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Lateral Condyle Temporary Hemiepiphysiodesis in Treatment of Cubitus Varus Deformity Post Supracondylar Humerus Fracture: A Case Report

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Abstract

A cubitus varus deformity often seen as a complication of a malunited supracondylar humerus fracture in children. several surgical management have been described to correct this deformity in this case report we described a Lateral condyle hemiepiphysiodesis as a surgical treatment in a 10 years old boy with a cubitus varus deformity post supracondylar humerus fracture with the outcome in 1 year follow up.

Keywords: Cubitus varus; Deformity; Hemiepiphysiodesis; Supracondylar humerus fracture

Introduction

Humerus Supracondylar fracture has been recognised since the time of Hippocrates as one of the common fractures in pediatric age group [1,2]. Gun stock or Cubitus varus deformity of the elbow is the most common complication following malunited supracondylar fracture of the humerus in skeletal immature children [3].

Various causes have been suggested, the frequent cause of cubitus varus deformity is malunited supracondylar humeral fragment rather than growth disturbance, Osteonecrosis either with or without growth arrest is considering a rare cause [4]. This deformity not only involving loss of the coronal alignment that make the forearm and hand deviate or adducted toward the midline of the body during elbow extension [5], but also has sagittal and axial planes deformity, summarized in recurvatum deformaty and internal rotation deformity respectively.

Recurvatum deformity is in the plane of joint motion and remodels well. The internal rotation deformity is compensated by the shoulder movements and also tolerated well. Both of sagittal and axial deformities do not require any corrections and mostly the correction is focussed on the coronal plane deformity [1], although this deformity does not cause functional limitation [5], Cosmetic appearance is still the most common reason for presenting the parents with their child in the clinic [1].

Case Report

A 10-year-old boy presented with non-dominant left elbow cubitus varus deformity. According to the mother, the patient had diagnosed with a supracondylar humerus fracture five years ago in a local hospital after history of falling on outstretched hand, there he was treated conservatively on above elbow cast for a period of time.

After removal of the cast, the parents noticed the deformity of the left elbow which was kept on progressing over the next five years.

At presentation, there were no old records, so the exact type of fracture and the follow up was not known on clinical examination patient had a cubitus varus deformity of the left elbow **(Figure 1)** with painless full movement of the elbow comparing with the other side.

Figure 1: Showed cubitus varus of the left elbow.

X-rays was done for the left elbow and showed reducing of normal carrying angle **(Figure 2)**. As the deformity was progressive, his mother was told about the need of surgical intervention, informed consent was obtained for the surgery, and pre-operative planning was done for hemiepiphysiodesis of the lateral condyle as a day case surgery.

Figure 2: Showed carrying angle 3 degree of the left elbow.

Patient was operated under general anesthesia, in supine position and prophylactic antibiotic was given. Tornequet wass applied as a standby, Drape and prep done of the left upper limb, around 1 cm longitudinal incision was done over the lateral condyle, eight plates was applied under guide wire and c-arm, then fixed with 2 screws.

Closure done after irrigation and sterile dressing applied and the limb was put to rest in arm sling **(Figure 3A-3C)**.

Figure 3A: Eight plate applied under guide wire.

Figure 3B: Anteroposterior view.

Figure 3C: Lateral view of the left elbow after application of eight plate.

Patient discharged home afternoon, Exercise started once the patient pain free, clinical check-up and X-ray had performed during the follow up **(Figure 4)**.

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Figure 4: 6 months post-surgery, carrying angle improved to 5 degree.

After 1 year follow up, the patient was having a corrected cubitus varus deformity, with restricted elbow flexion with 100 degree due to missing of some sessions of physical therapy, so patient booked for eight plate removal and manipulation under anesthesia of the left elbow which was done as a day case surgery **(Figure 5A-5C)**.

Figure 5A: Showed clinically improvement of left cubitus varus deformity.

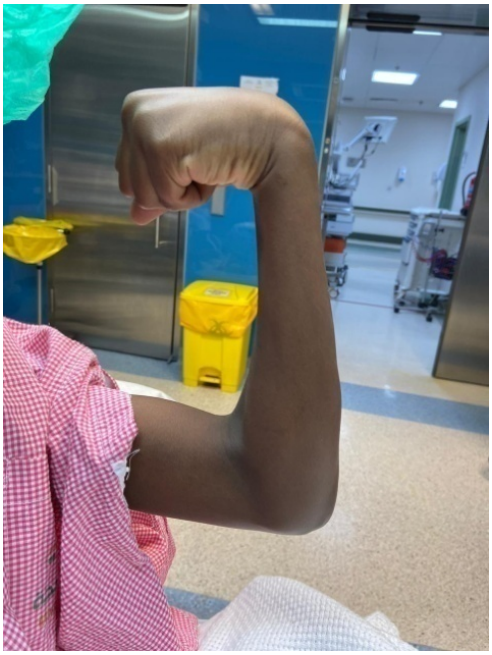

Figure 5B: With restricted elbow flexion.

Figure 5C: Intra operative MUA.

The patient underwent aggressive physical therapy sessions for 4 months, which showed the outcome as left elbow 120 - degree flexion, new X-ray done at that time, with an improvement of carrying angle **(Figure 6A and Figure 6B)**.

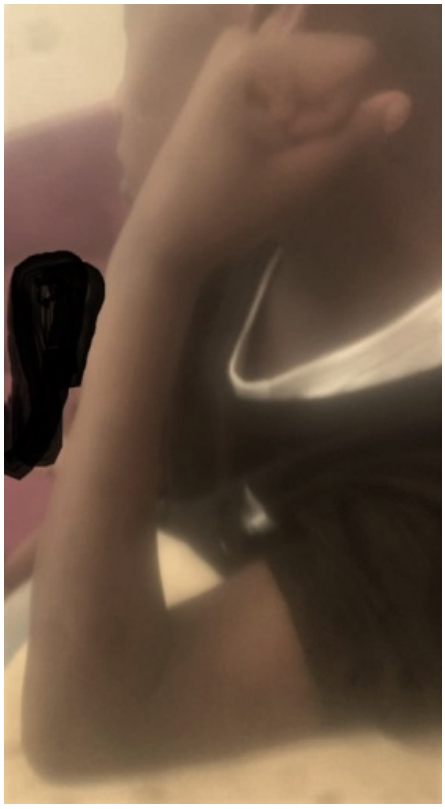

Figure 6A: Improvement of carrying angle of the left elbow.

Figure 6B: Left elbow flexion.

Discussion

Cubitus varus deformity is one of the most common complication that seen in children following trauma [3]. Most of the literature supports that malreduction is the main leading cause of this deformity, while trochlea osteonecrosis and medial physis growth arrest could be a rare causes [4]. Indication of treatment in cubitus varus for the most part for cosmetic reasons as the majority of the patients are asymptomatic with no functional impairment [5], several studies have shown that cubitus varus might lead to complications in the long term follow up, such as the increased risk of lateral condyle fractures, posterolateral elbow instability and pain, and tardy ulnar nerve palsy [1].Timing of surgical deformity correction is controversial, as well there is no gold standard surgical procedure to correct this deformity [6], remaining growth potential, patient desire and status of the physis, all of these should be taken in consideration when planning for the surgery [1].Various surgical procedures including major intervention such corrective osteotomies with internal or external fixation have been described for correction of this deformity, regardless of the technique, Each procedure has its advantages, disadvantages, possibility of a loss of correction and recurrence [7-8], hemiepiphysiodesis or guided growth with instrumentation using eight plate or staples is consider as an alternative method in the gradual correction of coronal angular deformity that mainly described in the correction of lower limb deformity [9] and limited reports in using this technique in upper extremity deformity. However, in this presented case, temporary hemiepiphysiodesis using eight plate had provided gradual correction of the degree of the deformity and carrying angle both clinically and radiologically with minimally invasive surgical procedure and less complication.

Conclusion

Temporary hemiepiphysiodesis of the lateral condyle is a minimally invasive surgical procedure that achieved the correction of cubitus varus deformity both clinically and radiologically in skeletally immature patients, with a lesser amount of complication and simple technique, except the need for 2nd surgery for implant removal and close follow up.

Ethical consideration

Informed consent was signed by the parent.

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