Musculoskeletal images. Ganglion cyst of Guyon's canal causing ulnar nerve compression

A 48-year-old man presented complaining of pain in the right little finger for 2 months, associated with clawing and paresthesia in the ring and little fingers. Physical examination revealed muscular wasting of the interossei and the hypothenar eminence, and grade M3 (MRC classification) weakness isolated to the ulnar-innervated intrinsic muscles of the hand. Sensory function in the hand was normal.

Electromyographic nerve conduction studies revealed a marked reduction in amplitude of the right ulnar motor response to the abductor digiti minimi and the first dorsal interosseus muscles, with prolonged distal motor latency, indicating slow conduction distally through the wrist and hand. Ultrasonography demonstrated a ganglion cyst within Guyon's canal arising from the pisiform-triquetral joint, impinging

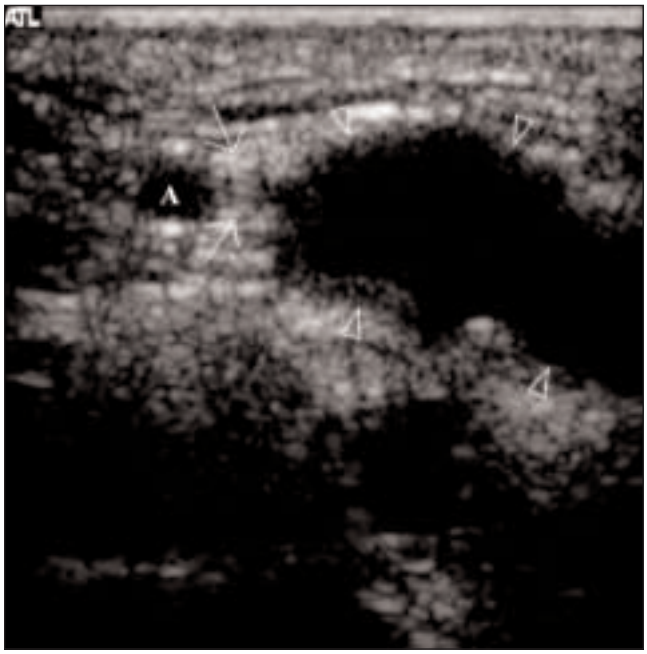

FIG. 1. A ganglion cyst of Guyon's canal demonstrated by ultrasonography. This axial image shows the cyst (arrowheads) abutting the ulnar nerve (white arrows). A = radial artery.

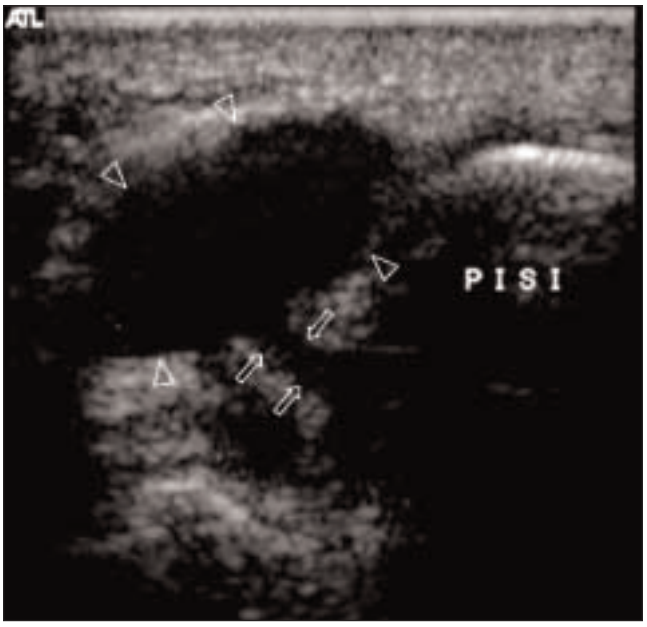

FIG. 2. The parasagittal image demonstrates the ganglion cyst (arrowheads). The neck of the ganglion (open arrows) is clearly seen to arise from a deep connection with the pisiform (PISI)-triquetral joint.

Section editor: Norman S. Schachar, MD

Submitted by David A. Elias, MB BS, Mathew J. Lax, MD,* and Dimitri J. Anastakis, MD,† from the *Department of Radiology, Mount Sinai Hospital and University Health Network, and the †Department of Surgery, University of Toronto, Toronto, Ont.*

Submissions to Surgical Images, musculoskeletal section, should be sent to Dr. Norman S. Schachar, Heritage Medical Research Building, 436–3330 Hospital Dr. NW, Calgary AB T2N 4N1; fax 403 270-0617

Correspondence to: *Dr. Mathew J. Lax, Staff Radiologist, Musculoskeletal Imaging, 5th Floor, Mount Sinai Hospital, 600 University Ave., Toronto ON M5G 1X5*

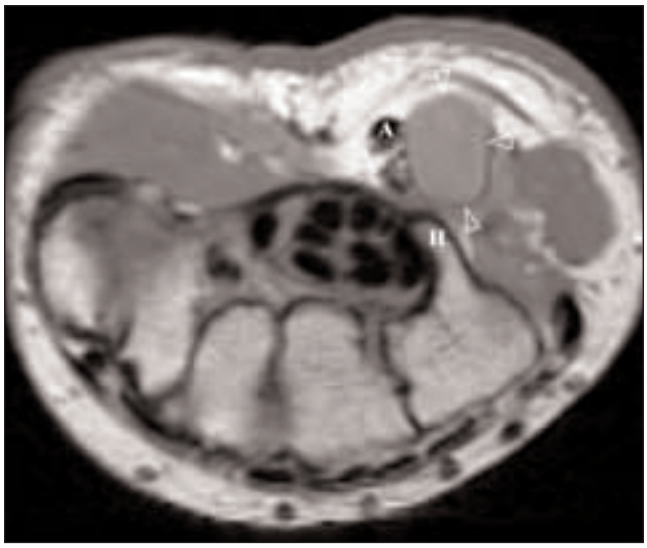

FIG. 3. An axial proton density magnetic resonance image from a similar patient demonstrates a ganglion cyst (arrowheads) in Guyon's canal deviating the ulnar nerve (white arrow). A = radial artery, H = hook of hamate.

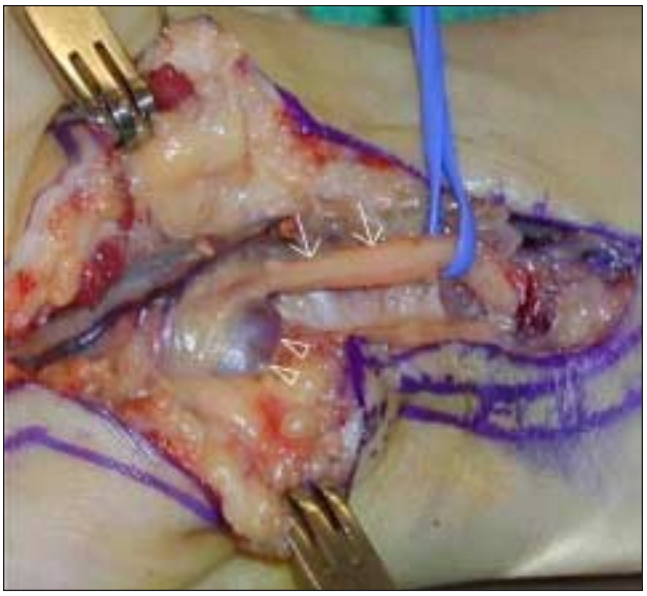

FIG. 4. Intraoperative view demonstrates the ulnar nerve (white arrow) stretched around the ganglion cyst (arrowheads).

on the ulnar nerve (Figs. 1 to 3).

Surgical exploration of Guyon's canal using an axillary block confirmed the presence of a ganglion (Fig. 4), which showed evidence of internal hemorrhage. It was seen to arise from the pisiform-triquetral joint and compressed the ulnar nerve proximal to the origin of its deep motor branch. The ganglion and its origin were excised.

At 4 weeks postoperatively, the patient's pain had resolved and motor function had recovered fully as is typical for this disorder.

Within the forearm the ulnar nerve supplies the flexor digitorum profundus IV and V and the flexor carpi ulnaris. Palmar and dorsal branches supply sensation to the ulnar sides of the palm and dorsum of the hand. The ulnar nerve then enters the wrist, passing through Guyon's canal along with the ulnar artery. The walls of this canal consist of the pisiform medially and the hook of the hamate laterally. The floor is formed by the flexor retinaculum and the roof by the transverse palmar carpal ligament. Within the canal, the ulnar nerve divides into a deep motor branch, which supplies the muscles of the hypothenar eminence, the interossei, lumbricals III and IV, adductor pollicis and one head of flexor pollicis brevis, and a superficial sensory branch, which supplies sensation to the little finger and the ulnar side of the ring finger. Ulnar nerve compression within Guyon's canal proximal to its bifurcation (termed zone 1) will therefore result in both motor and sensory deficits. Compression of the motor branch only (zone 2) or the sensory branch only (zone 3) will cause purely motor or purely sensory symptoms respectively.

The common causes of ulnar neuropathy at Guyon's canal include the following: ganglion cysts, occupational neuritis, laceration, ulnar artery disease (e.g., pseudoaneurysm, arteritis); fractures (e.g., hook of hamate); scar tissue contractures; anomalous muscles (e.g., accessory abductor digiti minimi); tumours (e.g., nerve sheath tumours).■