

# Bilateral Post-Traumatic Osteonecrosis of the Trochlea – A Rare Case Report

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**Abstract-** A rare case of bilateral osteonecrosis of the trochlea following supracondylar fracture is presented. The patient presented with bilateral cubitus varus deformity three years after trauma.

**Index Terms-** trochlea, cubitus varus, supracondylar fracture.

## I. INTRODUCTION

Supracondylar fracture of the humerus is a common pediatric injury around the elbow that is historically associated with morbidity due to malunion, neurovascular complications, and compartment syndrome. Malunion which is a common occurrence can result in a cubitus varus deformity which remains static and has cosmetic implications in majority of the cases.

A rare complication of these fractures is the occurrence of osteonecrosis of the trochlea which may present clinically as a progressive varus deformity depending upon the skeletal age of the patient.

## II. CASE REPORT

A 10 year old male child was brought to our hospital by his parents with the chief complaints of bilateral deformity (bowing) of his elbows following trauma to both elbows 7 years back. At the age of 7 years the child had sustained a bilateral supracondylar fracture of the humerus that was managed by closed reduction and posterior splint for 3 weeks. The deformity was noticed by his parents 2 year back and was gradually progressing with no functional limitations, and the bowing of the limbs being the only reason for attending our orthopaedic hospital.

On clinical examination patient had a bilateral cubitus varus deformity more on right side with varus angle of 30° on right side and 20° on left side (Fig. 1A, 1B). Range of motion was from 0° to 135° with hyperextension of 10° on both sides. Supination and pronation was normal with intact distal neurovascularity on both sides. Rest of the physical examination revealed no significant finding.

Radiographs revealed a bilateral cubitus varus with complete resorption of bilateral trochlea (Fig. 2A, 2B).

Patient was offered surgery in form of bilateral lateral closing osteotomy for correction of his deformity which was refused by his parents.

## III. DISCUSSION

Osteonecrosis or avascular necrosis is a condition resulting from cellular death of bone components as a result of a temporary or permanent interruption in blood supply.

Osteonecrosis around the elbow joint is very infrequent. Of these, avascular necrosis (AVN) of humerus is more common in capitellum (so called Panner Disease)<sup>1,2</sup>. Olecranon<sup>3</sup>, radial head<sup>4,5,6</sup> and humeral epicondyles<sup>7</sup> may also undergo AVN.

Osteonecrosis of the trochlea (Hegemann's disease) is very rare with incidence rates varying between 0.27%<sup>8</sup> to less than 0.001%<sup>9</sup> in different studies. It was first reported as a clinical entity by Uhrmacher<sup>2</sup> in 1933, who reported on 2 cases of osteonecrosis, in patients aged 7 and 9 respectively. It has been seen to occur predominantly in pre-adolescent and adolescent boys. Presenting symptoms are mainly swelling and restricted range of motion of the elbow, pain is rare<sup>10</sup>. Clinically it can be differentiated from osteochondritis dissecans by the absence of locking in elbow joint<sup>11</sup>. Definite associations of osteonecrosis of trochlea have been made to trauma<sup>12,13</sup> (acute or remote) and chemotherapeutic agents<sup>14,15</sup>.

Osteonecrosis affects bones with a single terminal blood supply with limited or absent collaterals, such as the femoral head, carpals, talus, and humerus. Interruption of the vascular supply results in necrosis of marrow, medullary bone, and cortex. The peculiar vascular anatomy of the trochlea has been a predisposing factor. Haraldsson<sup>16,17</sup>, in 1957, demonstrated that the medial crista of the trochlea is supplied by two different vessels. The lateral vessels, lying just below the articular surface, supply the trochlear apex and lateral aspect of the medial crista and the medial vessels, entering through the non articulating surface of the trochlea, supply the medial aspect of the trochlea. There is no anastomosis between these two sets of vessels.

It has been proposed that the result of traumatic disruption of these vessels may vary with age, as the appearance and development of ossification centers is subject to adequate blood supply. In younger children, before the appearance of ossification centers, trauma may lead to only a delay in appearance of ossification centre whereas in older children, with well developed ossification centers, trauma may lead to a full blown picture of avascular necrosis<sup>18</sup>.

Osteonecrosis of the trochlea may be only partial, affecting only the apex or the lateral portion of medial crista of trochlea (Type A or fish-tail deformity) or it may involve the whole of trochlea including portion of the metaphysis (Type B or malignant varus deformity)<sup>18</sup>. Patients with the so called fish-tail

deformity are usually asymptomatic and without any angular deformities whereas those with type B osteonecrosis usually develop a progressive varus deformity at the elbow, with significant loss of range of motion and early progress to secondary osteoarthritis.

Tardy ulnar nerve palsy is one of the known complications. It is thought to be due to a multiplicity of factors which include joint malalignment, abnormal position of the ulnar nerve and triceps tendon, loss of protection by a deep ulnar groove, and the acute angle of entrance of the two heads of the flexor carpi ulnaris<sup>19,20,21</sup>.

#### IV. CONCLUSION

Trochlear Osteonecrosis following trauma is a very rare entity with only few case reports. Our case is an interesting case with bilateral trochlear AVN following supracondylar fracture. It's probable that some underlying predisposing factor was responsible for trochlear necrosis in our case with bilateral involvement. Further studies on identifying these etiological factors is suggested.

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**Figure 1 Clinical Photograph of the patient showing Bilateral Cubitus varus deformity.**



**Figure 2 Radiographs of the same patient A/P and Lateral views showing complete dissolution of trochlea on both sides.**

