Original Article
Orthopaedics

CUBITUS VARUS DEFORMITY IN ADULTS TREATED WITH LATERAL CLOSING WEDGE OSTEOTOMY AND FIXATION WITH PLATE

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Abstract

Cubitus varus deformity is a common complication of malunited supracondylar fractures of humerus. 5 cases were treated in our institute from Jun. 3 2016 to June 2018. They Cubitus were treated with lateral closing wedge osteotomy and fixation with plating. Mean operating time was 98 minutes. Lateral closing wedge osteotomy and fixation with plate is effective and safe technique in treatment of cubitus varus deformity in young adults.

Keywords: *Cubitus Varus, Deformity, Adults, Lateral, Closing Wedge, Osteotomy*

Introduction

Cubitus varus deformity is a common complication of malunited supracondylar fractures of humerus. The normal carrying angle at the elbow, between three to seven degrees of valgus, is lost producing a varus deformity. Medial tilt and medial rotation are the most important contributing factors for varus deformity. It comprises the components of varus, hyperextension and internal rotation in all three planes The coronal alignment deformity makes the distal forearm and hand deviate to the midline of the body ,the hyperextension produces recurvatum deformity in the sagittal plane and internal rotation deformity produces the medial tilt/rotation in the axial plane[1]. Correction of cubitus varus in adult and fixation is challenging due to mature skeleton, inherent instability at osteotomy site, risk of delayed union and nonunion, implant failure, infection, stiffness and neurovascular complications[2].

Materials and methods

Patients with cubitus varus deformity between age group 20-50 was the study group. Five cases were treated and studied in our institute from June 2016 to June 2018. The assessment of cubitus varus deformity was done by using goniometer clinically. Patient should have the deformity being present for at least 1 year following fracture. Moreover It is a Patient demanding surgery due to cosmetic reasons.

Preoperative X-ray was taken for each patient with both elbows in full extension and forearm in full supination. Preoperative carrying angle was measured as angle between the bisecting line of arm and forearm in both normal and affected side. They were treated with lateral closing wedge osteotomy and fixation with plating. The angle to be corrected and the base of lateral closing wedge osteotomy was calculated preoperatively. Wedge of the osteotomy was calculated by adding the varus angle of affected elbow with normal valgus carrying angle of normal elbow[3,4]. The other methods of fixation usually includes k wires, screws with figure of eight wire, various type of plates, various type of external fixation and Illizarov[1]. However for correction of the cubitus varus deformity in adolescent or adult patient, strong fixation of corrective osteotomy is required to allow early mobilization[5].

Surgical technique

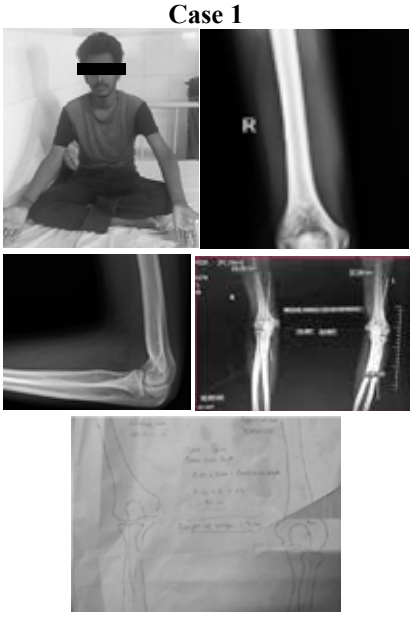
Patients were operated either under general anesthesia or supraclaviclular block, in the lateral position with tourniquet inflated. Mid line posterior incision with triceps on approach was used. Ulnar nerve was exposed, released from the cubital tunnel and protected. Exposure of posterior, medial, and lateral aspect of distal humerus was made. Osteotomy site and lateral wedge marked with scale and lateral wedge was resected from the distal humerus with its base calculated according to the desired degree of correction leaving the medial cortex and periosteum intact. Osteotomy completed breaking the medial cortex and reduction done to correct the varus deformity and restoring the near normal carrying angle The osteotomy was closed. The reconstruction plate was applied on the posterior surface of humerus and fixed screws. Wound was closed with suction drain. Posterior slab was applied for 4 weeks. Patients are instructed to start passive range of motion as pain tolerated from 3rd week then active movement from 4 to 6 weeks. Follow up visits were made 2, 4, 6, 8, and 12 weeks after surgery, then 6 month and 12 month postoperatively. In 12 month follow up visit patients were examined for complete healing of osteotomy.

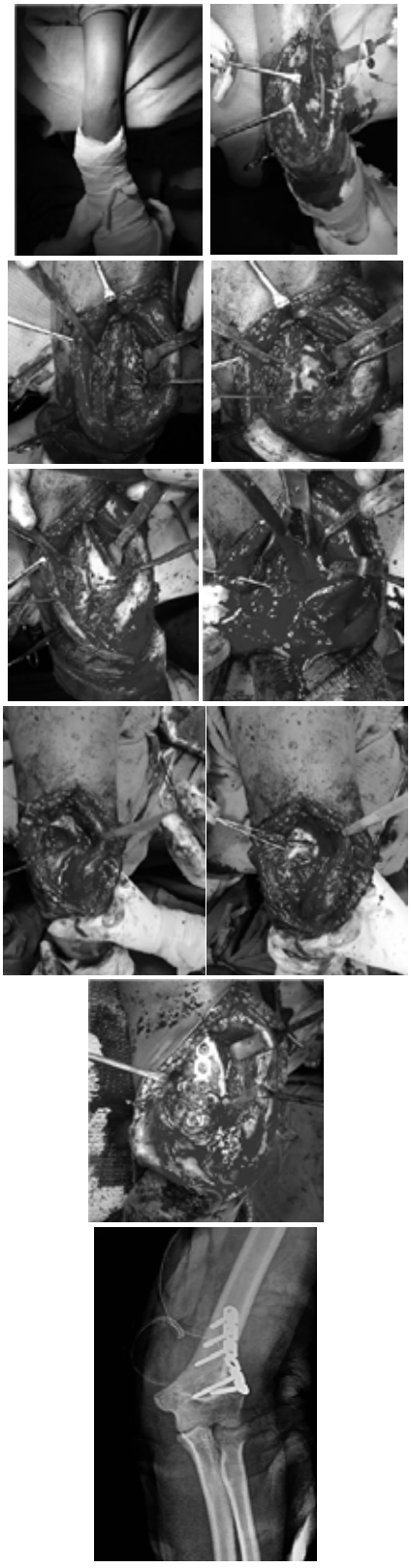
Results

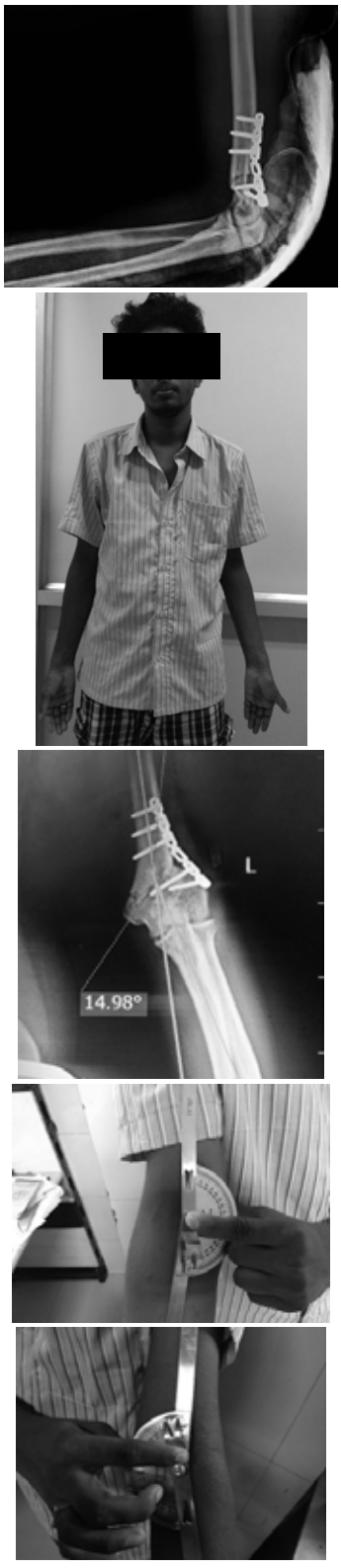
Of the 5 cases, 3 were male and 2 were female patients. Mean patient age was 34 years. No patient had functional problem resulting from the deformity as ulnar nerve palsy or posterolateral instability. Mean operative time was 98 minutes. Time of complete healing of osteotomy site was between 12 week to 14 weeks. The average follow up period was 13 months. Full range of motion returned in 4 cases after 12 week with the correction of the deformity. One case had stiffness and took 18 months to regain the full range of motion. No cases had wound infection, neruo vascular injury, loss of fixation or nonunion in our study. Mean carrying angle of our cases was 10 degree with range 8-14 degree postoperatively.

Case Illustration

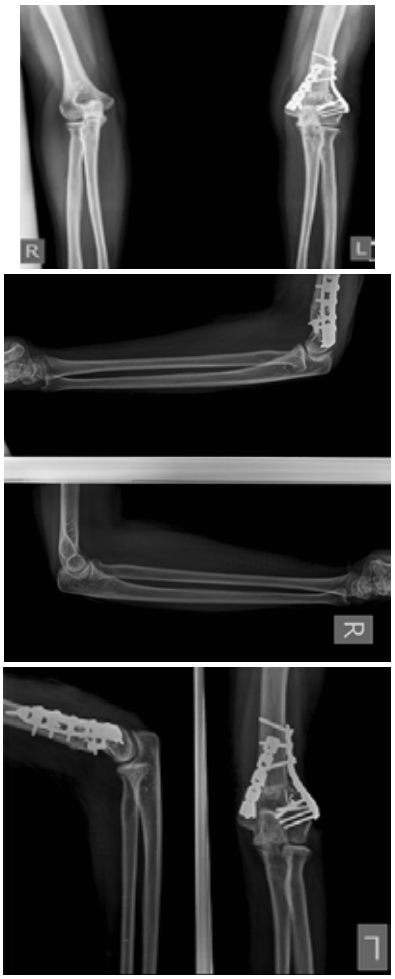
Case 1







Case -2



Discussion

As said earlier cubitus varus is a triplanar deformity. There still exists significant debate over the deformities that need to be corrected. Recurvatum deformity is in the plane of motion of the joint and remodels well. The internal rotation deformity is compensated by shoulder movements and is tolerated well. Both these deformities may not require corrections and most of the times correction is focussed on coronal plane deformity. The significance of medial rotation is still questionable[6], the minor rotation can be compensated by shoulder movement and major and recent deformity may produce an attitude of medial rotation of the limb that makes the varus deformity look worse. Therefore correct any rotation which is to be in excess of 20°. In cases of cubitus varus with significant rotational component, posterior plating for osteotomy fixation is considered ideal method of fixation as rotation of distal fragment result in loss of medial contact which decreases the stability of fixation method and healing potential of osteotomy site[7].

Conclusion

Supracondylar corrective osteotomy for cubitus varus deformity is commonly accepted method. It is important to be well planned. The distal fragment must be medially translated to reduce the lateral condylar prominence and fixation must be strong enough to prevent recurrence of the deformity. Lateral closing wedge osteotomy and fixation with plate is effective and safe technique in treatment of cubitus varus deformity in young adult with adequate correction of the deformity with preservation of the patient preoperative range of motion together with good patient satisfaction and minimal complication rate.

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