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

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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 hypoaesthesia 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 hypoaesthesia 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
Entrapment of the ulnar nerve at the elbow region is the seventh most frequent entrapment neuropathy after the entrapment of the median nerve at the wrist (carpal tunnel syndrome) and the ulnar nerve at the wrist and forearm. The incidence of ulnar nerve entrapment at the elbow region is rare and only a few case reports have been published. Sir John Struthers was the first person who described the arcade as a possible entrapment region for the ulnar nerve in 1854 and Kane et al have shown it in 1973. Struthers has also described the ligament which seldom causes the entrapment of the median nerve at the distal medial region of the 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 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 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.

### 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 the 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 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 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.

### References