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Osteotomy of the neck of the humerus for traumatic varus deformity

Seven patients had osteotomy for traumatic varus deformity of the humeral neck following fracture. Indications for the operations were limited active abduction and forward flexion of the arm. The result was good in five cases.

Correspondence: Martti Vastamäki, Elotie 1A2, SF-20780 Kaarina, Finland

Kauko A. Solonen
Martti Vastamäki

Orthopaedic Hospital of the Invalid Foundation, Helsinki, Finland

Fractures of the neck of the humerus are often treated with a sling only. Anatomical reduction is not considered necessary for a good functional result; considerable deformity of the neck of the humerus may be compatible with satisfactory function. However, when the distal fragment is markedly displaced, limitation of mobility may be disabling (Campbell 1980, Paavolainen et al. 1983). In the literature, little attention has been paid to this condition. We have reviewed seven patients after osteotomy for traumatic humerus varus.

Patients and methods

Since 1968, the senior author (KAS) has treated seven patients with traumatic humerus varus with wedge osteotomy. The patients were adults, four males and three females, with average age 41 years. All had been subject to high energy trauma, resulting in a two-part fracture of the neck of the humerus with subsequent varus deformity. All had severe limitation of active shoulder motion which either prevented or encumbered their normal work. Passive shoulder motions also were somewhat limited. Active and prolonged physical therapy had been ineffective.

The preoperative angulation ranged from 40 to 60 degrees. The operation was performed through a deltopectorial incision. Fixation was accomplished with a T-formed AO plate, and the extremity was immobilized for 6–8 weeks on an abduction splint. The mean interval between the injury and the osteotomy was 11 (3–18) months. The average follow-up time was 5 years.

Results

Five patients achieved normal or almost normal shoulder motion. In two patients the result was not good. Prior to the corrective osteotomy the mean range of active forward flexion was 91° and abduction 64°. At follow-up the mean range of active flexion was 147° and abduction 134° (Table 1). The two failures (cases 3 and 7) were probably associated with several preoper-

Table 1. Seven cases of osteotomy of the humerus for traumatic varus deformity

Case no.	Sex	Age at injury	Degrees of active motion			
			Preoperatively		At follow-up	
			Flexion	Abduction	Flexion	Abduction
1	M	41	130	90	180	180
2	F	18	60	30	180	170
3	M	46	80	40	90	80
4	F	57	100	80	150	110
5	F	55	125	90	145	130
6	M	25	90	80	180	180
7	M	46	50	40	105	90

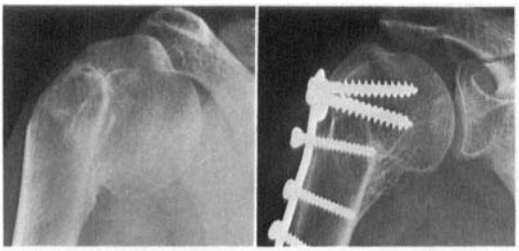

Figure 1. Case 6. Right shoulder of a 25-year-old man 6 months after the accident and after healed valgus osteotomy.

ative factors: fracture through the anatomical neck, contracture of the shoulder joint, persistent severe muscle atrophy, and postoperative poor motivation for rehabilitation.

Case reports

Case 1. A 40-year-old sea-pilot fell from his motor scooter, incurring a fracture of the neck of the right humerus, which subsequently healed with a varus deformity. He was unable to abduct his arm actively above the horizontal level and was forced to give up his work because of inability to reach or climb a rope ladder. A year and a half after the injury, a corrective abduction osteotomy of the humerus was performed. Motion at the shoulder joint improved and the patient returned to work. After 11 years, his shoulder motion was normal and he had no complaints.

Case 6. A 25-year-old sawmill worker was hit by a car and received numerous fractures, including a fracture of the surgical neck of the right humerus which subsequently healed with a varus deformity. Half a year later, active abduction was limited to 80° and forward flexion to 90°. A 45° valgus osteotomy and 20° derotation were performed (Figure 1). After 3 years his shoulder motion was normal, and he had no complaints.

Discussion

Varus deformity of the humeral neck is often a disabling condition. Marked varus deformity causes limitation of abduction and usually also of forward flexion of the arm. The joint surface of the caput humeri is turned, and accordingly the tuberculum majus limits raising of the arm forwards or sideways. Lloyd-Roberts (1953) excised the acromion as far as the acromioclavicular joint; Anglesio 1930, Lucas & Gill (1947), Bosworth (1949) and Minami et al. (1975) successfully performed a wedge osteotomy in cases of congenital or idiopathic humerus varus. If the glenohumeral joint itself has not been badly damaged and there is no marked contracture of the soft tissue, valgus osteotomy seems to be logical, even though we are not aware of any previous reports on this method for traumatic cases. However, the osteotomy does not always result in marked improvement.

The indication for corrective osteotomy is severe varus deformity causing considerable limitation of active shoulder abduction in a patient whose vocation or hobbies demand positions of the arm above the head. Passive motion may be somewhat limited preoperatively, but a frozen shoulder is a contraindication for corrective osteotomy.

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