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A rare cause of deep peroneal nerve palsy due to compression of synovial cyst – Case report

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ABSTRACT

INTRODUCTION: Synovial cyst is a rare cause of compression neuropathy and its differential diagnosis can be misleading.**PRESENTATION OF CASE:** This article presents clinical, radiological, and histological findings of deep peroneal nerve palsy due to compression of a synovial cyst in a 30-year-old patient admitted with sudden drop foot.**DISCUSSION:** Focal nerve entrapment in lower extremity due to synovial cyst is a rare entity. Differential diagnosis is important. Surgical excision is the main treatment method with high success rate.**CONCLUSION:** Synovial cyst compression which can be treated easily with surgical excision should be considered in rapidly progressed drop foot.© 2013 Surgical Associates Ltd. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](http://creativecommons.org/licenses/by-nc-nd/3.0/).

1. Introduction

Although synovial cysts are very common soft tissue tumors, compression neuropathy due to synovial cysts are extremely rare. Several cases of ulnar and median nerve compressions due to ganglia have been described.^{1–3} However, synovial cysts result peripheral nerve compression in the lower extremities much more rarely. Sultan firstly reported a case of compression neuropathy to peroneal nerve by a synovial cyst in 1921.⁴

In the present case report, a rarely seen compression neuropathy of deep peroneal nerve by a synovial cyst has been presented and evaluated in the light of literature.

2. Presentation of case

A 30-year-old man was admitted to our hospital complaining of pain in lateral part of his proximal leg and drop foot that

progressed rapidly during the same day in several hours. On physical examination, there were no atrophy of the peroneus muscles and the tibialis anterior muscle, however, peroneal muscles strength was 5/5 whereas tibialis anterior, extensor hallucis, and extensor digitorum muscle strengths were 1/5 with reduction of plantar flexion and stepping gait. Additionally, a cystic mass that was approximately 5 cm long and 3 cm width was palpable at the proximal neck of fibula. Medical record revealed that swelling had occurred 2 months before and pain with motor deficit progressed rapidly during days. There was no trauma history. He had been diagnosed with lumbar magnetic resonance imaging (MRI), however no pathologic findings had been found. Therefore, electromyography (EMG), MRI, and soft tissue ultrasound (US) were performed. A hypodense mass around the fibular neck extending distally to syndesmosis was detected with MRI (Fig. 1a and b). Decreased motor potential amplitude and a loss of conductivity in the region of the proximal fibular head were seen in EMG study. These EMG findings were relevant to acute denervation of deep peroneal nerve. US showed a cystic, hypoechogenic lesion over the proximal fibular head. Excisional biopsy was performed with provisional diagnosis of synovial cyst (Fig. 2). Surgical exploration revealed synovial cyst that applied pressure to deep peroneal nerve in the 1/3 proximal part of cruris. The presence of hyaluronic acid in the synovial cyst was detected in the histologic examination (Figs. 3 and 4). Motor functions had started to recover within the

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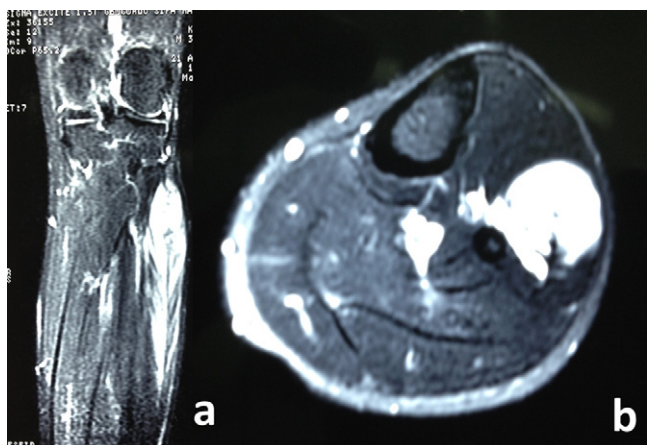


Fig. 1. Preoperative MRI views: (a) coronal view and (b) axial view.

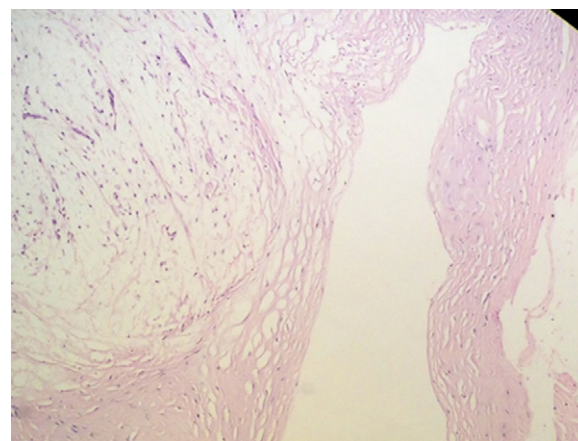


Fig. 3. Histopathologic view.

first week of operation. At the 2nd month of surgery total recovery of sensorial and motor functions were seen. Re-innervation of deep peroneal nerve was detected in EMG study at the 2nd month follow-up.

3. Discussion

Focal nerve entrapment syndromes due to ganglia are not common entities especially in the lower limb. List of peroneal nerve palsies include prolonged squatting, infection, varicose veins, rapid marked weight reduction, schwannoma, nerve herniation through a facial defect, neurofibromatosis, pneumatic compression, knee arthroplasty, high tibial osteotomy, and synovial cysts, to name a few.^{5–15} We described a deep peroneal neuropathy due to compression of a synovial cyst.

Compression to peroneal nerve by a synovial cyst was firstly described in 1921 by Sultan.⁴ Additionally, several cases of intra-neural synovial cysts of peroneal nerve have been reported.^{16–18} Reports of deep peroneal nerve compression due to a synovial cyst are much less.^{5,19,20}

Synovial cysts are mucinous filled cysts that can be found adjacent to joint capsule or tendon sheath. They can originate within perineural tissue or in an adjacent joint space or bursa and extend toward the nerve.²¹ They consist of an outer fibrous coat and an inner synovial lining and contain a clear, colorless, gelatinous fluid.²¹ In our case we observed these findings during the surgery (Fig. 2). Additionally, histologic examination revealed presence of hyaluronic acid in the synovial cyst (Figs. 3 and 4).

The frequent non-specific symptoms and findings like pain, swelling cause difficulty in differential diagnosis of synovial sarcoma, extra-skeletal chondrosarcoma, venous aneurysm. Diagnosis can be confirmed with imaging studies and ultimately surgical exploration.²² US is a non-invasive and cheap screening method, however, it is not sensitive enough to distinguish ganglia from other nerve sheath tumors. MRI can demonstrate fluid filled cystic

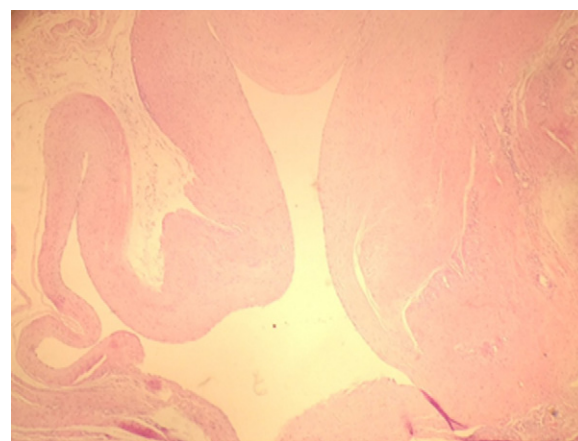


Fig. 4. Histopathologic view.

lesion that is hypointense on T1 and hyperintense on T2-weighted images.^{22,23} Electrophysiological tests can help to localize the lesion along the course of the nerve and can help to distinguish entrapment of deep peroneal nerve from sciatic neuropathy or L5 radiculopathy.^{24–26} In our case, we performed EMG, MRI and US to confirm the diagnosis preoperatively. MRI showed a hypodense mass around the fibular neck (Fig. 1), US showed a cystic, hypoechogenic lesion over the proximal fibular head, and EMG showed decreased motor potential amplitude and a loss of conductivity in the region of the proximal fibular head.

Synovial cysts that cause neuropathy can be successfully treated with surgical removal of the cyst. Recurrence rate is reported as approximately 10%. In order to prevent the recurrence, removal of the stalk and the base of the cyst in the tibiofibular joint could be performed.²⁷ We performed surgical excision of the cyst with removing the stalk and the base of the cyst in the tibiofibular joint. At 14th month follow-up, there were no findings of recurrence.

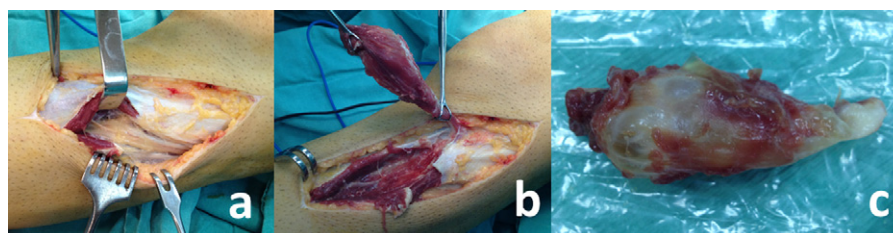


Fig. 2. Intraoperative views of the patient: (a) deep peroneal nerve beneath the synovial cyst, (b) ganglion stalk extending toward the tibiofibular joint, and (c) excised cyst.

This case demonstrates the etiologic cause of sudden drop foot and demonstrates the importance of considering synovial cyst around the knee in the differential diagnosis of deep peroneal neuropathy.

Conflicts of interest

None.

Funding

None.

Ethical approval

Obtained.

Author contributions

Mehmet Erdil, corresponding author of the case, diagnosed the patient and made study design. Korhan Ozkan had performed the surgery with Dr. Erdil, and also worked in data collecting (follow-up data). Feyza Unlu Ozkan, helped in English language editing and writing the manuscript. Kerem Bilsel, had attended the surgery with Dr. Erdil and Dr. Ozkan. He had taken the intraoperative photos. Ismail Turkmen worked in data collecting (follow-up data) with Dr. Ozkan. Serkan Senol worked in data collecting by preparing and evaluating the histopathologic specimens. Serhan Sarar had been in the surgery team as anesthesiologist, also he had helped in preparing the images of the manuscript.

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