CUBITAL TUNNEL SYNDROME

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SYNOPSIS

Twenty-one patients in the age range twenty to seventy-five underwent anterior transposition of the ulnar nerve for cubital tunnel syndrome. Pre-operative symptoms were parasthesia in the hand, weakness of grip and pronounced slowing of ulnar nerve conduction. Post-operative response in all patients included almost immediate relief of pain and an increase in the velocity of nerve conduction.

INTRODUCTION

Tardy paralysis of the ulnar nerve was first described by Pavas more than 100 years ago in a 30-year-old man who sustained a fracture when he was a child, and who subsequently developed a cubitus varus deformity. Tardy paralysis has been attributed to various causes. These include impingement by osteophytes, occupational trauma, congenital anomalies, prolonged intra-operative flexion of the elbow, subluxation or dislocation of the ulnar nerve, old lateral condylar fracture of the humerus and compression of the nerve beneath the arcade of the flexor carpi ulnaris.

Diagnosis of the condition is generally unambiguous and is based on the patient's history and the clinical examination. Electromyelographic (EMG) studies may be used to further confirm the diagnosis. These studies will demonstrate a marked slowing of the motor conduction velocity across the elbow in the presence of this condition.

MATERIALS AND METHOD

Twenty-one patients seen in the Department of Orthopaedic Surgery, Singapore General Hospital for tardy paralysis of the ulnar nerve from 1978 to 1984 were selected for this study. There were 18 males and 3 females, with ages ranging from 20 to 75. The causes of the tardy paralysis in these patients are given in Table 1. The patients were followed up for 6 months to 7 years. The duration of symptoms ranged from 1 month to 6 years. All except 2 patients reported sensory loss in the ulnar distribution of the hand. Other symptoms included weakness and clumsiness of the hand accompanied by parasthesia. Symptomatology are tabulated in Table 2. Early motor weakness was noted in the adduction and abduction of the little finger. As the duration of symptoms increased, gross weakness of the intrinsic muscles became more apparent.

TABLE 1
CAUSES OF TARDY PARALYSIS OF ULNAR NERVE

Unknown	8
Dislocated elbow	3
Old lateral condylar frature	3
Old medial condylar fracture	1
Old medial epicondylar fracture	1
Old supracondylar fracture	1
Contusion of elbow	1
Laceration ulnar nerve	1
Snapping ulnar nerve	2

TABLE 2
SYMPTOMATOLOGY OF TARDY PARALYSIS OF ULNAR NERVE

Sensory Deficit	19 cases
Motor Weakness	15 cases
Wasting of Muscles	8 cases

SURGICAL TECHNIQUE

An incision, 15-20 cm long, is made centred over the medial epicondyle. The upper limit of the incision begins where the ulnar nerve pierces the intermuscular septum. The ulnar nerve is dissected free with a "mesentery" containing its accompanying vessels. The origins of the flexor carpi ulnaris are identified and the arcade is incised at the cubital tunnel. Occasionally neurolysis or endoneurolysis may be indicated. The ulnar nerve is then transposed anteriorly and buried in the flexor-pronator group of muscles. There should be no tension as the elbow moves through its full range of motion. A subcuticular closure is made, followed by application of a soft compressive dressing.

RESULTS AND DISCUSSION

The post-operative recovery of the patients were graded excellent, good, fair and poor according to the following criteria:

Excellent: A full recovery of sensory and motor function. EMG study showed near complete recovery of conduction velocity.

Good: Recovery of either motor or sensory function was noted. EMG study indicated an improved conduction velocity.

Fair: Only subjective improvement of either sensory or motor function was recorded. There was no improvement in the conduction velocity.

Poor: No improvement was noted.

According to these criteria, 6 patients made excellent recovery, 12 patients had good recovery and 2 patients made fair recovery. 1 patient made poor post operative recovery. The results are shown in Table 3. Only case of poor result happened in the patient who had his ulnar nerve severed during the injury. All the patients were followed up in the outpatient clinic. Relief of numbness and sensory loss was almost predictable and similar to the response to carpal tunnel decompression. Contrary to earlier reports by Craven and Green, (4) the present results showed that the return of motor function was not related to the duration of symptoms and the extent of pre-operative dystrophy. This is shown in Table 4.

TABLE 3
POST OPERATIVE RESULTS OF TRANSPOSITION OF ULNAR NERVE

	Cases	Percentage
Excellent	6	28.6%
Good	12	57.1%
Fair	2	9.5%
Poor	1	4.8%
Total	21	100%

TABLE 4
RELATIONSHIP BETWEEN DURATION OF SYMPTOMS AND RECOVERY OF MOTOR FUNCTION AFTER 6 MONTHS OF FOLLOW UP

No. of Cases	Duration of Symptoms	Motor Recovery	
5	1 months to 4 months	4 cases improved	80%
4	5 months to 8 months	All improved	100%
4	1 years to 3 years	3 improved	75%
2	3 years to 6 years	All improved	100%

CONCLUSION

The precise etiology of ulnar nerve entrapment at the cubital tunnel in the absence of post-fracture cubitus valgus deformity or direct trauma may be difficult to determine. However, if the signs and symptoms of entrapment are unequivocal, it is likely that the nerve has been repeatedly exposed to compression and irritation. EMG studies are extremely helpful in the confirmation of the diagnosis. Anterior transposition of the ulnar nerve is a relatively simple operation and consistently gives good to excellent results.

REFERENCES

1. Gay JR, Love JG: Diagnosis and treatment of tardy paralysis of the ulnar nerve. J Bone Joint Surg 1974; 29: 1087-97.
2. Childress HM: Recurrent ulnar nerve dislocation at the elbow. J Bone Joint Surg 1956; 38A: 978-84.
3. Eisen A, Danon J: The mild cubital tunnel syndrome. Neurology 1974; 24: 608-13.
4. Craven PR, Green DP: Cubital tunnel syndrome — Treatment by medial epicondylectomy. J Bone Joint Surgery 1980; 62A: 986-9.