

mangled extremities.

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### 1A.18

#### Evaluation of the west riding trauma skills course

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**Introduction:** The AO Foundation Operative Fracture Management course is the gold standard in training courses currently available for trainees at ST3 level. However it is expensive (approximately £1050) and over subscribed. The West Riding Trauma Skills Workshop is a practical workshop teaching operative skills and basic principles of fracture management expected of an ST3 trainee, at a reduced cost. Candidates' feedback was used to improve the course and this was further analysed after the second year of running to determine whether the teaching objectives were achieved.

**Methods:** This intensive course was held over a weekend, further details: [www.orthotraineecollege.com](http://www.orthotraineecollege.com). Trainees were given short instructional lectures by consultant orthopaedic surgeons followed by workshops, with a maximum ratio of 4 candidates per consultant. The majority of time was allocated to workshops (total 5 h) and 3 h 30 min in lectures. The trauma inventory including implants and saw bones were provided by Stryker Trauma UK, ensuring a nominal candidate fee (£50). Candidates' feedback was anonymously collected and analysed using non-parametric methods appropriate for ranked data.

**Results:** Twenty-one of 22 (95%) candidates completed feedback questionnaires in 2008, 18 out of 18 (100%) candidates completed feedback in 2009 (Table 1).

Overall feedback was very positive with high scores for all the sessions, both years. An informal session on theatre tips and tricks was present in the 2008 course but due to low ratings was not repeated in the 2009 course to allow more practical time. According to Wilcoxon matched pairs analysis there was only one session which had a significant difference between the 2 years, the intramedullary nailing lecture ( $p = 0.0445$ ), due to improved scores.

**Table 1**

Breakdown of feedback scores (1 = minimum, 5 = maximum approval).

Session	Type I = informal session L = lecture W = workshop	Median score 2008	IQR (2008 scores)	Median score 2009	IQR (2009 scores)
Bone healing	L	4	3–4	4	4–5
Fixation	L	5	4–5	4	4–5
Screws	L	4	4–5	4	4–5
Plating	L	4	4–5	4	4–5
small fragment intramedullary nailing	W	5	4–5	5	4–5
Proximal femoral nail	L	4	3.5–5	5	4–5
IM nailing	W	5	4–5	4.5	4–5
Hip # treatment	W	5	4–5	5	4–5
DHS	L	4	4–5	5	4–5
Damage control orthopaedics	W	5	4–5	5	4–5
External-fixator	W	5	4–5	5	4–5
Theatre tips and tricks	I	3	3–4	–	–

theatre and this may impact on the frequency of opportunities for trauma operating. Candidates gave very high ratings for the course, demonstrating it is possible to teach practical skills course at a low cost. This course is designed to provide further opportunities, in addition to those provided on the AO course, in terms of improving practical skills and knowledge of fracture management. This may improve the likelihood of a trainee being able to use these trauma operating skills in a time pressured environment.

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### 1A.19

#### Tibio-fibula transposition in high energy closed fractures

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**Introduction:** We report two cases of failed attempts at closed reduction of high energy tibial fractures with associated fibula fracture. Operative reduction revealed that the proximal fibula fragment was entrapped in the medulla of the distal tibial fragment. This is an uncommon occurrence and has not previously been reported.

**Material and methods:** Two cases presenting to a district general hospital over a 4-month period. The first case was a 39 year old involved in high speed motorbike collision. The second case was a 14 year old following a fall of 3 m. The injuries were closed and the mechanism of injury consisted of a high energy valgus forces applied to the leg on impact. On scene emergency medical services reported a 90° valgus deformity of the injured limbs. In both cases the limbs were realigned on scene and stabilized with a box splint.

**Results:** Adequate alignment of the tibia could not be achieved by manipulation under sedation or manipulation under anaesthesia. Operative reduction was undertaken and exposure of the fracture sites revealed that the proximal fibula fragment was entrapped in the medulla of the distal tibial fragment. Reduction required traction and simulation of the mechanism of injury i.e. valgus force to release the trapped fibula fragment.

**Conclusion:** In closed high energy tibial fractures, with an associated fibula fracture, it is possible for the fibula to be transposed into the tibia. Transposition occurs during the initial first aid attempt to realign the deformed limb. Our experience demonstrates that closed reduction is not always achievable in these circumstances even under anaesthesia.

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### 1A.20

#### The outcome of grade III open tibial fractures treated at a District General Hospital at 5 years

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Recent combined guidelines from the British Orthopaedic Association and British Association of Plastic Reconstructive and Aesthetic Surgeons about the management of severe open limb fractures recommends the treatment of these cases in specialised centres with appropriately trained orthopaedic and plastic surgeons. Thirty-three grade III open tibial fractures have been treated at the Rowley Bristow Orthopaedic Unit since 2004 and were

reviewed for their time to union, amputation rates and the need for plastic surgical intervention.

Seventy-two percent of the grade IIIA tibial fractures received their first operation within 6 h and 64% received their definitive method of stabilization at this time. Whereas, 86% of the IIIB tibial fractures had their first operation within 6 h and only 14% had their definitive skeletal stabilization performed at this initial operation. An Ilizarov frame was the most common method of skeletal stabilization for our open tibial fractures followed by intramedullary nailing.

None of the Gustilo grade IIIA patients required plastic surgical intervention whereas five of the IIIB required referral to the plastics unit. Two of these underwent a free-flap, one had a split skin graft and two required simple VAC dressings. Fifteen further operations were performed on the IIIA patients, averaging 0.6 per patient, and six on the IIIB group averaging 0.9 per patient. The average time to union for Gustilo grade IIIA tibial fractures was 32 weeks and 43 weeks for grade IIIB. One Gustilo grade IIIA tibial fracture suffered an acute infection and two grade IIIB's. One grade IIIB fracture developed a chronic infection and subsequently required an amputation.

Our analysis supports the view that specialised orthopaedic centres, with an interest in complex trauma and reconstruction, can carry out the management of such cases to produce comparable results despite the lack of an onsite plastic surgical unit.

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#### 1A.21

### The Chertsey classification of tibial plateau fractures and a comparison of the outcome of treatment with internal fixation or an Ilizarov fine wire circular frame

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Early methods of treating high-energy tibial plateau fractures by open reduction and internal fixation led to high infection rates and complications. Alternative treatment methods include minimally invasive techniques and implants, external fixator stabilization (monolateral and circular) and temporary external fixation followed by delayed definitive surgery. A clear understanding of the different fracture types is critical in achieving optimum results with minimally invasive techniques.

The Chertsey classification system is based on the direction of force at the time of injury and helps with surgical planning. There are three groups; valgus, varus or axial fracture patterns. 124 tibial plateau fractures have been surgically treated in our hospital since 1995; there were 62 valgus, 14 varus and 48 axial type fracture patterns. Seventy-nine underwent open reduction with internal fixation, and forty-five had an Ilizarov frame. For valgus fractures the average IOWA knee score was 88 if internally fixed or 86 with an Ilizarov frame, range of motion was 140 and 131 degrees and time to union was 81 versus 126 days respectively. Varus fractures had an IOWA score of 83 (ORIF) and 95 (Ilizarov), ROM of 138 and 130 degrees and time to union of 95 versus 82 days. For axial fractures the average IOWA knee score was 85 (ORIF) compared to 82 (Ilizarov), the ROM was 124 degrees for both groups and time to union was 102 days and 141 days respectively. Deep vein thrombosis occurred in 9% of cases with an Ilizarov and one patient required a total knee replacement for painful post-traumatic osteoarthritis. The infection rate for those internally fixed was 2.5%, three patients required a total knee replacement and 2.5% suffered a DVT.

Our results are comparable to the literature and the Chertsey classification of tibial plateau fractures is a better aid to surgical planning.

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#### 1A.22

### End-to-side anastomosis for limb salvage in the single artery of the traumatized extremity

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In free flap transfer, the recipient's artery is often sacrificed to provide the pedicle anastomosis. Since the recipient artery is necessary for distal circulation, preserving its patency is also important (especially in the traumatized extremities). Decision-making is a difficult task in choosing among the following types of anastomoses for a single artery extremity reconstruction: T, Y arterial shape, vein graft or end-to-side arterial anastomosis. These techniques can be used to preserve the recipient's flow beside other clinical purposes depending on the recipient's vessel condition. To this end, angiography was performed on all the patients who were planned for free flap and a single artery was confirmed in 11 cases. End-to-side anastomosis was applied for limb salvage in single artery extremity reconstruction, such as preserving recipient's flow and preserving donor's flow in 11 patients. The anastomosis arteries included the popliteal artery ( $n=3$ ), the posterior tibial artery ( $n=2$ ), the peroneal artery ( $n=5$ ) and radial  $n=1$ . Finally, the results show that free flap transfer by end-to-side anastomosis for limb salvage with a single artery is a safe procedure, so a vein graft, T and Y shape anastomosis are not necessary. **Keywords:** End-to-side anastomosis; Single artery extremity; Traumatized extremities; Free flap

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#### 1A.23

### An epidemiological study of diaphyseal tibial fractures: the Belfast experience. Reasons for re-admission and treatment modalities

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**Background:** Diaphyseal Tibial shaft fractures are the most common long bone fractures with a significant risk of being compound injuries. This retrospective epidemiological review explores the experience of a regional trauma centre over a seven-year period in particular exploring reasons for re-admission.

**Methodology:** All patients coded as tibial shaft fractures by FORD (Fracture Outcomes Research Database) between 2002 and 2009 were included. Subsequently all charts were explored for patients that required re-admission.

**Results:** A total of 1043 people sustained a diaphyseal tibial fracture within the timeframe. The average age was 37.8 and 76.3 percent were male with the majority of injuries sustained following an RTA (27.7%). The majority of tibial shaft fractures were managed with intra-medullary nailing 34.4% and with the availability of local