OLGU SUNUMU CASE REPORT

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Efficacy of Ultrasonography for Diagnosis and Treatment of the Ganglion Cyst that Causes Ulnar Neuropathy

Ulnar Nöropatiye Neden Olan Ganglion Kistinin Tanı ve Tedavisinde Ultrasonografinin Etkinliği

Cevriye MÜLKOĞLU[a], Hakan GENÇ[a]

[a]Clinic of Physical Medicine and Rehabilitation, Health Sciences University Ankara Training and Research Hospital, Ankara, TURKEY

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ABSTRACT Ganglion cyst is a benign mass which is filled with gelatinous fluid, the most common soft tissue tumor in the hand and wrist. In this article, we reported a 40-year-old male who had a ganglion cyst and presented with the ulnar neuropathy findings. Ultrasonographic (US) examination was performed on the patient who was resistant to the treatment. The ganglion cyst that compresses the ulnar nerve in the wrist was detected and aspirated by ultrasound guidance. After the aspiration, there was a significant improvement in the hand functions of the patient who was a musician and playing guitar. Diagnosis and US-guided aspiration of the wrist ganglion cyst is reliable, easy and quite effective with high patient satisfaction.

Keywords: Ganglion cyst; wrist; ulnar neuropathy; ultrasonography; aspiration

ÖZET Ganglion kisti, el ve bilekte en sık görülen yumuşak doku tümörü yerine jelatinimsi sıvıyla dolu benign bir kitledir. Bu yazıda, 40 yaşında, ganglion kisti olan ve ulnar nöropati bulgularıyla başvuran bir erkek hasta sunuldu. Tedaviye dirençli olan hastaya, ultrasonografik (USG) inceleme yapıldı. El bileğinde, ulnar siniri sıkıştıran ganglion kisti tespit edildi ve ultrason eşliğinde aspire edildi. Aspirasyon sonrası, müzisyen olan ve gitar çalan hastanın el fonksiyonlarında önemli iyileşme oldu. El bileği ganglion kistinin tanısı ve USG eşliğinde aspirasyonu güvenilir, kolay ve yüksek hasta memnuniyetiyle oldukça etkilidir.

Anahtar Kelimeler: Ganglion kisti; bilek; ulnar nöropati; ultrasonografi; aspirasyon

Ganglion cyst (GC) is a mucin-filled benign mass which is located adjacent to joints, ligaments, nerves and tendon sheaths. GC is one of the most common benign hand and wrist tumor. It can be seen at any age but, usually occurs in 20-40 years-old women. Although most of the GC in the wrist is on the dorsal side, it may also appear on the volar side up to 20%.[1] GC is usually asymptomatic, but it can cause swelling, pain, limitation of movement and difficulties in daily activities. If the GC compresses the surrounding structures such as arteries, veins, nerves or tendon sheaths, it may cause pain and interfere with certain activities.[2]

The diagnosis of GC is based on patient's history and physical examination. When there is no obvious swelling, the ultrasonography (US) and magnetic resonance imaging (MRI) become important for detecting the location of the cyst.

Ulnar nerve compression is the second frequent nerve entrapment seen in the upper extremity. Ulnar nerve may be compressed by a ganglion cyst with mechanical pressure. US can reveal deformities causing extraneural entrapment of nerves such as GCs, soft tissue tumors, fibrous bands, osseous pathologies.[3] In this report, we presented a 40 year-old musician with Guyon neuropathy due to GC. In

Correspondence: Cevriye MÜLKOĞLU
Clinic of Physical Medicine and Rehabilitation, Health Sciences University Ankara Training and Research Hospital, Ankara, TURKEY/TÜRKİYE
E-mail: drckaraca@hotmail.com

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the treatment-resistant patient, neuropathy due to GC was diagnosed by ultrasonography and successfully treated with ultrasound guided aspiration.

CASE REPORT

A 40-year-old male was admitted to outpatient clinic with the pain and numbness of the fourth and fifth fingers of the right hand for four months. The patient has also described weakness in his hand. There was difficulty holding up something heavy. He had no obvious swelling on his hand. He was a professional musician and playing guitar. There was a history of lifting heavy stone before a week ago from his complaints starting. On inspection, interosseous muscle atrophy was observed between the first and second fingers. Tinel's sign was bilaterally negative at the wrist. Hypoesthesia was determined at the fourth, fifth fingers and adductor muscles strength was assessed as 4/5 according to Medical Research Council scale. Electrophysiological evaluation revealed ulnar neuropathy at the Guyon's canal on the right hand and the patient was admitted to a physical therapy programme including transcutaneous electrical nerve stimulation, paraffin and US (Table 1). Despite two weeks of physical therapy, the patient's complaints did not relieve. Therefore, US was performed and a 6x8.5 mm GC was detected at the volar side of the wrist. The cyst was between the ulnar artery and the ulnar nerve and compressing the ulnar nerve towards the pisiform bone (Figure 1). US also revealed anatomical variation of bifid median nerve and persistent median artery. The diagnosis of GC was supported by MRI, without any other soft tissue pathologies. After the diagnosis, aspiration of GC was planned because the patient did not prefer a surgical excision. US-guided aspiration was performed from the volar aspect of the hand. Following the cyst aspiration, the patient's symptoms alleviated significantly. At 8 weeks of follow-up, it was shown that the size of cyst was decreased to 4.4x3.7 mm and patient's symptoms were relieved (Figure 2). The quick disabilities of the arm, shoulder and hand (DASH) score decreased from 84 to 31.8 and Quick DASH-work score declined from 75 to 25. The pain score evaluated with visual analog scale was also decreased from 7 to 2.

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

DISCUSSION

GC is a benign mass filled with gelatinous mucopolysaccharide fluid associated with joint capsule, tendon or nerve sheaths. GC is often due to excessive use of the joints. It is the most common soft tissue tumor in the hand, wrist and foot. Although GC within the body occurs 60-70% in the dorsal aspect of the wrist, it can also be seen on the volar side up to 13-20%.[1,4] Commonly, it occurs among young women, keyboard users, gymnastics and lace workers. Pain due to GC occurs by pressure of the surrounding arteries, tendons or nerves. Although GC is mostly asymptomatic, large cysts may cause pain, swelling and restriction of joint motions and interfere with daily activities poorly. If there is no swelling, the diagnosis of GC is difficult and in case of doubt for GC, imaging became important. As a matter of fact, the ganglion cyst was not detected on the physical examination because there was no obvious

TABLE 1: Electrophysiological studies of the patient.

	Amplitude (mV)		Velocity (m/s)		Distal latency (ms)	
Nerve	R	L	R	L	R	L
Ulnar, motor (hypothenar)	4.5	7.2	46.2	58.8	3.9	3.2
Ulnar, sensory (fifth digit)	7.9	25.9	63.0	65.0	3.4	3.0
Median, motor (thenar)	10.1	10.2	62.5	62.4	3.2	3.1
Median, sensory (second digit)	19.2	19.1	51.2	51.3	2.5	2.6

R: Right hand; L: Left hand.

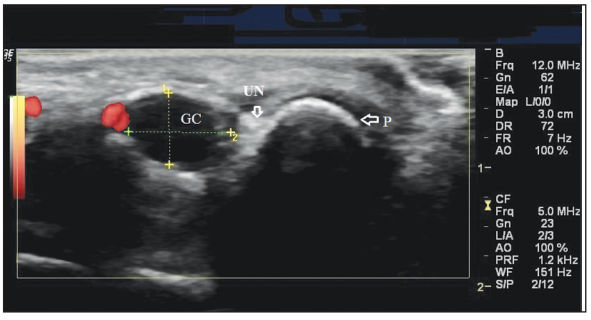

FIGURE 1: Ultrasonographic image of cyst before aspiration.
GC: Ganglion cyst; UN: Ulnar nerve; P: Pisiform bone.

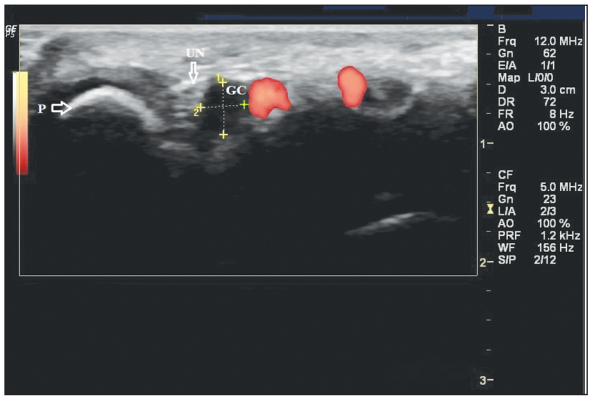

FIGURE 2: After the aspiration, the size of cyst was decreased.
GC: Ganglion cyst; UN: Ulnar nerve; P: Pisiform bone.

swelling in the dorsal or volar side of the wrist in the patient we presented. This caused the patient to resist treatment. Primary treatment of GC is conservative because of about 50% may disappear spontaneously. Conservative treatment includes resting of hand, reassurance, observation, aspiration and steroid injection. Our patient wanted to recover as soon as possible and rejected surgery, we recommended aspiration of GC with US-guidance. GC was aspirated successfully and safely with US-guided technique. After the intervention, the patient stated that the method was quite comfortable and satisfactory. Classically, there is as high as 78% risk of recurrence despite conservative measures.[5] But in these studies aspiration was performed as office-based without additional imaging methods.[1] US-guided aspiration was conducted in our patient without detriment to neurovascular structures at the wrist by seeing the localization of the needle. It is a non-invasive, reliable, and highly satisfactory method for patients.

The ulnar nerve is compressed in the upper extremity mostly on elbow and secondly on the wrist.[3] GCs, hook of hamate fracture or displacement, tumors (e.g., lipoma), repetitive trauma, aberrant muscle or excess fat tissue within the canal, ulnar artery thrombosis or aneurysm (e.g., hypothenar hammer syndrome) may result in comppression of ulnar nerve at the wrist. It is estimated that approximately 30% to 40% of cases with Guyon's canal syndrome depend on GCs.[6] Shea and McClain proposed a classification of the lesions of ulnar nerve in the Guyon's canal into three types based on the site of ulnar nerve compression. Type I: Compression of ulnar nerve just in the beginning of Guyon's canal- proximal from the subdivision of the nerve, causing sensory loss and motor weakness. Type II: Compression of the deep motor branch of the ulnar nerve, leading to motor deficits associated with muscles supplied by this branch. Type III: Compression of the superficial sensory branch of the ulnar nerve, which leads to only sensory deficits.[7] In our patient, Type I compression was detected, both numbness of 4-5th fingers and muscle weakness was observed at his affected hand. The patient we present here had treatment-resistant ulnar neuropathy at the right hand. As the complaints of the patient were not improved despite the physical therapy, we evaluated the patient with US and detected a GC which pushes up the ulnar nerve towards to the pisiform bone.

Surgical excision is necessary in case of the cysts do not respond to conservative treatment and the size of the cyst increases drastically, becomes symptomatic and causes difficulties in daily activities, cosmetic concerns. Surgical excision of GC can be performed openly or arthroscopically.[5,8] Arthroscopic excision is indicated only for dorsal GC and has a recurrence rate of 0-17%.[5] Head and et al. showed that 6%, 21%, 59% recurrence rates of arthroscopic surgery, open surgery and aspiration, respectively, in a systematic analysis.[9]

Our patient did not prefer open surgery because of personal reasons. Additionally, due to existence of GC on the volar side, it was not suitable for arthroscopic intervention.

Wrist GC should be kept in mind in patients with ulnar neuropathy findings. US is an important imaging method in diagnosis of the GC. Additionally, aspiration of the wrist GCs may be performed by

using real-time imaging with US and treatment of the cyst can be made successfully and safely.

Source of Finance

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

All authors contributed equally while this study preparing.

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