terms of surgical strategy and execution, complications and correction.

Methods: Nine patients were identified from the senior author's database. The index procedure and reason for failure was assessed. The revision procedure was reviewed in terms of type of surgery, surgical time, blood loss, intra-operative and post-operative complications and their management, and the final clinical outcome.

Results: Five patients had their index operations before age ten. Crankshaft phenomenon from posterior only fusion after implant failure and pseudoarthrosis after early implant removal were the commonest cause. There was a high incidence of syndromes – Otto's, Marfans, epiphyseal dysplasias. Two underwent transthoracic release and traction before definitive correction. The median blood loss during the revision surgeries was 1050ml with operative time of 225 minutes. Osteotomies of the posterior bone mass was required with medial exploration of the pedicles to identify screw sites. Hooks were also used into the bone mass.

One case had to have intra-operative rod removal due to loss of transcranial motor evoked spinal cord signals on monitoring. He awoke clinically intact and was taken back later for rod re-insertion. One suffered a post-operative proximal junctional fracture with acute spinal cord injury requiring revision with full recovery.

Conclusion: Surgical management in failed deformity surgery is complex problem, requiring utilization of pseudarthrosis, bone mass osteotomies and novel fixation methods.

Despite this, excellent correction of the spinal deformity in terms of balance and trunk height can be achieved.

P44. Management of scoliosis associated with syringomyelia

Category: Paediatrics

Presentation: Podium Presentation

Joseph Seritsane (University of Cape Town) , Sean Tromp (University of Cape Town) , Robert Dunn (University of Cape Town)

Background

Scoliosis associated with syringomyelia is an uncommon, complex association to diagnose and treat. These patients are at higher risk for adverse neurological outcomes with scoliosis correction. We aim to review the diagnosis, referral pattern, and experience of management in this difficult patient group.

Methods

This is a review of the senior author's prospectively collected database of surgically managed scoliosis with associated syringomyelia. Aetiologies of syringomyelia were included, and divided into Chiari related and non-Chiari related for analysis. Data collected included patient demographics, clinical history, MRI indication, diagnosis, side of the curve, surgical data including spinal cord monitoring, Cobb angle and the syrinx dimensions peri-operatively.

Results

Twelve patients matching inclusion criteria were found. Five patients had Chiari 1 malformation, 3 congenital scoliosis, 3 juvenile idiopathic scoliosis, and 1 benign intra-medullary spinal cord tumour. The median age of symptom onset was 12 years, age of referral 14 years, age of surgery 16 years. The diagnosis was made by the deformity surgeon in 8 out of 12 patients after referral for correction. The scoliosis was left curve in 5 out of 12 patients. The major Cobb angle was 74° preop and 27° post op. Neuromonitoring was used in 10 cases, and was only normal in 3. The Chiari patients had a median syrinx size of 11mm, which reduced to 4mm after posterior fossa decompression. Their scoliosis was worse at diagnosis (Cobb 97°) but operative result the same (Cobb 27°).

Conclusions

This is a dangerous patient population to manage. It is important to recognise early with good clinical acumen. Our patient population presents later than published reports with larger Cobb angles. All Chiari patients responded to posterior fossa decompression and made scoliosis correction safer. It is imperative to use spinal cord monitoring, and often necessary to moderate correction to preserve neurological function.

P45. Epidemiology of Humeral Supracondylar fractures in children presenting at Pelonomi Hospital from 1 January 2018 to 31 December 2018.

Category: Paediatrics

Presentation: Podium Presentation

John Myburgh (University of the Free State)

Abstract

Background: The paediatric humeral supracondylar fracture pattern is described. These fractures' burden is also determined in a South African tertiary hospital and the resources needed to treat this common paediatric fracture.

Methods: Retrospective, cross-sectional folder review of children age 0 to 12 years who presented with a humeral supracondylar fracture at Pelonomi Hospital orthopaedic referrals or orthopaedic clinic from 1 January 2018 to 31 December 2018.

Results: A total of 147 files were used for analysis. The mean age of the patients was 6.18 years. There was a 2.1 male to female ratio. 94 Patients had a left-sided supracondylar fracture, 53 patients had a right-sided supracondylar fracture. 38.4% (53/138) of the patients had a supracondylar elbow fracture on the same side as the dominant hand, and 61.6% (85/138) of patients had a supracondylar elbow fracture the contralateral side as the dominant hand. There were 51 Grade 1, 52 Grade 2, and 44 Grade 3 humeral supracondylar fractures. 51 Patients were treated conservatively, and 96 patients were operated. Eighty-one were extension-type, 22 were flexion-type humeral supracondylar fractures, and in 44 humeral supracondylar fractures, it was unknown if it were flexion or extension type of injuries. 8 Patients had an ipsilateral forearm fracture, and in 5 patients, the presence of ipsilateral forearm fracture was not recorded.

Conclusion: Ninety-four of the hundred-and-forty-seven were hospitalised and operated. This information can assist us in determining the burden on the health system at Pelonomi Hospital. Our results confirm that most supracondylar humeral fractures occur on the left or non-dominant side. The percentage of ipsilateral forearm fractures were in keeping with the literature. Many children sustained a supracondylar humeral fracture from falling from a height.

Level of evidence: 3

Keywords: Supracondylar, Humeral, Elbow, Fracture, Children, Burden, Pattern, Epidemiology, Flexion-type, Extension -type, Hand dominance

P46. Charcot feet: Quality of life and radiological outcomes- A case series

Category: Foot and Ankle

Presentation: Podium Presentation

Michael Abramson (University of Cape Town) , Graham McCollum (University of Cape Town)

Background

Foot and ankle Charcot neuroarthropathy can lead to poor reported quality of life for patients. Recurrent ulceration, deep infection and instability are common. Surgical management can be challenging due to poor bone quality, impaired healing, and immunodeficiency. The surgical goal is to correct the deformity and maintain this correction till union.

Aim

Our aims were to assess the improvement in patients' reported quality of life, to assess the radiological correction and to report adverse events and complications.

Methodology

We conducted a patient reported outcome and radiological assessment study of patients requiring surgery for unstable Charcot feet. 15 consecutive patients (male 6, women 9) who underwent reconstruction (2018-2020) for mid tarsal and transverse tarsal Charcot were included. Minimum follow up was 12 months.

The PROMIS (Patient Reported Outcome Measure Information System) physical score 10a and FFI (Foot function index) scoring tools were used to measure patient outcomes.

Results

The mean PROMIS (Physical function 10a) score improved from 46% to 60% (Range 40%-65%). The mean FFI score improved from 51% to 65% (38%-71%) Radiologically, the mean correction in Meary's angle was 20 (range 5-44), cuboid height, 8 (range 4-12) and the tibia talus angle, 19 (range 1-53). There were significant complications. 6 patients required revision surgery. 4 for failure of fixation and 2 for post-operative wound issues. There were no amputations at 12 month follow up.

Conclusion.

Although several patients at the follow up had complications, there was good lasting radiological correction of the deformity in the majority and no amputations were recorded. Failure of internal fixation resulting in further deformity remains a problem in this cohort.

P47. The Use of a 3D-Printed Titanium Implant in the Management of Large Osseous Defects in the Ankle

Category: Foot and Ankle

Presentation: Podium Presentation

Andrew Strydom (Private Practice) , Nikiforos Saragas (University of the Witwatersrand) , Paulo Ferrao (University of the Witwatersrand)

Large osseous defects around the ankle have multiple aetiologies, commonly revision from a total ankle replacement (TAR), major trauma, infection and diabetic neuropathy. Traditional management involves complex fusions requiring large structural allograft or autograft, with reported failure rates as poor as 80-100%.

Three-dimensional printing technology allows the use of custom implants and instrumentation to manage large osseous defects and may solve some of the problems around allograft fusions in the ankle. The authors hypothesized that a 3D printed patient-specific porous titanium cage, which allows for peripheral osteo-integration and autogenous bone-grafting, would offer superior results to conventional allograft arthrodesis.

Methods: Retrospective review of a consecutive multi-centre, multi-surgeon cohort of patients requiring either TTC or AAD with an associated large osseous defect for a variety of indications between June 2019 – June 2020. All patients underwent pre-operative CT scans for the design and production of a custom 3D-printed prosthesis. Post operative fusion rates were assessed clinically and radiographically.

All patients who underwent this procedure between Jan 2019 and December 2020 were included, with no exclusions. SEFAS and AOFAS scores were reviewed from pre-operative and post-operative reviews, with a minimum 1 year follow-up.

Results: Thirteen cases (12 tibio-talo-calcaneal arthrodeses and 1 ankle arthrodesis) were included. Mean follow-up was 16.5 months (range 12-24 months). The fusion rate was 84% (confirmed on post-operative CT-scans and X-rays), with 92% implant survival at current follow-up; one case required explantation for sepsis post-dental procedure and one case has progressed to a stable septic non-union on long term antibiotic suppression. There was a significant difference between pre- and post-operative SEFAS and AOFAS scores.

Conclusion: A 3D-printed porous titanium implants offers a solution to managing large osseous ankle defects, with a high fusion rate and improvement of objective and patient reported outcome scores comparable to the existing literature

P48. Identifying Research Priorities in Musculoskeletal Trauma Care in Sub-Saharan Africa

Category: Trauma

Presentation: Podium Presentation

Bakhokhele Tshayinca (University of Cape Town) , Sithombo Maqungo (University of Cape Town) , Maritz Laubscher (University of Cape Town) , Simon Graham (University of Liverpool)

Background: In low- and middle-income countries (LMICs), individuals suffer from a disproportionately higher number of musculoskeletal (MSK) injuries, compared to those living in a high-income setting. However, despite the higher burden of death and disability from MSK injuries in LMICs there has been little policy, research and funding invested in addressing this distinctly overlooked problem. Using a consensus-based approach, the aim of this study was to identify research priorities for clinical trials and research in MSK trauma care across sub-Saharan Africa.

Methods: A modified Delphi technique was utilised, involving an initial scoping survey, a two- round Delphi process and finally an expert panel review formed of members of the Orthopaedic Research Collaboration in Africa. This study was conducted amongst MSK health care practitioners treating trauma in sub-Saharan Africa.

Results: Participants from 34 countries across sub-Saharan Africa contributed to the two rounds of the Delphi process, scoring priorities from one (low priority) to five (high priority). Public health topics related to trauma care ranked higher than those focused on clinical effectiveness, with the top ten public health research questions scoring higher than the top questions for clinical effectiveness. Ten public health and ten clinical effectiveness question related to musculoskeletal trauma care were identified, with the top highest ranked questions in respective categories relating to education and training and the management of femur fractures.

Conclusion: This consensus driven research priority study will guide healthcare professionals, academics, researchers, and funders to improve the evidence in MSK trauma care across sub-Saharan Africa and inform funders about priority areas of future research.

P49. Open Tibial Shaft Fractures: Treatment Patterns in Sub- Saharan Africa

Category: Trauma

Presentation: Podium Presentation

Makabongwe Ngxota (University of Cape Town) , Sithombo Maqungo (University of Cape Town) , Simon Graham (University of Liverpool) , Maritz Laubscher (University of Cape Town) , David Shearer (University of California)

Objectives:

Open tibial shaft fractures are a leading cause of morbidity and mortality worldwide, particularly in low- and middle-income countries (LMICs). Guidelines for these injuries have been developed in many high-income countries (HICs), but treatment patterns across Africa are less well documented.

Methods:

A survey was distributed to orthopaedic service providers across sub-Saharan Africa. Information gathered included surgeon and practice setting demographics, and treatment preferences for open tibial shaft fractures across three domains: initial debridement, antibiotic administration, and fracture stabilization. Responses were grouped according to country income level and were compared between LMIC and upper middle-income countries (UMICs).

Results:

Responses from 261 survey participants from 31 countries were analyzed, with 80% of respondents practicing in LMICs. Most respondents were male practicing orthopaedic surgeons at a tertiary referral hospital. For all respondents, initial debridement occurred most frequently in the operating room (OR) within the first 24 hours, but LMIC surgeons more frequently reported delays due to equipment availability, treatment cost, and OR availability. Compared to their UMIC counterparts, LMIC surgeons less frequently confirmed tetanus vaccination status and more frequently used extended courses of postoperative antibiotics. LMIC surgeons reported lower rates of using internal fixation, particularly for high-grade and late-presenting fractures.

Conclusions:

This study describes management characteristics of open tibial shaft fractures in sub-Saharan Africa. Notably, there were reported differences in wound management, antibiotic administration, and fracture stabilization between LMICs and UMICs. These findings suggest opportunities for standardization where evidence is available and further research where it is lacking.

P50. Return to work following intramedullary nailing of lower limb fractures in South Africa: A Cohort Study

Category: Trauma

Presentation: Podium Presentation

Sithombo Maqungo (UCT) , Maritz Laubscher (UCT) , Nando Ferreira (Stellenbosch University) , Michael Held (UCT) , William Harrison (University of Liverpool) , Kaylin Williams (UCT) , Samuel Masterson (University of Liverpool) , Simon Graham (University of Liverpool)

Background: Injuries are a leading cause of death and disability worldwide, commonly leading to catastrophic physical and economic implications. The economic impact of injuries is particularly pronounced in low- and middle-income countries (LMIC), where 90 % of global injuries occur. This study aims to assess the proportion of people who return to work following a fracture to their lower limb in a LMIC and identify factors that impede injury victims' ability to return to employment.

Setting: This prospective cohort study was set across two tertiary trauma centres in Cape Town, South Africa.

Methods: Adults who received intramedullary nail fixation for a lower limb fracture between September 2017 and December 2018 were recruited and followed up for eighteen months postoperatively. The participants' return to work and their full earning capacity were assessed at six- and eighteen-months post-injury. Multivariate logistic regression was used to identify factors that impede return to work eighteen months following a lower limb injury.

Results: Of the 194 participants enrolled, 192 completed follow-up. The study population had a median age of 33.0 years, and most of the participants were male (76.6%) and employed before their injury (75.0%). At six- and eighteen-months post-injury, 34.4% and 56.3% of participants had returned to work, respectively. Multivariate regression identified increasing age, unemployment prior to injury and working in the informal sector as factors that impede an individual's return to work at eighteen months.

Conclusion: Injuries have a profound effect on an individual's ability to work and subsequently have a significant economic impact on their livelihoods and that of their dependants. This is particularly salient for those living in LMICs, where injuries are most prevalent and social support is limited.

P51. Injury pattern, management and outcomes of gunshot- related fractures to the hand and wrist at a tertiary level trauma center.

Category: Trauma

Presentation: Podium Presentation

William Howard (Stellenbosch University) , Nando Ferreira (Stellenbosch University) , Marilize Burger (Stellenbosch University) , Hentas Van Zyl (Stellenbosch University)

Background: Civilian gunshot-related hand and wrist injuries are largely underreported in the literature, especially in South Africa. This type of injury can carry significant financial, social, and quality of life implications. This study aimed to describe the injury pattern, management, complications, and treatment outcomes of patients with gunshot-related injuries to the hand and wrist. A secondary objective was to identify possible risk factors for patients lost to follow-up.

Method: This retrospective descriptive study included all patients who sustained a gunshot-related injury to the hand and wrist, managed at a tertiary level hospital between 2013 and 2017. Patient demographics, injury-related information, definitive management, management outcomes, and functional ability at the final follow-up visit were recorded. Associations between risk factors and loss to follow up were investigated.

Results: A total of 144 patients (92% male) were included in the study (mean age 29 ± 9 years, range 10 – 62). Most injuries were sustained to the metacarpals (43.1%) and phalanges (40.9%). The most used definitive management was conservative (45.1%), followed by ORIF with Kirschner-wires (31.3%). The outcomes noted in the study were non-union (4.2%), joint contracture (22.2%), sepsis (1.4%) and range of motion loss (39.6%). 51.4% of patients were lost to follow-up, with significant associations observed between injury site ($P=0.037$), and type of definitive treatment ($P=0.042$) and the likelihood of being lost to follow-up.

Conclusion: Gunshot-related injuries to the hand and wrist predominantly affected male patients, which is in agreement with the literature. There was no clear, distinct injury pattern with a wide variation of reported injuries. Low complication rates were noted, with the highest being loss of range of motion. Lost to follow-up rates were expectedly high with two interesting associations: the injury site and the type of definitive treatment. Future research should interrogate these findings in more detail.

P52. Epidemiology of civilian gunshot fractures of the neck and head of femur. A review of 70 cases.

Category: Trauma

Presentation: Podium Presentation

Sithombo Maqungo (University of Cape Town) , Pule Pule (University of Cape Town) , Maritz Laubscher (University of Cape Town) , Simon Graham (University of Liverpool) , Andrew Nicol (University of Cape town) , Aristomenis Exadaktylos (University of Bern)

INTRODUCTION: Gunshot injuries are increasingly becoming common and impose a continuous burden on the community and health resources. Gunshot injuries of the hip joint constitute 2–17% of all extremity firearm injuries, but these are becoming more prevalent.

METHODS: We present a retrospective review on 70 patients who presented to our institution with civilian gunshot fractures of femoral neck and head between January 2010 and December 2021. Socio-demographic data, injury pattern, associated injuries, management, radiological outcomes, complications, and risk factors were recorded and analyzed.

RESULTS: Thirty-one patients (44.3%) had a femur head fracture, while 39 (55.7%) were femur neck fractures. Treatment was as follows: 31 patients (44.3%) had an intra-articular retained bullet requiring bullet removal, 22 (31.4%) had an open reduction and internal fixation (ORIF), 13 (18.6%) were conservatively treated while 4 patients (5.7%) had a primary total hip replacement. Of the 31 patients (44.3%) who had a bullet removal, 13 (18.6%) were done through a hip arthrotomy and 18 (25.7%) had surgical hip dislocation. Of the 22 patients (31.4%) treated with ORIF, 10 (14.3%) had proximal femur locking plate, 6 (8.6%) had dynamic hip screw, while cephalomedullary nail and cannulated screws groups had 3 patients (4.3%) each. Thirteen patients (18.6%) sustained associated GSW to the abdomen requiring exploratory laparotomy. Five patients (7.1%) from the series had an implant failure, all of which had a complete neck of femur fracture. Two patients (2.9%) were treated with plate and 2 (2.9%) had DHS, while 1 (1.4%) had surgical hip dislocation with headless screws. Four patients (5.7%) of those with implant failures were converted to THR. The average time to failure was 4.4 months.

CONCLUSION: Future research should be directed at attempts to further analyse the fracture patterns as well as modes of failure in the internal fixation group.

P53. 3D fracture mapping in civilian gunshot injuries of the femoral neck.

Category: Trauma

Presentation: Podium Presentation

Sithombo Maqungo (University of Cape Town) , Habtamu Yimam (University of Cape Town) , Roopam Day (University of Cape Town) , Aristomenis Exadaktylos (University of Bern) , Andrew Nicol (University of Cape town) , Shafique Jakoet (Stellenbosch University) , Maritz Laubscher (University of Cape Town)

Background

Displaced neck of femur fractures in young patients are rare injuries with relatively poor outcomes. Anatomical reduction has been shown to a good predictor for a better outcome but is not always easy to achieve. The presence comminution, however, is an independent risk factor for poor outcome. Neck of femur fractures secondary to civilian gunshot injuries are even more rare, and they have inherent comminution leading to universally poor outcomes following fracture fixation.

We aimed to perform fracture mapping to identify the most common fracture patterns following gunshot fractures of the femur neck.

Methods

A retrospective search of prospectively collected data of all patients presenting with gunshot fractures in the hip region was conducted at two Level 1 hospitals. Once identified from PACS, CT scans in DICOM format were imported into Mimics 16 software and fracture fragments were segmented and 3D reconstruction was generated.

The reduced fractures were exported to 3-Matic software to merge the fragments and adjust the orientation in 3 planes. We used the uninjured contralateral femur as a template for reduction.

Results

A total of 25 intracapsular femur neck fractures were identified and suitable for 3D mapping. All patients were male with an average age of 22 (range 18-32).

Once generated, fracture maps were used to show the location, distribution and frequency of the fracture lines.

Heat maps were used to show the fracture lines' intensity and zones of recurrent fracture patterns graphically.

Conclusion

This is the first study to perform 3D fracture mapping for gunshot neck of femur fractures. The exercise has helped us better understand the commonest fracture patterns and assisted us with surgical planning and execution.

The data we have generated may help in optimising implant designs for treating these complex injuries with poor outcomes.

P54. Early outcomes of surgically managed civilian gunshot femur fractures at a level one trauma unit in Cape Town, South Africa: A retrospective review

Category: Trauma

Presentation: Podium Presentation

Obakeng Makhubalo (Tygerberg Hospital) , Nando Ferreira (Tygerberg Hospital) , Marilize Burger (Tygerberg Hospital)

Purpose: To assess the outcome of surgically fixated femur shaft and distal femur fractures following low-velocity civilian gunshot injuries over a 4-year period..

Methods: A retrospective review was conducted on all patients who sustained femur shaft and distal femur fractures from civilian low-velocity gunshot injuries that required definitive surgical fixation between January 2014 and December 2017. Patient demographics, comorbidities, injury characteristics, duration between injury and surgical fixation, and presence of complications were captured. Data were described using appropriate summary statistics, and associations were investigated using chi-square statistical tests using an alpha-level of 0.05.

Results:

A total of 122 patients (mean age, 29.1 ± 9.5 years) were included. Supracondylar femur fractures (AO 33) accounted for 49% of total injuries, followed by femoral shaft (AO 32) and intraarticular distal femur fractures (AO 33 B & C) with 40% and 11% respectively. Intramedullary nail fixation was the choice of treatment for femur shaft fractures (49,98%) and supracondylar fractures (63%). Intra-articular injuries were predominantly treated with distal femoral locking plates (85%). Arterial and nerve injuries were the most commonly encountered associated injuries occurring in five patients (4.1%) each. Fracture related infection was diagnosed in two patients (1.6%). No cases of non-union and compartment syndrome were recorded. Fracture fixation with plate and cannulated screws were associated with more complications than intramedullary nailing ($p = 0.003$).

Conclusion:

This study demonstrated that femur shaft and supracondylar fractures fixated with intramedullary nails are associated with low complication rates. Intra-articular distal femur fractures fixated with locking plates and cannulated screws have a high complication rate and poorer surgical outcomes. This study also suggests that non-union and compartment syndrome are rare complications of gunshot femur fractures fixated with either intramedullary nails or locking plates. Future studies assessing the functional outcome of patients with these injuries are warranted.

P55. Vascular injuries associated with civilian gunshot fractures: treatment outcomes at a major trauma centre in South Africa

Category: Trauma

Presentation: Podium Presentation

Shafique Jakoet (Division of Orthopaedic Surgery, Stellenbosch University, Tygerberg hospital) , Michele Nardi (Università degli Studi di Torino Dipartimento di Scienze Chirurgiche) , Nando Ferreira (Division of Orthopaedic Surgery, Stellenbosch University, Tygerberg hospital) , Marilize Burger (Division of Orthopaedic Surgery, Stellenbosch University, Tygerberg hospital)

Objective:

To describe injury characteristics of patients who sustained low-velocity gunshot fractures with associated vascular injuries and evaluate the current management at our institution. Secondary aims was to assess these patients' therapeutic pathways and treatment outcomes.

Materials and methods:

The study was a retrospective, observational, descriptive study conducted at a major trauma centre in South Africa. All skeletally mature patients presenting to our trauma unit with a gunshot injury requiring orthopaedic assessment between 2014-2017 were considered for review.

Results:

The records of 1452 patients who sustained gunshot fractures of the appendicular skeleton were reviewed. The final cohort comprised 63 patients who had arterial injuries demonstrated on CTA, including 61 males (97%) and 2 females (3%).

Most injuries were sustained to the lower limbs (n=44, 69%), while the upper limbs were affected in 19 (31%) of the cases. The femur was the most frequently fractured bone (n=23, 36%), while 20 injuries (31%) were intra-articular. The superficial femoral artery was the most frequently injured vessel (n=18, 28%), followed by the popliteal artery (n=15, 23). Great saphenous vein bypass grafting was the most common vascular procedure (n=23, 46%) followed by direct repair (n=11, 22%).

Eleven patients (17%) developed a fracture-related infection (FRI). Nine patients who developed FRI (81%) were initially treated conservatively for their orthopaedic injuries. 55% of fracture-related infections occurred following intra-articular fractures. Fracture union was achieved in 89% (56) of the patients. Four patients (6%) developed fracture non-union.

Conclusion:

Vascular injury associated with low-velocity gunshot fracture is a potential limb- and life threatening event that represents a challenge for the treating clinician. Our study showed the absence of adequate debridement by the orthopaedic surgeon leads to a greater FRI and non-union risk compare to the gunshot related fracture without vascular injury. Larger prospective studies are needed to evaluate this association.

P56. Gunshot fractures of the forearm: burden, management and outcomes

Category: Trauma

Presentation: Podium Presentation

Douglas Bruce-Brand (University of Stellenbosch) , Nando Ferreira (University of Stellenbosch) ,
Marilize Burger (University of Stellenbosch)

Background: This study aimed to assess the burden, management and outcomes of gunshot-induced extra-articular forearm fractures at a tertiary institution in the Western Cape.

Methods: Patients who presented with extra-articular gunshot-induced forearm fractures between January 2014 and December 2017 were included. Injuries were classified and categorized using the AO classification system. Patient demographics, injury variables, management information, the timing of events and treatment outcome information was collected. Fracture union was assessed on serial x-rays. Data was reported using summary statistics.

Results: Ninety-six patients (93.8% male, mean age 29 ± 10.6) were included with 45 radius, 36 ulna and 15 both bone fractures. A total of 51 patients (53.1%) were treated operatively, with an average time to surgery of 5.5 days. Fractures treated non-operatively united 2 weeks earlier than those treated operatively, 12 versus 9.8 weeks for radius fractures and 10 versus 8 weeks for ulna fractures. Associated injuries were identified in 53 (55.2%) patients and included 36 (37.5%) patients who sustained more than one gunshot injury, 24 (25%) patients who had associated nerve injuries and four (4%) patients who sustained arterial injuries. One patient presented with a fracture-related infection. Of the patients who followed up beyond 12 weeks ($n=53$, 55.2%), union occurred in 92.5% ($n=49$ of 53). Isolated radius fractures were malunited in a shortened position in 29.2% ($n=12$ of 41) patients.

Conclusion. An important finding was the large proportion of patients lost to follow-up, resulting in only a subset of patients for whom outcomes could be reported. A second finding was that forearm fractures can be treated conservatively or operatively with similar times to union. Special care needs to be taken when managing isolated radius fractures as shortening is a common complication.

Finally, there is a low burden of infection with GSW-induced fractures when treated conservatively or with single-stage surgery.

P57. Management of Gunshot Injuries to the humerus

Category: Trauma

Presentation: Podium Presentation

Tamsanqa Mazibuko (Witwatersrand university south africa), Athenkosi Mbombi (Witwatersrand university south africa)

Background : Patients with penetrating trauma are more likely to sustain neurovascular complications due to their injuries.

Aims:

Objectives: To assess the outcomes of treatment of gunshot injuries of the humerus.

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

Methods: Eighteen consecutive cases of fractures to the humerus secondary to low velocity civilian gunshot wounds, with ages ranging from 15 to 57 years were retrospectively reviewed. Debridement, Open reduction Internal fixation and expectant or exploratory management of nerve injuries.

Inclusion Criteria: All gunshot humerus fractures

Eclusion Criteria: Fractures of the humerus 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 humerus were reviewed. Fracture treatment method was chosen according to the fracture type, location and the condition of the soft tissues at presentations.

Results:

Eighteen patients met the inclusion criteria for this study. The average age was 20 years (mean 16- 57). Six patients presented with Proximal humerus fractures. Midshaft fractures accounted for 7 of the cases. Five patients had distal humerus fractures. 16 out of the 18 patients were treated surgically. Plating osteosynthesis of the humerus was performed in 10 patients, whilst 6 patients underwent intramedullary nailing. Two patients were treated in a brace. There was a 16%(3/18) incidence of nerve injuries. 2 nerve injuries were radial nerve and 1 ulnar nerve injury.

Conclusion: Timely presentation of gunshots to the humerus coupled with surgical fixation of the fractures can offer satisfactory functional outcomes. This study supports the view that surgical fixation of the humerus following low velocity civilian injuries is safe, Nerve injuries can be addressed expectantly or in a staged procedure. Our results have been satisfactory.

P58. Gunshot Injuries of the Spine

Category: Spine

Presentation: Podium Presentation

Bryan Botha (UFS)

Aims

Retrospective review of the prevalence of GSW to the bony spine at a Level 1 Academic Hospital. The outcomes, associated injuries and description of the injury to the spine's bony elements were determined.

Patients and methods:

A review was conducted of all trauma patients treated at the relevant hospital (2013-2018). All gunshot injured patients were identified, paper, electronic notes were reviewed, identifying direct injury to the spine.

Results:

25 335 patients were treated. 3.8% sustained a GSW. 81 sustained a GSW to the bony spine. 62.96% patients sustained vertebral body injuries. 43.68% sustained a thoracic zone GSW. 84.31% bullet trajectories were anterior. 39.51% had ASIA A neurology which was 100% associated with fragments in the cord. The most common complete neurological level was T10

In the cohort 184 associated injuries were found. 24.59% sustained an associated chest injuries. 17.64% sustained head, neck or facial injuries. 15.5% sustained abdominal injury. 56.79% required surgical intervention not related to the spine injury. 27.16% received a laparotomy. The jugular vein was most commonly injured 27.27% 44.44% of the cohort had complications, sepsis most common at 22.22%. Spinal surgical intervention was performed in 2.47%. 95% survived until discharge.

Conclusion

In the studied civilian population gunshot injuries were uncommon Direct injury to the spine was rare. Significant neurological morbidity was associated with injuries to the spine. Bony cord fragments were associated with ASIA A neurology. This study confirmed the trend towards conservative management. There is a high association with chest, abdominal and vascular injury requiring surgical intervention. Gunshot injuries to the spine are more often associated with other life threatening injuries.

P59. Evaluating patient outcome post-tubular lumbar microdiscectomy

Category: Spine

Presentation: Podium Presentation

Aftab Younus (Helen Joseph Hospital) , Mkhululi Lukhele (Helen Joseph Hospital) , Scott Tink (Helen Joseph Hospital)

Introduction:

Herniated lumbar disc is a common problem in adults. While the majority of these disc herniations resolve with 6 weeks of conservative treatment. While open surgery has been the gold standard for many years. The introduction of the microscope the microdiscectomy become possible, which allowed smaller incisions to be made as spine surgeons were now able to operate effectively down a narrow surgical corridor with superior visualization. Several retrospective studies have reported good outcomes with the microdiscectomy. This study was done to conform the outcome of microdiscectomy.

Material & methods:

We did a retrospect Study of the 62 patients, who presented to the our department with symptomatic lumbar disc hernation, underwent a minimally invasive lumbar tubular microdiscectomy during a five years period and a completed a year follow-up period. The study period was 2014 -2019 which included the 1-year follow-up. All the demographic data was collected.

Results:

A 62 subjects were qualified for the study, The mean age was 52.3 years, Regarding gender 47% female and 53% Male. In term of mechanism of disc injury in 81% subjects the mechanism was presumed degenerative. 19% gave a history of recent significant lumbar trauma. No significance was demonstrated between mechanism of injury and 1 year patient satisfaction ($P=0.73$). Regarding length of surgery, all subjects were 90-120 minutes, (Ave time of 64 min). Post-operatively, utilizing the visual Analogue pain scale as our outcome measure, 42% subjects reported immediate pain relief and 11% late pain relief. The complications in 2/62 (3.2%) subjects an incidental dural tear occurred.

conclusion:

Tubular microdiscectomy techniques yielded good improvements of leg pain and Backache up to 12 months of follow-up. The Tubular microdiscectomy patients were experience improvement of associated back pain, leg pain, less bleeding and early discharge from hospital.

P60. Blood management strategies in posterior corrective surgery for idiopathic scoliosis

Category: Spine

Presentation: Podium Presentation

Mohammad Aftab (University of the Witwatersrand) , Uhala Ukunda (University of the Witwatersrand) , Anthony Robertson (University of the Witwatersrand) , Brenda Milner (University of the Witwatersrand)

Background:

Corrective surgery for idiopathic scoliosis is associated with large volumes of blood loss and a need for blood transfusion. Our study aim was to measure blood loss and blood products used intra- operatively in corrective surgery, and to identify modifiable factors that may influence blood loss.

Methods:

The study was a retrospective review of patients who underwent posterior corrective surgery for idiopathic scoliosis between 2015 and 2020. A total of 43 patients were identified, of which 36 met the inclusion criteria. Sociodemographic data, intra-operative blood loss parameters, transfusion requirements, and use of tranexamic acid (TXA), intra-operative cell salvage (ICS) and ultrasonic bone scalpel (UBS) were documented. Data were analysed to identify factors affecting intra-operative blood loss and blood transfusion.

Results:

The 36 patients (30 female, 6 male) had a median age of 16 (interquartile range: 13-17) years. The mean duration of surgery was 355 (+/-75.38) minutes and the average number of segments fused was 10.25 (+/-1.87). The mean estimated blood loss (EBL) was 722.22 (+/-328.30) mL with the mean percentage blood loss being 22.99 (+/- 11.61) %. A total of 11 patients (30.56%) received a blood transfusion; in these patients every 139.58mL of blood lost resulted in 1 unit of blood being transfused ($p=0.005$). Statistically significant differences in mean EBL were found with the use of TXA ($p=0.018$) and UBS ($p=0.01$). Use of ICS did not result in statistically significant differences in mean EBL. A direct correlation was also found with EBL and the duration of surgery ($p=0.025$), and the number of segments fused ($p=0.005$).

Conclusion:

Multifactorial blood management strategies should be implemented to decrease blood loss and reduce the need for blood transfusion in corrective scoliosis surgery. These include the use of TXA, UBS and ICS. Additionally, attempts should be made to decrease the duration of surgery.

P61. Clinical, immunological and diagnostic phenotypes of suspected spinal tuberculosis patients, with or without HIV- co-infection, presenting to an urban tertiary hospital in South Africa.

Category: Spine

Presentation: Podium Presentation

Robyn Waters (University of Cape Town) , Michael Held (University of Cape Town) , Anna Coussens (Walter and Eliza Hall Institute of Medical Research: WEHI) , Robert Dunn (University of Cape Town) , Maritz Laubscher (University of Cape Town)

Background. With specific and timely diagnostic tools, sufficiently sensitive in HIV co-infected individuals, and the initiation of an appropriate treatment regime, most spinal tuberculosis (STB) patients stand the best chance of being functionally cured.

Objectives. To prospectively investigate the clinical and immunopathological characteristics of patients with suspected STB with or without HIV co-infection. To evaluate performance of the novel next-generation Xpert MTB/RIF Ultra (Xpert Ultra) in comparison to culture for STB diagnosis in a high burden setting.

Methods. We conducted a single-center descriptive cohort study of adult patients presenting with signs and symptoms of suspected STB. We report the clinical, laboratory and diagnostic findings, and report on characteristics of HIV-co-infected and HIV-uninfected patients.

Results. Thirty two patients with suspected STB were prospectively recruited over the study period. Patient presentation was impacted by the COVID-19 pandemic. The final data analysis included 31 patients. The median age of the cohort was 48 years [IQR, 37-54] and 45% (n=14) were males. HIV co-infection was reported in 48% (n=15) patients, of whom 100% were on ARVs. Definite STB (MGIT culture positive) was reported in 10 (31%) patients, probable STB (Xpert Ultra positive) in 8 (25%) and not STB in 13 (41%) patients. Decompressive surgery utilizing a variety of anterior and posterior procedures was performed on 19 (61%) patients, whereas 12 (39%) patients underwent a percutaneous CT-guided biopsy. Four patients were on tuberculosis treatment at the time of recruitment for concurrent pulmonary tuberculosis. 15 (47%) patients reported previous pulmonary TB episodes, of which 93% (n=14) had successfully completed first-line anti-TB treatment. The mortality rate within our cohort was 12.5% (n=4).

Conclusions. This work will have an impact on how we understand the pathogenesis and interaction of viral co-infections on the poorly understood presentation of STB and how this may impact diagnosis, treatment and patient outcomes.

P62. Radiographical analysis of allogeneous fibular strut graft usage in anterior cervical corpectomy and reconstruction

Category: Spine

Presentation: Podium Presentation

Mohamed Bhamjee (Department Of Health) , shazad khan (Department Of Health)

Background: The published body of knowledge within spinal surgery specifies that the performance of cervical corpectomy and reconstruction surgery is well established within the surgical discipline.

Clinical observations suggested the hypothesis that an increased usage of this procedure by spinal surgeons, as evidenced by a marked upsurge in anterior cervical corpectomy and reconstructions has important long-term significance.

Aim: To investigate the radiographical outcomes of allogeneous fibular strut grafts post anterior cervical corpectomy and reconstruction procedures

Methods: A descriptive retrospective study using a purposive sampling technique was applied to select the population for this research study. All 29 adult patients who underwent an anterior cervical corpectomy and reconstruction using an allogeneous fibular strut graft, between 01 January 2012 and 31 December 2019 were sampled for this study. The spinal surgery registry was the primary source used for data collection for patients who underwent this spinal surgery (anterior cervical corpectomy and reconstruction) using the allogeneous fibular strut grafts during the study period stipulated. These radiographs were independently reviewed by the researcher using a prepopulated checklist.

Results: The allogeneous fibular strut graft displayed encouraging biomechanical characteristics with low rates of lucency and subsidence. This study suggested that allogeneous fibular strut grafts used in anterior cervical corpectomy and reconstruction procedures whether single level corpectomy or 2 level corpectomy is both a safe, feasible and possibly a sustainable alternative grafting material in the spinal surgical sphere.

Conclusion: This research study has endeavoured to describe the novel initial investigation into using allogeneous fibular strut grafts as a viable and safe grafting material in anterior cervical corpectomy and reconstruction procedures in the South African spinal surgical sphere.

P63. Correlation of CD4 count and histological findings in spinal tuberculosis

Category: Spine

Presentation: Podium Presentation

Julian Scherer (Groote Schuur Hospital) , Simon Graham (University of Liverpool) , Michael Held (Groote Schuur Hospital) , Robert Dunn (Groote Schuur Hospital) , Friedrich Thienemann (University of Cape Town)

Background: South Africa has the highest prevalence of people with HIV-tuberculosis (TB) coinfection globally. People living with HIV have an increased risk of TB infection and are more likely to develop extrapulmonary TB (EPTB). Approximately 10-20% of EPTB account to skeletal TB with spinal involvement in 50-60% of the cases. This study aims to describe neurological symptoms, radiological findings, histopathological characteristics, and laboratory characteristics of patients diagnosed spinal TB stratified by HIV-status.

Methods: We retrospectively analysed data of patients who were treated for spinal TB at Groote Schuur Hospital, Division of Orthopaedics.

Results: We assessed 52 patients (mean age 38 years, SD 15.2 years, range 17-80 years), 55.8% female, 59.6% HIV-infection; five (9.6%) patients were identified with MDR-TB spine, four (19.0%) in the HIV-infected (3.2%) and one in the HIV-uninfected cohort ($p=0.058$). More patients with HIV-infection presented with neurogenic symptoms (29%, $p=0.029$). The mean overall erythrocyte sedimentation rate (ESR) was 69.3 (SD 35.9) with no significant difference between HIV-infected and HIV-uninfected patients ($p=0.086$). The rate of vertebral collapse was higher in the HIV-infected cohort (39% versus 67%, $p=0.048$). There was no correlation between CD4-count and the number of affected vertebrae. The mean number of granulomata per low-power field (LPF) was 10 (SD 12.6) with no difference between the two cohorts. There was a positive correlation between granuloma count and CD4 count in HIV-infected patients (Pearson 0.503, $p=0.02$) with a significantly higher formation of granulomas at a CD4-count of more than 400 cells/ μL ($p=0.045$).

Conclusion: CD4 count may play a role in spinal TB granuloma formation and may affect extend of disease.

P64. The microbiological, histological and biochemical findings in native joint septic arthritis in adults

Category: General

Presentation: Podium Presentation

Dane Maimin (UCT Dept of Orthopaedic Surgery) , Sithombo Maqungo (UCT Dept of Orthopaedic Surgery) , Roopam Dey (UCT Dept of Orthopaedic Surgery) , Kaylin Williams (UCT Dept of Orthopaedic Surgery) , Alex Vijay Martin (UCT Dept of Orthopaedic Surgery)

Background:

Septic arthritis is an orthopaedic emergency with an incidence of 2 to 10 per 100,000 patients in the general population. Mortality rates between 3-29% can be expected.

We aimed to review and analyse the microbiological, histological and biochemical findings in patients taken to theatre for the purposes of treating a septic arthritis of native joints in adult patients at our institution.

Methods:

A retrospective analysis of prospectively collected data was undertaken using an existing operative database. We included only adult patients that were taken to theatre for treatment of a presumed septic joint. We excluded paediatric patients and joints distal to the elbow or ankle, and the spine. Pre-operative blood tests, and samples obtained intraoperatively for microbiological and histological testing were analysed. Inflammatory markers were compared against culture results. Bacteria trends and antibiotic sensitivities were assessed. Histological findings were analysed against positive cultures.

Results:

In our study, 106 patients were taken to theatre for the treatment of presumed septic arthritis during the data collection period. 86 (81.1%) were found to have septic arthritis based on cultures and/or histology. The knee was the most affected joint (67%). A regression analysis suggested that High ESR and High CRP levels were better predictors for septic arthritis compared to WCC.

Methicillin Sensitive Staphylococcus Aureus (31%), Staphylococcus Epidermidis (10%) and Enterobacter Cloacae Complex (8%) were the most common organisms identified.

Multidrug resistant organisms were cultured in 19% (9/48) cases, in the form of Methicillin Resistant Staphylococcus Aureus, Proteus Mirabilis and Acinetobacter Baumannii.

Conclusion:

Septic arthritis remains a diagnostic challenge and organism and antibiotic patterns vary. We present a review and summary of all septic joints over a 7-year period at a tertiary level orthopaedic service.

P65. Impact of COVID-19 intervention on pulmonary and extrapulmonary tuberculosis testing at an urban tertiary hospital in South Africa.

Category: General

Presentation: Podium Presentation

Robyn Waters (University of Cape Town) , Michael Held (University of Cape Town) , Robert Dunn (University of Cape Town) , Anna Coussens (Walter and Eliza Hall Institute of Medical Research)

Background. The COVID-19 pandemic has threatened the positive signs in annual decline of tuberculosis incidence. There was a significant decrease in TB testing and case detection across South Africa in the past years, coincident with COVID-19 waves and associated lockdown restrictions.

Objectives. To analyse and describe the initial impact of the COVID-19 pandemic, and implemented regulations, on the number of patients newly diagnosed with tuberculosis spine (STB) and pulmonary tuberculosis (PTB) during 2019 (pre-COVID-19) and 2020 (COVID-19).

Methods. The number of TB testing episodes and positive TB cases for January - December 2019 (pre-COVID-19) were compared with the same time frame in 2020 (COVID-19). The COVID-19 timeframe included initiation of a national 'hard lockdown' from 26 March 2020, in preparation for an increasing volume of COVID-19 cases.

Results. Overall, the total number of patient samples (pulmonary and extrapulmonary) sent for TB testing decreased 20.4% from 2019 to 2020 (n=9333 to 7428). April, May and June 2020, the time of the hard lockdown at Alert Level 5, were the most affected months revealing decreases in TB episodes of 43%, 49% and 42%, respectively, when compared to the same months the year prior.

The total number of positively diagnosed pulmonary TB and spinal TB cases decreased significantly during 2020 ($p < 0.05$).

Conclusions. COVID-19, and the associated lockdown, has heavily impacted on both number of TB episodes and positive cases detected at our hospital. Lockdown led to a significantly large reduction in TB testing and detection of positive TB cases ($p < 0.05$). TB testing capacity and health service availability remained operational during the COVID-19 pandemic and associated lockdown periods, hence the drastic decrease in TB tests conducted cannot be attributed to this, but probably rather due to transport and movement restrictions and fear of SARS-CoV-2 risk at hospital 'hotspots'.

P67. Lets talk business, a public-private partnership in soft tissue knee surgery

Category: Knees

Presentation: Podium Presentation

Wing Cham Yu (Karl Bremer Hospital) , Johan le Roux (Groote Schuur Hospital, Division of Orthopedics) , Richard von Bormann (Cape Town Sports and Orthopaedic Clinic) , Michael Held (Groote Schuur Hospital, Division of Orthopedics)

Background: South Africa's focus on the National Health Insurance (NHI) has accelerated the introduction of public-private partnerships (PPP) to integrate existing public and private healthcare resources. In such partnerships it is crucial to evaluate the hospital experience and feasibility, especially for cost intensive orthopaedic procedures.

Aims: To analyse costs, training capacity, and hospital experience of PPP to process knee arthroscopy of state patients in a private hospital.

Methods: Retrospective analysis was done for cases operated between April 2019 and December 2019 as part of PPP. The costs analysed included theatre time, bed nights, consumables, implants, and salaries. The theatre capacity in the form of percentage increase of total annual surgical volume of the unit time of surgical exposure to trainees were evaluated. The hospital experience of the patients was assessed, using the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) score.

Results: Thirty-two participants (23 male) with a median age of 24.5 (IQR 10) were included. The average cost per patient was R 44,442.71 (SD R 20,037.73), for implants R 16,123.87 (SD R 13,775.62), for theatre time (incl. Anaesthetics) R 20,816.22 (SD R 7,865.36), for consumables R 5,206.68 (SD R 1,855.53) and for bed nights R 2,295.93 (SD R 1,260.09). The collaboration increased the Knee Unit's surgical capacity and exposure time of trainees by 15,8%. The assessment of hospital experience showed excellent scores in the nurses and doctor's communications, communications about medications, cleanliness of hospital and willingness to recommend hospital again.

Conclusions: On average, it amounted to R 44,442.71 per state patient operated in a private hospital. Exposure to surgery for trainees was increased and patient satisfaction was excellent. The results provide insight for further PPP and to plan for a future NHI. Additional research should focus on outcomes and complications of such partnerships as well as process flow and logistics.

P68. The utilisation of the South African Orthopaedic Registry: An interrupted time-series analysis

Category: General

Presentation: Podium Presentation

Odette Koch (Dr O Koch Ortopediese Chirurg Ingelyf) , [Hannah Bussio \(SMU\)](#) , Sonke Khanyile (SMU)

The utilisation of the South African Orthopaedic Registry: An interrupted time-series analysis

This qualitative, observational, interrupted time-series study will quantify the utilisation of the South African Orthopaedic Registry (hereafter referred to as the SAOR) by orthopaedic surgeons in South Africa from inception until December 2021. Several interventions have been applied to create awareness of the SAOR and emphasise the importance of the Registry. Their use and utilisation will be examined before and after these interventions' application.

In a data-rich medical world, the value of concise record-keeping in research cannot be overestimated. The South African Orthopaedic Association executives have recognised the benefits registries offer. Consequently, they have advocated for all members of the SAOA, irrespective of particular interest, to utilise the Registry.

One of the drawbacks of international databases is the cost incurred in their setup and maintenance. This may lead to a financial obstacle to obtaining valuable research information.

The research question: Has the use of the SAOR increased after implementing informational interventions aimed at apprising the orthopaedic community of its utility and benefits?

The primary outcome of interest is the rate of increase in users after the individual interventions. The exact number of contributors is determined for each time segment. The time segments are determined by the period between the interventions of interest. Secondary outcomes will include the number of contributions to the Registry, defined as the number of new surgeons and cases added.

Inclusions: All data logged on the SAOR from inception until the end of December 2021.

Results: The number of patients increased exponentially since the interventions to promote the Registry and surgeon users have tripled.

Conclusion: Favourable increase in the utilisation of the SAOR amongst SAOA members. Still, room for more members to contribute.

P69. Does increased peri-operative communication improve patient satisfaction after Total Joint Arthroplasty?

Category: Arthroplasty

Presentation: Podium Presentation

Philani Ntombela (University of the Witwatersrand) , Solomon Ndou (University of the Witwatersrand) , Mmampapatla Ramokgopa (University of the Witwatersrand) , Lipalo Mokete (University of the Witwatersrand) , Khodi Sikhauli (University of the Witwatersrand)

Background: TJA is a very successful procedure. It is reported with relatively high satisfaction rates. One of the pillars in improving patient satisfaction is strengthened communication between surgeons and patients. The aim of this trial was to determine whether peri-operative cell phone messaging patients undergoing TJA improved the satisfaction rate.

Methods: We conducted a RCT of 90 patients and were left with 80 patients at final analysis, 40 participants in each group. The intervention group received SMSs in the peri-operative period (day before surgery up to 6 weeks post-operatively) and were compared to the control group which followed the traditional routine. The primary outcome was the satisfaction rate evaluated using a questionnaire. Secondary outcome was functional improvement evaluated using the HHS and the OKS. Differences between the groups were evaluated using the Pearson's chi-squared test.

Results: In the study group, 57.5% were satisfied, 22.5% very satisfied, 12.5% indifferent and 7.5% were dissatisfied versus the control group's 77.5% satisfied, 17.5% indifferent and 5% dissatisfied. Asked if they would recommend TJA to their family/friends 80% answered yes, 12.5% unlikely and 7.5% were indifferent in the control group. In the study group 57.5 % answered yes, 20% highly recommend it, 15% were indifferent and 7.5% unlikely. There was no statistically significant difference in pre-operative HHS i.e., p-value = 0.07 and post-operative HHS i.e., p-value = 0.61 between the groups. There was statistical significance in pre-operative OKS between the 2 groups i.e., p-value = 0.00000032 and for post-operative OKS i.e., p-value = 0.00086.

Conclusion: The satisfaction rate of patients receiving SMSs is equivalent and comparable to that of patients using traditional forms of communication. The quality of the satisfaction is superior for SMS patients. Patients receiving peri-operative SMSs while undergoing TKA do functionally better. Peri-operative SMSs are beneficial for patients undergoing TJA.

P70. Outcomes of Single Stage Bilateral Total Hip Arthroplasty through a direct anterior approach in HIV positive patients at a Regional Hospital

Category: Arthroplasty

Presentation: Podium Presentation

Goitsemodimo Tau (SMU) , Sikheto Sam Golele (SMU) , Tabane Moagi (SMU)

Background

HIV complications are most cost consuming diseases in the employment sector leading to high hiring costs and loss of work. One of the many complications an orthopaedic surgeon encounters is Avascular necrosis of the hip(AVN), a debilitating condition, and as a result total hip arthroplasty is usually indicated. Finding the correlation between infection and HIV, amount of hospital stay, rate of transfusion and complications is paramount in reaching a consensus to treat such patients.

Methods

A retrospective observational study of 19 patients, who underwent single stage bilateral total hip arthroplasty in a single setting was conducted at Regional Hospital from 01 January 2013-30 April 2021. Ethical clearance was sourced from our institution.

Results

Total of 56 patients were reviewed, 19(12 males,7 females) met the inclusion criteria with a mean age of 53 ± 7.87 years. Modified Steinberg classification was used and mostly were stage 5/6. Mean hemoglobin was 12.8 g/dL, minimum CD4 count was 222 cells/mm³ ,maximum was 1123 cells/mm³ and minimum viral load ranging from undetectable to maximum of 1019. Harris hip scoring(HHS) was used and Mean HHS was 26 ± 7 preoperatively with a progressive increase of 22 postoperatively. P value was determined to be 0.001. Mean hospital stay 7.5 ± 10.37 days and mean intraoperative time was 187 ± 35.39 minutes. 10 patients were transfused. Mean time to mobilization range from 1-5 days. Mean time to one crutch was 23.7 ± 9.42 days and mean time to independent mobilization without crutches was 109.7 ± 87.43 . One patient had postoperative femur fractures bilaterally and were treated with cerclage wires. Two patients developed wound dehiscence and wound discharge for which no organism was identified after 14 days of culture, were debrided and given postoperative antibiotics.

Conclusion

Our study demonstrate that bilateral hip arthroplasty in HIV population is a successful and rewarding procedure for patients presenting with Hip AVN although it is not without complications.

P71. Femoral stem subsidence in cementless uncollared prosthesis: a new problem?

Category: Arthroplasty

Presentation: Podium Presentation

Kirsty Berry (University of Cape Town) , Bredan Dower (Vincent Pallotti) , Garth Grobler (Vincent Pallotti) , Marc Nortje (University of Cape Town)

Introduction:

Uncemented stem subsidence is a potentially avoidable reason for early revision in hip arthroplasty. There has been an increase in uncemented stem subsidence in our practice after more than 10 years of successfully using two uncollared stems. We have migrated to use predominantly a collared prosthesis. The aim of the study was to identify and analyze the case series of subsidence and early revision and assess possible reasons for failure.

Method:

Retrospective database review looking at all uncemented stem revisions. Of those that had early subsidence and revision, the underlying diagnosis, post operative mobilization regime, duration since primary surgery, radiological features, findings at revision surgery and last known follow up were recorded.

Results:

Between Jan 2018 and March 2022, a total of 206 revisions total hip replacements were done at two hospitals with three surgeons. Of these 50 were for loose stems. Six patients have early subsidence of uncemented stems. The average time to revision from primary surgery was 11 months (3 weeks - 28 months).

Conclusion:

Although relatively rare (2.9% of total revisions), early stem subsidence has a high morbidity. The collared prosthesis decreases this risk, but should not be a reason for undersizing or malpositioning of the prosthesis as this leads to other complications such as a periprosthetic fracture.

P72. The direct anterior approach for femoral neck fractures: 5 years of experience at a high volume trauma centre in South Africa

Category: Arthroplasty

Presentation: Podium Presentation

Shafique Jakoet (Division of Orthopaedic Surgery, Stellenbosch University, Tygerberg hospital) , Johan Charilaou (Division of Orthopaedic Surgery, Stellenbosch University, Tygerberg hospital) , Jacobus Jordaan (Division of Orthopaedic Surgery, Stellenbosch University, Tygerberghospital)

Background:

Neck of femur fractures in the elderly are a significant course of morbidity and mortality. Perceived benefits of the direct anterior approach (DAA) include a lower dislocation risk, lower mortality and a substantial reduction in post-operative pain and recovery time. Disadvantages include the higher incidence of complications during the “learning curve”. The objective of our study was to describe our experience with the DAA with treating neck of femur fractures over a 5 year period from March 2017 to February 2021.

Methods:

All patients with displaced neck of femur fractures requiring arthroplasty were included except bilateral neck of femur fractures, polytraumatic injured patients and patients with suspected pathological fractures. The incidence of perioperative complications, in-hospital mortality rate and clinical and radiological outcomes was included.

Results:

514 patients were included over the period with 330 (64%) female and 184 (36%) male, with a mean age at surgery of 72.5 years old. 233 bipolar hip replacements were performed of which 74 (32 %) had cemented stems and 159 (68%) uncemented stems. Of the 281 total hip replacements, 33 (12%) had cemented stems and 248 (88%) uncemented stems. The commonest bearing surface for the THR's was ceramic on poly and head size was 32. In terms of early complications there were 14 femur fractures, 6 dislocations, 4 femoral canal perforations, 3 prosthetic joint infections requiring revisions and 2 acetabular fractures. 5 (1%) patients demised in the immediate post-operative period.

Conclusion:

The DAA is a reliable and safe option for treating patients with neck of femur fractures with a low complication rate once the “learning curve” has passed. Future prospective studies are needed to evaluate the potential in reduction in mortality rate and better perceived functional outcomes compared to other approaches.

P73. Assessment of hip abductor strength of patients with hip osteoarthritis

Category: Arthroplasty

Presentation: Podium Presentation

Emmanuel Dwomoh Osei (University of Witwatersrand) , Richard Kgabo (University of Witwatersrand) , Mmathapelo Lewele (University of Witwatersrand)

ASSESSMENT OF HIP ABDUCTOR STRENGTH OF PATIENTS WITH HIP OSTEOARTHRITIS

Background: Hip abductor strength is very essential in the proper functioning of the hip for daily activities. There is an associated weakness of hip abductors in primary and secondary osteoarthritis of hip. This study sought to find out if there is a correlation between hip abductor muscle strength and the various pathologies of the hip, degree of severity, the impact on the patient's health and functioning of the hip.

Methods: This was a prospective study where we carried out measurement of hip abductor muscles, Harris hip score (HHS) and Short form 12 (SF-12) score of 76 patients who had been radiologically diagnosed with hip osteoarthritis. Analysis of variance and linear regression tests were used to assess if there was a significant correlation between the strength of the hip abductor muscles, HHS and SF-12 scores

Results: The degree of the strength of the hip abductors significantly correlate with the severity of the radiological diagnosis, HHS and SF-12 scores.

Conclusion: Primary and secondary osteoarthritis of the hip are associated with weakness of hip abductor muscles. Physiotherapy, non-surgical and surgical management should be aimed at strengthening hip abductor muscles both pre-operatively and post-operatively.

P74. Single day discharge post THR: Review in the public health environment

Category: Arthroplasty

Presentation: Podium Presentation

Jacobus Jordaan (US) , Johan Charilaou (US) , Shafique Jakoet (US)

Single day discharge post THR: Review in the public health environment

Background:

Enhanced recovery after surgery (ERAS) has become a constant focus in hip arthroplasty and many other surgical procedures. Poor socio-economic status, inefficiency, administrative red-tape are all non-clinical barriers to any ERAS pathway. These barriers are often the norm in the South African public health sector.

Methods:

Prospective pilot project to implement single day discharge after total hip arthroplasty in a South African tertiary public hospital. The primary aim was the successful completion of discharge within 24 hours post-surgery. Secondary aim was to record the clinical and non-clinical barriers to discharge.

Results:

A total 10 patients were included. Discharge within the goal period was achieved in 100% of cases. In all cases we identified either a clinical or multiple non-clinical barriers to discharge. The most common being non-clinical barriers of administrative red-tape of awaiting discharge documentation and discharge medication. Collective buy-in from ward staff improved drastically toward the second part of the project.

Conclusion:

Discharge within a single day post total hip replacement is possible in a South African public health sector hospital. Barriers-to-discharge identified in this study, will help with future projects in similar health care environments.

P75. The prevalence of malnutrition in patients presenting to a South African tertiary hospital arthroplasty unit.

Category: Arthroplasty

Presentation: Podium Presentation

Richard Almeida (University of the Witwatersrand, Johannesburg) , Josip Cakic (University of the Witwatersrand, Johannesburg) , Nkhodiseni Sikhauli (University of Witwatersrand) , Lipalo Mokete (University of Witwatersrand) , Jurek Pietrzak (University of the Witwatersrand, Johannesburg)

INTRODUCTION

An increased demand for Total Joint Arthroplasty (TJA), including Total Hip and Total Knee Arthroplasty exists worldwide, with a subsequent increase in the number of complications. There is a focus on identifying and optimizing modifiable risk factors to limit the impact of post-operative complications. Malnutrition is one such modifiable risk factor, however there is limited published data regarding malnutrition in arthroplasty in South Africa. The aim of this study was to determine the prevalence of malnutrition amongst patients presenting to an arthroplasty unit of a South African Tertiary Institution.

METHOD

A retrospective review was performed of patients presenting over a 12 month period at a tertiary Arthroplasty Unit in South Africa. Malnutrition was defined as hypoalbuminaemia (albumin < 35g/L) or low transferrin (< 2g/L). Demographics, BMI, albumin, transferrin, haemoglobin and the type of surgery required were recorded.

RESULTS

In total 414 patients were assessed. The mean age was 61 years, and 75.1% (n 311) of patients were female. 88.4% (n 366) of patients presented for elective arthroplasty surgery with 11.6% (n 48) patients were referred for neck of femur fractures.

The overall prevalence of malnutrition was 11.4% (n=47). Patients presenting for elective TJA had a prevalence of malnutrition of 6.3% (n=23). The most common co-morbidities in patients with malnutrition included hypertension 45% (n=18), HIV 19,1% (n=9), Diabetes Mellitus 14.9% (n=7), chronic kidney failure 14.9% (n=7) and inflammatory arthritis 12.8% (n=6). Patients with HIV had a mean CD4 count of 588 with 8% (n=4) of patients not virally suppressed. Patients with HIV had a prevalence of malnutrition of 15% (n=9).

CONCLUSION

The prevalence of malnutrition of 11.4% in this cohort of patients is similar to other published results. Higher powered prospective studies are needed to further investigate the prevalence of malnutrition in patients requiring arthroplasty surgery in South Africa.

P76. A Vertical Measurement System (VMS) Mitigates the Risk of Leg Length Inequality in Direct Anterior Approach (DAA) Total Hip Arthroplasty

Category: Arthroplasty

Presentation: Podium Presentation

Jurek Pietrzak (Charlotte Maxeke Johannesburg Academic Hospital) , Ashleigh Lewis (Charlotte Maxeke Johannesburg Academic Hospital) , Josip Nenad Cakic (Charlotte Maxeke Johannesburg Academic Hospital)

Introduction

Limb length inequality (LLI) may negatively impact functional and clinical outcomes after THA. Today, very few viable options for accurate real time measurement of leg length intra-operatively exists. The aim of the study was to assess the accuracy of a vertical measurement system (VMS) to attain equal leg length (LL) in the Direct Anterior Approach (DAA) Total Hip Arthroplasty.

Material and methods

A prospective study of 199 consecutive patients undergoing DAA THA using a specialised traction table was conducted. The VMS was used for assessment and achievement of appropriate equal leg length intra-operatively. The cumulative summation (CUSUM) analysis was used to assess the learning curve for operative times, accuracy of implant positioning, leg length and complications.

Results

There were 114 females and 75 males, aged 59.1 ± 14.2 years with a BMI of $26.26 \pm 5.1 \text{ kg/m}^2$. The pre-operative LLI of 3.8 ± 4.9 mm was corrected to 1.6 ± 1.3 mm on the 6 week post-operative X- Rays. In 188 cases (94%) the LLI was ≤ 2 mm. BMI, method of fixation, pre-operative LLI and diagnosis did not significantly influence LLI. The VMS was integrated into the surgical workflow by the fifth case according to surgical time, blood loss and accuracy of equal length achievement.

Conclusion

The VMS allows the accurate, consistent attainment of equal leg lengths in DAA THA with minimal learning curve.

P77. A Medium-Term Comparison of Obese and Non-Obese Patients Undergoing Anterior Minimally Invasive (AMIS®) Direct Anterior Approach Total Hip Arthroplasty

Category: Arthroplasty

Presentation: Podium Presentation

Jurek Pietrzak (Charlotte Maxeke Johannesburg Academic Hospital) , Nabila Goga (Charlotte Maxeke Johannesburg Academic Hospital) , Sebastian Magobotha (Chris Hani Baragwanath Academic Hospital) , Josip Nenad Cakic (Charlotte Maxeke Johannesburg Academic Hospital)

Introduction

An increased risk of peri-operative complications and inferior outcomes exist in obese patients undergoing Total Hip Arthroplasty (THA). Poorer results may be exacerbated in minimally invasive direct anterior approach (DAA) THA. The aim of the study was to compare the short-term functional and clinical outcomes in obese (BMI $\geq 30\text{kg/m}^2$) and non-obese patients undergoing DAA THA

Methods and Materials

This retrospective study compared 149 non-obese patients with 107 obese patients who underwent DAA THA by a single high-volume orthopaedic surgeon with mean follow-up was 3.49 years. The study evaluated for radiological, medium term PROMS and complication rates of all patients.

Results

The obese and non-obese patient groups were matched for gender, age, ASA grade and preoperative diagnoses. Intraoperatively, the obese group had longer surgical time (92.71 ± 24.24 mins vs 84.39 ± 23.92), increased blood loss but no differences in mean radiation dose ($p=1$) and average exposure time ($p=0.9$) The LOS was equivalent (2.8 vs 2.6 days, $p=0.79$). The obese group was 2.4 times more likely to have the acetabular cap inclination of 31 to 40° . Both groups improved the VAS score but the obese group was 1.9 times more likely to have VAS > 3 at rest for > 1 year. An increased incidence of early surgical complications (<4 weeks) existed in the obese group (6.2% vs 4.3% , $p=0.83$) however this was not linked to SSIs or deep PJI complications. The FJS, satisfaction rates and other PROMS were not significantly different.

Conclusion

Equivalent clinical and functional outcomes exist in obese and non-obese patients undergoing DAA THA.

P78. An evolution of total hip arthroplasty bearing surfaces in a single practice over ten years

Category: Arthroplasty

Presentation: Podium Presentation

Kirsty Berry (University of Cape Town) , Bredan Dower (Vincent Pallotti) , Garth Grobler (Vincent Pallotti) , Marc Nortje (University of Cape Town), D Du Toit

Introduction:

Since the first total hip replacements introduced by John Charnley using polytetrafluoroethylene in the 1960, our understanding of material and wear patterns has changed significantly. The introduction of oxidation-resistant high cross-linked (XLPE) polyethylene has reduced osteolysis and revision rates; and the increase in femoral head size has seen a reduction in dislocations; improved range of motion and decreased impingement.

Methods:

We looked at the evolution of bearing surfaces used over ten years with specific focus on the thinnest liners (52mm cup size and 36mm head) in our arthroplasty practice. The Pinnacle cup (De Puy Synthes) with neutral XLPE liner has a dome thickness of 5.5mm and 45 degree angle thickness of 4.9mm. The number of these implants was assessed in order to identify a cohort of patients that can be followed up long-term to assess revision rates associated with polyethylene wear.

Results:

Over the 10 year period (January 2012 to October 2021), 1361 primary hip replacements were performed, of these 340 (25%) were with 52mm cups. The use of 36 head size with ceramic liners was 66.6% (n=32) of all cases with 52 cups in 2012. XPLE (Altex liner, De Puy Synthes) was used in 18% of cases with 32 heads in the same year. Over the next 10 years, ceramic on ceramic bearing surfaces decreased, with 93% bearing surfaces being XLPE liners with 36mm heads in 2021.

Conclusion:

The introduction of the Altrex liner in 2007 with low wear rates, has allowed for a shift in implant choice to mitigate the complication of squeaking, fracture and difficult extraction seen with ceramic-on-ceramic. Altrex liners are now almost exclusively being used in our practice. There have been no revisions of the ultra-thin XLPE in this medium term review, but long term follow up is required.

P79. The role of virtual and augmented reality, remote assistance and 3D printing in training hip and knee surgeons

Category: General

Presentation: Podium Presentation

Jacobus Jordaan (US) , Johan Charilaou (US) , Shafique Jakoet (US)

The role of virtual and augmented reality, remote assistance and 3D printing in training hip and knee surgeons.

Background:

The place for virtual reality, augmented reality, and remote assistance in training of hip and knee surgeons is not well documented or widely available in the South African context. Conventional teaching and training methods remain the gold standard. The mantra of “see one, do one, teach one” is too often the reality.

Methods:

Implementing pilot projects into the orthopaedic registrar training program with virtual reality, augmented reality, remote assistance, and 3D printing with surgical planning. We report back on success, feasibility, and the practical place of modern training technology.

Results:

Virtual reality was very successfully used to train trainees in performing total knee replacement surgery and direct anterior approach total hip replacement surgery. Augmented reality was used to train trainees on knee balancing philosophies that we used while performing robotic-assisted knee replacements. Real-time, remote assistance and training with Rods&Cones surgical glasses and 3D printing, templating and streaming of complex hip replacement surgery were performed.

Conclusion:

There are multiple benefits to incorporating modern technology in the training and teaching of hip and knee surgeons.

P80. Assessment of quadriceps muscle weakness in patients with knee osteoarthritis

Category: Arthroplasty

Presentation: Podium Presentation

Emmanuel Dwomoh Osei (University of Witwatersrand) , Richard Kgabo (University of Witwatersrand) , Mmathapelo Lewele (University of Witwatersrand)

Background: Osteoarthritis of knee has been associated with significant weakness of the quadriceps muscles which affect the functional activities of the patient's knee and general well-being. Our study sought to find out if the degree of weakness of the quadriceps muscles directly correlates with the severity of the osteoarthritis and the functioning of the knee.

Methods: This was a prospective study where we carried out measurement of quadriceps muscle strength, knee society score and SF-12 of 84 patients who had been diagnosed radiologically with knee osteoarthritis. Analysis of variance (Anova) and linear regression tests were used to assess if there was a direct correlation between the weakness of quadriceps muscles and severity of radiological diagnosis, SF-12 and KSS scores.

Results: The degree of weakness of quadriceps muscles significantly correlates with the severity of knee osteoarthritis, SF-12 and KSS scores.

Conclusion: Osteoarthritis is associated with debilitating weakness of quadriceps muscles. The quadriceps weakness significantly affects the general health of the patient and functioning of the knee. There should be concerted efforts to rehabilitate patients who are to undergo total knee replacement both pre-operatively and post-operatively to maximize patient reported outcomes.

P81. An evaluation of coding questionnaire for hip (THA) and knee (TKA) replacement surgery

Category: General

Presentation: Podium Presentation

Allan van Zyl (SAOA)

Under inflation remuneration by medical aids over 30 – 40 years has given rise to multiple coding for orthopaedic procedures. Suggestions of codes to use have been given without data of current coding in private practice. Bundled payment agreements are based on the current codes used in practice.

Members who attended the 2022 SAAS meeting were asked to complete a questionnaire concerning their current usage of codes for hip & knee replacement surgery.

We received 57 completed questionnaires which excluded 0009/ 0008 assistant modifiers.

Results.

The average number of codes used was 8,16 for THA (range 3-16) and 8,25 for TKA (range 4 – 16). Included are modifiers 0014 and 0018 - not always applicable.

20 codes used for THA, % used is: 0637 (100%), 0825 (86%), 0614 (84,2%), 0592 (84,2%), 0497 (66,7%), 0499 (54,4%), 0521 (40,4%), 0593 (40,4%), 2802 (35,1%), 0545 (29,8%), 0475 (29,8%), 0507 (24,6%), others 0465, 0051, 0583, 0537, 0759, 0901. (< 10%).

22 codes used for TKA, % used is : 0646 (100%), 0614 (87,5%), 0592 (87,5%), 0497 (67,9%), 0593 (64,3%), 0831 (46,4%), 0527 (44,6%), 0499 (37,5%) , 2802 (33,9%), others 0051, 0755, 0537, 0583, 0677, 2831. (< 10%)

Different combinations are used and will differ for each case.

Different Medical Aids accept different codes which reflect codes used.

Conclusion:

Multiple coding for procedures is well accepted by both Medical Aids as well as the orthopaedic community.

Bundled payment agreements with a zero impact on medical schemes have included these multiple codes. One of these bundle agreements in Rand divided by the RCF (rand conversion factor) of GEMS R16,294 will give a unit value of 2038,84 units (excluding assistant modifiers) for this bundle payment.

Accounts with a total unit value of up to 2038,84 (excluding assistant) irrespective of codes used should be seen as perfectly ethical.

P82. Coding Guidelines for Soft Tissue Knee Procedures based on a national consensus study.

Category: General

Presentation: Podium Presentation

Michael Held (University of Cape Town) , David North (Paarl Hospital) , Ponky Firer (Linksfield Knee Clinic) , Michael Barrow (Sunninghill Hospital) , Peter Hardcastle (Mediclinic Vergelegen) , Bradley Gelbart (Linksfield Knee Clinic) , Richard Von Bormann (Christiaan Barnard Hospital)

Objectives: Ethical remuneration practice for commonly performed soft tissue knee procedures is important but no guidelines exist in South Africa. The aim of our study was to establish and prioritise codes used to bill for these procedures via a consensus of knee surgeons.

Methods: South African Knee Society (SAKS) members were approached for a blinded Delphi consensus process. In the first survey round, a list of codes was generated and prioritized in subsequent rounds. 70% agreement or more was defined as consensus. These codes were then moderated during a fourth round by a SAKS committee.

Results: Fourteen SAKS members, performing a median of 220 knee procedures (IQR 255) annually, participated in each round. Consensus was achieved for codes 0667 (93%), 0614 (93%), and 0673 (71%) when billing for meniscus and cartilage surgery. For ACL surgery 0679 (93%), as well as 0775 (57%) and 0593 (14%) for tendon graft harvesting and preparation were proposed. Here, some codes did not achieve consensus although their inclusion was promoted by the SAKS committee round. Furthermore, 0592 (36%) was seen as an inappropriate code in case of minor synovial or fat pad debridement. No code exists to bill for increased complexity in meniscal root repairs and therefore 0677 was proposed, as well as 0296 to code for the major technical nature of the procedure. For medial patellofemoral ligament reconstructions, 0679 (86%) and 0579 (21%), should be billed along with 0667 (86%), 0679 (86%), 0775 (71%), and 0614 (64%).

Conclusion: This consensus study is based on the billing practice of members of the South African Knee Society. Consensus was not easily achieved for certain procedures. Also, a variety of techniques are available, some without specific allocated codes which required moderation. With this work we hope to achieve transparent and consistent billing for soft tissue knee procedures.

P83. A new method of Cast Wedging : Description of Technique and Clinical Experience

Category: Trauma

Presentation: Podium Presentation

Craig Brown (Khayelitsha District Hospital) , Francois Muller (Khayelitsha District Hospital) , Daniel Hugo (Khayelitsha District Hospital)

Background: Cast wedging is an established technique for displaced fractures in the paediatric and adult population. Wedging provides a cost-effective, safe and reproducible alternative to more invasive techniques, such as closed reduction and casting and open reduction internal fixation in the theatre complex.

Objective: We describe a simple, accurate and safe new method of cast wedging using principles of limb deformity correction

Methods: The planning for the position of the cast wedge is based upon the clinical assessment of the patient's cast and limb rotation; radiological parameters of the current and desired post wedging fracture alignment and assessment of the size of the the wedge and block required using basic deformity correction principles.

Results: We will demonstrate the effectiveness of our technique in several clinical cases in the distal humeral shaft; distal radius and tibial shaft pre- and post wedging

Conclusions: We have demonstrated the efficacy and effectiveness of a new cast wedging technique that may aid in reducing the operative burden for the healthcare system. The technique is accurate and reproducible in the fracture clinic setting.

P84. Orthopaedic Virtual Fracture Clinic: A South African first, and a success story from Cape Town

Category: Trauma

Presentation: Podium Presentation

Kudzai Chironga (Groote Schuur Hospital / University of Cape Town) , Sithombo Maqungo (Groote Schuur Hospital / University of Cape Town) , Maritz Laubscher (Groote Schuur Hospital / University of Cape Town) , Kim Laubscher (Groote Schuur Hospital / University of Cape Town)

Background: Trauma is responsible for 4.7 million (8.5%) of annual global deaths and 90% of these occur in Low-middle-income-countries (LMICs), including South Africa. This has subsequently resulted in a global surge of emergency department visits, and a proportional increase in orthopaedic workload at a time when resources are limited. To cope with the overwhelming burden of orthopaedic trauma in a LMIC we established a Virtual Fracture Clinic (VFC). The primary aim of this study was to report on implementing and assessing the feasibility of utilising a VFC in LMICs.

The

secondary aim was to report on reduction in unnecessary clinic visits whilst optimising specialist consultations for more complex cases.

Methods: A retrospective case series on patients treated utilising a VFC between September 2021 and August 2022 was conducted. All patients referred and treated utilising the VFC were included. . Data collected included patient demographics, injury description, cases subsequently referred to specialist orthopaedic clinics and waiting times required to review VFC referrals. At one-year, telephonic interviews were conducted evaluating patient satisfaction consequent to utilising the VFC. Simple descriptive statistical analysis was used to analyse and describe data using measures of central tendency and dispersion.

Results: Our study cohort consisted of 57% females and 43% males. The most common injuries referred were distal radius and stable ankle fractures. About 92% of cases were discharged from the VFC and 8% were referred to specialist orthopaedic clinics. The mean waiting time was 2 days (range 0-7 days] and the mode was 1 day.

Conclusion: A VFC in LMICs is relevant, feasible and consequently reduces patient waiting times. It subsequently has significant benefits of minimizing unnecessary fracture clinic visits whilst optimizing specialist assessment of more complex cases.

P85. The Orthopaedic Virtual Clinic: Early Experiences in Khayelitsha, Cape Town, South Africa

Category: General

Presentation: Podium Presentation

Craig Brown (Khayelitsha District Hospital) , Daniel Hugo (Khayelitsha District Hospital)

Background: Virtual Clinics utilising multimedia devices have been adopted in many countries and specialities globally, to reach patients in rural and remote areas. Orthopaedic Surgery is a specialty whereupon the use of Virtual Clinics has been used to aid in the management of basic fractures.

Aim: To pilot the Orthopaedic Virtual Clinic (OVC) at Site B Clinic in Khayelitsha with oversight from 2 Specialist Orthopaedic Surgeons at Khayelitsha District Hospital (KDH)

Objectives:

1. To optimise basic fracture management at the Primary Care level for patients
2. To reduce patient referrals to District Orthopaedic level
3. To promote Orthopaedic teaching and skill sharing in the Primary care setting

Methods: A weekly OVC at Site B Clinic was commenced and one Intern from the Orthopaedic Surgery cohort at KDH would assist the Intern at Site B for the morning. After assessment of the patients clinically and radiologically (if required) the Interns would contact the Orthopaedic Surgeon at KDH via Microsoft Teams / WhatsApp or the Rods and Cones platform to discuss further management.

3 outcomes would then occur:

1. Patient would continue to be managed at Site B
2. Patient would be transferred to KDH for further investigation and management
3. Patient would be discharged

Results: The OVC commenced in October 2021 to May 2022 (ongoing) The mean number of patients seen per week was 12. 336 patients (over a 7 month period) were managed at a Primary level initially with no delay to definitive management with early Specialist input. The mean time required by the Specialist was 30 minutes per clinic.

Conclusion: The Orthopaedic Virtual Clinic is a safe, viable and cost effective tool to deliver Specialist care at the Point of Access for patients. We have shown that there are no major technological barriers to deliver Specialist input via this medium.

P86. The evolving practice of WALANT surgery in general orthopaedic trauma

Category: Trauma

Presentation: Podium Presentation

Hammaad Gamielien (GSH) , Sithombo Maqungo (GSH) , Michael Abramson (GSH) , Steven Roche (GSH) , Maritz Laubscher (GSH) , Ramanare Magampa (GSH)

Introduction: Wide awake local anaesthesia no tourniquet (WALANT) is a well described-technique that uses a mixture of local anaesthetic, sodium bicarbonate and adrenalin to achieve intraoperative anaesthesia and haemostasis. Advocates for WALANT highlight time-saving, safety and cost as advantages over conventional anaesthesia.

While widely accepted for certain hand surgeries, literature demonstrating its expanding role in orthopaedics remains limited.

This study aims to demonstrate the efficacy and utility of WALANT amongst patients undergoing open reduction internal fixation (ORIF) for certain fractures presenting to our facility.

To our knowledge, it is the first study of its kind in the English literature with the expanded indications.

Methods: We performed a retrospective review of all 50 patients who underwent orthopaedic surgery at our facility from February 2022. Inclusion criteria for study was anaesthesia by WALANT. Minimum follow up time was 12 weeks. Data was collected prospectively. A visual analogue score (VAS) pain score was used pre, intra and post-op. Patient reported outcome score (PROMIS) SF V1.2 – Physical function scoring system was used to assess functional outcome.

Results: 62,5% of the patients were male and 37.5% female. Mean age 37.82 (Range 14-91). A variety of upper and lower limb ORIF's were performed. The patients had varying co-morbidities including diabetes, hypertension, HIV and increased BMI including polytraumatized patients. The outcomes of the cases were all satisfactory with no reported intra and post-operative complications. There were no conversions to general anaesthesia. A large proportion of the patients were discharged on the same day and majority would recommend WALANT to friends and family.

Conclusion: WALANT for general orthopaedics is a safe, effective and time saving alternative to conventional anaesthesia. In a resource limited country such as South Africa, its usefulness in improving access to theatre time, decreasing costs and shortening hospital stay cannot be overstated.

P87. Bone Mineral Density in HIV: A Comparison Of HIV positive versus negative patients with lower limb long bone fractures

Category: Trauma

Presentation: Podium Presentation

Peter Botha (UCT/ GSH) , Maritz Laubschr (UCT/GSH) , Sithombo Maqungo (UCT/GSH) , Micheal Held (UCT/GSH) , Simon Graham (UK/ UCT)

Background

Osteoporosis causes deterioration in the microstructure of the bone, leading to a compromised bone strength, predisposing the individual to an increased risk of fragility fractures. This is a global health concern

There is a strong association between HIV and decreased bone mineral density (BMD) due to the HIV virus or secondary to ARVs. This has been documented in a number of cross-sectional studies with low BMD, osteopenia/osteoporosis being found in both male and female HIV infected individuals

Aim

Assessing the incidence of decreased BMD in HIV positive individuals compared to the HIV negative individuals utilizing quantitative ultrasound monitoring (QUS). Secondly reviewing additional risk factors for decreased BMD in the groups, i.e nutrition, Vitamin D and smoking

Methods

We review a prospectively collected observational cohort, HIV in Orthopaedic Skeletal Trauma (HOST) Study database

All the patients who are HIV infected and have undergone a calcaneal QUS utilizing the DXL Calscan heel densitometer were compared to all the patients who are HIV negative and have undergone the same scan.

Results:

A total of 181 participants had their BMD measured using a Calscan densitometer, all performed at Groote Schuur Hospital. These included 154 HIV negative patients and 27 HIV positive patients.

On measuring the 181 participants T scores, seven participants had a score that was diagnostic of osteoporosis ($T < -2.5$).

There was a slightly higher proportion of HIV positive participants who were classified as osteoporotic compared to HIV negative participants (2/27 [7.4%] vs 5/154 [3.2%]) but no statistical significance was found between the two groups ($p=0.500$).

Overall the BMD and T-scores were similar in both HIV positive and negative participants

Conclusion

We found no statistically significant difference between the two groups in comparison of BMD (T- scores), although average BMD were lower in the HIV positive group



P88. Comparison of dynamic versus static external fixation throughout distal tibial fracture union

Category: Trauma

Presentation: Podium Presentation

Franz Birkholtz (Department of Orthopaedics, University of Pretoria and Institute of Orthopaedics and Rheumatology, Stellenbosch) , Annette-Christi Barnard (Institute of Orthopaedics and Rheumatology, Stellenbosch)

Background:

The mechanical characteristics of an external fixator have a direct impact on the biomechanical environment at the fracture site. To permit bone reduction, optimal external fixation requires limited off-axis motion. However, evidence indicates that cyclic axial-micromotion promotes bone regeneration. This study set out to evaluate the efficacy of controlled axial dynamisation during external fixation.

Methods:

To date, this analytical observational prospective cohort study includes seven cases, treated at a specialised limb reconstruction unit, with frame construction performed by a single surgeon with standard frame configurations. Standard struts were replaced with four dynamisation modules set at a controlled micromotion amplitude of 2mm.

Fracture union was evaluated utilising radiographic analysis at monthly intervals, looking at callus size and time to union compared to similar historic cases without dynamisation. Functional and patient-reported outcomes were determined using the timed up and go (TUG) and EQ5D scores. A series of questions concerning pain and patient-perceived comfort together with exerted foot pressure gait analysis were recorded when dynamic versus static.

Results:

Callus formation was observed in various degrees around fracture sites, with a direct correlation to the patient's degree of mobilisation. Union was achieved in all 7 cases. The average time to union for dynamised-frames was 167 days (\pm SD 26,46) and 182 days (\pm SD 62,3) for un-dynamised historic cases. Patients completed the TUG test on average 1,4 seconds faster when dynamised. Patients had an EQ-index of 0.61 ± 0.17 and an EQ-VAS of 74.3 ± 23.8 at timepoint-1 and 0.64 ± 0.13 , 77.86 ± 21.02 at timepoint-2. Most patients indicated perceived ease of mobilisation when dynamised, this was supported by exerted foot pressure measurements showing that gait is closer to normal when dynamised.

Conclusion:

External frame dynamisation reduces distal tibia fracture union time. Patient functional and perceived outcomes are improved over time with dynamisation treatment.



P89. Management of high velocity Fractures in Pregnancy

Category: Trauma

Presentation: Podium Presentation

Tamsanga Mazibuko (Witwatersrand university south africa)

Background : Outside of Obstetric related complications, trauma is the leading cause of maternal and fetal deaths during pregnancy. Abdominal or pelvic surgery does not increase the chance of preterm labour during pregnancy.

Furthermore, Medical imaging through radiation in pregnancy pregnancy safe can be performed safely within clearly described parameters.

Aims: To assess the clinical outcomes in patients who sustained high velocity trauma to pelvic ring and acetabulum during pregnancy.

Objectives: Retrospective review of all prospectively collected data on patients who sustained pelvic ring and acetabular injuries during pregnancy

Hypothesis: Fracture fixation under general or regional anesthesia is safe in pregnancy.

Methods: This is a single centre retrospective review of patients who sustained high velocity injuries to the pelvis and acetabulum during pregnancy, and were treated surgically. We reviewed the short and midterm complication rates in this group of patients.

Inclusion Criteria: Fractures due to high velocity trauma during pregnancy

Results: sixteen patients underwent 24 orthopaedic related procedures. Average age was 24 years(15-44) Average gestational age at time of injury was 18 weeks (6-37). Average gestational age at delivery was 32 weeks. Eight out of 16 patients had minor injury severity scores. Whilst the injury severity scores for 6 patients were moderate(5-16). Seven patients had pelvic ring injuries. Three patients had acetabulum injuries. Ten fetuses were viable at presentation, all 10 fetuses survived the injuries

Conclusion: Low rates of complications and successful operative fixation of fractures of the pelvis and acetabulum as well as other long bones is achievable during pregnancy. An important factor in ensuring good clinical outcomes was that patients were treated via a multidisciplinary approach.

Notably, maternal and fetal mortality was not influenced by trimester of pregnancy, fracture grade, fracture type(pelvic ring or acetabulum) or the injury severity score of the mother.



P90. Posterior Malleolus Ankle Fractures: Investigating the fracture patterns and the management decisions of posterior malleolus ankle fractures in the South African population

Category: Trauma

Presentation: Podium Presentation

Edward Fuzy (University of Stellenbosch) , Nando Ferreira (University of Stellenbosch) , Danie Hugo (University of Stellenbosch) , Craig Brown (University of Stellenbosch)

Background: Trimalleolar fractures constitute a significant proportion of ankle fractures with poor functional outcomes. Paramount to improving outcomes is correctly identifying and managing these complex fracture patterns. This research aimed to understand the prevalence, morphology, and surgical management of these injuries in the South African setting to determine if there were any significant differences from that of international literature. Additionally, radiological diagnostic accuracy among the authors was evaluated to establish potential diagnostic difficulties with the current classification systems.

Methods: This multicenter retrospective analysis reviewed all participants who had Computed Tomography scans for injuries to the foot and ankle. All scans with posterior malleolus fractures were included for review; Pathoanatomical data was collected and stratified according to established classifications and the definitive surgical management evaluated. Authors individually reviewed the radiographic data and their findings collated.

Results: In 71 cases reviewed, the average age was 41 years, with a female predominance of 69% and 73.2% left sided injuries. High energy injuries accounted for 23.9% of fractures and 50.7% having concomitant co-morbidities. Although the injuries could be stratified according to established classifications, the interrater reliability of correct radiological diagnosis was found to be poor (43%-54%). No consistent treatment pattern could be identified, with variations in both operative and non-operative strategies.

Conclusion: In contrast to international literature, this research identified a different patient population of younger individuals with higher energy mechanisms of injury and found to be managed with greater variability in the local context compared to proposed treatment algorithms in international studies. Complexities of current classifications, resource limitations and poorly defined treatment algorithms impacted their management.

Implications for practice: International literature and subsequent management algorithms for trimalleolar fractures have altered treatment in recent years. However, they need to be scrutinized further and contextualized to the local population in our settings.



P91. The Cape Town Modified Squat and Smile test: Correlation with fracture union in long bone fractures of the lower limb

Category: Trauma

Presentation: Podium Presentation

Delroy Arnolds (UCT) , Maritz Laubscher (UCT)

Background

The ability to squat is one of the most basic functional movements that is required to perform activities of daily living and religious tasks.

Determining whether a fracture has united is one of the most important aspects of orthopaedic fracture care. However, there are no standardized methods of assessing fracture union, which in turn has created significant disagreement among orthopaedic surgeons in both clinical and research settings. The ideal fracture assessment tool would be quick and easy to use, accurate and inexpensive. The aim of our study was to compare the Squat and Smile to union and in turn be used as a proxy for union in intramedullary nailed tibia and/or femoral fractures.

Methods

This is a retrospective cohort study in which patients who had their Cape Town Squat and Smile test recorded following intramedullary nailing for femur and / or tibia shaft fractures selected from the HIV in Orthopaedic Skeletal Trauma (HOST) Study database.

Video footage of patients performing the Squat and Smile test at their routine clinic follow up was collected and scored by two independent observers. Each individual score of the test was compared to union, as well as the patients EDQ5 and DRI scores. Inter/Intra observer reliability of the Squat and Smile were also determined.

Results

xxx videos of patients performing the Squat and Smile Test were analysed. The test had good sensitivity (xxx) and specificity (xxx) in predicting fracture healing using RUST as the gold standard. Each domain of the S&S improved over time and correlated positively with ED-Q5 scores. The facial expression in the S&S was not a reliable measure of fracture healing.

Conclusion

The S&S is reliable to predict healing of lower limb fractures fixed with intramedullary nailing and can be used as a surrogate for union.



P92. Outcomes of intramedullary nailing of femur fractures: An comparison of anterograde- and retrograde nails

Category: Trauma

Presentation: Podium Presentation

Johann Groenewald (State Health) , Simon Graham (State Health) , Sithombo Maqungo (State Health) , Michael Held (State Health) , Nando Ferreira (State Health) , Maritz Laubscher (State Health)

Background

Intramedullary nailing for femoral shaft fractures, is the current most effective, gold standard treatment modality of femoral shaft fractures in the adult population.

In the past the most intramedullary femur nails were performed utilising the anterograde approach (AFN). Recently the retrograde approach (RFN) has become a very attractive alternative option because it enables the surgeon to address the more distal, metaphyseal fractures.

The indications for the retrograde approach further expanded specifically as no traction table is required during surgery. This is an attractive option where in multiple fractured or polytraumatized patients, multiple procedures might have to be combined.

The retrograde insertion as alternative utilizes a through knee approach with potential injury to anatomical supporting structures. There is also the concerns of post operative knee pain, stiffness, sepsis and the negative impact on functional knee scores.

Methods

This is a retrospective review of a prospectively collected database of the HIV in Orthopaedic Skeletal Trauma (HOST) Study database. Patients that underwent anterograde and retrograde femoral nailing in the HOST study will be included in our data collection.

Our primary aim was to compare outcomes of AFN vs RFN. We also compared the incidence of complications such as malalignment, delayed or non-union and occurrence of post operative infection.

Results

227 patients underwent intramedullary nailing of their femur fractures. 141 had an AFN performed and 86 a RFN. There were no significant difference between the outcomes or complications between the 2 groups.

Conclusion

In the cohort of patients with femoral fractures treated with intramedullary nailing during the HOST study, AFN and RFN achieved similar outcomes.



P93. Treatment outcomes of delayed definitive surgery of Tibia Plateau fractures

Category: Trauma

Presentation: Podium Presentation

Lewellyn Green (Edenvale) , Philani Ntombela (University of the Witwatersrand)

Purpose: To compare outcomes of definitive tibial plateau surgery performed within 21 days from the date of injury to those done after 21 days.

Tibial plateau fractures are complex injuries that can present with soft tissue compromise. Low energy tibia plateau fractures can be treated with definitive surgery within 48 hours. High energy tibia plateau fractures require a staged treatment plan that allows healing of the soft tissue envelope, with avoidance of devastating complications.

Methods: A retrospective cohort study was conducted. Group A consisted of patients that received their definitive surgery within 21 days of the injury. Group B were those who had definitive surgery after 21 days. Outcomes of interest included infectious complications and non-infectious complications (pain and reduced ROM).

All patients were treated in one centre between 2018 and 2020.

Results: 44 patients were included in the study. 23 were in group A while 21 were in group B. The mean age was 43 (32 - 62) years

in group A and 39 (14 - 69) years in group B. Group A consisted of 15 males and 8 females while group B had 8 males and 13 females.

Superficial infection rate in group A was 26% compared to 33% in group B. Deep infection occurred in 2% of patients in group A compared to none in group B. The pain VAS in group A averaged 2.52 (0

- 8) in group A and 3.29 (0 - 8) in group B. Range of motion was found to be 94.13 (40 - 130) degrees on average for group A and 99.5 (70 - 120) degrees for group B.

Conclusion: We conclude that the outcome of surgeries performed after the prolonged period of 21 days still had comparable results. This may affect a surgeon's decision-making when faced with these challenging injuries.



P94. Fracture healing in patients with human immunodeficiency virus in South Africa: a prospective cohort study

Category: Trauma

Presentation: Podium Presentation

Wilhelm Hansen (University of Cape Town) , Sithombo Maqungo (University of Cape Town) , Maritz Laubscher (University of Cape Town) , Michael Held (University of Cape Town) , Nando Ferreira (University of Stellenbosch) , Simon Graham (University of Liverpool)

Background: Human immunodeficiency virus (HIV) reduces bone mineral density, mineralisation and turnover, and may impair fracture healing. This prospective cohort study in South Africa investigated whether HIV infection was associated with impaired fracture healing following trauma.

Methods: All adults with acute tibia and femur fractures who underwent intermedullary nailing (IM) for fracture fixation between September 2017 and December 2018, at two tertiary hospitals, were followed for a minimum of 12 months post-operatively. The primary outcome was delayed bone union at 6 months (defined by the radiological union scoring system for the tibia [RUST] score <9), and the secondary outcome was non-union (defined as RUST score <9) at 9 months. Multivariable logistic regression models were constructed to investigate associations between HIV status and impaired fracture healing.

Results: In total, 358 participants, who underwent 395 IM nailings, were enrolled in the study and followed up for 12 months. Seventy-one participants (71/358, 19.8%) were HIV positive (83 IM nailings [83/395], 21.0%). HIV was not associated with delayed fracture healing after IM nailing of the tibia or femur (multivariable odds ratio [OR]: 1.06; 95% confidence interval [CI]: 0.50–2.22). Participants with HIV had a statistically significant lower odds of non-union compared to HIV-negative participants (multivariable OR: 0.17; 95% CI: 0.01–0.92).

Conclusions: Fractures sustained in HIV-positive individuals can undergo surgical fixation as effectively as those in individuals who are HIV negative, with no increased risk of delayed union or non-union.



P95. Usefulness of radiological acetabular lines in the accurate diagnosis of posterior wall fractures amongst pre- specialist-training orthopaedic medical Officers

Category: Trauma

Presentation: Podium Presentation

Mzwandile Nyalungu (Edenvale) , Philani Ntombela (University of the Witwatersrand) ,
Anati Ngcakani (University of the Witwatersrand)

Background: The classification of acetabular fractures using plain radiographs is most commonly performed using the system described by Letournel and Judet. Some studies found that the correct classification was made in approximately 65% cases. 6 radiological lines have been described to aid in making the correct diagnosis.

Purpose: To determine the usefulness of the radiological acetabular lines in the accurate diagnosis of posterior wall fractures by pre-specialist-training orthopaedic medical officers.

Methods: Five orthopaedic medical officers were included. None of the included participants had more than 5 years' experience in orthopaedics. During the study, participants were presented with 11 AP pelvis radiographs of which all had acetabular fractures. Participants were requested to make a diagnosis from the radiographs. CT-scans were available to the assessors for confirmation of diagnosis. The participants were blind to the aim of the study. This data was then collected and analysed to determine how frequently a correct diagnosis of a posterior wall fracture was made.

Results: Five participants were included and 11 radiographs evaluated. The combined experience of all participants was less than 15 years. Seven radiographs had posterior wall fractures. Of a possible 35 times, posterior wall fractures were picked up only 7 (20%) times. There was one incident where a participant incorrectly identified a posterior wall fracture on a radiograph that did not have one.

Conclusion: The low pick-up rate observed in this study is in keeping with findings in existing literature. This data suggests that the described radiological acetabular lines are not particularly useful in aiding pre-specialist-training orthopaedic medical Officers to accurately identify posterior wall fractures. Evaluation of more senior staff could yield different results.



P96. Occult Neck of Femur Fractures – A Current Concepts Review

Category: Trauma

Presentation: Podium Presentation

Bradley Bonner (State Health) , Sithombo Maqungo (State Health)

Background

Neck of femur (NOF) fractures are an ever increasing orthopaedic problem seen daily in hospitals around the world. These fractures and their management have been well investigated and published in the literature. However, between 2 and 10% of these may be occult at first presentation.

Delayed diagnosis may expose a patient to the known complications of immobility as well as rising risks around surgery of an increasing complexity. Therefore, a patient presenting with hip pain, a clinical concern of a NOF fracture and negative radiographs should undergo further imaging to ensure an occult fracture is not missed. MRI is accepted as the gold standard for this, however, point of care ultrasound, CT and dual energy CT are useful adjuncts.

Our aim for this article was to assess and summarise the most recent publications on occult NOF fractures.

Methods

A review of the English literature published in the last 10 years on the topic of occult NOF fractures was performed.

Results

Multiple studies have compared the efficacy and timing of different imaging modalities in diagnosing occult NOF fractures. MRI remains the gold standard but this delay to diagnosis may be detrimental. The management of these fractures is still poorly understood. Non operative and operative management have been compared in small series' and showed mixed results.

Conclusions

Whilst the management of nondisplaced and displaced NOF fractures is well established, the same is not true for occult NOF fractures. There is a paucity of literature around this unique subset.

Directed investigation into their management, with multicenter randomized controlled trials, is needed.



P97. Fragility Fractures of the Hip: Are we complying with International Best Practice?

Category: Trauma

Presentation: Podium Presentation

Bayanda Ndindwa (University of Cape Town) , Sithombo Maqungo (University of Cape Town) , Ntambue Kauta (University of Cape Town)

Fragility Fractures of the Hip: Are we following International Best

Practice? Introduction:

Fragility fractures of the hip (FFH) are caused by osteoporosis in its various forms. This constitutes the more severe complication of osteoporosis because of associated high mortality and morbidity rates.

Studies have suggested that adopting a multidisciplinary team approach with proven treatment guidelines in the management of FFH both decreases the associated mortality and morbidity. Aims

The purpose of this study is to assess the standard of care of FFH at a tertiary institution following establishment of new treatment guidelines for Fragility Fractures of the Hip.

Methods

A retrospective review of clinical and radiographic records of patients treated for FFH from October 2018 to October 2019 was conducted. Records were interrogated for presence or absence of the recommended osteoporosis work up and treatment.

The work up included DEXA scan, calcium and vitamin D levels. Treatment included bisphosphonate prescription, calcium and vitamin D supplementation unless contra-indicated and referral to a geriatric or endocrinology service for further follow up.

Results

A total number of 91 patients were screened and only 77 recruited for the study. The 22 patients excluded was due to incomplete/missing records. Patients who received the work up and treatment as recommended were classified as “fully managed” and those that received some but not all recommended treatment were classified as “incompletely managed.” 22.6% patients were fully managed, whilst 77.3% were incompletely managed in reference to the established guidelines.

Conclusions:

This study has shown an improvement in the management of FFH, when compared to before the establishment of the guidelines.

Although progress has been made, 77.3% of patients were still incompletely managed. This has further highlighted the need for a multidisciplinary team approach to ensure that protocols are adhered to, resulting in optimal patient care.



P98. Outcomes of Tibial Plateau fractures in Chris Hani Baragwanath Academic Hospital: a retrospective review

Category: Trauma

Presentation: Podium Presentation

Philani Ntombela (University of the Witwatersrand) , Loyiso Gqamana (University of the Witwatersrand) , Christian Makita (University of KwaZulu Natal)

Peri-articular injuries to the proximal tibia pose significant treatment challenges to the orthopaedic surgeon tasked with their management. Various treatment modalities have been used over the years, with mixed results. The aim of this study is to do a retrospective review of outcomes on the patients that were treated for tibial plateau fractures at a South Africa tertiary hospital

Methods

This was a retrospective study conducted from January 2018 to December 2020. This study aimed to evaluate short-term outcomes with a required minimum follow-up of 18 months.

Results

Forty-six patients (23 males and 23 females) met the inclusion criteria. Twelve (26.09%) patients developed early complications within 6 weeks following surgery while 5/46 (10.87%) developed late complications. Four of the 5 patients that had late complications also had early complications. Two (4.35%) patients had prominent hardware, 12/46 (26.09%) had surgical site infection (SSI), 2/46 (4.35%) had deep infection, 3/46 (6.52%) developed knee stiffness and 1/46 (2.17%) had loss of reduction (LOR). The mean pain VAS was 2.7 (SD: 2.1). When reviewing the post-operative range of motion (ROM), the average knee extension was 8.91 degrees (range 0 – 35) and 109.24 degrees (range 70 – 130) for flexion.

Conclusion

The short-term outcomes of treatment of tibial plateau fractures is favourable but could be improved. Bicolumnar fixation is associated with early complications compared to the anterolateral approach. With appropriate time interval from injury to definitive surgery, the rate of deep infection after ORIF is low.



P99. Analysis of Orthopaedic Injuries in Polytrauma Patients at Charlotte Maxeke Johannesburg Academic Hospital

Category: Trauma

Presentation: Podium Presentation

wezley laney (wits) , dharshen naicker (wits) , brenda milner (wits) , shahed omar (wits)

Background:

In South Africa, we commonly see patients who have sustained major trauma with multiple injuries. This significant burden necessitates the demand for rapid diagnostic assessment of injuries for appropriate therapeutic intervention. A CT pan scan allows for a rapid multisystem injury diagnosis of polytrauma patients. There's scarcity of literature evaluating the extent of orthopaedic injuries in polytrauma patients.

Methods:

A retrospective, observational analysis, performed at Charlotte Maxeke Johannesburg Academic Hospital during a 2-year period from 01/01/2018 – 31/12/2019. The qualitative data was reported using frequencies and percentages. Categorical variables were analysed using the Chi-squared test. Results:

Over the study period a total of 296 polytrauma patients had a reported CT pan scan. Of these, 85% male and 15% female with a median age of 33 years. The most common mechanism of injury was motor vehicle accidents (33.1%). A total of 1012 injuries were found. One hundred and ninety-six spinal fractures, 137 pelvic/sacral fractures and 101 long bone fractures were detected. The most common non-orthopaedic injury sustained was a chest injury. The most common combination of injuries was chest injury with a pelvic/sacral fracture secondary to a pedestrian vehicle accident.

Interpersonal and intentional injuries were significantly associated with a higher risk of thoracic spine fractures. Road traffic accidents were significantly associated with higher risk of scapular/clavicular fractures and a higher risk of tibial/fibula fractures.

Conclusion:

A patient involved in a road traffic accident is 3.5 times more likely to sustain a tibia/fibular fracture as opposed to any other fracture. The most common non-orthopaedic injury was a chest injury; of these, 1 in 4 patients sustained an associated cervical spine injury and 1 in 3 a pelvic injury. The findings highlight the significant burden of orthopaedic injuries in polytrauma patients and highlight injury patterns that should be anticipated in polytrauma patients.



P100. Serial radiographic assessment during non operative treatment for distal radius fractures

Category: Hands

Presentation: Podium Presentation

Stephan Le Roux (UFS) , Cobus Erasmus (UFS)

Abstract

Distal radius fractures (DRF) are among the most common Orthopedic injuries of the upper limb and sometimes one of the most challenging to manage. Closed reduction and cast immobilisation remains the primary treatment modality in a large number of cases, however, the best approach to closed reduction still needs to be determined.

Aim of study

We tested the null hypothesis that there are no significant changes in the radiographic parameters of distal radius fracture reduction and cast immobilisation after the first three weeks of non operative treatment.

Patients and methods

The study is a retrospective x-ray review, done between January 2021 and June 2021, of all patients who sustained distal radius fractures (DRF) and who were eligible to be treated conservatively. X- rays were measured making use a digital radiology system. Five categories were measured over the first eight weeks of treatment.

Results

Sixty three cases (n = 63) were reviewed. Thirty seven patients (59%) displaced beyond acceptable limits. For ulnar variance, 5 out of the 8 cases displaced between week two and three, with a mean of 2,77mm (IQR -18, 95; 1). For volar tilt, most displacement took place between week three and six, where seven (11%) displaced beyond acceptable parameters (mean displacement 2,43) (p =0,003). For radial inclination ten out of the sixteen cases displaced between week three and six (mean of 1,43) (p = 0,005). Radial height decreased gradually over the first six weeks after reduction, with a mean (0,78mm) loss in height each week. Thirty one cases (49%) had articular involvement, eight (13%) displaced more than 2mm.

Conclusion

From our data most displacement took place in the first three weeks of immobilization (43%), but not all fractures stabilized at three weeks and a significant amount of cases (15%) still displaced beyond three weeks of immobilization.