



# Symptomatic Elbow Ganglion Causing Pronator Syndrome

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**Summary:** Descriptions of ganglion cysts date back to 400 BC. Ganglions causing peripheral nerve compression have been described most notably at the wrist. Ganglion compression of the median nerve at the elbow is rare. We report a case of a palmar elbow ganglion causing median nerve compression and the clinical presentation of pronator syndrome. After removal of the ganglion and median nerve decompression, the patient's symptoms fully resolved. (*Plast Reconstr Surg Glob Open* 2014;2:e109; doi: 10.1097/GOX.000000000000046; Published online 18 February 2014.)

**H**ippocrates described ganglion cysts as “knots of tissue containing mucoid flesh.”<sup>1</sup> Ganglions are most commonly found on the wrists and fingers but can also develop on the shoulder, elbow, and knee. Ganglions may arise from joint synovium or may communicate with tendon sheaths, tendons, nerves, or joints.<sup>2</sup>

Ganglions causing peripheral nerve compression are well recognized. The earliest report of compression, by Brooks<sup>3</sup> in 1952, described 13 cases involving compression of the ulnar nerve at the wrist and elbow, the median nerve at the wrist, and lateral popliteal and tibial nerve.

Shortly after Brooks,<sup>3</sup> Seddon<sup>4</sup> described ganglionic compression of the deep branch of the ulnar nerve at the wrist. Others have since reported similar nerve compressions at the wrist from ganglions, including cases of carpal tunnel syndrome.<sup>5</sup>

Peripheral nerve compression secondary to elbow ganglions has also been described, most notably radial nerve compression.<sup>6</sup> Kato et al<sup>7</sup> reported

a case of cubital tunnel syndrome due to a medial elbow ganglion compressing the ulnar nerve. The following case describes an elbow ganglion causing median nerve compression resulting in pronator syndrome.

## CASE REPORT

A 62-year-old, right-handed tennis professional developed worsening pain in the proximal, palmar, dominant forearm with intermittent numbness in the median nerve distribution. Both pain and numbness progressed to constant symptoms over 2 months. He was unable to hold a tennis racket. On physical examination, static 2-point discrimination was 20 mm over the median nerve distribution of the forearm and 15 mm over the thenar eminence, as compared with 10 and 6 mm, respectively, on the unaffected extremity. A Tinel's sign was not elicited on examination. No thenar muscle wasting was noted and strength was preserved. The patient's pain was notably worse with active pronation and passive supination. There was significant tenderness on palpation of the proximal pronator teres muscle. He lacked the last 15 degrees of elbow extension, presumably secondary to osteoarthritis seen on plain x-ray.

Electrodiagnostic testing was performed. There was no evidence of median neuropathy at the wrist or other upper extremity mononeuropathy or of a cervical radiculopathy. However, needle examination revealed increased motor amplitude in the

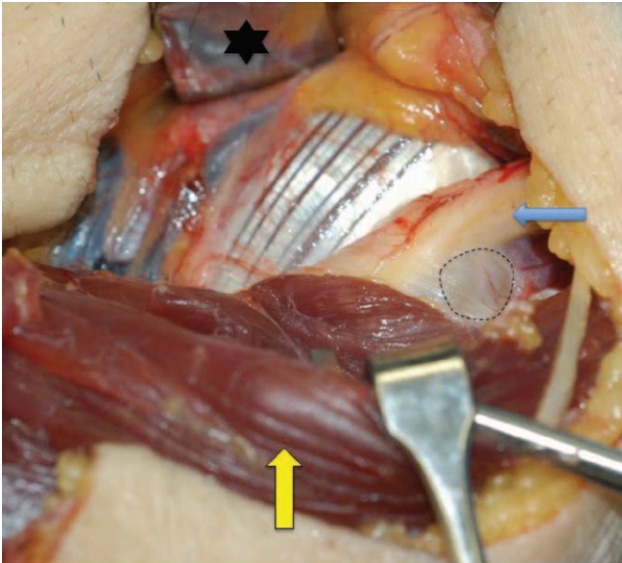
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**Fig. 1.** Elbow ganglion causing compression of the median nerve. Right forearm showing median nerve (blue arrow) progressing from proximal (right) to distal (left) between the heads of the pronator teres muscle (yellow arrow). The brachial artery is retracted (asterisk). A ganglion (dotted outline) arises from the elbow joint, compressing the median nerve from the deep side.

flexor digitorum profundus. Chronic reinnervation of this muscle, innervated by the anterior interosseous nerve, suggested likely compression of this nerve branch at the level of the pronator teres muscle.

Surgical exploration of the proximal forearm identified compression of the median nerve in the region of the heads of the pronator teres. A 2-cm palmar-facing ganglion from the elbow joint caused tenting of the median nerve (Fig. 1). The nerve was narrowed and fibrotic in the region of the ganglion. In addition to ganglion resection to the level of the elbow capsule, tendinous fibers of the deep head of the pronator were divided.

At 2 weeks postoperatively, the patient reported noteworthy subjective sensory improvement with resolution of pain. One year postoperatively, his arm remained pain free and sensation was subjectively normal. Physical examination revealed normalized 2-point discrimination over the region of the median nerve in the forearm and hand. The patient had resumed teaching tennis with good function.

## DISCUSSION

This case describes an elbow ganglion causing median nerve compression and presenting as pronator syndrome. Valbuena et al<sup>8</sup> described a similar median neuropathy secondary to compression by a giant lipoma. Similarly, others have described various extraneural soft-tissue tumors at the elbow causing

both ulnar and median nerve palsies.<sup>9</sup> In this case, we surmise that the progression of median neuropathy from intermittent to constant was directly related to increasing compression from an enlarging elbow ganglion. Similar to authors reporting cases of peripheral neuropathy due to compression from other soft-tissue tumors, we advocate surgical decompression with removal of the mass.

Pronator syndrome typically presents with paresthesias in the thumb, index, middle, and radial ring fingers. Since the palmar cutaneous branch of the median nerve originates proximal to the transverse carpal ligament, evaluating for decreased sensation in the skin overlying the thenar eminence is important in distinguishing pronator syndrome from a more distal median nerve compression.<sup>10</sup>

Diagnosing pronator syndrome can be difficult as there is a lack of dependable objective testing. For instance, electrodiagnostic studies are typically normal.<sup>10</sup> Variability in patient symptoms can further complicate the diagnosis.

## CONCLUSIONS

It is essential that clinicians be aware of elbow ganglions as a potential cause for peripheral nerve neuropathies as these are unlikely to improve without surgical management. Because the nerve is superficial to the ganglion, percutaneous drainage of the ganglion is not an option. With a high clinical suspicion for elbow soft-tissue mass compression, imaging studies, such as ultrasound, x-ray, and magnetic resonance imaging, may assist in making a diagnosis.<sup>1</sup> Ultimately, hand surgeons must be aware of peripheral nerve compression secondary to soft-tissue masses, such as ganglions, and be prepared for operative exploration and excision of the mass.

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