Journal of Plastic, Reconstructive & Aesthetic Surgery (2017) 70, 1404—1408

JPRAS
An International Journal of Surgical Reconstruction
www.JPRASurg.com

The cubital tunnel syndrome caused by the intraneural or extraneural ganglion cysts: Case report and review of the literature

Wen Kai Chang, Yong Ping Li, Deng Feng Zhang, Bing Sheng Liang*

Department of Orthopaedics, The Second Hospital of Shanxi Medical University, 382 Wuyi Road, Taiyuan, 030001, Shanxi, China

Received 23 November 2016; accepted 9 May 2017

KEYWORDS
Cubital tunnel syndrome;
Ulnar nerve;
Intraneural ganglion;
Extraneural ganglion;
Cysts

Summary Cubital tunnel syndrome is the second most common nerve compression syndrome in peripheral nerve compression disease. Although potential ulnar nerve entrapment can occur at multiple points along its course, such as the arcade of struthers, the medial intermuscular septum, the medial epicondyle, the cubital tunnel, and the deep flexor pronator aponeurosis, the most common site of entrapment is the cubital tunnel. However, cubital tunnel syndrome could also be caused by the occupying masses along the course of ulnar nerve, such as intraneural or extraneural ganglia. The cubital tunnel syndrome caused by intraneural or extraneural ganglion cysts has been rarely reported. In our hospital, there were 184 patients with cubital tunnel syndrome who underwent surgical treatment from January 2010 to January 2014. Of these patients, 16 had extraneural cysts and 3 had intraneural ganglion cysts. The incidence rate of cysts in the cubital tunnel was 10.33%. Electromyography was used as routine examination. Ultrasound was used only in some patients in whom elbow mass was suspected. In the surgery of the cubital tunnel syndrome combined with cyst, if any other cysts were found, we should be remove completely the cyts and decompress the ulnar nerve thoroughly with the ulnar nerve being anterior transposition. These cysts were confirmed by histopathological examination. Finally, we compared the clinical features of patients who had a medial elbow ganglion with those of patients who had only cubital tunnel syndrome. B ultrasound can significantly improve the diagnosis. All patients were followed up for 4 months to 2 years, and the curative effect was good.

* Corresponding author.
E-mail addresses: changwenkai666@126.com (W.K. Chang), liangbs3989@163.com (B.S. Liang).

http://dx.doi.org/10.1016/j.bjps.2017.05.006
1748-6815/

Cubital tunnel syndrome is the second most common nerve compression syndrome in the upper extremity.[1,2] Although potential ulnar nerve entrapment can occur at multiple points along its course, such as the arcade of struthers, the medial intermuscular septum, the medial epicondyle, the cubital tunnel and the deep flexor pronator aponeurosis, the most common site of entrapment is the cubital tunnel.[3] Cubital tunnel syndrome caused by soft tissue masses is rarely reported. However, cubital tunnel syndrome could also be caused by the occupying masses along the course of the ulnar nerve, such as intraneural[4] or extraneural ganglion,[5] synovial chondromatosis,[6] hemangioma,[7] venous thrombosis,[8] and giant cell tumor of tendon sheaths,[9] which might compress the ulnar nerve as it lies in the condylar groove or within the cubital tunnel.

Intraneural ganglions are rare mucinous cysts that originate within the epineurium of peripheral nerves.[10–14] They typically lead to symptoms and signs of peripheral neuropathy whose pathogenesis mechanisms has remained controversial.[13,14] On the basis of the unifying articular (synovial) theory of formation of intraneural ganglions, a capsular defect or tear allows joint fluid to pass along an articular branch into the parent nerve. Intra-articular pressure pushes the synovial fluid along the path of the least resistance with the extension of the involvement along the nerve and its branches. The fluid propagation usually advances proximally, but it can extend distally or in both directions.[10,11] Different treatments have been recommended, but their outcomes have been disappointing, and the recurrence rate was high and under reported.[13] The extraneural ganglions are common mucinous cysts outside the epineurium of peripheral nerves.[12,15,16] The extraneural cysts are connected to joints through capsular tears, which are presumably located separate from an articular branch. Their connection is therefore through a non-neural pedicle.[16]

Materials and methods

Between 2010 and 2014, 19 of these patients had cysts at the cubital tunnel among 184 patients who had cubital tunnel syndrome. We retrospectively reviewed the cases of these 19 patients to delineate the prevalence and the clinical and pathologic features of the lesion, to describe our operative findings, and to further reveal the mechanism of pathological changes. The diagnostic criteria included (1) hypesthesias in the area innervated by the ulnar nerve, including the ulnar aspect of the dorsum of the hand and (2) a positive elbow-flexion test, a positive Tinel's sign at the cubital tunnel or a marked delay in motor nerve-conduction velocity of the ulnar nerve at the elbow. Patients suspected of having cervical radicular lesions or thoracic outlet syndrome were excluded. Osteoarthritis was noted in 118 (64%) of the 184 elbows. Nineteen of these patients with the cysts had osteoarthritis at the elbow.

Of these 19 patients, 16 had extraneural cysts, while 3 had intraneural ganglion cysts. Electromyography was used for routine examination. In the surgery of the cubital tunnel syndrome combined with cyst, if any other cysts were found, we should be remove completely the cyts and decompress the ulnar nerve thoroughly with the ulnar nerve being anterior transposition. These cysts were confirmed by histopathological examination. Finally, we compared the clinical features of patients who had a medial elbow ganglion with those of patients who had only cubital tunnel syndrome. Surgical exploration was performed for all patients through a curved incision, which was made on the medial aspect of the elbow. The subcutaneous tissues were dissected by identifying and protecting the medial antebrachial cutaneous nerves. From the proximal arcade of struthers to distal tendon of flexor carpi ulnaris, several common clamping points of ulnar nerve were completely decompressed and released by one by one. The cyst that found by sonography should be resected completely. For patients with mild neural compression, the ulnar nerve was decompressed and released in situ. However, for space occupying lesion or severe neural compression or entrapment in the cubital tunnel, routine anterior transposition of the ulnar nerve should be performed. Owing to the interconnection between intraneural cysts and elbow joint through the articular branch of the ulnar nerve in our two cases, we would treat the elbow cysts by ligating or disconnecting the articular branch near the joint to prevent intraneural cyst recurrence.

Result

General information

There were total 184 cases with Cubital tunnel syndrome (CuTS), most of whom were males (131); there were 53 females, and the average age was 51.91 years (Table 1). There were 19 patients with cubital tunnel syndrome caused by ganglion, and their average age 56.21 years (Table 1). There was no significant difference between the two groups.

A total of 184 patients with cubital tunnel syndrome were recorded in the study period, among whom 3 patients with intraneural ganglion (Figure 1) were pathologically (Figure 2) confirmed, while 16 patients had extraneural ganglion (Figure 3), with incidence rate of cysts of 10.33%. Thirty-five patients underwent preoperative B ultrasound examination. Of these, 11 patients had cysts and 1 patient had low echo, and the positive rate of sonography was 35.29%. In 35 patients, 2 patients with intraneural ganglion and 5 patients with extraneural ganglion were confirmed by operation, with the positive rate of 20%. All patients were followed up for 4 months to 2 years, and the curative effect was good.

Discussion

The incidence of the elbow cyst

The elbow cyst with cubital tunnel syndrome is rarely reported in the literature, with the prevalence rate of 3–8%,[17] and occasional case reports have been reported in Europe and the United States.[18] Kato[19] reported that the morbidity rate of the disease is up to 8% in a large sample of 472 patients. Gao Ming jie[8] reported the entrapment of the