OLGU SUNUMU / CASE REPORT

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Atypical ulnar entrapment neuropathy, Arcade of Struthers: A case report

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ÖZET

Atipik ulnar tuzak nöropatisi, Struthers arkı: Olgu sunumu

Ulnar sinir sıklıkla kübital olukta tuzaklanmasına karşın seyrek olarak bilek düzeyinde tuzaklanabilir ve en sık neden kronik basıdır. Kol düzeyinde ulnar sinir tuzaklanması çok nadirdir ve sadece birkaç olgu sunumu bildirilmiştir. Kol orta kısmında bulunan Struthers arkusu ulnar sinir için bir tuzak nöropati yeri olabilir ancak halen varlığı tartışmalıdır. 20 yaşında klinik olarak ulnar tuzak nöropati bulguları olan ve elektrofizyolojik olarak kolun orta kısmında tuzaklanma saptanan olgumuzda Struthers arkusunun varlığına ve önemine dikkat çekmek istedik.

Anahtar Kelimeler: *ulnar nöropati, Struthers arkusu, nörofizyoloji*

SUMMARY

Ulnar nerve usually gets entrapped at cubital sulcus, but it may rarely occur at the wrist region and the most frequent reason is chronic pressure. Entrapment of the ulnar nerve at the arm region is very rare and only a few case reports have been published. Arcade of Struthers, which is found in the middle region of the arm, is an entrapment area for ulnar nerve. We aimed to underline the importance and presence of arcade of Struthers by presenting a 20 year old male patient with a clinical presentation of ulnar entrapment neuropathy and having electrophysiological findings of ulnar entrapment at the middle region of his arm.

Key words: *: ulnar neuropathy, arcade of Struthers, neurophysiology*

Introduction

Ulnar entrapment at the elbow region is the second most frequent entrapment neuropathy. Rarely an entrapment of ulnar nerve may be at the wrist. The most frequent reason is chronic pressure. It is very rare that ulnar nerve gets entrapped at the arm or forearm. The arcade of Struthers has been reported as the most frequent entrapment area in the arm. We presented a case with a clinical presentation of ulnar entrapment neuropathy and having a possible entrapment in the arcade of Struthers.

Case

A 20 year old male patient complained about paresia of his right hand and hypoesthesia of his right 5th finger and lateral half side of his 4th finger which he realized one day ago when he woke up in the morning. His examination revealed a flexion posture in his right 4th and 5th fingers; paresia of his right abductor digiti minimi (ADM) muscle at a degree of 1/5 and hypoesthesia of his right hypothenar region. The electrophysiological examination was found to be normal on the same day. Physical rehabilitation for 15 days started after the 5th day of his complaints. His control visit on the 25th day revealed no difference in his examination. His second electrophysiological examination showed no entrapment at wrist and elbow regions but it showed entrapment approximately 15 cm proximal of the medial epicondyle (Figure 1 and Table 1) and the needle EMG of right flexor carpi ulnaris (FCU), first dorsal interosseous (FDI) and ADM muscles showed active denervation and reduced interference pattern. Cervical MRI revealed no

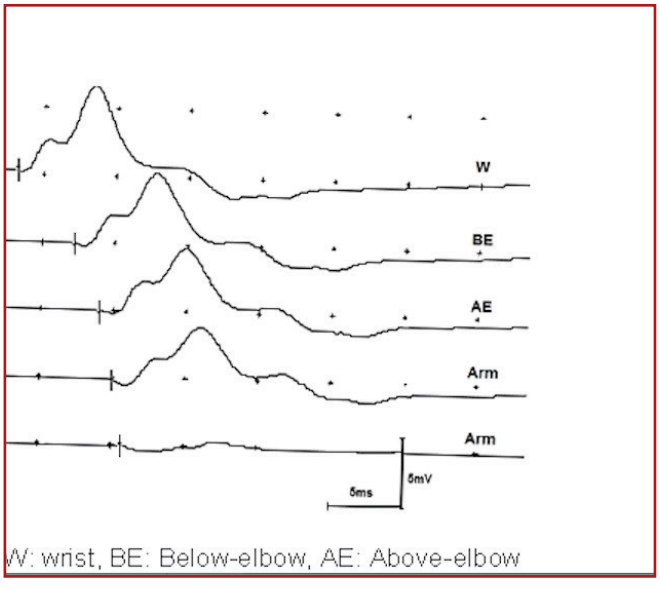

Figure 1: The trace of motor nerve conduction study recorded from right ADM muscle

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Table1. The findings of the nerve conduction study recorded from the right ADM muscle of the case

R ULNAR ADM	Latency (ms)	Amplitude (mV)	Length (cm)	Velocity (m/s)
Wrist	3,65	6,6	7	
Below elbow	6,85	5,3	23	71,9
Above elbow 5 cm	8,85	4,8	13	65,0
Above elbow 10 cm	9,80	4,1	5	52,6
Above elbow 12 cm	10,50	0,6	2	28,6

pathology. The MRI of the upper extremity of the case with gadolinium revealed that the ulnar nerve at the region of the entrapment, which was detected electrophysiologically, was isointense with the muscle tissue in T1 weighted images; the nerve was hyperintense in fat saturated T2 weighted images, which was consistent with edema; and it showed contrast enhancement in fat saturated T1 weighted series, which meant inflammation (Figure 2 A, B, C). After two months, the complaints of the patient started to relieve and his examination showed hypoesthesia of the hypothenar region, the 5th and the lateral half side of the 4th finger; positive Wartenberg sign and +4/5 paresia of the ADM and interosseous muscles. No surgery was considered because the symptoms were relieving. Control needle EMG done in the 5th month revealed slight decrease in interference pattern of the ADM and FDI muscles. The nerve conduction study of the ulnar nerve was found to be normal. After 6 months the patient was completely free of the complaints and his examination was normal. Control MRI of the arm showed no pathology.

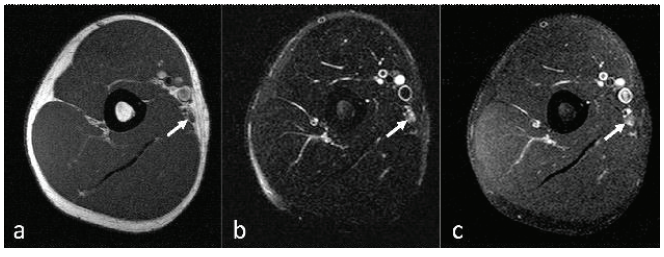

Figure 2: Axial T1-weighted (A), fat-saturated T2-weighted (B) and contrast fat saturated T1-weighted (C) magnetic resonance images show entrapped ulnar nerve (arrows). Ulnar nerve is isointense to the adjacent muscle on T1-weighted image (A), hyperintense on fat saturated T2-weighted image consistent with neuronal edema (B) and enhancing on fat saturated T1-weighted image consistent with inflammation (C).

Discussion

Entrapment of the ulnar nerve at the elbow region is the second most frequent entrapment neuropathy after the entrapment of the median nerve at the wrist (carpal tunnel syndrome) and can easily be treated with decompression using mini incisions at elbow level (1). Entrapment of the ulnar nerve at the arm region is very rare and only a few case reports have been published (2,3). Sir John Struthers was the first person who described the arcade as a possible entrapment region for the ulnar nerve in 1854 (4) and Kane et al have shown it in 1973 (5). Struthers has also described the ligament which seldom causes the entrapment of the median nerve at the distal medial region of humerus. When the arm is in the anatomic position, the roof of the arcade is made up with the contribution of the deep fascia of the distal arm; the superficial muscle fibers of the medial head of triceps muscle which reach to the intermuscular septum (MIS) and internal brachial ligamentum. MIS forms the front side; and the inner side of the humerus covered with the deep fibers of the medial head of triceps muscle forms the lateral side of the arcade (Figure 3). The reported prevalence is very variable and is between 0% and

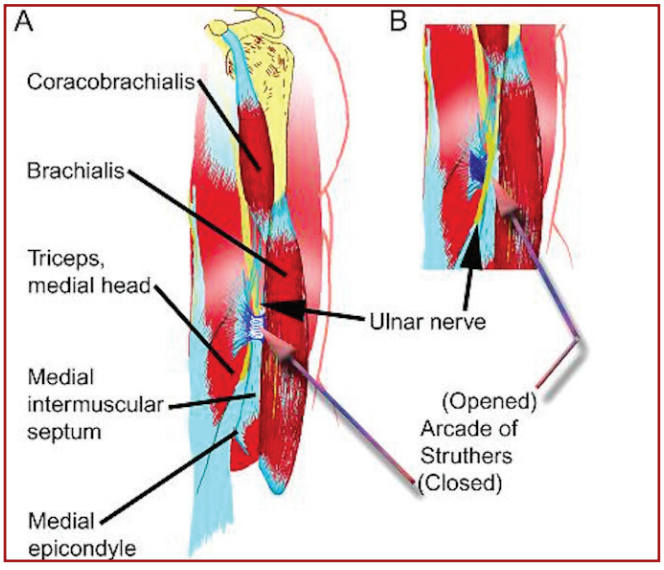

Figure 3: Anatomy of the arcade of Struthers

100% (6,7). This may be due to the differences of the anatomical classifications of the arcade. Some papers in the literature have denied the presence of the arcade and denied this region as an entrapment place for the ulnar nerve (8-14). It is possible that the frequency of the entrapment in the arcade is more than the reported, because in the electrophysiological studies if the stimulus is given only a few centimeters above the medial epicondyle the entrapment can be missed (2). Some authors blame the secondary entrapment in the arcade, if the surgery to the cubital ulnar entrapment is unsuccessful (15-19). The electrophysiological findings of our case, with clear symptoms of ulnar entrapment, show an entrapment at 15 cm proximal to the medial epicondyle. No surgery was needed because the patient was free of symptoms after 6 months with conservative treatments. The clinical, electrophysiological and MRI findings suggest an entrapment region in the middle of the arm and this was possibly in the arcade of Struthers. It should be kept in mind that the ulnar nerve can be entrapped in the arcade of Struthers and for this reason nerve conduction studies of the patients with ulnar nerve entrapment symptoms must be done at the upper regions in order to prevent wrong surgical procedures to the cubital sulcus.

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