

Arthroscopic Treatment of Lateral Meniscal Cyst Causing Peroneal Nerve Injury

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ABSTRACT

Compression of the common peroneal nerve by lateral meniscal cysts is rare. We report a 29-year male patient who complained of a gradually enlarging mass in the right popliteal fossa. He was diagnosed with a lateral meniscal cyst and a common peroneal nerve injury. The patient underwent arthroscopic surgery, including lateral partial meniscectomy and cyst drainage. When followed up at 3 months, the dorsal extensor strength of the right foot recovered to grade 5, and sensation of the distal right lower limb returned to normal. No recurrence of the cyst was found at the last follow-up at 18 months. This is a rare case of common peroneal nerve paralysis caused by a lateral meniscal cyst.

Key Words: *Meniscal cyst, Common peroneal nerve, Nerve injury.*

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INTRODUCTION

Meniscal cysts are often secondary to meniscus injury, mucinous degeneration resulting from contusion and hematoma in meniscal tissues. Young people and athletes are vulnerable groups. The MRI studies report a general incidence of meniscal cysts ranging from 4 to 7.9%.¹ The occurrence rate of lateral meniscal cyst is higher than that of medial meniscus. Meniscal cysts are mostly asymptomatic. When the cysts enlarges to a certain extent, there will be knee swelling and painful symptoms. However, lateral meniscal cysts pressing on the common peroneal nerve have been rarely reported. At present, the main treatment methods for symptomatic meniscal cysts are arthroscopic meniscus repair plus cyst excision and arthroscopic meniscus repair alone. Here, we report a case of a giant lateral meniscal cyst that compressed the common peroneal nerve and resulted in nerve injury. This patient was treated with arthroscopic simple meniscus partial meniscectomy and achieved good clinical results.

CASE REPORT

A 29-year male presented with a gradually enlarging mass in the right popliteal fossa over the past 3 years in the Department of Orthopaedics, Lanzhou University Second Hospital. Neither pain nor other discomforts were present until 20 days before admission.

He felt pain in his popliteal fossa and his right foot felt weak when he walked. The patient reported no history of right knee trauma.

We performed a physical examination after the patient was admitted. A mass of approximately 2.5×1.5 cm could be palpated outside the right popliteal fossa. It was soft and well-circumscribed, with poor mobility and no obvious tenderness. There was no ulceration on the surface and no redness or swelling around it. The McMurray, the Apley, and the Swing tests were positive. The dorsal extension of the right foot was restricted, and muscle strength was grade 3. There is no pronation deformity of the right foot. The Lysholm knee function score was 71, and the IKDC (International Knee Documentation Committee, IKDC) score was 66.

The electromyogram (EMG) showed that the motor nerve velocity of the right common peroneal nerve slowed down from the superior knee to the fibular head. Ultrasound of the popliteal fossa showed a low echo area that was 2.9×1.4 cm in size with a clear boundary underneath the knee (Figure 1A).

Fluid accumulation was observed in the suprapatellar bursa in MRI. In the popliteal fossa, there were multiple high signals, small cyst-like shadows, and they were also seen in the posterior horn of the lateral meniscus. The signal in the cyst was well distributed, the boundary was clear, and a line-like low signal separation shadow was seen in the large cyst (Figure 1B-D).

The diagnosis was a meniscus injury of the right knee, a meniscal cyst of the right knee, and a common peroneal nerve injury.

The patient underwent arthroscopic surgery under spinal anaesthesia. A horizontal tear of the lateral meniscus was seen, and the tear was connected to the lateral joint capsule (Figure 1E).

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We released the cyst and closed the orifice; finally, lateral meniscoplasty was performed. The contents of the cyst were sent for histopathologic examination (Figure 1F).

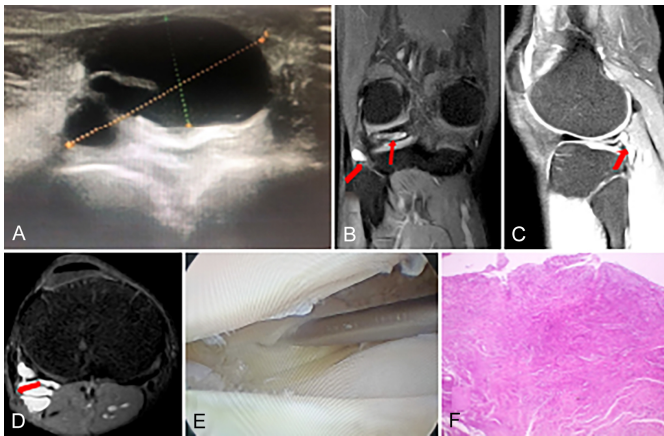


Figure 1: Imaging and pathological manifestations of the right knee meniscal cyst. (A) The results of popliteal ultrasound showed a cyst about 2.9 × 1.4 cm in size on the lateral side of the right knee. (B) MRI shows a horizontal tear of the posterior horn of the lateral meniscus, accompanied by the formation of a lateral cyst. (C) Sagittal view shows the formation of a multilocular cyst connected to the horizontal tear of the meniscus. (D) The arrow indicates the common peroneal nerve, and the image shows that the multilocular meniscal cyst oppresses the common peroneal nerve. (E) Arthroscopic exploration revealed horizontal tears of the lateral meniscus. (F) Cyst stained with haematoxylin and eosin showed fibrocollagenous wall lined by reactive synovial cells.



Figure 2: Imaging of the right knee at the 18-month follow-up. (A) MRI coronal view of the right knee joint shows the shape of meniscus is normal. (B, C) Sagittal view shows no recurrence of the cyst. (D) No sign of cyst can be seen in the popliteal fossa.

The postoperative functional exercise was performed on the 2nd day after the operation. The patient was discharged on the 4th postoperative day, and the muscle strength of dorsal extension returned to grade 4.

At the 3-month follow-up, the Lysholm knee function score was 93, and the IKDC knee score was 91. The Glasgow curative effect evaluation was excellent, and the muscle strength of ankle joint extension and flexion was grade 5.

At the 18-month follow-up, the patient felt well and no discomfort was complained. MRI of the right knee showed that the shape of the meniscus was normal, and no recurrence of the cyst was found in the popliteal fossa, the knee function score was very good (Figure 2).

DISCUSSION

Meniscal cysts occur commonly after meniscal tears. Anderson *et al.* found that cysts occurred in the lateral meniscus (41.3%) and medial meniscus (58.7%).² About 57.8% of meniscal cysts

were related to meniscal tears, and that multilocular cysts accounted for 62.3%.² In this case, MRI confirmed that the cyst was a multilocular cyst, as shown in Figure 1.

The formation of cysts is caused by synovial fluid retention, synovial cell infiltration, and chondrocyte proliferation. Myxoid degeneration is the main cause of cyst formation after meniscal degeneration.¹ A recent study showed that cyst formation occurred in 14 of 102 patients who underwent surgical suturing after a meniscal injury, indicating that meniscus suturing is also a risk factor for the formation of meniscal cysts.³ When the cysts become large, these may produce local masses and pain in the knee joint. In 2016, Ohishi *et al.* reported a giant medial meniscal cyst with a size of 80×65×40 mm.⁴ The main symptoms were pain and limitation of flexion and extension of the knee joint. However, cases of nerve injury caused by cyst compression of the common peroneal nerve are rare. Complete nerve injury can be characterised by dorsal curvature of the foot and inability to extend the toe. MRI plays an important guiding role in diagnosis and treatment.⁵ EMG can assist in the diagnosis of common peroneal nerve injury, but the diagnosis is mainly based on the patient's clinical symptoms and signs.

As for the treatment of meniscal cysts, the main surgical methods are arthroscopic meniscus repair plus cyst excision and arthroscopic meniscus repair alone. The treatment of the meniscus needs to be determined by the extent of the damage. To avoid cyst recurrence, a tract at least 5 mm between the joint should be created.¹ Haklar *et al.* indicated that arthroscopic lateral parameniscal cyst decompression with superior and anterior portals is a safe and effective technique.⁶

When the meniscal cyst compresses the common peroneal nerve, the choice of operation depends on the degree of nerve injury. In patients with common peroneal nerve paralysis caused by meniscal cysts, as reported by Jowett *et al.*, intra-articular meniscectomy and popliteal fossa open cyst incision were selected.⁷ The advantage of this method is that it can completely peel off the capsule wall and detect nerve injury. For patients with permanent injury of the common peroneal nerve caused by cyst compression, arthroscopic cyst decompression combined with posterior tibial tendon transplantation has been used to treat foot ptosis.⁸ A patient with meniscal cyst compression of the common peroneal nerve was treated by arthroscopy alone. After 6 months, the cyst recurred and cystectomy was performed again.⁹

Since the degree of common peroneal nerve injury was mild in this patient, arthroscopic cystectomy was used, which greatly reduced surgical trauma. The results of the knee joint function and curative effect score suggested that the patient had a good therapeutic effect. When similar cases are encountered in clinical work, accurate diagnosis and the choice of appropriate surgical methods will bring the best benefits to patients.

PATIENT'S CONSENT:

The consent of the patient was obtained for the publication of this case report.

COMPETING INTEREST:

The authors declared no competing interest.

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AUTHORS' CONTRIBUTION:

LH: Literature research and manuscript writing.

FL, FT: Collection of information and images.

MW, JJ: Design of treatment and surgery.

YX: Paper revising and supervision of the final version.

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