

**BILATERAL GUNSTOCK DEFORMITY: RARE ENTITY IN PRESENT CLINICAL PRACTICE**<sup>1</sup>Narinder Singh and <sup>2\*</sup>Aditi Ranaut<sup>1</sup>MS Orthopaedics, Zonal Hospital Dharamshala, Himachal Pradesh.<sup>2</sup>MD Anesthesia, Zonal Hospital Dharamshala, Himachal Pradesh.**\*Corresponding Author: Dr. Aditi Ranaut**

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**ABSTRACT**

Cubitus varus deformity is the most common late complication after supracondylar fracture of distal humerus in children, incidence varying from 4% to 58%.<sup>[1]</sup> Distal humerus malunions most commonly develop following distal humerus fractures in children and adolescents. These malunions are thought to result from inadequate reduction and fixation of the fracture initially, or as a result of a loss of fracture reduction, or failure of the implants, in the setting of a delayed union. Distal humerus malunions may result in an unfavorable cosmetic deformity (gun stock deformity) and decreased elbow and upper extremity motion and function. We report herein a rare case of bilateral gunstock deformity in 35 years old male patient presented for treatment of functional limitation and cosmetic correction.

**KEYWORDS:** Gunstock deformity, malunion, supracondylar fracture.**INTRODUCTION**

Elbow injuries are common in skeletally immature children, between 5-10 years of age.<sup>[2]</sup> Metaphyseal area of the distal humerus is the weakest region around the elbow, so supracondylar fractures are the most common elbow injuries. Cubitus varus (gunstock deformity) is a malalignment of the distal humerus that results in a change of carrying angle from the physiologic valgus alignment (5-15 degrees) of the arm and forearm to varus malalignment. Historically, it is a complication of supracondylar fractures with a frequency as high as 30%.<sup>[3]</sup> However, the incidence has decreased substantially with the operative treatment of these injuries. The patient discussed in present case report has bilateral gunstock deformity which is a rare entity in present scenario. Its appearance is the major concern, as it causes little functional impairment.

**CASE PRESENTATION**

A 35 years old male presented to open patient door (OPD) with deformity and inability to fully flex his both elbows since his adolescence (Figure 1,2). This occurred following injury to his both elbows due to fall on outstretched hands later diagnosed as bilateral supracondylar fractures with fracture of lateral condyle on right side at the age of 8 years as per documents presently available with him. He belonged to a remote area and was treated by application of above elbow slab at that time. However, the patient did not continue clinicoradiological follow up at hospital in subsequent period of time. His parents noticed the deformity after 2-

3 years of injury, which has progressed with time. Patient presented to OPD for cosmetic correction and treatment of functional limitation. He had no pain, tenderness or swelling on presentation to us. There was cubitus varus deformity of both elbows associated with internal rotation of the forearms (Figure 1). Medial supracondylar ridges were thickened (Figure 3,4). The relationships of three bony points of tip of the olecranon, medial & lateral epicondyle were altered on both sides. Elbow range of motion (ROM) was 0-100° on right side and 0-110° on left side as well. There was no limb length discrepancy & distal neurovascular status was intact. ROM of both shoulders and forearms were within normal limits. X-rays of elbows of both sides were done. Supracondylar fracture of humerus on left side has malunited and on right side there is malunion of supracondylar fracture along with non-union of lateral condyle (Figure 3,4). The medial condyles were ill developed bilaterally. Baumann's angle decreased on both sides (Figure 3,4). After thorough counselling of patient he was referred to tertiary care centre for operative management.



**Figure 1: Bilateral gunstock deformity in supination.**



**Figure 2: Bilateral Gunstock deformity in mid-prone position.**



**Figure 3: Cubitus varus deformity with decreased Bowmann's angle (Anteroposterior view).**



**Figure 4: Cubitus varus deformity with non-union of lateral condyle of distal humerus right side (Anteroposterior view).**

### DISCUSSION

The distal humerus, proximal radius and ulna forms the elbow joint. It is one of the most complex joints in the body, allowing flexion, extension, pronation, and supination. The ligamentous and bony anatomy provides static stability to the elbow joint. In full supination and extension, the elbow joint deviates between 5 and 15 degrees in the coronal plane known as the carrying angle or physiologic valgus of the elbow.<sup>[3-4]</sup> Gunstock deformity is a malalignment of the distal humerus that results in a change of carrying angle from the physiologic valgus alignment (5-15 degrees) of the arm and forearm to varus malalignment.

Supracondylar fractures are the most common elbow injuries in skeletally immature children between 5-10 years of age and cubitus varus or gunstock deformity is the most common late complication. In cubitus varus, the carrying angle decreases, and the hands are closer to the midline than expected.<sup>[4-5]</sup> The differential includes varus deformity occurring as a result of previous fractures involving lateral condyle, trochlear osteonecrosis, distal humerus physis injury. The resulting structure and function of the elbow joint with cubitus varus deformity may be compromised. Various type of corrective osteotomies are used of which lateral closed wedge French osteotomy is commonly used which has its own complications like lateral condylar prominence, unsightly scar and limitation of movement. Closed dome osteotomy is a technique which overcomes these complications.<sup>[5-6]</sup> It is found that in younger age group rotation of dome and correction of deformity was easier which was difficult in older age group due to tight soft tissue structures.

Bilateral gun stock deformity is a rare condition found in clinical practice nowadays due to easy availability of diagnostic facilities and early surgical interventions.

Although in patients from rural areas the cases can be seen owing to their inability to pay for surgery and forced to go for non-operative treatment which has high incidence of cubitus varus deformity. It has been reported that incidence of cubitus varus is high in fractures which are treated conservatively.<sup>[7]</sup>

## CONCLUSION

Supracondylar fractures are easy to manage and if proper counseling of patient and guardians are done about treatment and future outcomes then these deformities can be prevented.

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