

point of our study. Successful completion of treatment was defined as the accomplishment of both clinical and radiological union.

Both clinical and radiological union occurred in 52 (86.6%) cases of the rhBMP-7 group compared to 41 (68.3%) cases of the PRP group, with a lower median clinical and radiographic healing time observed in the rhBMP-7 group (3.5 vs 4 months and 8 vs 9 months, respectively). This study supports the view that in the treatment of persistent long bone non-unions, the application of rhBMP-7 as a bone stimulating agent is superior compared to that of PRP in regards to their clinical and radiological efficacy.

**Keywords:** rhBM-7; PRP; Long bones non-union; Risk factors non-union

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## 8B.11

### Can changing the mechanical environment increase the speed of fracture healing? A pilot study in tibial fractures

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We hypothesized that fracture healing could be speeded up by changing the mechanical environment from initial rigidity followed by micro movements (dynamization) to initial macro movement followed by rigidity. We based this hypothesis on two tenets. Firstly, callus requires movement for its formation and its production is limited to the first few weeks after fracture. Secondly, that callus would mature faster in the absence of movement (based on theoretical reasoning and supported by a prior rabbit experiment).

An external fixator was built that would allow axial macro movements (up to 5 mm) and then compression to produce a rigid configuration. Permission from the Helsinki Ethical Committee was obtained for a pilot trial. 15 patients with an isolated closed (12 patients) or open grade 1 (3 patients) tibial fracture were treated.

The average time of removal of the fixator was 11 weeks (range seven to 15.4 weeks) which was faster than other comparable series.

This trial indicates that it is possible to speed up the healing of tibial fractures by changing the mechanical regimes used today of initial rigidity followed by dynamization to one of initial macro movement followed by rigidity

**Keywords:** Healing; Tibia; Fracture; Biological

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## 9A.1

9A: Upper Limb Trauma

### Uncomplicated displaced supracondylar humer fractures in children—Complications in early versus delayed management

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**Introduction:** Displaced supracondylar fractures are traditionally managed as a surgical emergency. We looked into our practice of supracondylar fracture management in children to look at the complications in those treated before or after 6 h from injury.

**Methods:** There were 61 children who underwent surgery for displaced supracondylar fractures over a period of 3 years. Of these 27

from the study. Both the groups were similar in age, gender distribution ( $p > 0.05$ , Fishers exact test).

**Results:** The rate of open reduction is 13% (8) in early group and 8% (5) in the delayed group. There were 2 (3%) iatrogenic nerve injuries in each group. The most significant complication is the loss of reduction in 3 cases in the early group. At an average follow-up of 14 weeks loss of extension was noticed in 4 (6.5%) of early and 1 (1.5%) patient of delayed group.

**Conclusion:** Our study demonstrated a general increase in complications with early surgery which is usually during the night. We support the hypothesis that uncomplicated supracondylar fractures operation at night can be avoided following the NCEPOD regulations of 'Who Operates When' and can be managed as 'urgent' rather than 'emergency'.

**Keywords:** Supracondylar humeral fracture; Delayed surgery; Children

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## 9A.2

### Surgical treatment of complex distal humeral fractures: Internal fixation using pre-contoured anatomical elbow plates

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**Introduction:** Restoration of painless early range of movement after distal humeral fracture requires anatomical reconstruction of the articular surface and restoration of the elbow's geometry with stable internal fixation. The purpose of this study was to determine the outcome of open reduction and internal fixation of these complex fractures using the Mayo Clinic Congruent Distal Humerus Plates (Acumed Ltd., UK).

**Method:** A retrospective review of 15 consecutive patients, who underwent internal fixation between 2003 and 2008. All operations were performed by one surgeon using the same implant and post-operative regime. The patients were assessed clinically and radiographically.

**Results:** Mean age was 42 years (range 20–78 years). There were 11 females and 4 male patients. Average follow up was 9.5 months. Thirteen fractures were AO Type C and two were Type A. Complete union was achieved in all patients at final review. There were no cases of superficial or deep infection. There were no cases of hardware failure or fracture displacement. Three patients had associated fractures (1 calcaneal, 1 distal radius and 1 proximal phalanx of small finger). Complications included one removal of prominent olecranon tension band wire, one ulna nerve neuritis and one hypertrophic scar. One patient required removal of plates for pain but not all screws were completely removed. Mild heterotopic ossification was seen in one patient radiographically. The mean flexion was 109 degrees and extension was 38 degrees and full pronation/supination. The mean DASH score was 46.7.

**Conclusion:** This study presents the first non-inventor single surgeon series demonstrating the use of the Mayo Clinic Congruent Distal Humerus Plates. Anatomically pre-contoured angular stable implants facilitate operative reduction and stabilization of these challenging fractures with high union rates and low implant failure. However, when removing the implant, screw extraction can be difficult.

**Keywords:** Distal humerus; Fracture; Internal fixation; Pre-contoured plate

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