

CASE REPORT

Compression of the common peroneal nerve caused by ganglion cyst in the right proximal tibiofibular joint: a case report and a review of the literature

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ABSTRACT

Background: Peripheral neuropathies of lower extremities caused by ganglion cysts are rare. The most frequent location of occurrence is the common peroneal nerve and its branches, at the level of the fibular neck.

Case Presentation: This case is of a 39-year-old male who worked as a doctor. He presented with complaints of pain and numbness in his right foot. The pain started insidiously, radiating from the fibular head along the anterolateral leg and dorsum of the foot. Local examination of the right knee showed mild swelling over the anterolateral side of the knee as compared to the contralateral side associated with tenderness due to compression over the right fibular head. X-ray of right knee and leg were done and were unremarkable. The diagnosis was made preoperatively using magnetic resonance imaging (MRI). Knee MRI reported a large lobulated cystic lesion seen at the level of proximal tibiofibular joint with intramuscular and intermuscular components.

Conclusion: The most effective way to treat the ganglion cyst is the surgical excision between the third and fourth months of diagnosis. The success of the surgery depends on careful preoperative planning and proper surgical technique.

Keywords: Peroneal nerve, ganglion cyst, tibiofibular joint, case report.

Introduction

A ganglion cyst is a soft tissue lump that may be associated with any joint but usually occurs on, around, or near the joints and tendons of the hands or feet [1]. The infiltration of fluid from the joint into the surrounding tissue is the primary cause of ganglion cyst [2]. These cysts most commonly occur around the dorsum of the wrist and on the fingers. Despite their high incidence, ganglion cysts rarely result in peripheral nerve compression [3]. The peroneal nerve is a branch of the sciatic nerve, which supplies movement and sensation to the lower leg, foot, and toes [4]. Most ganglion cysts are asymptomatic, but they may cause discomfort and pain if they become large enough to press the underlying structures [5]. The most frequent symptoms of ganglion cysts in the foot are pain and footwear problems [6].

Case Presentation

This case was of a 39-year-old Saudi male who worked as a doctor. Initially, the patient started complaining of

aching pain and numbness in his right foot. The pain started insidiously, radiating from the fibular head along the anterolateral leg and dorsum of the foot. The patient presented in an orthopedic clinic in King Khalid university hospital where the detailed history and complete physical examination were done. The patient underwent ganglion cyst repair in April 2014, then the cyst relapsed and the CT guided aspiration was done for him many times almost every 3 months.

The physical examination was started from spine to rule out neurological cause originating from the lumbosacral spine. Local examination of the right knee showed

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mild swelling over the anterolateral side of the knee as compared to the contralateral side associated with tenderness due to compression over the right fibular head. Full ROM of the knee was maintained in active and passive mode. The neurovascular examination only reduced the sensation over the dorsum of the foot with no motor weakness and intact pulses. X-ray of right knee and leg were done and were unremarkable; there were no abnormal findings in the X-rays (Figure 1).

Knee magnetic resonance imaging (MRI) was requested for the patient and images were reported by MSK radiologist and reported a large lobulated cystic lesion seen at the level of proximal tibiofibular joint with intramuscular and intermuscular components. In coronal photos, it measured about 5.2×1.8 cm. These findings likely represented the ganglion cyst (Figure 2).

After MRI, with a correlation of history and physical examination, the diagnosis was made as ganglion cyst in right proximal tibiofibular joint compressing the common peroneal nerve. After diagnosis, the patient was referred to the interventional radiologist and CT-guided aspiration of ganglion cyst was done. Patient's symptoms were relieved but temporarily as symptoms returned after 2 months. The patient was referred back to the interventional radiologist and CT-guided aspiration of ganglion cyst was done again. Three months later, the symptoms returned. Thus, the patient was subjected to surgical excision and fusion on October 22, 2015 and the biopsy was sent to a pathologist. The biopsy consisted of a single piece of irregular firm round tissue measuring $4.7 \times 1.5 \times 0.4$ cm. The specimen was serially sectioned and entirely submitted in one cassette. The pathology report stated that the biopsy was diagnosed as ganglion cyst without any evidence of abnormal cells. The pain was relieved after the surgery, and the patient became better.

The patient follow-up was done by MRI. By comparing MRI results on March 3, 2016 (about 5 months after surgery) with the previous one dated on October 4, 2015, no evidence of osteomyelitis or drainable collection was seen. By repeating the MRI as routine work on May 8, 2016 (about 7 months after surgery), the report stated that there were no abdominal signal intensity changes within the visualized bone and no abnormal bony enhancement could be seen. No evidence of collection was seen. Overall, a minimum interval decrease in the size of the ganglion cyst arising from the proximal tibiofibular joint. No evidence of osteomyelitis or drainable collection was seen.

Discussion

The occurrence of ganglion cysts is standard; however, it rarely occurs in lower extremities and hardly compresses the peripheral nerve [7]. Sultan was the first researcher who described the peroneal nerve neuropathy in 1921 [8]. After Sultan's description, very few cases of the lower limb compression neuropathies have been described in the

surgical literature [9]. The peroneal nerve is compressed by either extraneural or intraneural ganglionic cysts [10]. Most studies which are concerned with ganglionic cysts have reported intraneural type as the primary cause of the peroneal nerve compression. Compression of the peroneal nerve owing to an extraneural cyst, a condition rarely encountered with a history of knee trauma is a common finding [11,12]. The common peroneal nerve is derived from L4, L5, S1, and S2 as a division of the sciatic nerve [13,14]. The nerve becomes most vulnerable at its entrance to the fibular tunnel, where it courses superficial to the lateral surface of the fibula just distal to the fibular head [11].

This study was concerned with a 39-year-old man who was diagnosed with a ganglion cyst in right proximal tibiofibular joint compressing the common peroneal nerve. Patient's symptoms were relieved but temporarily as symptoms returned after 2 months. The patient was subjected to surgical excision on October 22, 2015 and a biopsy was sent to a pathologist who reported that the biopsy was diagnosed as ganglion cyst without any evidence of abnormal cells.

There were similar studies which were concerned about such cases. Mont et al. [12] conducted a retrospective study on 31 patients who received operative decompression for a peroneal nerve palsy, which showed bands of fibrous tissue constricting the peroneal nerve at this level and it could further increase the nerve's susceptibility to compression.

Rawal et al. [10] were concerned in two different cases. The two cases were finally subjected to surgical removal of the ganglionic cysts, they concluded that compression of the peroneal nerve by an extraneural ganglion is rare and often misleading condition, and the accurate diagnosis of this condition was obtained by a combination of MRI and ultrasonography.

Tehli et al. [15] described that a 22-year-old man presented with numbness and motor weakness in the lateral aspect of his right leg, which was present for 3 years, after the onset of severe pain. His medical history revealed a single episode of numbness, motor weakness and pain in his right leg which had caused hospitalization and resulted in the misdiagnosis of lumbar disk herniation. T2-weighted



Figure 1. X-ray of the right knee shows the anteroposterior view and the lateral views.

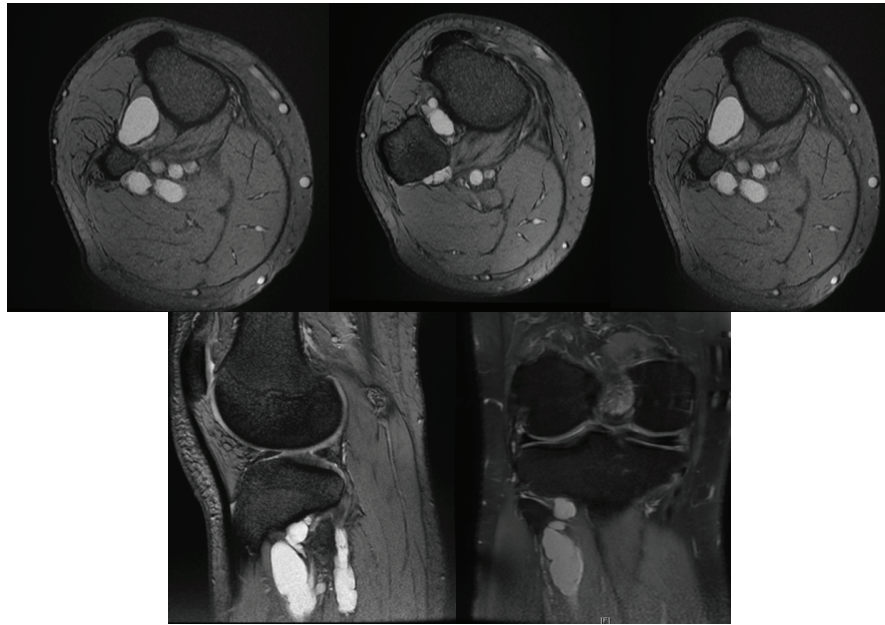


Figure 2. MRI images of the right knee showing large lobulated cystic lesion seen at the level of proximal tibiofibular joint with intramuscular and intermuscular components. In coronal images, it measured about 5.2×1.8 cm.

coronal MRI of the right leg described a lobulated, enlarged cystic lesion along the course of the common peroneal and sciatic nerve. T2-weighted sagittal MRI of the right leg showed a cystic mass at the sciatic nerve bifurcation. The patient also reported that he recovered to Grade 3 toe extension and ankle dorsiflexion within a couple of weeks after the surgery. There were no clinical signs of recurrence during a short follow-up period.

Ward et al. [16] described a case of a proximal tibiofibular joint ganglion, which resulted in compartment syndrome of the anterior compartment of the leg. Gibbon et al. [17] reported a case of peroneal nerve compression by a ganglion cyst in a patient who had undergone total knee arthroplasty.

Rapid diagnosis and prompt treatment of a suspicious case after confirmation tests are significant; many reports emphasize the importance of early diagnosis which has implications for complete recovery of the paresis [18].

In the current case, the diagnosis was made first by the physical examination then full ROM of the knee was maintained in active and passive mode. To confirm the present case, X-ray of right knee and leg were done, and it was reported that there were no abnormal findings. Finally, MRI was requested and reported that the diagnosis was ganglion cyst in right proximal tibiofibular joint compressing the common peroneal nerve. Erdil et al. [19] demonstrated a case report of a synovial cyst as the etiologic cause of sudden drop foot and stressed the importance of considering synovial cyst around the knee in the differential diagnosis of deep peroneal neuropathy. They reported this case of an isolated deep peroneal nerve palsy secondary to a ganglion cyst. Local cyst recurrence

postoperatively was reported and stressed the importance of articular branch ligation to avoid this complication [3].

Kukreja et al. [20] demonstrated a case report of a female patient aged 26 years, presented with right leg tingling and radiating pain followed up gradually with progressive right-sided foot drop. MRI diagnosed the lesion as a ganglion cyst and the electromyogram, and nerve conduction velocity confirmed the level of compression at the right fibular head. Surgical excision of the ganglion is known to be the most effective way to treat the peroneal nerve palsy due to a peripheral nerve ganglion compression [15,20,21]. When peroneal nerve palsies are carefully treated, recovery may take 1 or 2 years, and it can be incomplete, requiring the patient to use a peroneal brace. Instead, recovery is much faster after operative decompression and will take place after few days or a few weeks [22–25].

In the present case, 3 months later, after ganglion aspiration, the symptoms returned. Thus, the patient was subjected to surgical excision, when the fusion and the pain were relieved after the surgery and the patient became better. Fabre et al. [14] reported 60 patients with peroneal nerve palsies, many idiopathic, who were treated with operative decompression. Postoperative recovery of motor function was good to excellent in 87% of those who had both sensory and motor involvement preoperatively.

Conclusion

When the patient was suspected to have a peroneal nerve palsy, his history, and physical examination, ROMN

X-ray followed by a prompt investigation by MRI was important. Once the ganglion cyst was diagnosed, the most efficient way to treat it was the surgical excision between the third and fourth months of diagnosis. The success of the surgery depends on careful preoperative planning and proper surgical technique. After surgery, the patient must be followed periodically to make sure that the patient has completely recovered.

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Consent for publication

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Ethical approval

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