

“A Clinical Study of Functional Outcome After Management of Supracondylar Fracture Humerus in A Child”

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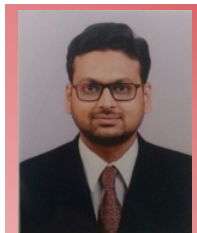
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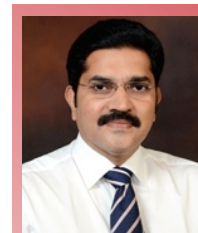
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Abstract

Objectives: Functional outcome following management of supracondylar Humerus fracture in a child was evaluated with different methods of management.

Method: 37 cases of supracondylar fractures treated by various methods [including conservative & operative methods] were studied between April 2011 to May 2013 at our institution and followed for an average of 6 months. Patients were treated with Closed reduction K wire fixation (open reduction if required) or closed reduction and strapping, or conservatively.

Results: Total 37 patients were evaluated. Out of 20 patients with TYPE III fracture treated by K wire fixation 13 (65%) patients had excellent results, 6 (30%) patients had good results & 1 (5%) patient had fair result. The remaining 10 (33.33%) patients with type III fracture was treated with closed manipulation & reduction & above elbow pop slab and strapping of elbow around chest. , out of which 6 (60%) patient had excellent results, 2 (20%) patients had good results, 1 (10%) patient had fair result & 1 (10%) patient had poor results. Out of 5 patients with type II fracture, 4 (80%) patients were treated conservatively with closed reduction and above elbow pop slab & all had excellent results, 1 (20%) patient was treated with open reduction & internal fixation with k wires had good result. Out of 2 patients with TYPE I fracture all were treated conservatively in an above elbow pop slab & all had excellent results according to Flynn's criteria.

Conclusion: The results of Conservative treatment with closed manipulation & reduction with above elbow pop slab (elbow in 110°-120° flexion) application and strapping of elbow around chest in type III fracture supracondylar fractures of humerus in children are almost similar to the operative group but there is high chance of increased rate of complications like loss of reduction, malunion & restriction of movement especially if it's done in older age group children.

Keywords: Supracondylar fracture Humerus, Distal humeral fractures.

THESIS SUMMARY

Introduction

Supracondylar fracture of humerus is the commonest injury around elbow in children. It constitutes about 65.4% of all the fractures about the elbow in children. Although the bony architecture of the distal humerus is responsible for the frequency of supracondylar humeral fractures, it is the soft tissue anatomy that has the potential to produce devastating long-term complications.

The management of displaced Supracondylar fracture of the humerus is one of the most challenging one to prevent complications. No single method of management is suitable for all Supracondylar fractures in children.

There is no controversy regarding treatment of undisplaced

supracondylar fractures. But various modalities of treatment have been proposed for the treatment of displaced supracondylar fractures of the humerus in children.

Aim of Study

- To study the Age, Sex and Side incidence of supracondylar fractures of humerus in children below 14ys of age.
- To know the most common mechanism of injury.
- To study complications associated with it.
- To study outcome of conservative management with POP application & elbow strapping.
- To study outcome of surgical management.

Percutaneous K wire fixation (Closed method)
Open reduction and k wire fixation

Methodology

37 cases of supracondylar fractures treated by various methods [including conservative & operative methods] were studied between April 2011 to May 2013 at our institution and followed for an average of 6 months.

All children upto 14 years of age with supracondylar fractures of humerus Closed fractures were included. Children more than 14yrs of age were excluded. The patients with open fractures and other fractures of the same extremity or polytrauma were also excluded from study.

The ethical clearance for this study has been taken from our institution. All patients selected for this study were admitted in Baby Memorial Hospital, Calicut Kerala and were examined according to protocol.

Preoperative informed consent was taken from the parents of the patient for anaesthesia and procedure.

We studied total of 37 patients out of which 30 were type III fractures, 5 type II fractures and 2 type I fractures.

Out of 30 patients with type III fracture, 20 patients were treated with surgical fixation which included 16 percutaneous pinning and 4 open reduction and k wire fixation.

Closed reduction was done under general anesthesia with use of image intensifier. Firstly, traction is applied with the elbow in 45° flexion and forearm in supination. While the traction is maintained the medial or lateral displacement is corrected by applying a valgus or varus force at the fracture site. The posterior displacement of the distal fragment is then corrected by applying a force to the posterior aspect over olecranon process and distal part of humerus while the elbow is gently hyperflexed and the elbow is secured in hyperflexion by strapping arm with forearm. The elbow is placed in the lateral position directly on the image intensification. The fracture is fixed with 1.2mm to 2.0 mm K-wires depending upon the age of the patients. In the coronal plane the pins are placed with an angle of 30° with the long axis of the humerus. Elbow was immobilized in 90° flexion.

10 patients were treated with closed reduction and strapping of elbow around chest. The closed reduction was obtained in similar manner described above.

Following achieving the reduction an above elbow POP slab is applied with the elbow at 110° flexion. This is then followed by strapping the elbow around the chest with dynaplast. The idea of strapping is to prevent the rotation at the fracture site by preventing movements at shoulder and elbow.

The patients were called for follow up after 3 weeks and the POP slab was removed. Active range of motion exercises was encouraged. A special mention and warning was given after the removal of splint about avoiding massage and passive stretching of elbow joint. Further follow up were done at 12 weeks and 24 weeks. The patients were

examined clinically and radiologically, assessed for range of motion and carrying angle.

Results

The final results of present study of 37 patients, 30 (81.08%) patients had TYPE III fracture, 5 (13.51%) had TYPE II fracture & 2(5.4%) had TYPE I fracture. Out of 30 patients with TYPE III fracture, 20 (66.66%) undergone surgical fixation with k wires with 16 patients treated with percutaneous k wire fixation & 4 patients with open reduction & internal fixation with k wires, 13 (65%) patients had excellent results, 6 (30%) patients had good results & 1(5%) patient had fair result. The remaining 10 (33.33%) patients with type III fracture was treated conservatively with closed manipulation & reduction & above elbow pop slab (with elbow in 110°-120° of flexion) and strapping of elbow around chest, out of which 6 (60%) patient had excellent results, 2 (20%) patients had good results, 1 (10%) patient had fair result & 1(10%) patient had poor results. Out of 5 patients with type II fracture, 4 (80%) patients were treated conservatively with closed reduction and above elbow pop slab & all had excellent results, 1(20%) patient was treated with open reduction & internal fixation with k wires had good result. Out of 2 patients with TYPE I fracture all were treated conservatively in an above elbow pop slab & all had excellent results according to Flynn's criteria.

In our study of 37 patients majority of the patients were treated within 24 hours. We have started flexion and extension elbow exercises at the end of 4 weeks and K-wire were removed at 4 weeks and all patients showed radiological union at 4 weeks of follow up.

Discussion

Surgical fixation with closed reduction & percutaneous pinning gives more stable fixation, better anatomical reduction with minimal complication. So it is safe and effective method of fixation. It gives excellent functional and cosmetic results when done at appropriate time for displaced supracondylar fracture of humerus in children. Moreover the results of closed reduction with POP slab followed by strapping of the elbow around chest in young kids are good when done early after injury. In this method the elbow is flexed at around 110 to 120 degrees which will be a problem if there is gross swelling at the fracture site. Hence one of the requisite for this method of treatment is absence of gross swelling. All the cases operated by this method in this series were operated within 6 hrs of hospital admission before the gross swelling appeared. The cases were observed for signs of compartment syndrome and vascular compromise. In our study no patient had any complications of compartment syndrome or vascular compromise due to this method of treatment. The idea behind strapping of the elbow around the chest is to prevent movements of the humerus preventing the fracture from getting displaced.

Conclusion: The results of surgical fixation with either closed reduction & percutaneous pinning or closed reduction and strapping

of elbow around chest were comparable with one another. Cubitus varus deformity is less with k wire fixation and with closed reduction and strapping of elbow around chest due to better anatomical reduction and prevention of movement at fracture. Elbow stiffness is less with k wire fixation and with closed reduction and strapping of elbow around chest due to early mobilization of elbow.

The results of Conservative treatment with closed manipulation & reduction with above elbow pop slab (elbow in 110^o-120^o flexion) application and strapping of elbow around chest in type III fracture supracondylar fractures of humerus in children are almost similar to the operative group but there is high chance of increased rate of complications like loss of reduction, malunion & restriction of movement especially if it's done in older age group children.

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