Case report

Cubital tunnel syndrome due to old lateral humeral condyle fractures with gouty stone: A case report

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A R T I C L E   I N F O

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A B S T R A C T

Introduction: Cubital tunnel syndrome is a peripheral nerve compression disease, which is caused by the reduction of cubital tunnel space and the compression of ulnar nerve in the cubital tunnel. The main clinical symptoms were numbness and hypoesthesia in the distribution area of ulnar nerve.

Case presentation: We report a case of complex cubital tunnel syndrome caused by an old lateral humeral condyle fracture combined with gouty stone compression. Before surgery, the patient’s left hypothenar, ring finger and little finger were numb, decreased grip strength, positive paper clamp test. And finger numbness and finger weakness were significantly improved after ulnar nerve release combined with Gout stone resection.

Clinical Discussion: In this case report, the elbow joint deformity caused by old lateral humeral condyle fracture was not treated surgically. Only ulnar nerve release combined with Gout stone resection was performed, and the patient’s symptoms were significantly relieved.

Conclusion: In this case report, for the treatment of cubital tunnel syndrome caused by multiple causes, we only need to find out the main causes of clinical symptoms and targeted treatment, which can not only reduce surgical trauma, but also achieve good treatment results. Its treatment method and treatment result, hoping to provide reference experience for the diagnosis and treatment of similar diseases.

1. Introduction

Cubital tunnel syndrome refers to a disease of peripheral nerve compression in which the ulnar nerve in the cubital tunnel is compressed due to the reductive space of the cubital tunnel. Its etiology is varied, anything that can cause the elbow narrowed, compression, or traction of the ulnar nerve may be the cause of the disease. Cubital tunnel syndrome may manifest as hand weakness, difficulty clipping nails, or loss of coordination during other fine motions. Pain in the area along the ulnar nerve from the posteromedial elbow to the ulnar forearm or hand may also be present. Physical examination revealed sensory impairment in the little and ring fingers, intrinsic hand muscle atrophy, Tinel and Froment signs (+), and possibly finger weakness, muscle atrophy, and claw hand deformity in advanced cases [1].

For the traumatic arthropathy of the elbow joint caused by cubitus valgus deformity because of old lateral humeral condyle fracture in adults, the local tension of the ulnar nerve is significantly increased, but the treatment of the old fracture is usually not required, and the treatment of the old fracture may not improve the joint function, usually only Ulnar nerve release and anterior submuscular transposition can achieve good therapeutic effects [2].

Gout is a chronic rheumatic disease caused by the deposition of urate crystals in tissues. The most important risk factor for the disease is hyperuricemia. Uric acid, which precipitates in the joints in the form of urate crystals, is a major factor in triggering the onset of arthritis. Gouty stone forms is that urate crystals deposit into joints and surrounding tissues. Gouty stone can erode the bone surrounding their site and cause soft tissue compression due to mass effect [3]. Long-term gouty stone is usually located in the elbow, forearm, Achilles tendon or external ear, and can cause various symptoms by compressing the surrounding tissues [4,5]. It is not common for a large amount of gouty stone deposits to involve the elbow. In very advanced cases, bone and joint damage, infiltration and tendon rupture, finger contracture, entrapment syndrome, and osteonecrosis may occur.
2. Case report

A 42-year-old male patient developed right toe pain without obvious cause in 2006, which relieved after rest. So the patient did not pay attention to it. In the following 6 years, the joint pain developed to both ankles and knee joints with gouty stone deposition, and the pain worsened in 2012. After being unable to tolerate it, he went to the hospital and was diagnosed with gout. After that, he did not receive regular drug treatment for gout. In 2016, gouty stone deposits appeared behind the right elbow joint. In 2018, gouty stone deposits appeared on the left elbow joint. Numbness in the little and ring fingers happened in 2019. The patient had an old fracture of the left lateral humeral condyle due to trauma in his teenage years. The patient had no other underlying diseases; physical examination showed multiple gouty stone deposits in the limbs and joints of the patient, and a mass of about 5 × 5 cm was seen on the posterior of the right elbow joint. The boundary was clear, the quality was hard, and the skin temperature was normal. There was a 5 × 5 cm mass on the medial side of the left elbow joint, which was hard and without pressing pain. There was no obvious abnormality in the movement of the right elbow joint, and the extension of the left elbow joint was partially restricted. The left hand ring finger, little finger and hypothenar showed severe hypoesthesia, the little finger and ring finger flexor strength is about IV grade lower than the right. The paper clip test was positive. Preoperative pictures and DR plain films of the patient's left elbow joint (Fig. 1).

The patient underwent surgery for ulnar nerve release and anterior submuscular transposition of the elbow. On the second day after the operation, the numbness of the ring finger, little finger and hypothenar of the left hand of the patient was significantly improved; the patient's sense of self experience was significantly improved compared with that before the operation; the patient had obtained the patient's formal informed and written consent before reporting the case. Intraoperative pictures and postoperative pathological examination pictures (Fig. 2).

3. Discussion

Cubital tunnel syndrome is caused by compression and stretch of the ulnar nerve in the elbow. It is the second most common upper extremity compression neuropathy, and patients with cubital tunnel syndrome are more likely severe than those with carpal tunnel syndrome to have advanced disease when they seek treatment. Chronic ulnar nerve dysfunction can lead to permanent sensory loss, muscle weakness, and contracture of joint. Therefore, prompt surgical treatment is crucial for patients with ulnar nerve dysfunction with worsening or persistent symptoms despite non-surgical treatment. Gout occurs due to excessive production or decreased excretion of uric acid and is characterized by recurrent attacks of arthritis and deposition of urate crystals in tissues. If the patient has a long medical history and received no systemic anti-gout...
treatment, it can lead to the formation of gouty stone in multiple joints of the limbs [6], and the gouty stone is usually located in the olecranon bursa, Achilles tendon, first metatarsophalangeal joints and ears, but atypical locations such as the tarsal tunnel, second metacarpal and flexor carpi tendon have also been reported [7].

The etiology of the patient's cubital tunnel syndrome in this case was localized gouty stone compression with the old lateral humeral condyle fracture lead to valgus deformity of the elbow joint. This patient had paresthesias in the ring and little fingers, but no muscle atrophy or claw hand deformity. For old lateral humeral condyle fractures, it is generally accepted that surgical intervention for old nonunion should be avoided because osteosynthesis may reduce the range of motion of the elbow or the bone may fail to heal [8,9]. So we decided to perform gout stone resection combined with Ulnar nerve release and anterior submuscular transposition for the patient. Nakamichi and Akizuki described gouty stone leading to cubital tunnel syndrome, and they reported relief of symptoms after surgical removal of the gouty stone, which was not visible on radiographs [4]. For gouty stone, they recommend surgical resection as the treatment of choice to prevent irreversible nerve damage. In addition, the need for drug treatment to prevent recurrence was emphasized at the same time [5]. The patient in this case also had cubitus valgus deformity and high nerve tension. Considering that the single gout stone resection may not be able to completely relieve the symptoms, so anterior submuscular transposition was performed at the same time after the gouty stone was removed, and the postoperative symptoms were significantly improved.

4. Conclusion

Ulnar nerve entrapment neuropathy at the cubital tunnel due to gouty stones and an old lateral humeral condyle fracture is a very rare condition. Patients with cubital tunnel syndrome caused by chronic gouty stone deposition and old lateral humeral condyle fracture should carefully evaluate whether old humeral lateral condyle fracture should be treated. Surgical decompression with ulnar nerve release and gout stone resection in cubital tunnel syndrome can significantly improve symptoms. Early diagnosis and a clear treatment plan are important to prevent atrophy of the intrinsic muscles of the hand and to avoid irreversible neurological damage.

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None.

Ethical approval

This is not research study.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Registration of research studies

Not applicable.

Guarantor

Chao Zhang

CRediT authorship contribution statement

All the authors contributed to the writing of this report.

Declaration of competing interest

No conflicts of interest.

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