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Entrapment neuropathy of the ulnar nerve by a constriction band: the role of MRI

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Summary The diagnosis of ulnar nerve entrapment at the elbow has relied primarily on clinical and electrodiagnostic findings. Magnetic resonance imaging (MRI) has been used in the evaluation of peripheral nerve entrapment disorders to document signal and configurational changes in nerves. In this case report we review the MRI and operative findings of a rare constriction band causing ulnar nerve compression at the elbow. We review the sensitivity and specificity in diagnosing ulnar nerve entrapment at the elbow as defined by MRI findings.

Journal of Clinical Neuroscience (2003) **10**(3), 374–375
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doi:10.1016/S0967-5868(02)00131-5

Keywords: ulnar nerve, fascial band, MRI, entrapment neuropathy

Received 25 March 2002
Accepted 6 May 2002

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INTRODUCTION

Ulnar neuropathy at the elbow (UNE) is the second most common entrapment neuropathy of the upper limb, next to carpal tunnel syndrome. Most frequently, UNE occurs in the region of the retroepicondylar (ulnar) groove due to various pathological processes.[1] In 23% of cases in one study, no specific cause could be identified.[2] The remainder can be attributed a variety of etiologies including; external pressure, intragroove pressure due to repetitive flexion, chronic stretch associated with valgus deformity, tight anatomical confines within the cubital canal, bony/scar impingement, anomalous muscles/bands and mass lesions.[1–3]

Traditionally diagnosis of UNE has relied primarily on clinical and electrophysiological evaluation with occasional use of roentgenography and thermography.[4,5] Magnetic resonance imaging (MRI) is emerging as a potential addition to the assessment of UNE, allowing more precise anatomical localisation. To the author's knowledge there have been three other studies reporting the utility of MRI for UNE.[6–8] In this paper, we present a case of UNE due to compression by a congenital band and discuss the value of MRI in the preoperative evaluation of UNE.

CASE REPORT

A 54-year-old male presented with pain in the distribution of the medial aspect of the forearm and hand over a 3-month period. There was no history of previous trauma to the elbow. There was associated weakness of the hypothenar eminence and the small muscles of the hand. Clinical examination demonstrated a small 5 mm dimple posterior to the medial epicondyle. There was no limitation of elbow movement. Nerve conduction studies were consistent with ulnar nerve dysfunction at the elbow. Due to the unusual dimple and tethering of the skin around the dimple an MRI scan was performed (Fig. 1). The MRI scan demonstrates a band-like structure extending from the dimple (as seen on gross examination), to surround the ulnar nerve and attach to the medial aspect of the elbow joint.

Neurolysis of the ulnar nerve was performed via a standard exposure of the ulnar nerve at the elbow. At operation there was a fascial band extending from the region of the skin dimple to encapsulate the nerve (Fig. 2). The forceps in the picture is grasping the band, which can be seen to continue around the nerve. The fascial band was divided and removed from around the nerve. The

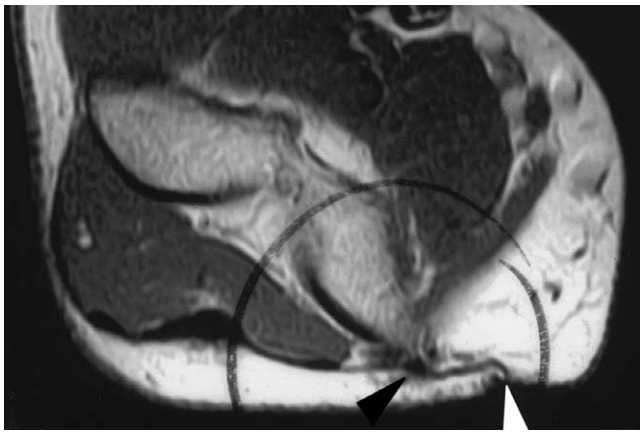

Fig. 1 MRI of fascial band extending from a skin dimple (white arrow) to encapsulate the ulnar nerve (black arrow).

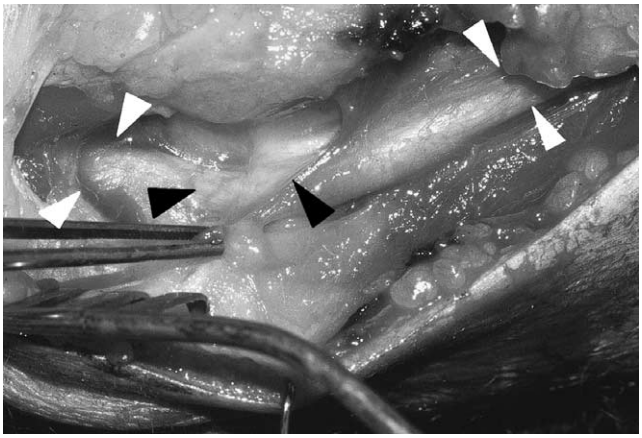

Fig. 2 Intraoperative picture of the ulnar nerve with the band intact. The white arrows indicate the ulnar nerve piercing the two heads of the flexor carpi ulnaris (FCU). The forceps are tenting the fascial band which is outlined with black arrows. The grey arrows indicate the proximal portion of the ulnar nerve.

patient had complete return of neurological function over a 3-month period.

DISCUSSION

The clearest way of classifying UNE is anatomically. Entrapment can occur at four locations about the elbow joint. From proximal to distal these are (1) the medial intramuscular septum/arcade of Struthers, (2) the retroepicondylar groove, (3) the humeroulnar arcade (true cubital tunnel syndrome), and (4) the exit point from the flexor carpi ulnaris through the deep flexor pronator aponeurosis.[1]

In our case, the pathology was a fascial constricting band located in the retroepicondylar groove. As there was no history of trauma or infection, we have concluded that the band is congenital in nature. There have been other case reports of similar congenital bands but to the authors' knowledge these have all been in the pediatric population, and usually corrected in early childhood.[9–12] Our case is certainly unusual due to the patient's age. We have been unable to find a report of a similar fascial band in this age group. Early excision of the band is advocated in all cases and some authors recommend neurolysis or discrete nerve segment excision followed by nerve grafting, depending on severity.[9,11] In our case simple neurolysis and removal of the band was adequate.

With the increase in accessibility of imaging technology, MRI is emerging as potentially useful in the assessment of UNE. As mentioned above, the author is aware of three other studies documenting the use MRI for UNE.[6–8] Britz et al. reported that MRI proved both sensitive (demonstrating increased signal in 97% of cases compared to 77% by electrodiagnostic methods) and specific with no false positives in controls.[6] Furthermore, there are a number of specific situations in which MRI may prove useful. Britz et al. suggest that preoperative planning of cases with previous ulnar nerve transposition is assisted by the use of MRI by allowing more accurate anatomical localisation and identification of adhesions or residual entrapment. Cases of dual entrapment or superimposed peripheral neuropathy may complicate electrophysioiogical localisation and thus benefit from the use of MRI. Finally, preoperative MRI allows precise localisation of anatomical causes of compression and therefore minimises the size of the necessary surgical exposure, thus reducing morbidity.

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Improvement in cognitive function after radical excision of an anterior skull base meningioma – a report of 2 cases

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Summary It has been well documented that memory difficulties in patients with anterior skull base meningioma may improve after tumour resection. However, there have been few reports on studies where precise testing of cognitive function has been conducted before and after surgery. Here we report 2 cases of anterior skull base meningioma where 2 tests of cognitive function, the Wechsler adult intelligence scale-revised (WAIS-R) and the Wechsler memory scale-revised (WMS-R), were performed by the patient before and after surgical treatment. After the operation there was a dramatic increase in the performance IQ as measured by the WAIS-R. In addition, the scores for both the "Attention/Concentration" and the "Delayed Recall" subsets of the WMS-R scale improved. There were differences between the 2 patients in the length of time required for functional recovery and this was thought to be due to the tumour size and the age of the patient. The use of these scales would enable