

4A TRAUMA AND ORTHOPAEDIC

O90 INTER-OBSERVER AND INTRA-OBSERVER ERROR IN ASSESSMENT OF HETEROTOPIC OSSIFICATION IN INTRAMEDULLARY NAILING OF THE FEMUR

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Introduction: Heterotopic ossification (HO) is the abnormal formation of bone within extra-skeletal soft tissues where bone does not normally exist. It is associated with stiffness and pain. The incidence of HO is reported to be anywhere between 8% and 90% in the literature. There are four recognized grading systems for heterotopic ossification. The aim of this study was to compare inter-observer and intra-observer error for each grading system.

Method: We reviewed 100 patients that underwent antegrade intra-medullary femoral nailing. Post-op radiographs were randomised and reviewed on two separate occasions by six blinded subjects and an assessment was made about the grade of HO using four classification systems (Brooker, Della Vale, Arcq and De Lee).

Result: The Brooker classification system had the highest rate of describing HO (38%). Kappa values for all four classification systems demonstrated poor agreement for both inter-observer and intra-observer error, although it was noted that the more senior reviewers demonstrated better kappa scores for intra-observer error.

Conclusion (s): HO frequently occurs following IM femoral nailing. No classification system offers acceptable intra-observer or inter-observer reliability. Implications: Treatment of HO is determined by the severity of the condition, often using the above classification systems. Existing classification systems fail to provide standardization and a common level of agreement with regards to severity. We believe there may be a role for the introduction of a new, universally acknowledged classification system that is easily reproducible and can guide treatment according to disease severity.

Take-home message:

Existing classification systems fail to provide standardization and a common level of agreement with regards to severity. We believe there may be a role for the introduction of a new, universally acknowledged classification system that is easily reproducible and can guide treatment according to disease severity.

O91 DOSE OPTIMISATION OF INTRAVENOUS TRANEXAMIC ACID FOR ELECTIVE HIP AND KNEE ARTHROPLASTY; THE EFFECTIVENESS OF A SINGLE PRE-OPERATIVE 30 MG/KG DOSE

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Introduction: Tranexamic acid (TXA) can significantly reduce post-operative bleeding and the requirement for blood transfusion. However, the optimal dose is still debated. We have increased the dose of TXA used in our department in elective total hip (THR) or knee (TKR) replacement. This study aims to evaluate the effect of this dose increase.

Method: We compared two separate cohorts of consecutive patients undergoing THR/TKR surgery in our unit. The control cohort (May 2008 – July 2011) received intravenous TXA 15mg/kg, maximum 1.2g, and the intervention cohort (February 2012 – February 2013) received 30mg/kg, maximum 2.5g as a single pre-operative dose. The primary outcome for this study was the requirement for allogeneic blood transfusion within 30-days of surgery. Secondary outcomes included thromboembolic complications, length of stay, critical care requirement, readmission rate, medical complications and mortality rates.

Result: There were 2,698 in the control group and 1,814 in the intervention group. The higher dose of TXA was associated with a reduction in blood transfusion (5.9 vs. 7.9%, $p = 0.01$). Length of stay (3.9 vs. 5.2 days, $p < 0.01$), readmission rate (3.3 vs. 4.7%, $p = 0.02$), and requirements for critical care (1.3 vs. 2.7%, $p = 0.01$) were also reduced. There was no difference in 90-day mortality, or in the incidence of GI bleed, MI, stroke, or in the incidence of DVT or PE (all $p > 0.05$).

Conclusion : We suggest that a single pre-operative dose of TXA of 30mg/kg has a greater reduction in transfusion requirement compared to a lower dose, with no increase in thromboembolic complications.

Take-home message:

We suggest that a single pre-operative dose of TXA of 30mg/kg has a greater reduction in transfusion requirement compared to a lower dose.

O92 SAFETY OF BILATERAL HIP RECONSTRUCTION IN CHILDREN WITH CEREBRAL PALSY

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Introduction: Approximately one third of children with cerebral palsy (CP) have instability of the hips, which may lead to subluxation or dislocation. Of these, up to half of children who undergo unilateral hip surgery require further bony surgical management of the contralateral side. This has generated interest in concurrent prophylactic surgical management of the radiologically stable hip. The aim of this study was to assess the safety of bilateral hip reconstruction in this patient group.

Method: All consecutive hip reconstructions performed for CP by a single surgeon within a tertiary-referral centre between January 2014 and July 2016 were identified. Patients were stratified by age,

gender, Gross Motor Function Classification Score (GMFCS) and side of procedure. Operative time, pre- and post-operative haemoglobin, immediate post-operative complications and length of stay were measured.

Result: 71 operations were performed (41 bilateral, 30 unilateral (15 right, 15 left), 112 hips). There was no statistically significant difference in operative time ($p=0.139$), haemoglobin decrease ($p=0.128$) or length of stay ($p=0.59$) when comparing bilateral with unilateral reconstructions. Immediate post-operative complication rates were similar ($p=0.78$). Irrespective of procedure, those with a GMFCS grade of 5 had a longer inpatient stay compared to GMFCS grade 4 (8.01 vs. 5.82 days, $p=0.021$).

Conclusion: No statistically significant differences between unilateral and bilateral hip reconstructions were identified in the peri-operative outcomes measured. This suggests that bilateral hip reconstruction is a safe surgical option in this group of paediatric patients.

Take-home message:

There is clinical equipoise regarding prophylactic fixation of at risk hips in children with cerebral palsy. This study suggests that bilateral hip reconstruction is of equivalent safety as unilateral procedures.

093 AVAILABILITY OF CONSULTANT POSTS AND SPECIALISATION IN TRAUMA AND ORTHOPAEDIC SURGERY IN THE UNITED KINGDOM

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Introduction: Trauma and Orthopaedics is a popular surgical specialty within the UK. Recent changes to the NHS have suggested an imbalance with fewer jobs yet more trainees. Within surgery, we have seen the emergence of sub-specialisation. This study looked to examine the number of T&O Consultant posts within the UK and determine the frequency of sub-specialisation over a decade.

Method: Fifty-one issues of the British Medical Journal (BMJ) Careers supplement from 2000 and 2010 were reviewed analysing the number of advertised T&O posts, any requested sub-specialty interests and the number of posts in other surgical specialties.

Result: 481 Consultant posts in T&O were advertised in the 102 issues of the BMJ Careers supplements reviewed. 281 were advertised in the year 2000 and 200 in 2010. The mean number of posts advertised per issue was 5.5 in 2000 and 3.9 in 2010. In 2000 and 2010, orthopaedic posts represented 30.5% and 37.8% respectively of all surgical posts. In 2000, 61.6% of posts requested a specialty interest, however, in 2010, 93% requested a specialist interest. There was a 12.7% increase in request for spine as a sub-specialty interest between 2000 and 2010, General decreased by 31.4%.

Conclusion (s): UK consultant posts in T&O are decreasing in frequency. Most advertised posts request a sub-specialty interest. Implications: Registrar training focuses on producing a generally competent orthopaedic consultant. Trusts seek a sub-specialty interest. Therefore the onus is on fellowships to develop subspecialty interest yet few are educationally approved thereby questioning the ability to demonstrate subspecialty competence.

Take-home message:

The surgical training curriculum contradicts the emergence of sub-specialty posts whereby the curriculum seeks generally competent surgeons but trusts want sub-specialty trained surgeons. Perhaps there is a need for standard setting of fellowships to ensure they meet the requirements to be a sub-specialist.

095 INTRA-OPERATIVE RADIATION DOSE FOR THREE DIFFERENT TOTAL ANKLE ARTHROPLASTY IMPLANTS

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Introduction: Total ankle replacement (TAA) is an increasingly popular procedure for the treatment of tibia-talar osteoarthritis. The Inbone implant requires intra-operative mobile fluoroscopy whilst the Mobility and Infinity implants do not. We carried out a study comparing the levels of radiation used between three different implants: Inbone, Infinity and Mobility.

Method: Analysis of a single surgeon case series of 20 TAAs was undertaken: 7 were the Infinity implant, 6 Inbone and 7 Mobility. Radiation doses and total screening times were recorded from the dose cards on PACS.

Result: Comparisons were made between intra-operative radiation doses in millisieverts (mSv) and total fluoroscopic screening time in seconds (s). The Inbone, Infinity and Mobility implant had mean radiation doses of 2.44mSv, 0.74mSv and 0.17mSv respectively and mean fluoroscopic screening times of 137s, 74s and 18s respectively. Significantly more radiation and a longer fluoroscopic screening time were required intra-operatively for Inbone implants compared to Infinity ($p=0.0006$ and $p=0.0016$ respectively). Inbone also requires a significantly higher radiation dose and screening time than Mobility ($p=0.0002$ and $p=0.00007$ respectively). The Infinity implant uses significantly more radiation and has a longer screening time than the Mobility implant ($p=0.02$ and $p < 0.00001$)

Conclusion : The difference between radiation dose for an Inbone versus an Infinity implant (1.7mSv) is equivalent to 17 chest radiographs (0.1mSv/radiograph). The Inbone implant has a mean radiation dose 1.7mSv higher than the Infinity whilst the Infinity has a mean radiation dose 0.57mSv higher than the Mobility. Similarly, the Inbone has the longest screening times.

Take-home message:

The Inbone implant uses significantly higher doses of radiation intra-operatively than other implants.

O96 THE USEFULNESS OF THE LATERAL RADIOGRAPH FOR PRE-OPERATIVE PLANNING IN PATIENTS WITH INTRACAPSULAR FRACTURED NECK OF FEMUR

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Introduction: Patients who suffer a fractured neck of femur often report excruciating pain associated with the awkward positioning required to obtain a lateral hip x-ray. Opiates are often utilised and regularly induce acute delirium in frail, elderly patient. Each lateral x-ray costs the NHS approximately £28 however, they are often not reviewed when formulating the management plan.

Method: We arranged two separate, randomised powerpoint presentations of AP and lateral x-rays of 100 patients with a fractured neck of femur. Five medical professionals of varying seniority graded the displacement and management plan for each case according to the AP film. Following this, the lateral film was reviewed to see if this altered initial grading or management.

Result: Kappa scores were used to calculate agreement between the assessors. Assessors were found to have 'substantial agreement' (0.65) and 'moderate agreement' (0.43) in relation to management plans and fracture displacement respectively. The lateral film was found to alter management in only 0.4% of occasions (2 in 500).

Conclusion (s): For patients with obvious displacement of a fractured neck of femur on AP pelvis x-rays, clinical information and the AP radiograph provide sufficient information with which to accurately diagnose and formulate a management. Implications: We believe there is limited use for the lateral x-ray in fractures that are obviously displaced on the AP film. We believe radiographers could be trained to interpret AP films thereby reducing patient discomfort, delirium associated with opiate administration as well as increased cost burden associated with obtaining the lateral film.

Take-home message:

In patients with a fractured neck of femur, lateral radiographs of the hip are expensive, commonly under utilised and, if opiates are used to obtain them, then frail elderly patients can become delirious. If the patient has a displaced intracapsular fracture on anteroposterior radiograph of the pelvis, a lateral radiograph is not required.

O97 OPEN LOWER LIMB FRACTURE MANAGEMENT AT A REGIONAL ORTHOPLASTIC CENTRE

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Introduction: Open lower limb fractures are severe injuries associated with significant soft tissue injury and high levels of infection and non-union which can be reduced to levels similar to closed injuries with appropriate treatment. We aim to quantify adherence to BOA/BAPRAS standards of care and identify differences in care in patients admitted directly to the Orthopaedic Centre and those transferred from peripheral hospitals.

Method: A retrospective review of 6 months (June-December 2015) of open lower limb fracture patients identified via the TARN database. Management scrutinised and compared to 2009 BOA/BAPRAS standards of care.

Result: 18 cases were identified. Initial antibiotic choice was appropriate in 82% however only 19% and 24% were appropriate at primary debridement and skeletal stabilisation. All primary debridements were undertaken within 24hrs however 17%(3) had time to definitive management >7 days. Median time to definitive management was 1.8 days in directly admitted patients compared to 5 days for transferred patients. Median time to transfer was 3 days (range 0-6).

Conclusion : The clear standards of care are not being met sufficiently within the South Wales area. Although primary debridement was undertaken on the same or next day in all patients some are waiting >7 days for definitive management which is associated with poorer outcomes in terms of infection and non-union. This was worse in patients transferred from peripheral hospitals with transfer delays often accountable. The establishment of a direct transfer process is needed to ensure high level of care for patients presenting to peripheral units.

Take-home message:

Open lower limb fractures need to be managed in an orthopaedic centre to ensure optimum care for these complex injuries. Current management in the South Wales area does not adhere to the BOA/BAPRAS standards of care and care is compromised in patients presenting to peripheral hospitals

O98 DOES 30 DAY MORTALITY VARY BETWEEN DIFFERENT TYPES OF HIP FRACTURE

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Introduction: There are over 75,000 hip fractures per year in the UK. This is a major event for an elderly person with approximately an 8% 30 day mortality. Many factors have been shown to cause an increase in mortality. There has been no assessment if the type of hip fracture has an effect on 30 day and 1 year mortality. Objectives The aim of this study is to assess if different types of hip fracture have different 30 day and 1 year mortality.

Method: Patients admitted to a large UK teaching hospital with a hip fracture were included between

2nd April 2011 and 31st March 2014. The type of hip fracture was recorded. Mortality at 30 days and 1 year was recorded from a hospital database and hospital records.

Result: Overall there were 1010 intracapsular neck of femur fractures. The mean age was 81.8, 730 females and 380 males. There were 684 extracapsular hip fractures. The mean age was 83.1. there were 475 females and 209 males. The 30 day mortality for intracapsular hip fractures was 8.7% (88 patients) and for extracapsular hip fractures was 7.1% (48 patients) (P=0.208). The 1 year mortality for intracapsular hip fractures was 23.6% (238 patients) and for extracapsular hip fractures was 25.7% (176 patients) (P=0.309).

Conclusion: There was no significant difference in 30 day and 1 year mortality between different types of hip fractures.

Take-home message:

There was no significant difference in 30 day and 1 year mortality between different types of hip fractures.

O99 PRE-OPERATIVE ANAEMIA SCREENING AND INTERVENTION FOR ELECTIVE HIP AND KNEE ARTHROPLASTY

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Introduction: Anaemia prior to elective hip (THR) or knee (TKR) replacement is associated with increased post-operative red blood cell transfusion rates, length of stay, morbidity and mortality. The aim of this study was to assess the effect of pre-operative anaemia optimisation.

Method: This comparative cohort study assessed patients having THR/TKR before (control) and after (intervention) the launch of an anaemia optimisation programme. Anaemia was defined per the World Health Organization definition. Patients identified as anaemic by their blood parameters when listed for surgery followed a treatment algorithm to normalise haemoglobin prior to surgery. The primary outcome for this study was the requirement for allogenic red blood cell transfusion within 30-days of surgery. Secondary outcomes included length of stay, critical care requirement, readmission rate, medical complications within 30 days, deep vein thrombosis or pulmonary embolism within 60-days, 90-day mortality rates, and financial cost.

Result: 1,814 consecutive control patients (February 2012 – February 2013) were compared to 1,622 intervention patients (February 2013 - May 2014). In the intervention group transfusion rate was significantly reduced (3.9% vs. 6.0%, p=0.005). Readmission rate (3.0% vs. 4.5%, p=0.02), critical care admission (0.6% vs. 1.3%, p=0.03) and length of stay (3.6 vs. 3.9 days, p=0.02) were all reduced. In addition, a reduction of 572 bed-days for this intervention cohort represents an overall saving of £263,000.

Conclusion: Algorithm-led anaemia screening and management in THR/TKR was associated with significant improvements following surgery as described. Surgical teams should consider following a treatment algorithm for anaemic patients on listing for surgery.

Take-home message:

Algorithm-led anaemia screening and management in THR/TKR is associated with significant improvements following surgery. Surgical teams should consider following a treatment algorithm for anaemic patients on listing for surgery.

O100 30 DAY MORTALITY IN PATIENTS SUSTAINING A PERIPROSTHETIC FRACTURE FOLLOWING A HEMIARTHROPLASTY

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Introduction: Periprosthetic fractures around hemiarthroplasty present many medical and surgical challenges. The aim of this study was to analyse the 1 year mortality of periprosthetic fractures around a hemiarthroplasty.

Method: A retrospective case review of all proximal femoral periprosthetic fractures between 1st January and 2008 and 31st May 2015 at a single institution.

Result: 32 patients presented with a mean age of 76.5 (57-96) with 16 males and 16 females. There were 6 (18.8%) Vancouver B1 fractures, 10 (31.3%) Vancouver B2 fractures, 9 (28.1%) Vancouver B3 fractures and 7 (21.9%) Vancouver C fractures. 4 (12.5%) underwent conservative treatment, 16 (50%) underwent open reduction internal fixation and 12 (37.5%) underwent revision arthroplasty. The mean time to surgery from admission was 105 hours with a range of 16 to 331 hours. The mean length of stay was 16 days (6-27). There were 2 (6.3%) in-patient deaths. The 30 day mortality was 12.5% (4 patients).

Conclusion: Periprosthetic fractures following hemiarthroplasties high mortality rates and long length of stays. These fractures should be treated in the same manner as hip fractures with regular orthogeriatric review and early time to surgery to improve outcomes.

Take-home message:

Periprosthetic fractures following hemiarthroplasties high mortality rates and long length of stays.