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A Case of Traumatic Partial Through-The-Elbow Amputation with Supracondylar Fracture of the Humerus

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Abstract: *Supracondylar fracture of the humerus is very common among children;but open variety of this type of fracture with mangled upper limb is rare. When they present with such injury, they are usually associated with neuro-vascular loss. Here we present a case of an open Gartland Type-III supracondylar fracture with near amputation of the upper limb without any neuro-vascular injury. It was managed as per standard AO principle of fracture management. It showed satisfactory result.*
Keywords: *traumatic partial upper-limb amputation, supracondylar fracture,open type.*

• Introduction

Most mangled upper extremity injuries occur following high-energy trauma and are usually associated with neuro-vascular injuries. Despite advances in microsurgical techniques,the treatment of severely injured limbs remains a great challange for the reconstructive surgeons [(1-3)]. Because of the high energy nature of these injuries,the extent of tissue damage is often greater than may appear on initial evaluation and this zone of injury will progress over time, even with most dedicated appropriate management[(3)]. We are presenting a case of a severely mangled open supracondylar fracture of the humerus; despite the near amputation of the limb,the neurovascular structure was not injured though the median nerve were exposed.

• Case Report

A 9 year old boy presented with mangled left upper extremity with an obvious open fracture in the distal humerus following a road-traffic accident 4 hours back. Examination revealed an approximate 8 cm long gaping laceration over the anterior and antero-lateral aspect of the left elbow,exposing the fractured distal part of the humerus from the wound. Median nerve was anatomically intact but exposed through the open wound. There was also swelling and deformity of the distal forearm of the same(left) side with few abrasion.

The radial and ulnar pulses were palpable and the patient had full sensation in the hand. Radiograph revealed left sided supracondylar fracture of the humerus. As per the Gartland classification it was aType III fracture. Salter-Harris Type-II physeal injury to the left diatal radius was also observed on the ipsilateral limb. This patient had no other bony injury or head/chest trauma.

The patient was immediately taken to the operating room. Regional anaesthesia(brachial block) was given on the affected side. The wound was thoroughly cleaned with copious amount of low pulsatile saline lavage. The fracture was reduced under vision through the open window and the reduction was confirmed under image-intensifier. The supracondylar fracture was now fixed with 2 Kirschner's wires from lateral side and one from medial side. Adequacy of reduction and position of the wires were re-checked under image-intensifier. Now again the wound was irrigated with low pulsatile saline lavage and all the devitalised tissues were debrided. The brachialis was grossly contused but its distal attachment together with biceps and triceps were not disrupted. The Lateral Collateral Ligament and the elbow capsule were intact. There was no chondral injury and no defect on the joint surface of the humerus. Exposed median nerve was re-positioned at subcutaneous plain. Radial and ulnar pulse were rechecked and were satisfactory. Distal radius physeal injury was reduced and fixed with two Kirschner's wire under image-guidence. A long arm Plaster of Paris(POP) back slab was applied following wound closure.

• Results

Wound dressings were changed on 2nd post-operative day(POD). The wound was clean and no sign of local infection were observed. Subsequent dressing were done on 5th and 7th POD and pin-tract dressing were done. The arm was immobilised with POP back slab for 3 weeks long. The wound showed blissful recovery without any neuro-vascular deficit and deformity. K-wires were removed at 3rd post-operative week and gentle

passive elbow exercise was advised. Active elbow motion exercises were initiated one week thereafter.

Post-operative skiagram at 3rd week and subsequently thereafter 3rd & 6th month showed complete union of the fracture. Elbow motion **********

- **Discussion**

Supracondylar fracture is very common among children. It comprises near about 15% of paediatric fractures and about two third of paediatric fracture about the elbow. Most of them are closed and occur as a result of fall on out-stretched hand commonly. Only 2% of these fractures are reported to be of open variety usually associated with relatively high energy trauma. Neuro-vascular injury is a known common complication of these fractures itself and mostly associated with higher magnitude of displacement(Gartland Type III). Neurological compromise-usually a neuropraxia- is reported to occur in 3%-22% of patients with supracondylar fractures. Median,Anterior interosseous, Radial,Ulnar- any of these nerve may be damaged and mixed lesion has also been reported. Injury to the brachial artery accounts for 10% of cases of these fractures.

So primary evaluation of these fracture mandates the assessment of neuro-vascular function and the goal is aimed at prompt reduction & fixation of the fracture.

In this case, following a high energy trauma the child presented with a mangled upper limb with partial through the elbow amputation with open supracondylar fracture. Fourtunately he had no neuro-vascular injury though the Median nerve was exposed through the wound. Prompt reduction and fixation of the fracture was done with Krischner's wire as per standard AO principle. Wound irrigation and primary debridement was also done as per standard protocol. Following immobilization for 3 weeks gentle elbow exercises were continued and the patient showed excellent outcome during the follw-up.

- **Conclussion**

We report a case an open supracondylar fracture(Gartland Type III) following a high energy trauma. The unique feature of this case was that the neurovascular structures were not injured despite the near amputation of the limb. Prompt reduction and fixation for 3 weeks followed by early motion exercise provided a good arc of motion and function of the elbow joint.

- **Images**

Fig-2: Traumatic partial through-the-elbow amputation with median nerve exposed.
Fig-1: Skiagram showing supracondylar fracture of left humerus.

Fig-4: Lateral view after CRIF;immediate post-operative.
Fig-3: CRIF done with cross k-wires; AP view;immediate post-operative.

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Fig-5: Post-operative wound after 2 months of surgery shows complete healing.

Fig-6: Post-operative movement at 3 months showing near normal range of movement of the elbow.

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