

A Ganglion Cyst Formed after Anterior Transposition of the Ulnar Nerve: A Case Report

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In this report, a case of a 70-year-old man with a large ganglion cyst formed after anterior transposition of the left ulnar nerve is presented. Three months after the index surgery, the patient presented with a painless superficial ovoid, soft mass measuring 5×4×2 cm in size located at the posteromedial aspect of the left elbow, the previously operated site. Magnetic resonance imaging showed a well demarcated cystic mass with a stalk connecting to the elbow joint. Excisional biopsy was performed and pathologic findings showed that the cystic wall had no definite lining cells with myxoid degeneration compatible with findings of ganglion cyst.

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Key Words: Ulnar nerve; Cubital tunnel syndrome; Subcutaneous anterior transposition; Ganglion cysts

Cubital tunnel syndrome (CuTS) is the second most common compression peripheral neuropathy in upper extremity following carpal tunnel syndrome.¹⁻⁷⁾

The floor of the cubital tunnel (CuT) is formed by the capsule of the elbow, the posterior and transverse parts of the medial collateral ligament (MCL).^{5,8)} The floor tissue can be injured during surgical release of adhesion between the nerve and the CuT floor tissue. Cyst formation by one way valve mechanism as a postoperative complication after anterior transposition of the ulnar nerve is a possibility.

No case of a ganglion cyst, a rare cause of CuTS,^{3,4,6,9)} presenting as a postoperative complication of anterior transposition of the ulnar nerve has been reported.

In this report, a case of a 70-year-old man with a large ganglion cyst after anterior transposition of ulnar nerve is presented with related literature.

Case Report

A 70-year-old man presented with a chief complaint of paresthesia in the left little and ring fingers for 1 year. His past medical history included hypertension and an intramedullary nailing

surgery for a left humeral shaft fracture 16 years ago. On visual inspection, he had muscle wasting in the left 1st web space and hypothenar muscles. Gabel and Amadio's score was 4 on physical examination. The elbow radiographs showed no specific findings except an intramedullary nail in the humerus. He underwent subcutaneous anterior transposition of the ulnar nerve under the diagnosis of CuTS confirmed with electromyography and nerve conduction velocity studies. There were no specific findings except the thickened CuT retinaculum and hypertrophy of the ulnar nerve.

At 3 months after surgery, he revisited with a left elbow mass lasting 2 months. Although his ulnar nerve symptoms of the hand had improved, he complained of a painless and growing mass at previously operated site. Gabel and Amadio's score was 4. The mass was ovoid and superficial, measuring 5×4×2 cm in size located at the posteromedial aspect of the elbow. On palpation, of the mass, soft, movable and mild tenderness was detected. The range of motion was normal. The radiographs showed no significant changes from previous ones. On the magnetic resonance imaging (MRI, 1.5 T; GE Healthcare, Milwaukee, WI, USA), the mass measured 9.0×4.2×2.7 cm in size and was located between the medial side of the distal triceps muscle

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and subcutaneous layer. It also extended approximately 9 cm proximal to the elbow and distal 2 cm to the joint. It was well demarcated and showed low signal intensity on T1-weighted images (WI), high signal intensity on T2-WI and no contrast-enhancement. The transposed ulnar nerve was seen in the anterior portion of the mass on axial images and demonstrated low signal intensity in T1-WI and T2-WI. The stalk connecting the mass with the elbow joint was observed at just the posterior aspect of the medial epicondyle (Fig. 1).

Excisional biopsy was performed after 1 month following observation. An incision was made along the previous operation scar at the posteromedial aspect of the elbow and dissected carefully after identifying the previously transposed ulnar nerve. On operative findings, clear yellowish fluid was observed in the mass and a stalk was located just posterior to the medial epicondyle. Ligation was performed for the stalk. There were no problems in the course of the nerve and its fascial sling.

On pathologic findings of staining with H&E, the cystic wall showed myxoid degeneration without definite lining cells (pseudocapsule)

(Fig. 2). These findings were compatible with ganglion cyst.¹⁰⁾

A posterior long arm splint was applied with 90 degrees flexion and neutral position of the elbow. Active stretching exercises were started after 3 weeks. The patient presented no elbow instability and no recurrence of the mass at the one-year follow-up.

Discussion

From the case presented, there are two distinct features. First, a large ganglion cyst was formed at the elbow as a postoperative complication after anterior transposition of the ulnar nerve. Second, in spite of a large ganglion cyst as a postoperative complication, ulnar nerve symptoms did not show deterioration.

CuT is the most common site of ulnar nerve compression neuropathy at the elbow.⁵⁾ Elbow flexion causes dynamic compression of the ulnar nerve due to the reduction in volume of the CuT.⁶⁾ Static compression can occur by space-occupying le-

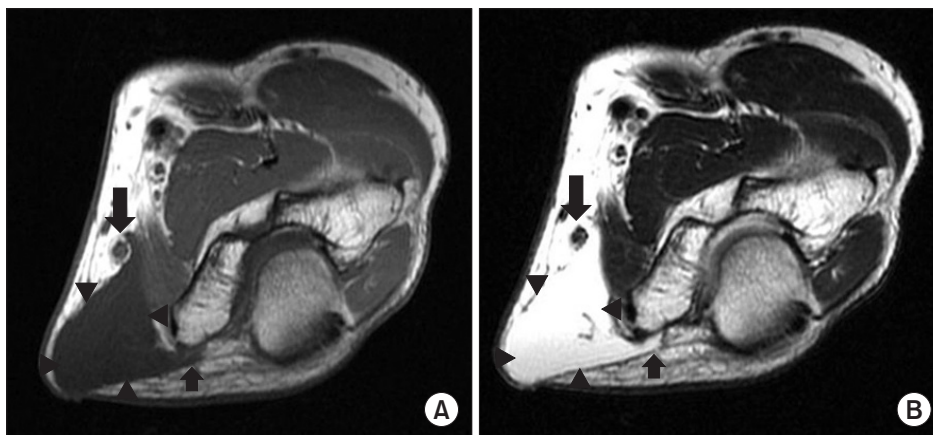


Fig. 1. The axial images show a well demarcated mass (arrowheads) with low signal intensity on a T1-weighted image (A) and high signal intensity on a T2-weighted image (B). Transposed ulnar nerve (long arrows) and the stalk (short arrows).

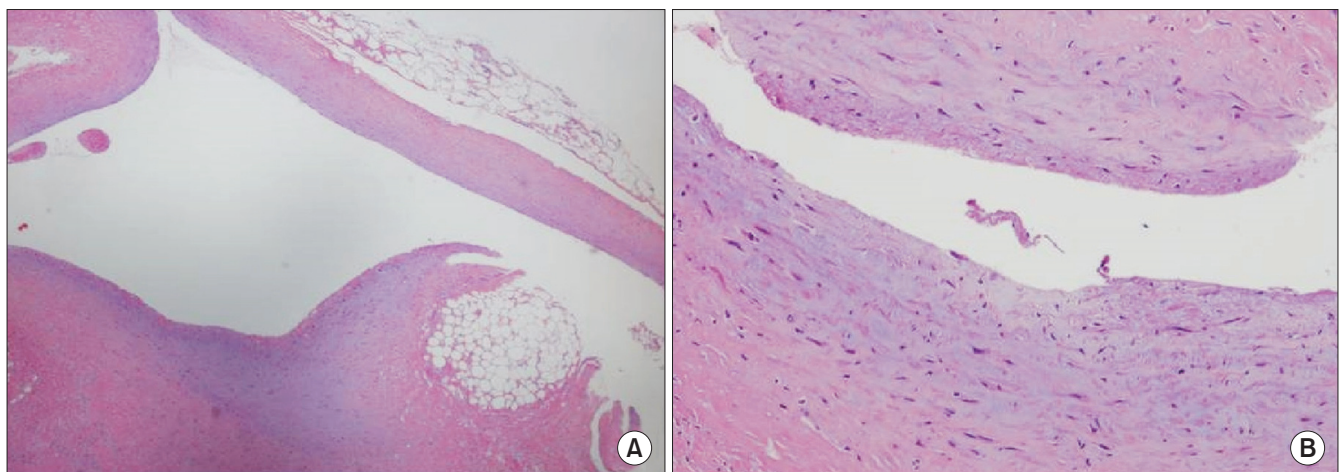


Fig. 2. Pathologic findings show that the cystic wall has myxoid degeneration without definite lining cells (pseudocapsule) (A: H&E, $\times 40$; B: H&E, $\times 200$).

sions in the CuT.³⁾ A ganglion cyst can give rise to CuTS as a rare cause. Several journals reported prevalence of a cyst in CuTS from 3% to 8%.⁴⁾ However, no cases of a postoperative ganglion cyst after anterior transposition of the ulnar nerve were reported. Only Bartels et al.⁷⁾ reported a seroma after simple decompression for CuTS. A seroma is a pocket of clear serous fluid that sometimes develops in the body after surgery. When small blood vessels are ruptured, blood plasma can seep out and inflammation caused by dying injured cells also contributes to the fluid.

Among the various surgical techniques for the CuTS, simple decompression and anterior transposition of the ulnar nerve are most commonly used.^{1,5,7)} It is generally accepted that patients with minor or moderate symptoms are treated by simple decompression, whereas patients with severe symptoms are more often treated by anterior transposition.^{2,5)} Subcutaneous anterior transposition of the nerve was decided for the presented case and the nerve was released and mobilized from adhesion of adjacent tissues in CuT.

The roof of CuT is formed by CuT retinaculum and the deep layer of flexor carpi ulnaris aponeurosis.⁸⁾ The retinaculum is attached to the medial epicondyle and the olecranon tip.⁸⁾ The floor of the tunnel is formed by the capsule of the elbow and the posterior and transverse parts of the MCL.⁸⁾ The floor tissue can be injured during surgical release of adhesion. In this case, MRI and operative findings showed that the large ganglion cyst was connected by a stalk with the elbow joint at just posterior to the medial epicondyle. Authors thought soft tissue redundancy in an old patient, an injury to the floor (MCL and capsule) and one way valve mechanism were possible causes of the ganglion cyst in this patient.

This case suggests that the operator should release the adhesion carefully, especially the floor of CuT during surgery for CuTS and warns of development of a ganglion cyst before surgery as a postoperative complication.

References

1. Soltani AM, Best MJ, Francis CS, Allan BJ, Panthaki ZJ. Trends in the surgical treatment of cubital tunnel syndrome: an analysis of the national survey of ambulatory surgery database. *J Hand Surg Am.* 2013;38(8):1551-6.
2. Gervasio O, Gambardella G, Zaccone C, Branca D. Simple decompression versus anterior submuscular transposition of the ulnar nerve in severe cubital tunnel syndrome: a prospective randomized study. *Neurosurgery.* 2005;56(1):108-17.
3. Li Y, Lao J. The cubital tunnel syndrome caused by the two synovial cysts. *J Plast Reconstr Aesthet Surg.* 2012;65(6):827-9.
4. Kato H, Hirayama T, Minami A, Iwasaki N, Hirachi K. Cubital tunnel syndrome associated with medial elbow Ganglia and osteoarthritis of the elbow. *J Bone Joint Surg Am.* 2002;84(8):1413-9.
5. Cutts S. Cubital tunnel syndrome. *Postgrad Med J.* 2007; 83(975):28-31.
6. Cha SM, Kim KC, Kang DH, Shin HD. Clinical outcomes of cubital tunnel syndrome after transmuscular anterior transposition of the ulnar nerve. *Clin Shoulder Elbow.* 2011;14(2):207-13.
7. Bartels RH, Verhagen WI, van der Wilt GJ, Meulstee J, van Rossum LG, Grotenhuis JA. Prospective randomized controlled study comparing simple decompression versus anterior subcutaneous transposition for idiopathic neuropathy of the ulnar nerve at the elbow: part 1. *Neurosurgery.* 2005;56(3):522-30.
8. O'Driscoll SW, Horii E, Carmichael SW, Morrey BF. The cubital tunnel and ulnar neuropathy. *J Bone Joint Surg Br.* 1991; 73(4):613-7.
9. Park KJ, Cha YC. Ulnar nerve palsy caused by a ganglion at the elbow: two case report. *J Korean Shoulder Elbow Soc.* 2004; 7(2):108-11.
10. Rosai J. Rosai & Ackerman's surgical pathology. Volume 2. 10th ed. New York: Mosby; 2011. 2070-71.