



Open Reduction of Supracondylar Fracture – Revisited

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Introduction

Supracondylar fracture of humerus is a common injury of elbow among children. When a satisfactory reduction can't be obtained by closed method, management remains controversial. The choice is then to accept an imperfect reduction, to place the children on traction, or to proceed with open reduction and internal fixation. Open reduction has a reputation for producing permanent elbow stiffness. These fractures are best treated by accurate reduction and immobilization. Historically, these are associated with significant morbidity due to malunion, neurovascular complication and compartment syndrome. Many workers strongly recommended open reduction of these fractures. The aim of the study was to review the cosmetic and functional results following open reduction and internal fixation for severely displaced supracondylar fractures of humerus and to determine whether choice of surgical approach had any bearing on the end result.

Material & Method

60 children were included in this study from which six children were lost to follow up, hence the study was conducted on 54 patients. There were 30 boys and 24 girls. The age ranged between 8 months to 13 yrs: with a mean of 5.5 yrs. All the injuries were as a result of direct trauma. We did not consider the lack of radial pulse at wrist to indicate significant vascular insult so long the distal extremity remains well perfused, in patients neurological deficit was found median was involved in 5 patients whereas radial and ulnar nerve lesion were found in 3 patients each.

As per protocol all these patients underwent a single attempt at closed reduction under general anaesthesia. If satisfactory alignment was not achieved, open reduction was performed under the same anaesthesia.

Single incision was normally used. After the fracture was reduced under the vision, it was fixed with two K-wires which were left protruding through skin and were secured by bending the

distal end. The procedure was carried under image intensifier. The arm was elevated until the patient was fully recovered from anaesthesia and was moving all the fingers well. The plaster of paris slab and the K-wires were usually removed 3 weeks after the surgery.

At follow up details of pain, stiffness, weakness and cosmetic result including the status of scar was recorded.

Range of movements and carrying angle was measured on either side. A detailed neurological examination was performed in the cases whose a previous deficit had been noted. If the difference in carrying angle or movement was more than 15 degree, as compared to contralateral elbow then a radiograph of the affected limb was carried out.

Result

Medial approach was used in 21 patients, lateral in 18 patients, posterior in 13 and a double incision in 2. K-wires were removed in 14 to 29 days, (mean 20 days). One patient developed infection which was treated with antibiotics. Of the 4 patients with varus deformity only one was considered for corrective osteotomy. The result was satisfactory in 50 patients and unsatisfactory in 4. All the neurological deficit recovered. There was no difference in final result between the children with various approaches. The unsatisfactory result in all the 4 patients seemed due to a failure to achieve a satisfactory reduction.

Discussion

A displaced supracondylar fracture in children, which does not reduce easily by closed means, poses a dilemma for the treating surgeon. Many authors suggest that these fractures are best treated by an accurate reduction and immobilization since repeated reduction may be either risky or impossible. Significant advancement has also been made in closed reduction and percutaneous pinning of these fractures.

As early as in 1937 Maclellan advocated open reduction of displaced supracondylar fracture. The

method however fell into disrepute probably due to risk of infection and stiffness of elbow. Open reduction allows the anatomical reduction and decompression of haematoma as it allows elbow to be extended for carrying angle comparison at the end of the procedure. It is essential that additional damage to an already traumatized joint be minimised. Repeated attempts at closed reduction can make matters worse and are to be deplored. Stiffness following open reduction in the earlier series might at least in part be due to repeated closed reduction before embarking on surgery.

Cubitus varus following open reduction is due to an inadequate initial reduction at the time of open reduction. The quality of reduction achieved at the time of surgery is crucial to the outcome. We had 4 cases of varus deformity of which only one required surgical correction.

Various surgical approaches have been used. Posterior approach has been condemned as it does not allow adequate visualisation and may increase the risk of stiffness. In some series triceps splitting approach has generally satisfactory result without much problems of stiffness. Some authors favoured either medial or lateral approach depending upon bone spike. Others feel that the scar on medial side was cosmetically better but surgical approach have no influence on end result.

Conclusion

We conclude that these fractures need to be managed aggressively and open reduction in severely displaced supracondylar fracture of the humerus is a safe option, when a satisfactory reduction can't be obtained by closed methods with single attempt.

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