

# Ulnar nerve palsy after supracondylar humerus fracture

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Six patients with cubitus varus deformity after a supracondylar fracture of the humerus had ulnar nerve palsy 7 (3-14) years following the fracture. All the patients showed anterior dislocation of the ulnar nerve during elbow flexion. In cubitus varus deformity, medial shifting of the triceps muscle occurs, which pushes the ulnar nerve anteriorly and frequently causes ulnar-nerve dislocation. Five of the 6 patients underwent surgery with subsequent improvement.

We present 6 cases of ulnar palsy associated with varus deformity of the elbow after a supracondylar fracture of the humerus in childhood.

## Patients and methods

All the patients (Table 1) suffered from numbness in the distribution of the ulnar nerve; 1 patient had severe intrinsic atrophy and weakness of pinch and power of the hand, and 2 patients had a slight muscle atrophy. Tinel's sign at the cubital tunnel was positive in 5 patients. In all the patients, the ulnar nerve slipped across the medial epicondyle when they flexed the elbow beyond 90°, and several patients felt numbness at this time.

Electromyography and nerve-conduction studies were performed in 5 patients. Two showed a marked delay in the conduction across the elbow, 2 had a normal electromyogram and slight delay in conduction, and the remaining patient was normal. The ulnar nerve was explored in 5 patients. In all of them during passive elbow flexion beyond 90°, the ulnar nerve slipped across the medial epicondyle pushed by the medial head of triceps brachii muscle. In 2 patients the epineurium was thickened, the individual fascicles showed swelling, and the adhesion be-

tween the fascicles were so severe that we performed an internal neurolysis. All the patients were reexamined clinically 1.5 (0.5-3) years postoperatively, and 5 of them also underwent nerve conduction studies.

## Results

Postoperative relief of numbness was immediate in 3 patients. In these patients the duration of symptoms was short, electromyograms were normal, and nerve-conduction delays were slight or absent. The postoperative nerve-conduction velocity soon reverted to normal. In the 3 other patients who had severe and lengthy symptoms, the recovery was slow and incomplete. They still had postoperative numbness to some extent. Nerve conduction studies for these patients still showed a marked delay across the elbow. The return of nerve function thus appeared to be related to the duration of symptoms and the extent of preoperative palsy. There was no correlation between the varus angle and the results obtained.

## Discussion

Dreyfuss and Kessler (1978) and Hayashi et al. (1984) reported cubital tunnel syndrome caused by the snapping of the medial head of the triceps brachii muscle with cubitus varus deformity. Ogino et al. (1986) reported 6 cases of cubital tunnel syndrome associated with cubitus varus deformity; they

Table 1. Observations in 6 patients with cubital tunnel syndrome associated with cubitus varus deformity

Case	Age	Sex	Side	A	B	C	D	E	F	G	H	I
1	24	M	L	6	20	17	+ -	+ +	-	56 55	1, 2	18
2	18	F	L	8	17	21	++ -	- -	-	48 53	1, 2	10
3	17	M	L	9	13	17	++ +	+ -	+	36 37	1, 2	12
4	27	M	L	3	7	12	+++ +	+++ ++	+	36 40	3	34
5	16	M	R	7	15	15	+ -	- -	-	48 53	1	12
6	20	F	L	6	9	18	++ +	- -	-	36	4	8

A age fracture occurred

B age symptoms' onset

C varus angle (degrees)

D numbness (preop. and postop.)

+++ severe, ++ moderate, + mild, - none

E muscle atrophy (preop./postop.), see D

F preoperative electromyographic abnormality

G nerve-conduction velocity (m/sec; preop. and postop.)

H treatment

1 osteotomy

2 subcutaneous anterior transposition

3 submuscular anterior transposition

4 medial epicondylectomy with neurolysis

I follow-up (months)

considered the most probable cause to be compression of the ulnar nerve between the medial head of the triceps and the humeral epicondyle.

We suspect that when a cubitus varus deformity occurs after a supracondylar fracture of the humerus during childhood the medial head of the triceps shifts medially, and this pushes the ulnar nerve anteriorly during elbow flexion and causes anterior ulnar nerve dislocation. Childress (1956) examined 2,000 supposedly normal ulnar nerves and found recurrent ulnar nerve dislocation at the elbow in 16 percent. Consequently, all the patients who have an ulnar-nerve dislocation do not develop cubital tunnel syndrome. Before the onset of symptoms, many of our patients were required to perform repetitive flexion of the elbow. Possibly cubital tunnel syndrome develops when repetitive elbow motion is required of a person who has recurrent ulnar nerve dislocation, although this hypothesis is not proved by our study.

In patients who suffered advanced symptoms and showed a marked delay in nerve conduction, postoperative recovery was slow and incomplete, so early treatment of cubital tunnel syndrome is recommended.

## References

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