

Protective wrapping of the ulnar nerve in severe cubital tunnel syndrome: treatment and long-term results

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SUMMARY: Protective wrapping of the ulnar nerve in severe cubital tunnel syndrome: treatment and long-term results.

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The authors report their surgical experience with 10 cases of anterior subcutaneous ulnar nerve transposition and coverage of the nerve with substitutive dural flap, performed between January and November 2008 at the Department of Neurosurgery ("Santa Maria alle Scotte" Hospital, Siena, Italy) in the treatment of severe cubital tunnel syndrome.

Clinical long-term results are analyzed and the relevant literature is reviewed.

RIASSUNTO: Protezione del nervo ulnare nella sindrome del tunnel cubitale grave. Trattamento e risultati a lungo termine.

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Gli Autori riportano la loro esperienza su 10 casi di trasposizione sottocutanea e decompressione del nervo ulnare, seguite dalla sua copertura con sostitutivo durale, per il trattamento della sindrome del tunnel cubitale, eseguiti tra gennaio e novembre 2008 presso l'Unità Operativa Complessa di Neurochirurgia del Policlinico "Santa Maria alle Scotte" di Siena.

Sono analizzati i risultati clinici a lungo termine e la letteratura attinente.

KEY WORDS: Ulnar nerve - Elbow - Surgery.
Nervo ulnare - Gomito - Chirurgia.

Introduction

Controversy exists nowadays about the consistency of methods for treating cubital tunnel syndrome and various procedures have been recommended. These methods include simple decompression, anterior superficial (subcutaneous or subfascial) transposition, anterior deep (intramuscular or submuscular) transposition and medial epicondylectomy. For the different surgical approaches, a number of serious complications and neurological deficits have been described (1). The most common causes of recurrent symptoms after initial surgery include dense perineural fibrosis of the nerve after subcutaneous transposition, adhesions of the nerve to the medial epicondyle and retention of the medial intermuscular septum (2).

Patients and methods

From January to November 2008, 10 patients (7 males and 3 females; mean age 59.6 years, range 46-72 years; duration of symptoms from 4 months to 3 years) were admitted at the Department of Neurosurgery, "Santa Maria alle Scotte" Hospital of Siena, Italy, for cubital tunnel syndrome. In all cases preoperative diagnosis was made by clinical examination, high-resolution ultrasonography of the elbow and electromyography. The preoperative disability scale was established according to the system of Dellon (Tab. 1).

Patients were surgically treated with the anterior subcutaneous ulnar nerve transposition (Figs. 1 and 2) and wrapping with substitutive dural flap (Dura-Guard[®], Synovis Surgical Innovations) under the axillary regional anesthesia. Follow-up time ranged from 6 months to 18 months with an average of 15.3 months.

Results

The mean operative time was 38 minutes (range 26-41 minutes) and all patients were discharged the day after the operation with drug therapy and a plaster cast, open in the superior half, positioned for 7 days.

Clinical outcome was determined according to a mo-

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TABLE 1 - DELLON'S CLASSIFICATION OF CUBITAL TUNNEL SYNDROME.

Disability	Mild (I)	Moderate (II)	Severe (III)
Sensory	Intermittent	Intermittent	Permanent
Motor	Subjective weakness	Measurable weakness	Palsy
Patients, n	-	3	7

dified Bishop scoring system (Tab. 2). Based on this scale, 7 patients (70%) were graded as excellent result (5 scored 11 and 2 scored 10) and 3 patients (30%) were graded as good (1 scored 7, 1 scored 6 and 1 scored 5). No elbow flexion contracture or scar pathology was recognized two months after surgery.

At the latest follow-up visit, no recurrence of cubital tunnel syndrome was present.

TABLE 2 - MODIFIED BISHOP SCORING SYSTEM.

Parameter	Points
<i>Satisfaction</i>	
Satisfied	2
Satisfied with reservation	1
Dissatisfied	0
<i>Improvement</i>	
Better	2
Unchanged	1
Worse	0
<i>Severity of residual symptoms</i>	
Asymptomatic	3
Mild, occasional	2
Moderate	1
Severe	0
<i>Work Status</i>	
Working or able to work at previous job	1
Not working because ulnar neuropathy	0
<i>Leisure activity</i>	
Unlimited	1
Limited	0
<i>Strength</i>	
Intrinsic muscle strength normal (M5)	2
Intrinsic muscle strength reduced to M4	1
Intrinsic muscle strength less than or equal to M3	0
<i>Sensibility (static two point discrimination)</i>	
Normal (≤ 6 mm)	1
Abnormal (≥ 6 mm)	0
<i>Total</i>	

Score: excellent 12-8; good 7-5; fair 4-3; poor 2-0.



Fig. 1 - Intraoperative image of anterior subcutaneous ulnar nerve transposition.

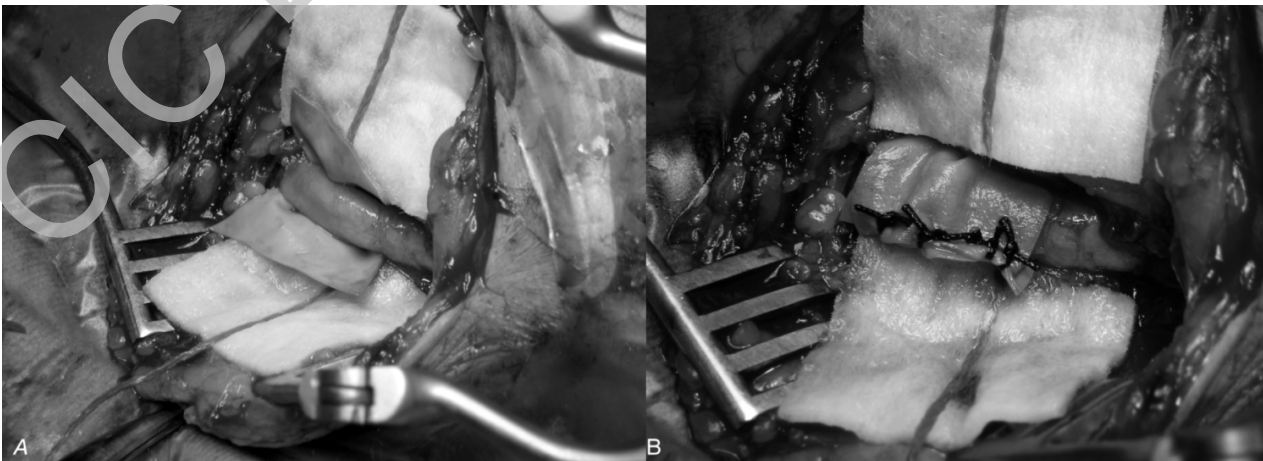


Fig. 2 - Intraoperative images of the ulnar nerve's preparation (A) and wrapping (B) with substitutive dural flap.

Discussion

Cubital nerve syndrome is the second most common peripheral compression neuropathy in the upper extremity after carpal tunnel syndrome. Causes include external trauma, pressure, muscular irregularities, bony impingement, subluxation of the ulnar nerve over the medial epicondyle and congenital abnormalities such as cubitus valgus (3).

The surgical management of choice in this pathology is still open to question. Several procedures have been advocated for the release of the ulnar nerve at the elbow, ranging from simple decompression to medial epicondylectomy as well as different methods of anterior transposition (i.e., subcutaneous, intramuscular and submuscular) (4, 5). However, for any of such procedure fail-

ures are known with various recurrence rates, requiring exploration in up to 15% of cases (6). The main complications requiring re-exploration were the epineural fibrosis around the ulnar nerve or scarring of the cubital tunnel (7, 8).

In consideration of these observations, we believe that the protection of the nerve with a graft is an evaluable alternative, which was supported by the satisfactory results we achieved. Furthermore, the new proposed surgical technique not been previously reported is safe and relatively easy.

Disclaimer

None of the authors has any financial interest in Dura-Guard® or Synovis Surgical Innovations.

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