

treatment included soft dressings with or without hard sole shoe in 21 patients with type I and 5 patients with type II fractures. 12 patients with type I, 13 patients with type II and all type III were treated with below knee plaster. The duration of immobilization was 3–6 weeks in type I and 6–12 weeks in type II and III fractures.

All type I fractures healed at 3 months follow-up. 4 patients with type II and 2 patients with type III fractures had non-union even after prolonged immobilisation and one re-fracture occurred in type III fracture, which were successfully treated with cannulated screws. The average number of days absent from work was 26 days (7–51 days) in type I fractures and 78 days (28–213 days) in type II and III fractures.

**Conclusion:** Fracture base of fifth metatarsal fractures are potential source of lost work productivity. Type II and III fractures are of particular risk with high incidence of non-union and re-fracture even after prolonged immobilization. We suggest that in active working individual with type II and III fractures should be treated primarily with cannulated screw or tension-band-wiring. This enables them to return to work earlier and prevent the incidence of non-union and re-fracture.

**Keywords:** Fifth metatarsal base fractures; Non-union; Absence from work

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#### 8A.10

##### Periprosthetic knee-management in interlocking plates

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**Introduction:** The management of periprosthetic fractures principally influenced by factors like nature of prosthesis in situ, type of fracture and quality of bone. Surgical treatment of these injuries includes either changing the prosthesis to a long stemmed implant or open reduction and internal fixation using various types of plates and screws, strut allografts alone or in combination with plates and circlage wires. The choice of implant is determined by fracture configuration, quality of bone and stem and or cement and bone interface. We present our experience in treating these fractures, using locking plates.

**Method:** All patients who had undergone open reduction and internal fixation of periprosthetic fractures were identified from theatre records and a retrospective case note review was performed.

**Results:** Six consecutive patients with periprosthetic fractures were treated with locking plates. There were one man and five women with a mean age of 71 years. The patients were assessed clinically and radio logically. We are presenting the outcomes of these cases including per operative and post-operative complications, fracture union, follow up and walking abilities. We achieved union and pre operative walking abilities in all of our cases.

**Discussion:** These are technically challenging procedures, as fixation has to be achieved in the presence of preexisting implant, which significantly reduces surface area available for fixation, and poor quality of bone. Locking plates, with their unique qualities like uni cortical fixation, and more angular stability addressing these clinically challenging situations in an efficient manner. We were able to successfully produce union in all our cases, including one previous non-union case after treating with long stemmed constrained revision prosthesis for a periprosthetic fracture.

**Conclusions:** Our experience concluding that locking plates producing promising outcomes in the management of these complex injuries.

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#### 8A.11

##### Results of Dall Miles cable plate fixation for periprosthetic fractures of femur

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With an aging population, the number of hemiarthroplasties and Total Hip Replacements is on a rise. Though uncommon, one of the serious postoperative complications is periprosthetic fracture of femur. Dall Miles cable plate system is widely used for fixation of these fractures. We present the results of 18 patients who underwent Dall Miles cable plate fixation during the last 5 years, reporting clinical and radiological outcome measures.

Female to male ratio was 2:1. The average age was 77.33 (range from 55 to 93). Seven patients had the periprosthetic fracture after hemiarthroplasty while 11 had it after Total Hip Replacement. Eleven were Vancouver B 1, 7 were Vancouver C. Five were initially managed with two plates, the remainder had only one plate.

Patients were followed up at an average of 3.1 years (range 3.2 months to 5.1 years). Three patients had died at the time of our follow up due to medical comorbidity. One patient had deep infection that required revision and 1 had superficial infection that healed with antibiotics. One patient underwent revision to a THR for hip pain.

Of those managed with a single plate, 3 patients had plate/cable failure and underwent revision DM plating with 2 plates and cables along with allogenic bone grafting; all of these healed well. All of these patients had periprosthetic # following a THR.

Five patients managed initially with 2 DM plates healed without any complications.

Even in this small series, we feel it is evident that Dall Miles plating using a single plate has a high incidence of plate failure (3 of 13). In this elderly group of patients we advocate initial management of periprosthetic fractures using 2 Dall Miles plates and bone graft to decrease the risk of non-union.

**Keywords:** Peri-prosthetic hip fractures; Dall Miles cable plating

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#### 8B.1

8B: Lower Limb Trauma

##### The posterolateral shearing tibial plateau fracture: Treatment and results via a modified posterolateral approach

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The posterolateral shearing tibial plateau fracture is relatively uncommon and few studies have concentrated on it so far. The purpose of this study was to review the results of surgical treatment of this kind of fracture using a modified posterolateral approach. The clinical results of a case series of 11 patients, collected prospectively, were presented here. At final follow-up 10 out of 11 (91%) patients had satisfactory reduction of the articular surface and all had acceptable alignment. There was neither any loss in reduction or alignment at one year postoperation, with a mean HSS score of 93 (s.d. 3.67, range 84–97), nor superficial or deep infections, except

that one case had a sanguinous effusion for more than one week postoperatively. It was concluded that the modified posterolateral approach could help to expand the surgical options for an optimal treatment of this kind of fracture, and plating of posterolateral shearing fractures would result in restoration and maintenance of alignment.

**Keywords:** Shearing fracture; Posterolateral approach; Tibial plateau; Functional outcome

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### 8B.2

#### Malpositional rates following femoral intramedullary nailing

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**Background:** Femoral intramedullary nailing is a commonly performed procedure for the treatment for femoral shaft fractures. Malposition is considered to be a rare complication of femoral nailing but there is little literature that quotes an actual rate or examines the factors that influence its occurrence.

**Methods:** Retrospective analysis was performed of patients treated with a femoral intramedullary nail for fractures between the lesser trochanter and femoral condyles from January 2005 to February 2007. Radiographs taken at follow up were examined for angulation, displacement and shortening as well as location of fracture, type of nail, insertion point, use of locking and complications.

**Results:** 145 patients were treated using a femoral nail. Out of these, 23 (15.9%) patients had malposition of the fracture site, defined as  $>10^\circ$  angulation on AP view or  $>10^\circ$  on lateral view. The mean AP angle on X-ray was  $3.7^\circ$  (range  $0.0^\circ$ – $31.6^\circ$ ) and the mean lateral angle  $4.6^\circ$  (range  $0.0^\circ$ – $22.9^\circ$ ). 52 (46.6%) were in the proximal third of the femur with 68 (46.9%) of the total fractures spiral in nature. 30 (20.7%) patients required further procedures including locking screw or nail removal and 5 (3.4%) patients required revision nailing.

**Discussion:** The malunion rate in our study was higher than expected. We have identified certain sub-groups which should be considered high risk cases for malunion and surgeons should be prepared to treat these types with greater caution.

**Keywords:** Malpositional; Femoral; Intramedullary; Nailing

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### 8B.3

#### The Taylor Spatial frame in the management of complex acute tibial fractures—A single surgeon series

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**Introduction:** The Taylor Spatial frame (TSF) is extremely versatile in limb reconstruction surgery, allowing six degrees of freedom bone fragment manipulation with computer accuracy. There are few reports in the literature describing its use in complex acute tibial fractures.

**Methods:** Case notes and radiographs were retrospectively reviewed by the first author (PMR).

**Results:** Between August 2004 and January 2008 13 acute tibial fractures were treated in our unit with the TSF. 6 patients were direct admissions to our unit, 5 patients were transferred from other units in the North West region and 2 were transferred from units outside the region. Initial stabilisation was achieved by mono-

lateral external fixation. Median age was 42 years (range 21–67). Fractures were classified as 6 Pilon (Ruedi-Allgower III), 5 shaft, 1 isolated plateau fracture (Schatzker VI) and 1 shaft combined with a plateau fracture (Schatzker I) requiring a split skin graft. 6 fractures were open. 1 open fracture developed osteomyelitis requiring debridement, antibiotics and VAC assisted closure. 4 fractures had significant bone loss. 2 bone defects were corrected using a piggy-back TSF construct and Ilizarov bone transport. The remaining 2 bone defects were managed by acute shortening, tibial corticotomy and subsequent limb lengthening. Median time spent in the frame was 22.1 weeks (range 13.7–80.4). Complications included 2 docking site nonunions requiring ORIF and application of OP-1. One patient had delayed union of a Pilon fracture requiring application of OP-1. Two further fractures required OP-1. 10 patients developed a pin site infection, median Otterburn grade was 2 (range 1–4). All cases resulted in union and satisfactory correction. Treatment was ongoing in 1 case.

**Conclusion:** The TSF is a viable option in the management of complex acute tibial fractures.

**Keywords:** Taylor Spatial frame; Trauma; Tibia; Fracture

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### 8B.4

#### The Taylor Spatial frame for the management of lower limb trauma—Our early experiences in a UK District General Hospital setting

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**Aims:** We present our early experiences with the Taylor spatial frame (Smith and Nephew®) for managing lower limb trauma, with respect to fracture union and complications.

**Patients and methods:** 17 patients had Taylor spatial frame application for definitive tibial fracture fixation or management of a tibial fracture non-union or malunion between November 2006 and November 2008.

**Results:** 8 patients (mean age 44.5 years, 20–63 years) sustained high-energy injuries; 2 were open Gustilo 3B fractures. Median time between injury and frame application was 13 days (6–40 days). Fracture union to date has been achieved in 5 patients with frame removal at a median of 24 weeks post-op (20–44 weeks). 4 patients suffered from pin site sepsis, which was recurrent in 2 cases. Pin loosening occurred in the 2 patients with recurrent sepsis requiring additional pin insertion and frame adjustment.

5 patients (median age of 45 years, 40–81 years) were treated for fracture non-unions of the tibia. Median time between injury and frame application was 22 weeks (12–104 weeks). Fracture union was achieved in all 5 cases with a median time for frame removal of 22 weeks (17–36 weeks). Pin site sepsis occurred in 4 of the 5 cases, which was recurrent in 2 cases with associated pin loosening.

4 patients (median age 46 years, 40–65 years) were treated for tibial fracture malunion. Frame application was performed along with a corrective osteotomy. To date, satisfactory correction and osteotomy site union has been achieved in 1 patient, with subsequent frame removal at 20 weeks post-op. Pin site sepsis occurred in 3 cases, 1 of which was recurrent with associated pin loosening.

**Discussion:** The Taylor spatial frame is a versatile tool which has, in our experience, proven useful in managing lower limb trauma, non-unions and malunions. The post-operative care of patients requires mandatory close and regular out-patient follow-up. Pin site sepsis was a problem in all 3 subgroups with recurrent sepsis closely associated with pin loosening.