

Non-union supracondylar humerus fracture in children

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Abstract

Supracondylar humerus fracture in children is very common. They are the most common elbow fractures in children [1, 2]. They vary from minimal displacement to gross displacement. They are divided into flexion and extension type, the later being the most common comprising 97% to 99% [3]. Gartland classified the extension type into type I, type II and type III depending on the amount of displacement [4]. Majority of the fractures are managed by closed reduction, sometimes supplemented by K-wires. Very less numbers with gross displacement and neurovascular compromise require open reduction. Almost all the fractures unite rendering non-union very rare. There are only few cases of non-union reported in the literature [5]. Mostly they are following open reduction of the fracture where devascularisation and infection may contribute to non-union.

We are presenting a case of a 10 years boy with supracondylar fracture humerus with non-union after two years of the incident.

Keywords: Supracondylar fracture, humerus, children, non-union, malunion

Introduction

Supracondylar fracture of humerus is a common entity in children. The thin column of bone, which connects the broad expanded condyles with the shaft usually, breaks when there is a deforming force. The common mechanism of fracture is fall on an outstretched hand. They are divided into flexion and extension type according to the displacement of the distal fragment. Extension types are more common and they are classified as type I, type II and type III depending on the amount of displacement [4]. Most of the fractures unite with conservative means; few grossly displaced fractures need surgical intervention, however. Closed reduction and pinning under image guidance is the standard mode of treatment [6, 7]. Malunion is quite common because of some rotational element. Varus deformity or gunstock deformity is the most common type of malunion. Non-union of this type of fracture in children is very rare.

The case report

The boy 10 years of age sustained injury to the left elbow two years back following fall while playing. The fracture was diagnosed as Supracondylar fracture left humerus and open reduction with K-wire fixation done in a local hospital. Following the surgery the wound healed well but there was a history of discharge from the pin tracts. The pins were removed after 6 weeks and mobilization started. Initially it was painful and difficult to move. Gradually the pain decreased and the boy regained some amount of movement of his elbow. No episode of fever or any draining sinus was there after pin removal. The pin tracts and the operative wound healed completely. During this period, he noticed the deformity (varus) of the elbow, which also kept on increasing. After about six months of the incident the elbow was painless with gross deformity and slight movement. He continued with the deformity and limited range of

movement.

He presented to our hospital following another incident of fall over the left elbow while playing. He sustained abrasion over the olecranon area. Fresh X-ray was done which revealed no recent fracture; but bony fusion of the elbow joint (both radial and ulner component) and non-union at the supracondylar area. Sclerosis of both the opposing ends and varus malalignment is also noted.

Treated conservatively his wound healed well and the pain subsided and he got his pre-injury status with same minimal movement and gross deformity.

Discussion

Supracondylar fracture humerus is a commonly occurring fracture around elbow in children. Its incidence is about 58% of all fractures around elbow [8] and prevalent mostly in 4 to 12 years of age group with peak age range are 5 to 6 years [9]. Multiple ossification centres, thin bony plates connecting the condyles with the shaft; increased incidence of fall with outstretched hand, are the major factors of this fracture. The possible malposition of the distal fragment is posterior tilting or displacement, medio-lateral tilting or displacement and internal rotation.

Union in this fracture is not a problem in most of the cases unlike lateral condylar fracture. After correcting the deformity by closed methods and immobilization, the fracture unites within six to eight weeks [6, 7]. In some unstable variety closed reduction supplemented by K-wires is required. Rarely when presentation is little late in grossly displaced fractures, open reduction is done followed by stabilization with pins. Gartland classification is based on displacement and cortical continuity is widely used to determine the treatment options.

Non-union in supracondylar fracture is a rarity. Wilkins and Beaty reported one case of non-union following open

reduction [5]. In this particular patient the occurrence of non-union can be attributed to the following causes.

1. Improper reduction of the fracture site. In one of the post-operative x-rays the fracture is seen fixed in distracted mode. The contact between the fractured ends was not there.
2. History of pin tract discharge suggests an ongoing process of infection. The fused elbow in later x-ray may be sequelae of septic arthritis of elbow. The same infective process may hinder the union of the fracture.
3. Vigorous mobilization without solid union may be another factor contributing to non-union of the fracture.

Treatment options in this case

Basically two options are available

1. An attempt for union of the fracture by open reduction and internal fixation supplemented by bone grafting can be made. This has to be followed by either excision arthroplasty of the elbow keeping the mobility of the joint in mind or the elbow can be fused in functional position. Since in this case the affected side is non-dominant upper limb, fusion may be a better option.
2. To continue the non-union till he attains adulthood and then either fuse the elbow in functional position or undergo elbow arthroplasty with suitable prosthesis [10].

** Our patient opted the second path.

Figure legends



Fig 1: A. Fixation of the fracture in distracted mode (only old x-ray found). B. Non-union of the fracture with fused elbow joint. C. Presentation after 2 years with abrasion. D. Gross deformity of left elbow

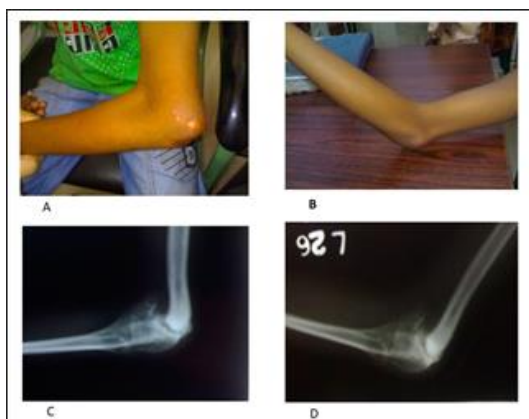


Fig 2: A. Clinically possible flexion. B. Clinically possible extension. C. X-ray in flexion at non-union site. D. X-ray in extension at non-union site.

Conclusion

Supracondylar humerus fracture non-union is very rare. They may present following open reduction. Decrease in vascularity and infection may halt the union process. Management options are still not clearly outlined.

Declaration

Written consent was obtained from the patient for publication of study. Funding was neither sought nor obtained.

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