

Ulnar Neuropathy Caused by a Schwannoma in the Guyon's Canal

Sang-Min Lee, M.D., Sung-Yong Park, M.D.[✉], and Min-Suk Park, M.D.

Department of Orthopaedic Surgery, Cheju Halla General Hospital, Jeju, Korea

Guyon's canal syndrome is a compression neuropathy of the ulnar nerve entrapment at the wrist. Compression of the ulnar nerve at the wrist by a ganglion, lipomas, diseases of the ulnar artery, fractures of the hamate and trauma is a common etiological factor. We report on a rare case of ulnar neuropathy caused by a schwannoma at the level of Guyon's canal.

Key words: schwannoma, ulnar nerve, neuropathy, Guyon's canal

Guyon's canal syndrome is a compression neuropathy of the ulnar nerve entrapment at the wrist or hand that can cause motor, sensory or combined motor and sensory loss depending on the localization of entrapment along the canal.^{1,2)} The most common etiological factor is the compression of the ulnar nerve at the wrist by a ganglion. However, other conditions such as anomalous musculotendinous arches, lipomas, diseases of the ulnar artery, fractures of the hamate, direct trauma to the ulnar side of the hand.^{3,4)} Schwannoma, also known as neurilemmoma of the hand is rare.⁵⁾ We report a rare case of ulnar neuropathy caused by a schwannoma at the level of Guyon's canal.

CASE REPORT

A 57-year-old female presented the hypothenar muscle atrophy and decreased little finger abduction power at the initial examination. She had no tingling sensation and burning pain in the little finger and ulnar side of the ring finger of right hand. There was marked atrophy of the dorsal and volar interossei, abductor digiti minimi, and adductor pollicis. Tinel's sign was negative at the level of Guyon's canal. Froment sign was positive.

We underwent electromyography (EMG) as involvement of a

motor branch of an isolated ulnar nerve was seen on physical examination. The EMG result showed right ulnar nerve entrapment neuropathy at the wrist level before undergoing surgery. We did not perform EMG after surgery. The patient underwent magnetic resonance imaging (MRI) due to the possibility of a space occupying lesion.

MRI showed a well-demarcated homogeneous low density 1.7×1.0 cm sized mass on spin-echo T1-weighted images, and high intensity on fast spin-echo T2-weighted images (Fig. 1).

Under brachial plexus block anesthesia, 5 cm incision was made directly over Guyon's canal. The mass was identified and was found to originate at the distal portion of Guyon's canal. The size of the mass was 1.7×1.0 cm. The mass was encapsulated inside the ulnar nerve motor branch sheath. Nerve sheath was incised longitudinally over the mass, and the mass was excised without ulnar nerve damage (Fig. 2).

The mass was composed histologically of spindle cells with wavy appearing nuclei. S100 protein stain was positive in immunohistochemical staining. The histological diagnosis was made as schwannoma (Fig. 3).

DISCUSSION

Guyon's canal syndrome is a compression neuropathy of the ulnar nerve at the wrist or hand, which presents the isolated motor, sensory or combined loss of motor and sensory function of the nerve.²⁾

Received April 9, 2015 **Revised** August 2, 2015 **Accepted** September 21, 2015

✉Correspondence to: Sung-Yong Park, M.D.

Department of Orthopaedic Surgery, Cheju Halla General Hospital, 65 Doryeong-ro, Jeju 63127, Korea

TEL: +82-64-740-5555 **FAX:** +82-64-740-5412 **E-mail:** nanbin82@naver.com

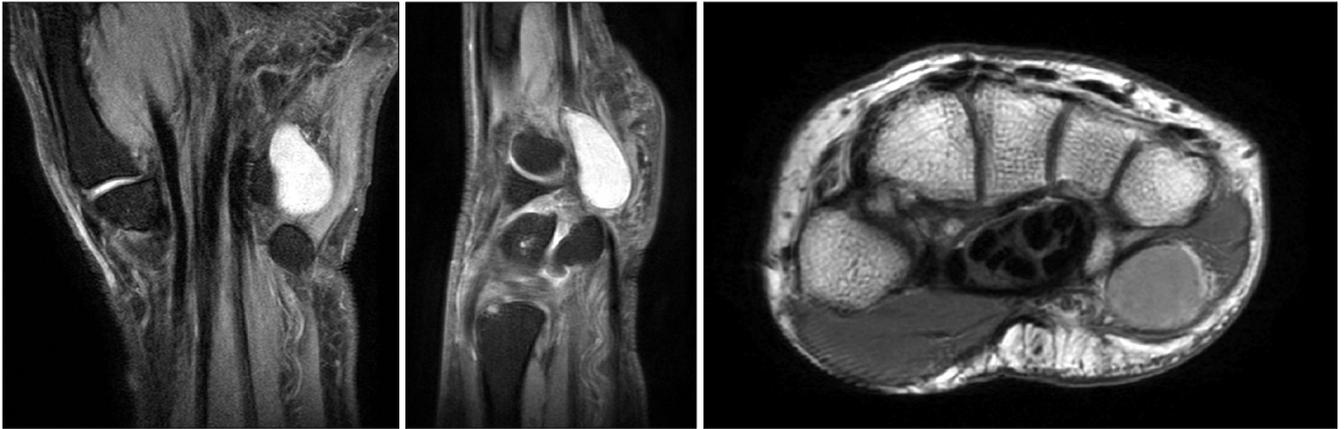


Figure 1. A about 2.2×1.4 cm sized homogeneous mass in Guyon's canal over the anterior portion of left pisiform is seen.

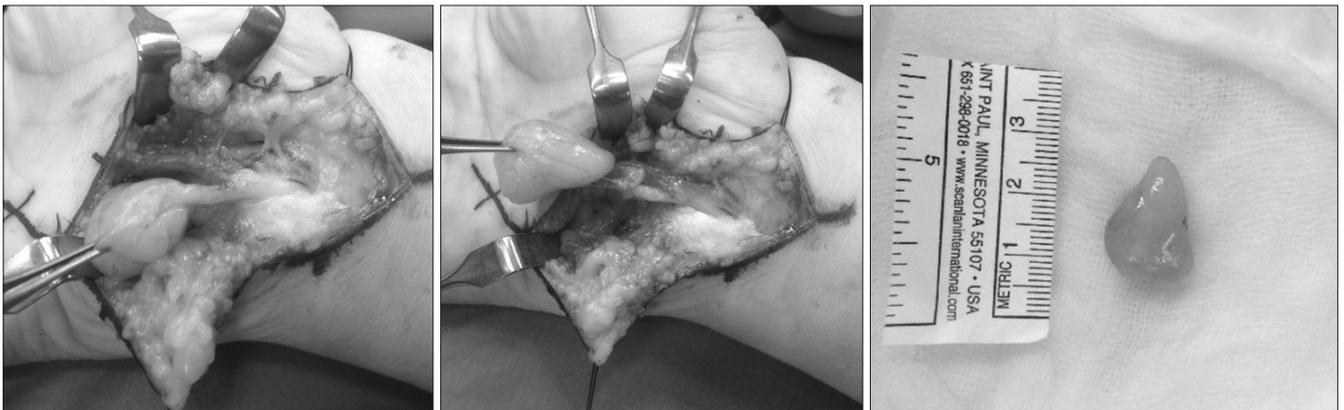


Figure 2. A well capsulated yellowish colored mass, 1.7×1.0 cm in size inside the epineurium of the ulnar nerve is identified when nerve sheath was incised, and the mass was enucleated.

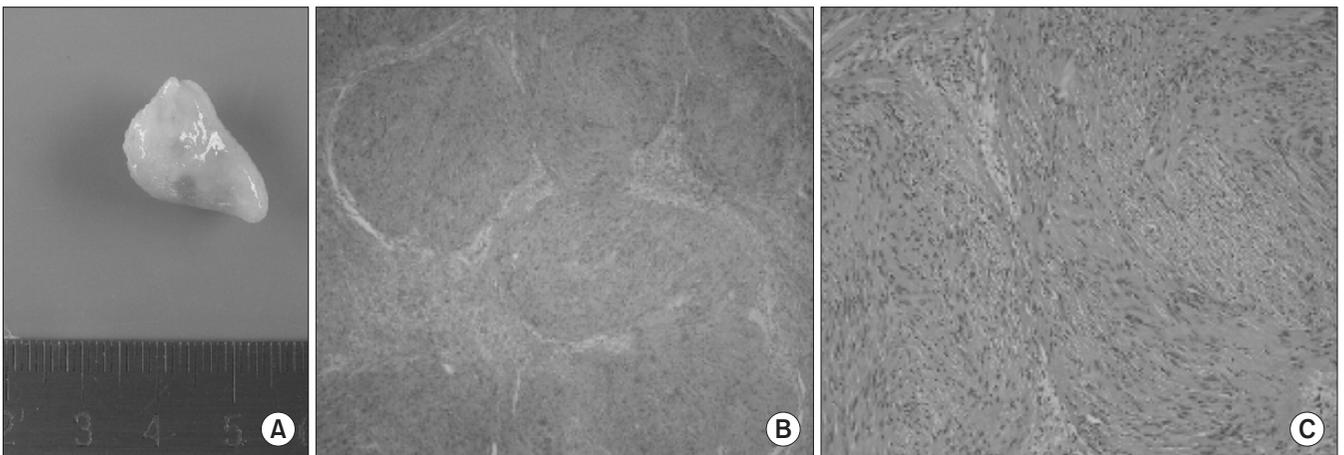


Figure 3. (A) Excised specimen was a yellowish round rubbery mass, measuring 2.2×1.5×0.8 cm. (B) The tumor is composed of spindle cells with wavy appearing nuclei (H&E, ×100). The mass is strongly positive with S100 protein. (C) There were more cellular "Antoni A" pattern with looser stroma and fewer cells "Antoni B" pattern (H&E, ×200).

The 4.0 to 4.5 cm long tunnel known as Guyon's canal begins proximal to the hypothenar eminence and extends to the fibrous arch of the hypothenar muscles. The roof is composed of the palmar carpal ligament, palmaris brevis and fibrous tissue. The floor is composed of the tendons of the flexor digitorum profundus proximally, the transverse carpal ligament, and the pisohamate and pisometacarpal ligaments. The medial wall includes the flexor carpi ulnaris, the pisiform, and the abductor digiti minimi. The lateral wall is formed by the tendons of the finger flexors, transverse carpal ligament, and the hook of the hamate.⁶⁾

Various lesions can cause ulnar nerve entrapment symptoms and signs at wrist and hand, such as ganglion, traumatic neuritis, ulnar artery disease and fractures of carpal bones. While, other lesions such as lipomas, anomalous muscles, osteoarthritis and lesions of ulnar artery can cause ulnar nerve compression. Schwannoma, known as neurilemmoma of the hand are the commonest benign peripheral nerve sheath tumors though rare.⁵⁾ They arise from a proliferation of Schwann cells. Aetiology is unclear.⁵⁾ Many schwannomas occur as solitary lesion and are often found incidentally.⁷⁾ However, multiple schwannomas can occur mostly related to conditions comprising the neurofibromatosis (neurofibromatosis type II-NF2 and schwannomatosis).⁸⁾

It was found that the risk of developing neurological deficits was more likely to be high in patients with larger tumors. Some authors reported that tumor size may be a risk factor for neurological deficits.⁹⁾ Park et al.¹⁰⁾ observed that larger tumors tended to have more fascicles entering the tumor substance and were at greater risk of major neurological deficits after surgery.

MRI was found to be the useful diagnostic tool. Ganglion cysts and schwannomas may show similar findings on MRI. Although cysts show homogenous T2 high signal, cystic schwannomas can also show T2 high signal making differentiation difficult. In this case, contrast enhancement study may help as schwannomas should show internal enhancement.

In schwannoma of the ulnar nerve of the current case, only the pure motor component was involved. Even after mass excision, there was no sensory change on ulnar nerve territory. At 4 months after surgery, abduction power of the little finger recovered from grade IV to grade V. A rare case of symptomatic schwannoma in

the Guyon's canal was reported together with the literature review.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

REFERENCES

1. Ozdemir O, Calisaneller T, Gulsen S, Caner H. Ulnar nerve entrapment in Guyon's canal due to recurrent carpal tunnel syndrome: case report. *Turk Neurosurg.* 2011;21:435-7.
2. Aguiar PH, Bor-Seng-Shu E, Gomes-Pinto F, et al. Surgical management of Guyon's canal syndrome, an ulnar nerve entrapment at the wrist: report of two cases. *Arq Neuropsiquiatr.* 2001;59:106-11.
3. Shu N, Uchio Y, Ryoke K, Yamamoto S, Oae K, Ochi M. Atypical compression of the deep branch of the ulnar nerve in Guyon's canal by a ganglion. Case report. *Scand J Plast Reconstr Surg Hand Surg.* 2000;34:181-3.
4. Bui-Mansfield LT, Williamson M, Wheeler DT, Johnstone F. Guyon's canal lipoma causing ulnar neuropathy. *AJR Am J Roentgenol.* 2002;178:1458.
5. Lim A, Richards SW. Benign palmar schwannoma: a rare case in a handball player. *BMJ Case Rep.* 2012;2012.
6. Rengachary SS, Arjunan K. Compression of the ulnar nerve in Guyon's canal by a soft tissue giant cell tumor. *Neurosurgery.* 1981;8:400-5.
7. Bhattacharyya AK, Perrin R, Guha A. Peripheral nerve tumors: management strategies and molecular insights. *J Neurooncol.* 2004;69:335-49.
8. MacCollin M, Chiocca EA, Evans DG, et al. Diagnostic criteria for schwannomatosis. *Neurology.* 2005;64:1838-45.
9. Kim SM, Seo SW, Lee JY, Sung KS. Surgical outcome of schwannomas arising from major peripheral nerves in the lower limb. *Int Orthop.* 2012;36:1721-5.
10. Park MJ, Seo KN, Kang HJ. Neurological deficit after surgical enucleation of schwannomas of the upper limb. *J Bone Joint Surg Br.* 2009;91:1482-6.

척골 신경의 신경초종에 의한 척골관 증후군

이상민 · 박성용[✉] · 박민석

제주한라병원 정형외과

척골관 증후군은 수장부 소지구에 있는 척골관에서 척골신경 포착으로 발생하는 압박성 신경병증으로 척골관에서 포착되는 위치에 따라 운동신경증상, 감각신경증상, 또는 운동신경과 감각신경 증상이 함께 나타난다. 손목부위의 결절종이 척골신경을 압박하여 발생하는 것이 가장 흔한 원인이며 다른 원인으로는 척골관을 형성하는 부위의 해부학적 기형, 지방종, 척골동맥의 병변, 유두골의 골절 등이 있다. 신경초종은 수부에서는 드물며 저자들은 척골관에 발생한 신경초종으로 인한 척골 신경병증을 문헌 고찰과 함께 보고한다.

색인단어: 신경초종, 척골 신경, 신경병증, 척골관

접수일 2015년 4월 9일 수정일 2015년 8월 2일 게재확정일 2015년 9월 21일

[✉]책임저자 박성용

63127, 제주도 도령로 65, 제주한라병원 정형외과

TEL 064-740-5555, FAX 064-740-5412, E-mail nanbin82@naver.com