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ORIGINAL ARTICLE

Ulnar Nerve Compression in the Cubital Tunnel by an Epineural Ganglion: A Case Report

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Abstract Epineural ganglia are considered to be a usual cause of peripheral nerve compression. In this report, we present a rare case of ulnar nerve compression by an epineural ganglion in the cubital tunnel. A 28-year-old right-handed female secretary developed progressive pain, numbness, and weakness in her right elbow, forearm, and hand for 6 months. Atrophy of the adductor pollicis and the first dorsal interosseous muscles was apparent. Clinical examination revealed a cystic mass at the posterior side of the elbow. Magnetic resonance imaging identified a ganglion while electrophysiologic studies revealed a severe conduction block of the ulnar nerve at the elbow. During surgery a 2-cm diameter epineural ganglion was identified compressing the ulnar nerve and was excised using microsurgery techniques. Two months postoperatively, the clinical recovery of the patient was very satisfactory, although the postoperative electrophysiologic studies demonstrated a less dramatic improvement.

Keywords Ulnar nerve · Epineural ganglion · Elbow · Cubital tunnel · Nerve compression

Introduction

Ganglia are the most common cause of focal masses in the hand and foot, but they can appear in nearly all anatomic locations. They arise either from the synovium of joints or tendon sheaths or from tendons or from nerves and are filled with synovial fluid that may become jelly-like over time.[4] Despite their benign histological figure ganglia can cause problems such as pain, numbness, and atrophies especially when they compress noble structures like nerves. The authors present a rare case of an epineural ganglion of the ulnar nerve in the cubital tunnel which was compressing the ulnar nerve and was successfully treated with surgical excision.

Case Report

A 28-year-old right-handed woman secretary presented at our department with a 6-month history of a cystic mass at the right elbow. She was complaining of progressive, subacute pain, numbness, and tingling at the elbow and the medial border of her forearm and hand. She also had sensory deficit especially at the little finger and the ulnar side of the ring finger. In addition, she had weakness of the hand with decreased grip strength, positive Froment sign, and atrophies of the adductor pollicis and the first dorsal interosseous muscles. The symptoms started 6 months ago and increased in the last month. The patient had no medical history of previous elbow or neck injuries or other medical problems. Palpation of the cystic lesion caused aggravation of the symptoms. The range of motion was full to flexion, extension, pronation, and supination, and no instability of the elbow was observed. The magnetic resonance imaging revealed a ganglion cyst compressing the ulnar nerve in the cubital tunnel (Figs. 1 and 2). The subsequent electrophysical studies demonstrated a severe conduction block and conduction slowing of both ulnar motor and sensory nerve fibres at the elbow (Table 1). The amplitude of the muscle action potential evoked at the wrist and forearm and

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Figure 1 Preoperative T2-weighter transverse MRI showing the ganglion cyst (arrow) in the cubital tunnel.

Figure 2 Preoperative T2-weighter sagittal MRI showing the ganglion cyst (arrow) in the cubital tunnel.

Table 1 Preoperative and postoperative ulnar nerve electrophysiologic study.

Characteristics	Units	Preoperatively		Postoperatively	
		Right Ulnar Nerve	Left Ulnar Nerve	Right Ulnar Nerve	Left Ulnar Nerve
Amplitude	mV	6.63	70.10	21.20	69.00
Conduction velocity	m/s	63.00	76.00	67.00	74.30
Motor nerve fibres					
Latency	ms	8.16	6.78	7.80	6.70
Amplitude (elbow)	mV	4.33	10.10	5.80	9.90
Conduction velocity (wrist–elbow)	m/s	50.20	61.30	53.20	62.10

the conduction velocity at the same anatomic locations were normal and similar to the unaffected side, whereas they decreased at the elbow.

During surgery, we found a 2-cm diameter epineural ganglion cyst compressing the ulnar nerve in the cubital tunnel (Fig. 3). As a result, the ulnar nerve appeared flattened. Under regional anesthesia, we explored the ulnar nerve and excised the ganglion cyst using microsurgery techniques without affecting the nerve (Fig. 4). The histological studies confirmed our primary diagnosis.

The patient was reevaluated 2 months postoperatively both clinically and electrophysiologically. The patient was almost completely relieved of pain, while sensory impairment, numbness, hand weakness, grip strength, Froment sign, and adductor pollicis muscle wasting showed a dramatic recovery. The postoperative electrophysiologic parameters showed some improvement but had not returned to normal at that time.

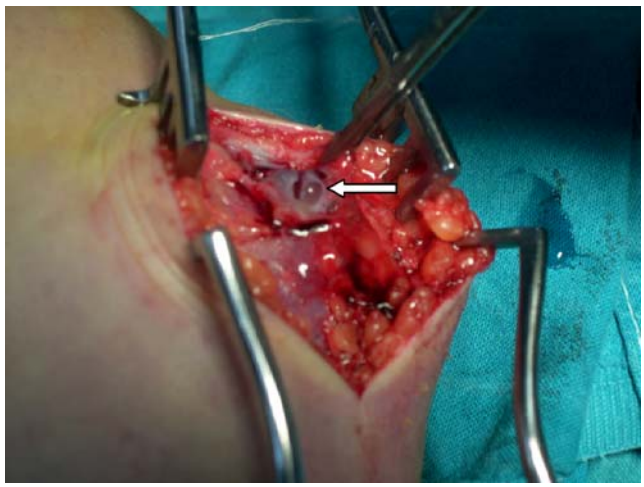

Figure 3 Intra-operative photograph of the epineural ganglion (arrow) compressing the ulnar nerve in the cubital tunnel.

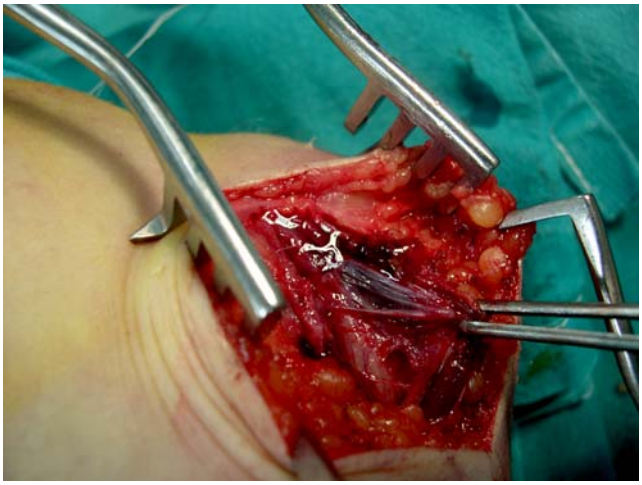

Figure 4 Intra-operative photograph showing the excision of the epineural ganglion and its attachment to the ulnar nerve.

Discussion

Ganglia are not a common cause of compression of peripheral nerves and have not been emphasized in the literature.[3, 5–16, 18, 20–24, 26, 1, 2, 17] Since the first description of ganglia involving nerves,[8] most reported cases concern the common peroneal nerve at the head of the fibula.[6, 15, 16, 18, 22, 23, 26] The compression of the ulnar nerve in the cubital tunnel by a ganglion is not common.[5, 10] In addition, most ganglion cysts involving nerves originate from the adjacent joints.[7, 21] In the largest series of 38 cases of ganglion cysts compressing the ulnar nerve in the cubital tunnel, all cysts originated from the medial aspect of the ulnohumerous joint, and none of them was epineural.[11] Ganglia commonly occur in middle-aged men especially those with history of elbow trauma.[14, 1] In this report, we present a rare case of epineural ganglion compressing and flattening the ulnar nerve in the cubital tunnel having no connection to the elbow joint. A similar case of ulnar nerve compression by a 1-cm diameter intraneural ganglion at the retrotrochlear groove was reported by Ming Chan et al.[14] In their report, the patient had symptoms for 3 months, there were no muscle atrophies observed, and there was an almost complete electrophysiological and clinical recovery after the ganglion excision. In our case, the patient developed muscle wasting due to the longer period of symptoms, the ganglion had a 2-cm diameter and originated from the epineurium without being surrounded by nerve fibers. The 6-month history of progressive symptoms in addition to the ganglion's bigger size may be the reasons why we did not observe a complete recovery of the electrophysiological parameters in spite of the patient's significant clinical improvement, 2 months postoperatively.

As ganglia are not a common cause of cubital tunnel syndrome, in many cases, they are misdiagnosed because imaging studies are not always performed preoperatively. [21] MRI provides the most detailed view of the cyst and its relation to the adjacent structures, whereas CT and ultrasound can also be useful.[12, 20, 2, 17, 19, 25] However, the importance of detailed history, clinical examination, and electrophysiological studies is crucial to the early diagnosis and evaluation of the problem. The symptoms involve pain, numbness, sensory impairment in the medial border of the forearm and hand which is the area of distribution of the ulnar nerve, reduced grip strength, and wasting of the intrinsic hand muscles.[21]

Total excision of the epineural ganglion may not always be possible without damaging the nerve, especially if the ganglion is intraneural.[21, 23] In all cases, early diagnosis and careful excision is associated with satisfactory outcome. [3, 9, 13, 14, 1, 25]

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