

## Distal Humerus Fracture Fixation In A Patient With Achondroplasia

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### INTRODUCTION:

Achondroplasia is the most common type of skeletal dysplasia. It is an autosomal dominant disorder, caused by a mutation in the fibroblast growth factor receptor-3 (FGFR3) gene, resulting in decreased endochondral ossification. This gives rise to myriad bony deformities, which increase complexity of fracture fixation in the event of trauma.

### CASE HISTORY:

We present the case of a 23 year-old right-hand dominant male with known case of achondroplastic dwarfism, who sustained a closed fracture of the distal right humerus following an alleged motor-vehicle accident. All limbs exhibited rhizomelic limb shortening, with swelling of the right elbow associated with tenderness and reduced range of motion. Radiographs of the right elbow revealed a fracture of the right distal humerus with intercondylar split. Fixation of the fracture was done under peripheral nerve block with patient in lateral decubitus position, using 2 cancellous screws to address the intercondylar split, as well as K-wiring and tension-band wiring to secure the condyles to the shaft of the humerus. The right upper limb was then immobilised with an above elbow backslab with elbow in 90 degrees flexion. There were no surgical or anaesthetic complications, and post-operative radiographs were acceptable.

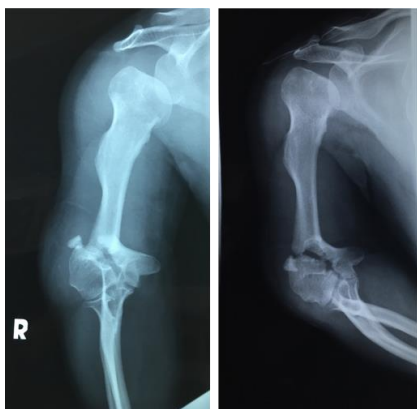


Figure 1: Pre-operative radiographs of right elbow



Figure 2: Post-operative radiographs of right elbow

**DISCUSSION:** Ordinarily, the recommended method of fixation for this simple complete articular fracture pattern of the distal humerus (AO/OTA 13-C1) is open reduction and plating. However, we were unable to find a suitable plate due to the anatomical abnormalities of his humerus. K-wires were used, being easiest adapted to his bony and fracture configuration. However, this construct is less stable. Furthermore, it requires augmentation with an above elbow backslab, giving rise to elbow stiffness as a potential complication later.

Even though this patient did not have the underlying cardiovascular or respiratory complications associated with this disease, nonetheless, his protuberant head, large tongue, short neck, and possible cervical instability characteristic of achondroplasia were likely to complicate airway management; hence, choice of regional anaesthesia.

### CONCLUSION:

Management of fractures in patients with achondroplasia presents a unique set of challenges, both from the orthopaedic as well as anaesthetic point of view, and requires careful pre-operative planning to obtain adequate fixation safely.

### REFERENCES:

1. Murphy, Colin G et al. "Small Is Challenging; Distal Femur Fracture Management in an Elderly Lady with Achondroplastic Dwarfism." *BMJ Case Reports* 2013 (2013): bcr2013008793. *PMC*. Web. 30 Jan. 2017.