

Original article

Intermediate and long-term outcomes following simple decompression of the ulnar nerve at the elbow

Les résultats à long et moyen termes de la simple décompression du nerf ulnaire au coude

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Abstract

Introduction. – There is currently little consensus regarding the appropriate surgical approach to treatment of cubital tunnel syndrome (CubTS), and few studies have reported long-term follow-up of patients who have received surgical treatment for ulnar nerve compression at the elbow.

Method. – Seventy-four patients with a total of 102 cases of CubTS treated with simple decompression of the ulnar nerve were examined 1.0–12.4 years postoperatively. Ulnar nerve conduction studies (slowest conducting 5 cm segment of ulnar nerve motor fibers measured at the elbow) were performed both pre- and postoperatively. The primary clinical outcome was percentage relief of symptoms, divided into “excellent” outcome group or less ($\geq 90\%$ improvement or $< 90\%$ improvement).

Results. – Ulnar nerve conduction improved pre- to postoperatively, but clinical improvement was not related to changes in velocity. Women reported greater clinical improvement than men, and weight gain in men (but not women) predicted less improvement. Relief of cubital tunnel symptoms was greatest for those arms receiving carpal tunnel release surgery simultaneous or subsequent to cubital tunnel release.

Discussion. – Simple decompression may offer excellent intermediate and long-term relief of symptoms associated with CubTS. Although improvement in ulnar motor nerve conduction velocity occurs following treatment of CubTS, it may not be a consistent marker of perceived symptom relief. Finally, these findings suggest that less complete relief of symptoms following ulnar nerve decompression may be related to unrecognized carpal tunnel syndrome or weight gain.

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Résumé

Il n'y a pas actuellement de consensus net pour le traitement chirurgical de la compression du nerf ulnaire au coude.

Méthode. – 74 patients pour 102 cas de syndrome du nerf ulnaire au coude ont été revus 1 à 12,4 ans après l'intervention. Une étude de la conduction des fibres motrices (les fibres à la conduction la plus lente sur un intervalle de 5 cm du nerf ulnaire au coude) a été pratiquée en pré- et postopératoire. L'étude des résultats cliniques était fondée sur l'amélioration des symptômes en pourcentage, divisés en “excellents” ($> 90\%$ d'amélioration) et moins bons ($< 90\%$ d'amélioration).

Résultats. – La conduction du nerf ulnaire s'est améliorée en post opératoire, mais cette amélioration clinique n'est pas corrélée avec des modifications de la vitesse de conduction. Les femmes ont été plus améliorées que les hommes, et la prise de poids à aboutit à moins de progrès chez l'homme (mais pas chez la femme). L'amélioration des symptômes a été meilleure chez les sujets ayant été traités pour un syndrome du canal carpien en même temps ou dans un deuxième temps.

Discussion. – La décompression simple peut donner une excellente amélioration des symptômes à moyen et long terme pour la compression du nerf ulnaire au coude. Quoique l'amélioration de la vitesse de conduction motrice du nerf ulnaire existe après traitement, ce n'est pas

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un élément constant de l'amélioration des symptômes sensitifs. Enfin, ces résultats suggèrent que des résultats moins bons après décompression du nerf peuvent être dus à un syndrome du canal carpien non diagnostiqué ou à une prise de poids.

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Keywords: Cubital tunnel syndrome; Surgical decompression

Mots clés : Nerf cubital au coude ; Décompression chirurgicale

Ulnar nerve compression at the elbow, frequently called cubital tunnel syndrome (CubTS), is the second most common entrapment neuropathy of the upper extremity. The diagnosis of CubTS is based on the identification of specific symptoms involving the ulnar nerve distribution of the forearm and hand, preferably confirmed electrodiagnostically by the presence of abnormal ulnar nerve conduction across the elbow [1]. In many cases, carpal tunnel syndrome (CTS) and CubTS are found in the same extremity [2].

Numerous authors report that simple decompression is the treatment of choice for most cases of ulnar nerve compression at the elbow [3–7] although anterior transposition as a general surgical approach to CubTS continues to have support [8,9]. Others approve of simple decompression in uncomplicated cases and/or patients with mild symptoms but recommend anterior transposition in complicated cases, including those with deforming bony abnormalities, trauma, prolonged or severe symptoms [10–12] or because preoperative subluxation is felt to preclude simple decompression [13]. Further, other authors recommend simple decompression, but supplemented by minimal or partial epicondylectomy in severe cases of CubTS [14]. Although this issue is far from resolved, two recent reviews have concluded that decompression is generally associated with superior outcome, principally because of its lower rate of postoperative complication and the opportunity for more rapid rehabilitation [15,16].

We report here both clinical and electrophysiologic findings for intermediate to long-term follow-up of 74 patients (102 arms) who received simple decompression for treatment of CubTS.

1. Materials and methods

The basic sample consisted of 119 patients who received simple decompression of the ulnar nerve at the elbow from our clinic between December 1985 and May 2001. Patients were chosen for study entry based on date of surgery, and follow-up ranged from 1.0 to 12.4 years postoperatively. During a telephone interview, patients were invited to participate in a more extensive follow-up, including clinical assessment and nerve conduction studies. Forty-one patients declined to participate, for reasons including distance from the clinic, schedule incompatibility, and reluctance to undergo further neurophysiological testing. A total of 78 patients (representing 110 nerve decompressions) returned to the clinic for follow-up. All patients provided written informed consent

upon their arrival at the clinic for follow-up testing, and all were provided with modest monetary compensation for travel expenses and participation.

Because the focus of this study was on simple decompression, two extremities that received anterior transposition elsewhere were deleted from the analyses. Six individuals also received subsequent limited medial epicondylectomy involving excision of less than 20% of the epicondyle at our clinic. In all six cases, the procedure was performed because of complaints associated with postoperative nerve subluxation rather than symptoms consistent with persistent compression neurostenia. These arms remained in the analyses because medial epicondylectomy was performed for treatment of symptoms secondary to postoperative subluxation rather than as a remedy for ongoing ulnar neuropathy. Missing data for one or more outcome variables resulted in the deletion of an additional three individuals (six surgeries) from the analysis. Following all deletions, there were 102 arms and 74 patients in the study sample, representing 28 bilateral surgeries. Because both length of follow-up and outcomes could differ by arm, analyses were performed on the basis of arms rather than individuals.

The primary symptoms of ulnar nerve compression at the elbow prior to surgery were chronic numbness or tingling in the ring and little fingers, and/or pain along the ulnar border of the hand and forearm, at times extending into the shoulder. Symptoms were generally supported by at least one of the following clinical findings: hypesthesia or abnormal two-point discrimination (>5.0 mm) in the distribution of the ulnar nerve, provocation of numbness or tingling in response to full elbow flexion and pronation of the forearm, positive Tinel's sign with percussion at the medial aspect of the elbow, muscle weakness and/or muscle atrophy, and an abnormal nerve conduction study [17]. In practice, we find two-point discrimination and muscular function in most patients to be intact. However, we should note that if McGowan's three stage model of CubTS severity [21] were to be applied to these cases, all would fall into the least severe category (i.e., sensory changes only), principally because of the absence of muscular weakness as a primary clinical sign.

The surgical procedure consists of simple deroofting of the ulnar nerve from approximately 5 cm above to 5–7 cm below the elbow. This is done with tourniquet, local anesthesia and loupe magnification. Three to five cc's of xylocaine are injected subcutaneously just posterior to the medial epicondyle immediately overlying the ulnar nerve. The injection starts at the axis of rotation and is directed proximally

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