

Cubital tunnel syndrome with small occult ganglion: A case report of bike rider

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Abstract

Cubital tunnel syndrome, the second-most common peripheral compression neuropathy, is associated with dynamic pressure in the cubital tunnel with the elbow flexion position. Medial elbow ganglion originated from the ulnohumeral joint causing cubital tunnel syndrome has been reported. This report describes the case of a 48-year-old man who developed numbness in his left ring and little finger after prolonged motorbike touring. He gradually showed decreased hand grip strength with medial elbow joint pain. Ultrasonography and magnetic resonance images revealed small occult ganglion at the medial side of elbow joint. Surgical resection of ganglion and ulnar nerve decompression relieved the ulnar neuropathy symptom. Prolonged motorbike riding while maintaining the elbow flexion position might exacerbate the symptom of cubital tunnel syndrome in patients with even a small space-occupying lesion such as the small occult ganglion.

Keywords

Orthopedics, rehabilitation, occupational therapy, cubital tunnel syndrome, motorbike, ganglion, complications, elbow flexion

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Introduction

Cubital tunnel syndrome, the second-most frequent entrapment neuropathy in the upper extremity,¹ is associated with dynamic pressure in the cubital tunnel with prolonged elbow flexion.^{2–4} The traction on the ulnar nerve with elbow flexion is a major cause of increased intraneural pressure.² Ganglion cysts can be found in any joint of the body, but ganglia around the elbow joint are rare.^{5,6} Occult ganglia might also contribute to entrapment neuropathy without a visible or palpable mass.⁵ Medial elbow ganglion that originate from the ulnohumeral joints, causing cubital tunnel syndrome, has already been demonstrated. The incidence among patients with cubital tunnel syndrome caused by ganglion cyst has been reported from <3%–8%, they have been rarely reported.^{5,6} Earlier studies evaluated musculoskeletal problems associated with motorcycle riding.^{7–10} A few reports of earlier studies have described the association between carpal tunnel syndrome (CTS) and chronic exertional compartment syndrome related to motorcycle sports.^{7–10} Nevertheless, no report has described about the exacerbation of symptom of cubital tunnel syndrome with occult medial elbow ganglion after prolonged motorbike riding. This report describes that an unusual case of worsening the symptoms of cubital tunnel

syndrome with small occult ganglion in the median elbow joint after prolonged motorbike touring.

Case report

A 48-year-old man, a desk worker, was referred to our hospital for evaluation of a history of numbness in his left ring and little finger and the ulnar side of the hand, which lasted for 3 weeks, in addition to a history of gradually decreased hand grip strength and medial side pain of the left elbow joint. The patient had a medical history of hyperuricemia. He had no upper extremity trauma or surgery. He occasionally rode a motorcycle as a hobby. The day before the onset of his symptoms of numbness in his left ring and little finger and the ulnar side of the hand, he had taken part in a 400-km motorcycle ride. Physical examination revealed no cubitus varus or

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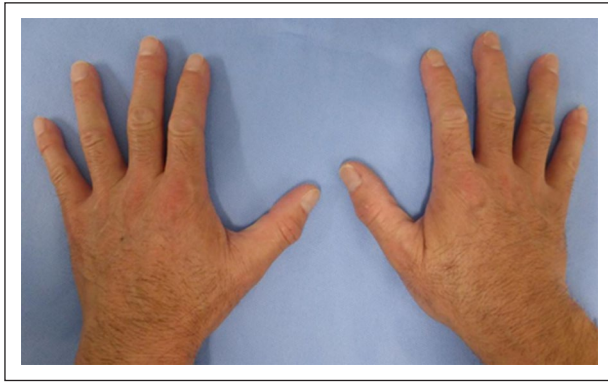


Figure 1. Mild atrophy of the dorsal and palmar interosseous muscles was found in the left hand.

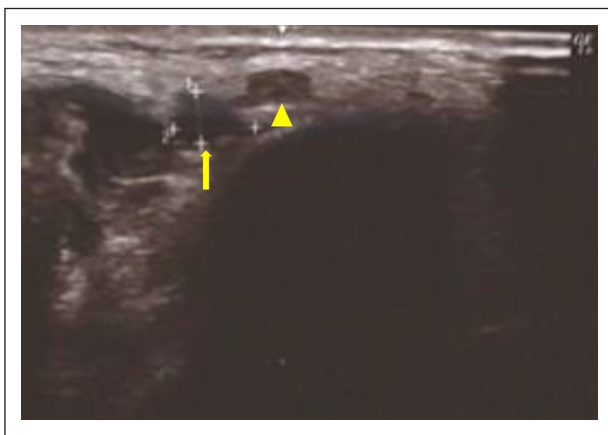


Figure 2. Axial view obtained using ultrasonography shows the occult ganglion (arrow) and the ulnar nerve (arrowhead) at the level of the medial epicondyle.

valgus deformity in the left elbow. Active elbow flexion was up to 140° ; extension was 0° with no instability. The range of forearm motion was 80° for pronation and 90° for supination. Tinel test results were positive at the cubital tunnel and negative at the Guyon tunnel. Before and after performing the elbow flexion test as a provocative test for cubital tunnel syndrome,³ his numbness symptom of the left hand was almost unchanged. However, a shoulder internal test⁶ worsened his numbness of the left hand. His left hand showed mild clawing of the fourth and fifth fingers with weakness in the abductor digiti minimi, and in abduction and adduction of the fingers. Atrophy of the dorsal and palmar interosseous muscles was found (Figure 1). The grip and key pinch strengths of the affected hand were 27.5 and 6.0 kg, whereas those of the unaffected hand were 45 and 10.0 kg, respectively. Froment's sign was positive on the left hand. Radiographs of the left elbow showed slight sharpness of the coronoid process. Ultrasonographic (US: LOGIQe; GE Healthcare, USA) examination (Figure 2) and magnetic resonance imaging (MRI: AchievaTM; Philips Healthcare, Best, Netherlands; Figure 3) showed an occupied lesion inside the ulnar nerve at the medial epicondyle of the humerus. Nerve conduction

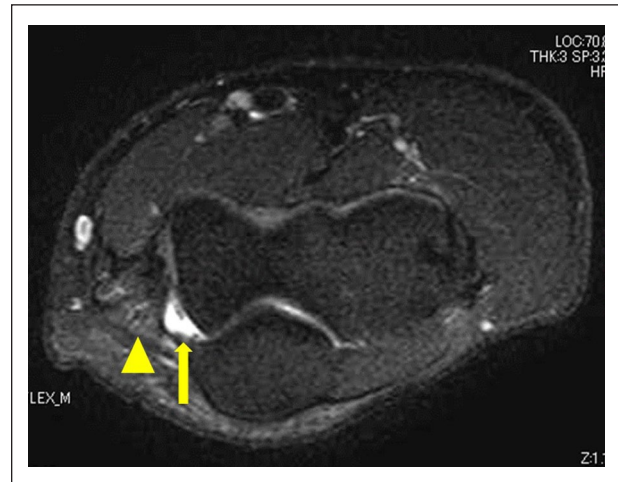


Figure 3. Axial view obtained using MRI shows the occult ganglion (arrow) inside the ulnar nerve (arrowhead) at the level of the medial epicondyle.

study results indicated the motor nerve conduction velocity of the ulnar nerve on the affected side as 40.2 m/s between the upper elbow and the below elbow, compared to 54.4 m/s on the unaffected side. The sensory nerve conduction velocity on the affected side was 45.5 m/s between the upper elbow and below the elbow compared to 55.0 m/s on the unaffected side. Clinical and electrophysiological findings led to our diagnosis of cubital tunnel syndrome caused by small occult ganglion and traction stress to the ulnar nerve caused by prolonged motorcycle posture. He was treated with open cubital tunnel release under general anesthesia. The ulnar nerve was compressed by Osborn's ligament, which was apparently harder and thicker than normal (Figure 4(a)). Neuroedema of the ulnar nerve caused by compression was found at the proximal position of the fibrous bundle (Figure 4(b)). Decompression was performed by releasing Osborn's ligament. We tried to resect the small ganglion en bloc. However, the ganglion was ruptured (Figure 4(c)). Subcutaneous anterior transposition of the ulnar nerve was performed and covered by a pedunculated fat flap. At the final follow-up, the grip and key pinch strengths of the affected side at 20 months after operation were restored to 46 and 12 kg, respectively, compared to 27 and 6.0 kg on the affected side before operation. The sensory disturbance of the ring and little finger and the ulnar side of the hand were relieved compared to those before operation. An electrophysiological study revealed recovery of the ulnar nerve function. The motor and sensory nerve conduction velocities were 50.5 and 53.8 m/s between the upper elbow and below the elbow, respectively.

Discussion

The patient examined in this case presented sensory and motor deficits of the ulnar nerve after prolonged motorbike touring. He had a small occult ganglion cyst at the medial elbow joint. Ganglion cysts compressing the ulnar nerve in

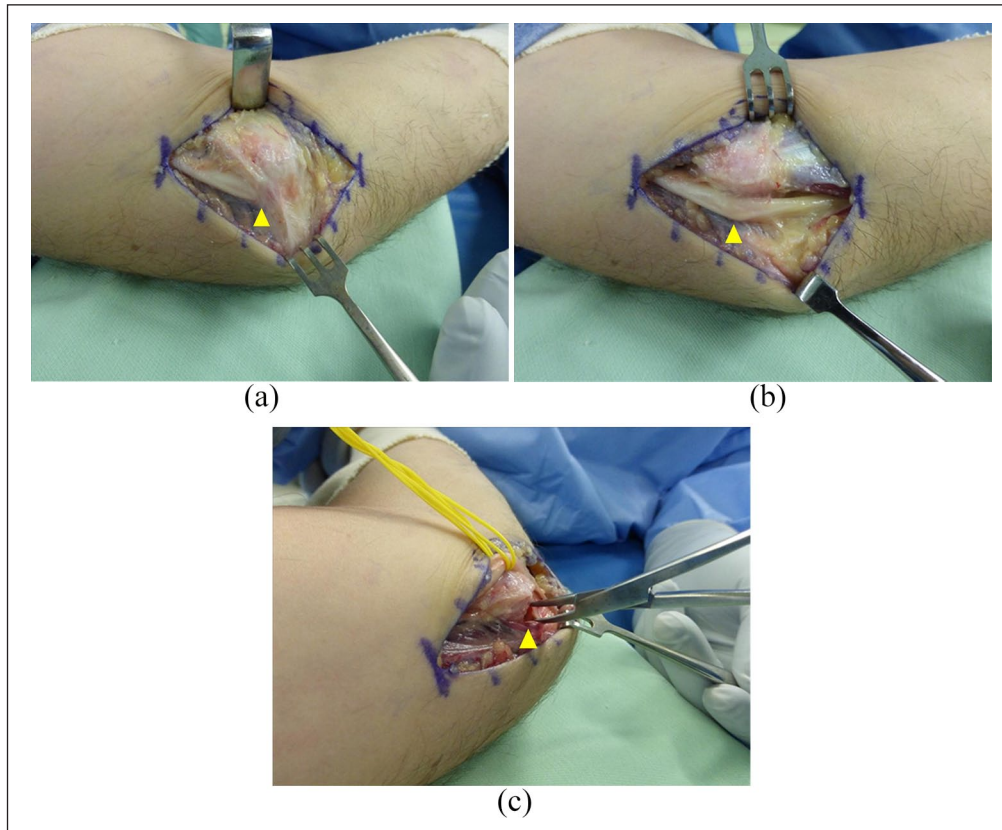


Figure 4. (a) The ulnar nerve was compressed by the Osborn ligament over the flexor carpi ulnaris (FCU) (arrow). (b) Decompression was performed by releasing the Osborn ligament and FCU fascia. Neuroedema of the ulnar nerve (arrowhead) caused by compression was found at the proximal position of the fibrous bundle. (c) We tried to resect the small ganglion as en bloc. However, the ganglion was ruptured (arrowhead).

the cubital tunnel are a rare condition. They can cause acute onset of cubital tunnel syndrome.^{5,6} The patient in our case had no subjective symptom of ulnar neuropathy before prolonged motorbike touring. The trigger of onset of subjective symptom of cubital tunnel syndrome might be the long maintenance of the bike riding posture while having the small occult ganglion cyst of his medial elbow. Earlier studies demonstrated the suspected pathophysiology of cubital tunnel syndrome such as a decrease in the cubital tunnel volume, an increase of pressure on the ulnar nerve in the cubital tunnel, and traction of the ulnar nerve with elbow flexion.^{1-4,11,12} Apfelberg and Larson¹⁰ demonstrated that the cubital tunnel can flatten and narrow by 55% with elbow flexion by stretching of the aponeurosis and by the innate tightness of the arcuate ligament, the tunnel, and elongation of the ulnar nerve with elbow flexion. Gelberman et al.² found from a cadaver study that extraneural pressure measurements increased from 7 to 28 mmHg with flexion and that intraneural pressure measurements increased from 8 to 41 mmHg with flexion. Prolonged motorbike touring while maintaining the elbow flexion position might stress the ulnar nerve in the cubital. Elbow osteoarthritis is a common cause of cubital tunnel syndrome.⁵ Also, ulnar nerve traction or friction because of

medial osteophytes during elbow flexion and compression by medial osteophytes might be causative factors for cubital tunnel syndrome in the osteoarthritic elbow.¹² Even space-occupying lesions such as small occult ganglion of the elbow joint, as in our case, might cause the onset of cubital tunnel syndrome. The osteophyte complicated the elbow arthritis under holding of the elbow flexion position for long duration might also cause the onset of cubital tunnel syndrome. Prior study demonstrated the characteristic clinical symptoms of the patient with cubital tunnel syndrome associated with a medial elbow ganglion: intolerable medial elbow pain and a sudden onset of elbow pain or numbness in the ring and little finger caused by local compression of the ulnar nerve by a ganglion in the cubital tunnel that had narrowed as a result of osteoarthritic changes.⁵ From the onset of the symptom point of view, we speculated that the medial occult ganglion was a direct causative factor of cubital tunnel syndrome and the symptom of cubital tunnel syndrome such as numbness was exacerbated by the prolonged motorbike touring forced to flex the elbow joint for a long time. However, our case had the mild atrophy of the dorsal and palmar interosseous muscles and weakness of the grip and key pinch strength at initial presentation. Mallette et al.¹³ demonstrated that hand muscle

atrophy at initial diagnosis of cubital tunnel syndrome was four times more common than in CTS and speculated that the involvement of the ulna nerve aspect of the hand was less notable, less bothersome, or less worrisome to patients than involvement of median nerve aspect. In our case, the motor nerve might be continued to take damage by the compression of occult ganglion for a while. Prolonged motorbike touring might make the involvement of the ulna nerve aspect of the hand more notable, more bothersome to the patients. As the result, he might visit our hospital at more advanced stage of cubital tunnel syndrome.

Our experience shows that attention must be devoted to the deterioration of cubital tunnel syndrome, especially for long-distance motorcycling enthusiasts.

Prior studies demonstrated the complication related to motorcycle ridings.

Sabeti-Aschraf et al.⁷ investigated prospectively the occurrence of CTS in 128 competitive Enduro motorcyclists. More than 50% of all riders had the transient CTS symptom. Gondolini et al.⁸ evaluated the results of mini-open fasciotomy in high-level motorcycling or motocross riders with chronic exertional compartment syndrome at long-term follow-up. In motocross racers, chronic exertional compartment syndrome can occur in the muscles of the lower arm. We have to take care of these complications related with motorcycle riding in mind.

Conclusion

This report describes a patient who had a small occult ganglion cyst in the medial elbow joint, with cubital tunnel syndrome exacerbated by the prolonged motorbike touring. Our case provides insight into a possible new association between the exacerbation of the symptom of cubital tunnel syndrome with medial elbow occult ganglion and motorcycle riding forced to flex the elbow joint for a long time.

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Declaration of conflicting interests

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Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

Informed consent

Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article.

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