Prechannel Entrapment of the Ulnary Nerve by an Intermuscular Arcade: The Importance of Ultrasonographic Neurography in the Demonstrating of Compression Site

Ulnar Sinirin İntermusküler Bağ Tarafından Kanal Öncesi Sıkıştırılması: Sıkışma Yerinin Gösterilmesinde Ultrasonografik Nörografinin Önemi

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Özet

Anahtar Kelimeler
Intermuscular Arcade; Ulnar Nerve; Ultrasonographic Neurography; Peripheral Nerve Surgery; Entrapment Neuropathy

Abstract
Aim: Ultrasonographic neurography is a described method in the cases with peripheral nerve injury and entrapment. The usual entrapment of the peripheral nerves had been described previously. Material and Method: In this report it was presented the unusual entrapment of the ulnar nerve and the neurographic findings in an illustrative case. The case was admitted to our neurosurgery department with the symptoms of ulnar nerve entrapment. Results: Electrophysiologic examination revealed that ulnar nerve entrapment before entering ulnar nerve canal. We examined the patient by using ultrasound assisted neurographic examination before operation. Ultrasonographic neurography demonstrated ulnar nerve compression 5 cm proximal portion from its entrance into the ulnar nerve canal. The patient was operated. Operative findings were similar with those of ultrasonographic neurography. Discussion: In this report we present clinical and operative findings of this case including the role of ultrasonographic neurography in demonstrating these type of pathologies in the clinical practice.

Keywords
Intermuscular Arcade; Ulnar Nerve; Ultrasonographic Neurography; Peripheral Nerve Surgery; Entrapment Neuropathy
Introduction

Neurological findings and electrodiagnostic tests are the gold standards in the diagnosing of peripheral nerve entrapments and making decision about the selection of treatment modality [1-3]. Intraoperative ultrasound has been used in the neurosurgical procedures, especially in the localising of cystic and solid lesions, for several years. Some previous studies had been conducted to evaluate peripheral nerves by ultrasound [4-8]. In these studies, the authors described normal and pathologic ultrasonographic appearance of peripheral nerves [4-8]. This clinical study was designed to evaluate the feasibility of presurgical and intraoperative ultrasound assisted neuroexamination in the localisation of entrapped field, determination of the type of the entrapment in a patient with entrapment neuropathy of ulnary nerve by an intermuscular arcade.

Material and Method

55 year-old man had been referred to our neurosurgery department with the symptoms of ulnary nerve entrapment. Electrophysiologic examination showed the ulnary nerve entrapment before entering its canal. We examined the patient by using ultrasound assisted neurographic examination before operation (Figure 1). Ultrasonographic neurography demonstrated that the ulnary nerve compressed at the point of 5 cm proximal to its entrance into the ulnar canal (Figure 1). The patient was operated. Operative findings showed the presence of intermuscular arcade compressed to ulnary nerve (Figure 2). Operative findings were similar with those of ultrasonographic neurography. The arcade was cut off by using a scissor. The chronical impression site on the nerve was inspected by using operative microscope after removing of intermusculary arcade (Figure 3). Postoperative period was uneventful. The patient was discharged after 3 days from the operation.

Discussion

Ulnar neuropathy at the elbow is the second most common entrapment neuropathy of the upper limb, next to carpal tunnel syndrome. The ulnary nerve entrapment is most frequently seen in the region of the retroepicondylar (ulnar) groove resulting from various pathological processes. Anatomically, the ulnary nerve travels from the axilla after emerging from the brachial plexus into the medial aspect of the anterior compartment of the arm. It then traverses the intermuscular (intercompartmental) septum, passes through the arcade of Struthers, and continues its path in the posterior aspect of the arm down to the elbow and submerges into the cubital tunnel posterior to the medial epicondyle [9]. The ulnary nerve may become entrapped at the arcade or across the intermuscular septum. Sir John Struthers, a whale anatomist, described the arcade in Scotland in 1854 [9].

Electrodiagnostic tests can precisely distinguish the severity of entrapment. Sometimes electrodiagnostic tests may not yield reliable information about the location of the entrapment site, because a variety of parameters may affect this examination [4]. In the same way, electrodiagnostic tests can not give any information about the position of the nerve, the presence of a neuroma and excessive scar tissue around the nerve. In this perspective, we need an image guided tool preoperative and intraoperative period in the surgical treatment of entrapment.
neuropathies for precise localization of entrapped site and determination of the type lesion. We theorized that sonographic neuroexamination may help us in the localization and type of the lesion. The electrodiagnostic test revealed that the entrapped site was located proximal of the ulnar canal. Sonographic neuroexamination showed the precise location of the entrapment. Our case demonstrated that ultrasonographic neuroexamination is a useful diagnostic test in the making-decision of the treatment of ulnary nerve neuropathy. Sonographic neuroexamination may also be used as an image guided tool during the surgical treatment of peripheral nerve entrapment neuropathy.

Competing interests
The authors declare that they have no competing interests.

References