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### A COMPLETELY DISPLACED RADIAL NECK SALTER AND HARRIS TYPE TWO INJURYTREATED WITH MANIPULATIVE CLOSED REDUCTION AND PERCUTA-NEOUS KIRSCHNER WIRE FIXATION - A CASE REPORT

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#### Abstract :

Fractures of radial neck accounts for slightly more than one percent of all childhoodfractures. Completely displaced radial neck fractures are rare. The loss of alignment of radial headover the neck in completely displaced radial neck fracture leads to incongruency due to cam effect. The chance of closed reduction is almost impossible when the initial angulation is more than ninety degree. We had a thirteen year old boy with left sided completely displaced radial neck fracture-Chambers group one classification with Obrien type three displacement and Salter and Harris type two physeal injury. He underwent closed manual reduction by Pattersons technique andpercutaneous Kirschner wire fixation under anaesthesia with image intensifier, forty eight hours postinjury. At the end of six weeks follow up, he had full flexion, extension of elbow with sixty degrees of supination and fifty degrees of

pronation. The parents of the boy, were counselled about the degree ofloss of rotation of elbow.

Keyword :Pattersons manipulative reduction ,Obrien type three displacement A COM-PLETELY DISPLACED RADIAL NECK SALTER AND HARRIS TYPE TWO INJURY TREATED WITH MANIPULATIVE CLOSED REDUCTION AND PERCUTANEOUS KIRSCHNER WIRE FIXA-TION -A CASE REPORT

#### AIM OF THE STUDY

The aim of reporting this case is to state that a completely displaced radial neck fracture in a child has been treated in our set up, by closed manual reduction with percutaneous Kirschner wire fixation.

#### INTRODUCTION

Fractures of radial neck in children are very rare and account for slightly more than one percent of all childhood fractures. <sup>3</sup>The completely displaced radial neck fracture are even more rare. <sup>1</sup> The incidence of completely displaced radial neck fracture is 1.9 percent

.7 The secondary ossification of radial head starts by third to fifth year and fuses with shaft by sixteen to eighteen years. The cartilaginous articular surface of radial head receives its blood supply through distal metaphysis, which may be injured in completely displaced radial neck fractures.<sup>4</sup> The mechanism of injury is fall on outstretched hand with elbow in extension and valgus. Chambers classified the fractures into three major groups based on mechanism of injury and displacement of radial head.<sup>3</sup> O'Brien classified them into three types based on degree of angular displacement of superior articular surface to the perpendicular shaft. The loss of congruency of proximal radio-ulnar joint may lead to loss of pronation and supination.

The treatment options are non-operative, with immobilization for thirty degrees of initial angulation, closed manipulative reduction for thirty to sixty degrees of initial angulation. Operative techniques such as percutaneous pin reduction, intramedullary pin reduction, open reduction with or without pin are used for severly displaced fractures. Associated injuries like green -stick fractures of olecranon and avulsion fractures of medial epicondylar epiphysis , initial angulation and displacement, angulation and displacement after reduction, age, timing of surgery are important factors in determining the final outcome.

#### MATERIALS AND METHODS

A thirteen year old boy presented to us, twelve hours after injury with history of fall on outstretched hand, left side. Radiography of left forearm with elbow and wrist antero-posterior and lateral view showed completely displaced fracture of radial neck- Chambers classification group one, O'Brien type three displacement with Salter and Harris type two epiphysial injury. He was initially stabilized with plaster of paris above elbow slab with analgesics. There was no distal neuro-vascular deficit. He underwent closed manual reduction by Pattersons technique with proximal

to distal percutaneous 1.8 mm Kirschner wire under anaesthesia with image intensifier control. Pattersons manipulative reduction needs one assistant holding the arm with support of medial aspect of distal humerus. The surgeon gives distal traction with forearm in supination and varus and giving direct pressure over the displaced head completing the reduction.<sup>5'</sup>

Post reduction, there was no translation confirmed by image intensifier with more than sixty degrees of supination and pronation. Above elbow slab with elbow in ninety degree flexion and mild pronation of forearm applied. The patient was discharged after two days.

#### FOLLOW UP

The boy was followed up in the third week. There was no posterior interossieus nerve injury, no fracture site tenderness or wrist joint tenderness. Radiography showed no translation but with twenty five degree of angulation of fracture fragments. The Kirschner wire was removed and he was advised active elbow mobilization and to review at sixth week. At six weeks follow up, he had full flexion and extension, sixty degrees of supination, fifty degree of pronation with no tenderness atfracture site and wrist joint. Radiography reveals twenty five degree of angulation which was acceptable. He was advised about active mobilization and regular follow up.



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# **PRE-OP LATERAL VIEW**



**PRE-OP AP VIEW C-ARM VIEW** 



POST-OP AP VIEW POST-OP LAT-ERAL VIEW RADIO-CAPITELLAR VIEW AT 3 WEEKS







#### THREE WEEKS POST-OP AP VIEW THREE WEEKS POST-OP LATERAL VIEW



## SUPINATION AT THREE WEEKS





## SIX WEEKS POST-OP AP VIEW



# SIX WEEKS POST-OP LATERAL VIEW



## PRONATION AT SIX WEEKS SUPINATION AT SIX WEEKS DISCUSSION

The completely displaced radial neck fractures are rare injuries.<sup>1</sup> According to Dorothea et.al, in their retrospective analysis of elbow fractures in 324 children, in the age group of five to fourteen years, showed completely displaced radial neck fracture only in six children(1.9%).<sup>7</sup> Tibone et.al, in their study from 1951 to 1977, of thirty three radial neck fractures in four to fourteen years age group, with minimum of two years follow up, showed five children having Salter

with completely displaced head given to the parents. (3.03%).8 Steele et.al in their prospec- KEY WORDS: Pattersons manipulative retive study of Angulated radial neck frac- duction ,Obrien type three displacement tures in thirty six children, in four to sixteen years age group, showed three children having complete displacement (8.3%)<sup>2</sup> The chance of achieving closed manual reduction is almost impossible when the initial angulation is more than sixty degrees because of capsule or annular ligament interposition.<sup>3</sup> The treatment for completely displaced radial neck fractures are Wallace periosteal elevator reduction technique, open reduction with or without internal fixation.<sup>2,3</sup> The acceptable residual angulation is forty five degree and no translation with fifty to sixty degrees of supination and pronation.<sup>3</sup> In our case report, we did Pattersons manipulative reduction and had residual angulation of twenty five degree with sixty degree of supination and fifty degree of pronation at six weeks follow up.

Steinberg et.al in his study of severly displaced radial neck fractures showed forty nine percent good results for open reduction, compared to that of five case series of non-operative treatment ,showing twenty nine percent good results.<sup>6</sup> But none of the studies used percutaneous Kirschnerwire fixation. So, the open reduction gives fifty percent results and the results are still worse for non- operative treatment in severly displaced fractures.

### **CONCLUSION:**

The achievement of closed manual reduction with acceptable residual angulation and functional outcome following this rare injury in this boy, still needs long term follow up.

-and Harris type two physeal injury and Pre-treatment counselling about the degree only one child with radial neck fracture of loss of pronation and supination, should be

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