

Atraumatic Multilobulated Lateral Meniscal Cysts in Younger Patients: A case report

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The incidence of meniscal cysts, a relatively rare condition in orthopedics, ranges from 1-8% of cyst cases⁽¹⁾. A typical meniscal cyst is from 0.3 to 9 mm. in diameter⁽²⁾. We report on a 32-year-old male patient who presented with swelling and a large, slow growing mass at the anterolateral side of the right knee. Arthroscopic examination was conducted, and debridement was performed with good results and a satisfactory outcome. No complications were detected at 12 months post-surgery.

Keywords: Meniscal cyst, multilobulated meniscal cyst, arthroscopic debridement, knee pain

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Introduction

Meniscal cysts were first described in 1883^(1,12,13). They are relatively rare, with a reported incidence of from 1 to 8% of cyst cases⁽¹²⁾. In the literature, lateral meniscus cysts have been more commonly reported than medial meniscus cysts^(1,12). Typically, the diameter of a meniscal cyst ranges from 0.3 to 9 mm.⁽²⁾ Gross and microscopic examination has found that approximately 7.1% contain one or more cysts. Most cysts are associated with a meniscal tear, although the etiology of meniscal cysts is still unknown^(1-3,13). It has been suggested that substance leakage leads to mucoid degeneration which subsequently results in synovial fluid extrusion. Approximately 50% of all cyst cases are related to traumatic events. In some patients a degenerative process also develops. Presently arthroscopic debridement and decompression is the gold standard for treatment of meniscal cysts in symptomatic patients.

Case presentation

A 32-year-old male presented to the outpatient orthopedic clinic with a four-month history of swelling at the anterolateral part of the right knee. He did not recall any trauma. The pain was reported to be worst when he moved his knee to the flexed position. Sometimes he felt a clicking or popping in his right knee and noticed a slow-growing mass approximately 3 centimeters in diameter at the anterolateral side.

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Clinical examination found a soft fluctuant 3-centimeter mass at the anterolateral aspect of right the knee (Figures 1, 2). There was mild medial swelling with marked joint swelling at the lateral side. He had full range of motion but with discomfort at the anterior knee in the deep flexion position. McMurray, Lachman's, and anterior/posterior drawer tests were negative. No ligament laxity was detected.

A radiograph of the right knee showed no significant articulate change and no sign of soft tissue density abnormality, calcification, or bony lesion (Figure 2). Magnetic resonance imaging found a 4×5.8×4.3 cm. peripheral enhancing complex meniscal cyst in the anterolateral part of the femorotibial joint and the infra-patella fat pad of the right knee (Figure 3). The adjacent lateral meniscus showed the transverse anterior horn and body were attached to the complex cyst. Magnetic resonance imaging found a 4×5.8×4.3 cm. peripherally enhanced complex meniscal cyst in the anterolateral part of the femorotibial joint as well as in the infrapatella fat pad of the right knee. The adjacent lateral meniscus showed the complex cyst was attached to the transverse anterior horn and body. (Figure 3)

While the patient was undergoing arthroscopic examination and debridement with the four-portal approach (supralateral, superomedial, anteromedial, anterolateral) under spinal anesthesia, surgical examination revealed meniscal cysts at the anterolateral side and the infra-patellar area. Both the medial and lateral meniscus were intact. The intraarticular space contained hemosiderin-like fluid (5 ml), the intact anterior cruciate ligament, the posterior cruciate ligament and both the lateral and the medial meniscus (Figure 4). An infrapatellar fat pad hypertrophy was found during arthroscopic

examination. After completion of the arthroscopic debridement, Kenacort (4.0 milligrams) plus Marcaine 0.1% (10 milliliters) were injected into the knee joint.

Microscopic tissue pathology examination found fibrocartilaginous-fatty tissue with synovial structure and evidence of cystic-lined synovial epithelium. Signs for granuloma and malignancy were negative (Figures 6-7).

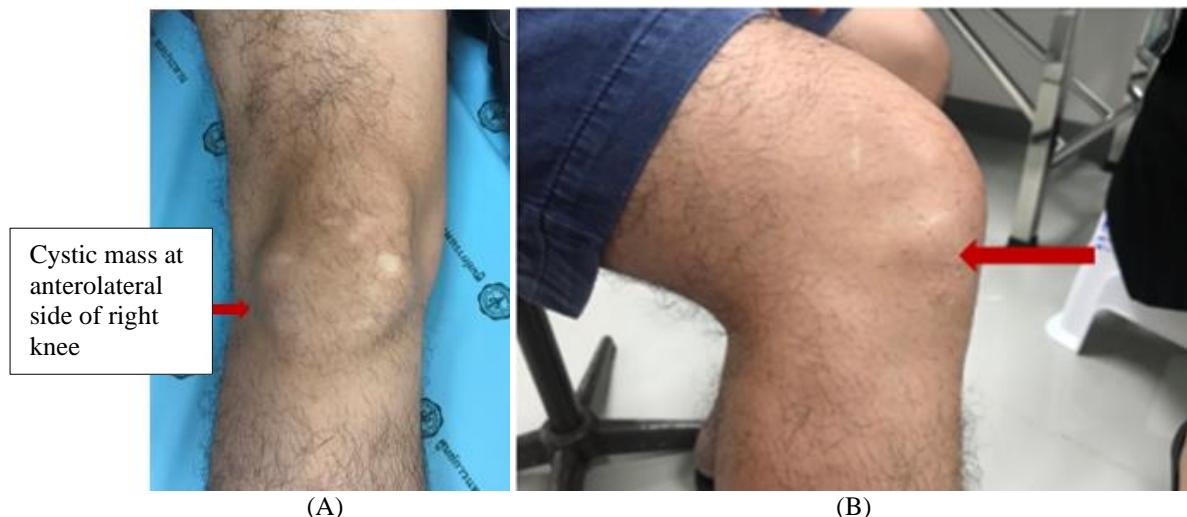


Fig. 1 Clinical appearance of the right knee prior to surgery in (A) anterior and (B) lateral view. (Red arrows point to swelling)

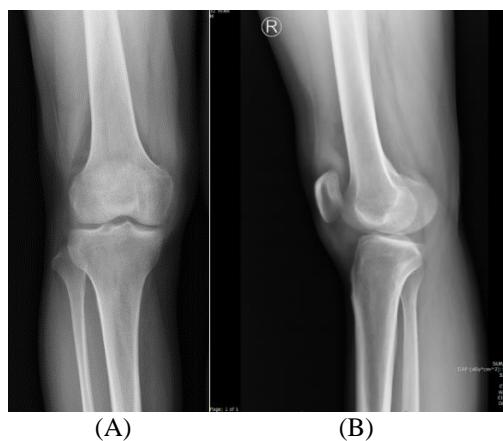


Fig. 2 Radiograph of the right knee showed no significant articulate change in AP view (A) and lateral view (B).

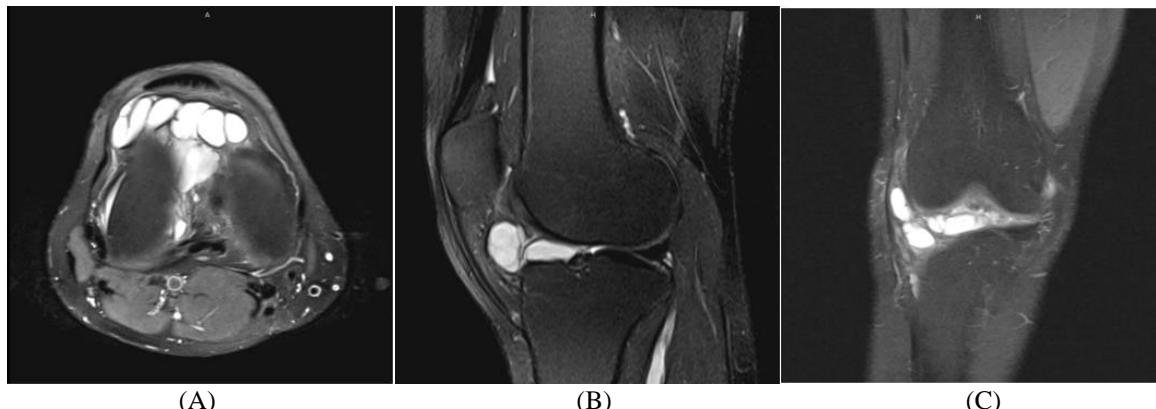


Fig. 3 Axial (A), sagittal (B), and coronal (C) T2-weighted MRI showing multilobulated meniscal cysts at the anterolateral side of the right knee.

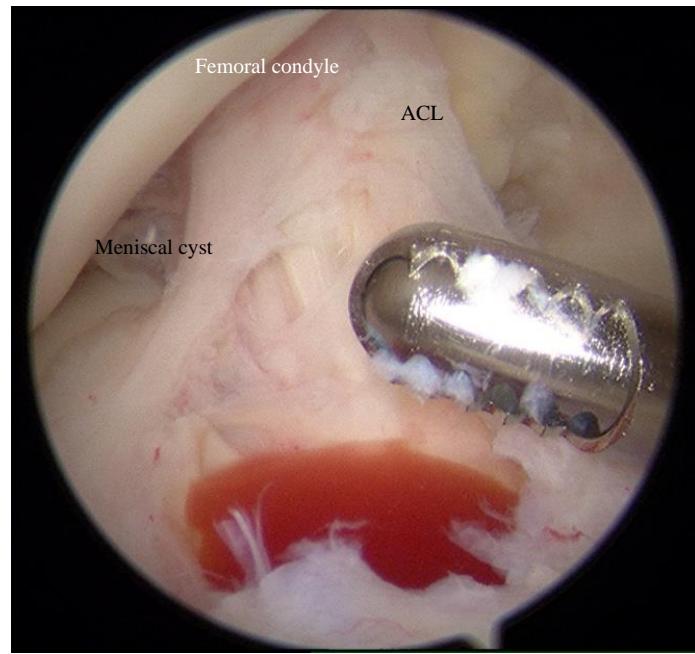


Fig. 4 Intraoperative photo showing intact ACL and lateral meniscal cyst before debridement.

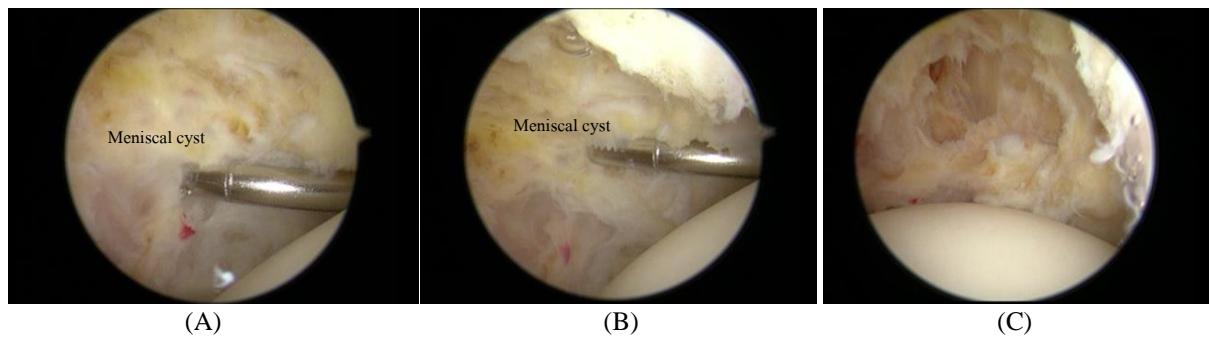


Fig. 5 Intraoperative photo During (A, B) and after (C) arthroscopic debridement of meniscal cyst.



Fig. 6 Macroscopic appearance of gross tissue filter from arthroscopic suction.

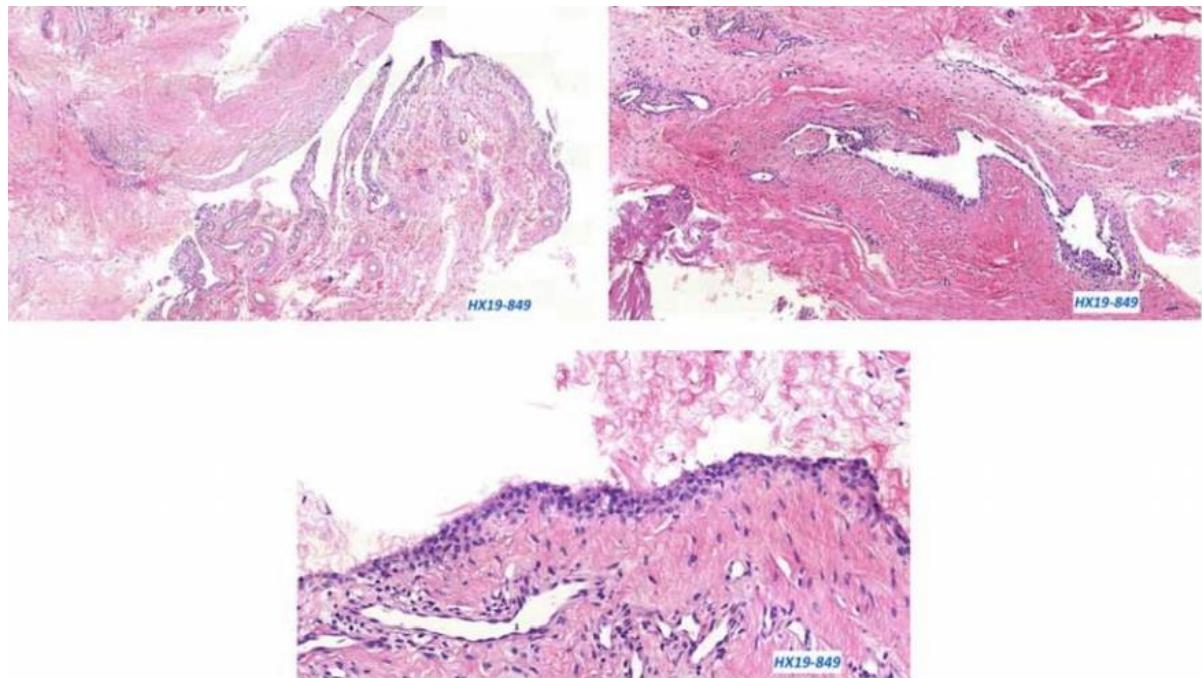


Fig. 7 Tissue pathology showing fibrocartilaginous-fatty tissue with synovial structure.



Fig. 8 Clinical pictures of the knee at the 12-month post-operative follow up.

Results

After arthroscopic debridement the patient had mild swelling of the right knee for two days. No sign of infection was detected. We allowed the patient to walk immediately after the operation. Normal range of motion was achieved within 2 weeks. The patient was satisfied with the outcome and was able to return to sports 2 months after surgery. There were no surgical complications or any signs of recurrence at the 12-month follow-up (Figure 8).

Discussion

A meniscal cyst can develop from both traumatic and nontraumatic (degenerative)

causes.⁽¹⁻³⁾ The pathomechanism behind the development of ganglion cysts originating from the meniscus is believed to be a meniscal tear in which the meniscal cyst portal functions as a check-valve⁽³⁾. Synovial fluid can enter the meniscal tissue through the tear, but the fluid is subsequently trapped, progressively generating a meniscal ganglion cyst. This hypothesis is strengthened by the histologic observation of tracks leading from a meniscal tear to the cyst⁽³⁾. However, many publications have reported that a meniscal cyst can also exist without a meniscal tear⁽⁸⁾.

The physical characteristics of meniscal cysts can vary. Typically, a meniscal cyst is between 0.3 and 9 mm. in diameter. Thus, patients with a

large multilobulated palpable mass at the joint line should result in a diagnosis different from patients with other diseases or infections, e.g., parameniscal cyst, osteophytes associated with DJD, synovial cyst, proximal tibiofibular joint cyst, traumatic bursitis, avulsion injury, pigmented villonodular synovitis, hemangioma and lipoma⁽¹²⁾. Achieving a precise diagnosis is challenging. MRI is usually the modality of choice for diagnosis as it can identify an increase in the loculated fluid signal intensity resulting from an adjacent meniscal root tear⁽²⁾.

Two very similar cases have been reported. Young-mo kim et al.⁽⁷⁾ reported on a 14-year-old boy who presented with a huge intra-meniscal cyst, although the exact size of the cyst was not specified. Another case was reported by Alwin Jager et al., describing a rare case of giant intra-articular ganglion cyst (27.7 × 13.5 mm) originating from the lateral meniscus⁽⁴⁾. However, these two cases involved a meniscal tear, a condition that was not present in our case study.

Most studies report that meniscal tears are interconnected with meniscal cysts. The notable characteristic is that horizontal meniscus tears are more common while radial tears are less frequently observed^(3,5,12). Although meniscal cysts have been found in the absence of a meniscal tear, patients should be examined using MRI to evaluate associated injuries, especially a meniscal tear, even when a previous traumatic event has not been reported.

In the past, a meniscal cyst was routinely treated with open meniscectomy, open debridement and isolated excision of the meniscal cyst⁽⁹⁾. However, different approaches have recently been adopted, e.g., the less invasive technique of arthroscopic decompression is now widely used. Thus, appropriate treatment including both decompression of the meniscal cyst as well as repair of the torn meniscus, e.g., subtotal meniscectomy, are necessary⁽⁹⁾. Hullet C. et al. reported the prognosis at the 5-year follow-up after arthroscopic debridement and partial lateral meniscectomy of a meniscal cyst with no other intra-articular damage to be excellent in 87% of cases⁽⁶⁾.

The recurrence rate of meniscal cysts is apparently very low, although no recurrence rate has been published. Several recent studies have reported successful treatment of meniscal cysts by arthroscopic partial meniscectomy or repair of the meniscus with cystic debridement^(6,7). In one report of 105 patients with lateral meniscal cysts, arthroscopic debridement was successful in 91 cases, whereas open removal of the cyst had to be performed in 14 cases⁽⁶⁾. Similar excellent clinical outcomes have been reported in many studies^(5,6). In the present study, the patient was satisfied with the outcome and was able to return to his sport 3 months after the surgery. There were no surgical complications or signs of recurrence at the 12-month

follow-up. These results suggest that arthroscopic debridement of meniscal cyst is an appropriate treatment for similar cases.

There are several options for treating meniscal cysts besides arthroscopic debridement⁽⁶⁾. For example, R. Lorio et al.⁽¹⁰⁾ reported that partial arthroscopic meniscectomy with percutaneous decompressive needling under arthroscope visualization is highly effective. The case of a 55-year-old male who developed a symptomatic meniscal cyst one year after he had been treated with arthroscopic debridement was reported by Anthony C.⁽¹¹⁾ The patient was then treated with ultrasound guided aspiration and corticosteroid injection which resulted in clinical improvement. In our opinion, these techniques are viable options, although both those techniques require that the physician have specific surgical skills.

Conclusions

Most lateral meniscal cysts are less than 3 centimeters, although some patients may have a large and multilobulated cyst. Arthroscopic debridement is an appropriate treatment for all meniscal cysts can be expected to result in satisfactory outcomes with no surgical complications or signs of recurrence at the 12-month follow-up.

Conflicts of interest

The authors declare no conflicts of interest.

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Ethical approval

Written informed consent was obtained from the patient for publication of this case report and the accompanying images.

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รายงานเคสคุณน้ำหนอนรองเข่าด้านนอก ในผู้ป่วยอายุน้อยที่ไม่ประสบอุบัติเหตุนำมายื่น

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โรคคุณน้ำหนอนรองเข่าพบอุบัติการณ์โรคต่ำประมาณ 1-3% ของประชากรทั่วไปโดยมักมีอายุต่ำ 0.3-9 มีลักษณะซึ่งผู้ป่วยจะมีอาการปวดข้อ หรือมีพิสัยการเคลื่อนไหวของข้อลดลง มีก้อนบริเวณด้านหน้า โดยส่วนใหญ่มักเกี่ยวข้องกับการเกิดอุบัติเหตุนำมายื่น แต่ปัจจุบันพบรายงานจำนวนน้อยที่ผู้ป่วยไม่มีบาดเจ็บก่อนการเกิดคุณน้ำและมักพบมีลักษณะคุณน้ำเดียว

รายงานฉบับนี้นำเสนอผู้ป่วยอายุ 32 ปี มีอาการคลำได้ก่อนที่เข้าข่าว 4 เดือน ลักษณะก่อนโผล่ขึ้นอย่างช้าๆ ทางด้านหน้า มีอาการปวดมากขึ้นเวลาอ่อนตัว บางครั้งมีอาการขัดล็อก ปฏิเสธประวัติอุบัติเหตุ ตรวจร่างกายพบก้อนด้านหน้าเข่า ขวางนัดประมาณ 3 เซนติเมตร พิสัยการเคลื่อนไหวสมบูรณ์ McMurray, Lachman's และ anterior/posterior drawer tests ให้ผลลบ ภาพรังสีไม่พบลักษณะการเบลี่ยนแปลงของกระดูกและกระดูกอ่อน หรือความผิดปกติอื่นๆ ภาพเอกซเรย์แม่เหล็กไฟฟ้าพบคุณน้ำหนอนรองกระดูกขนาด $4 \times 5.8 \times 4.3$ เซนติเมตร ลักษณะซับซ้อน พบร่องรอยต่อของคุณน้ำไปยังหนอนรองกระดูกด้านนอก และบริเวณด้านหน้าเข่าข้อ ทำการรักษาด้วยวิธีผ่าตัดลอกกล้องตรวจภายในเข่า พบว่า คุณน้ำหนอนรองเข่าด้านนอก และไม่มีการบาดเจ็บของหนอนรองกระดูกทั้งด้านในและด้านนอก ไม่พบการบาดเจ็บของเอ็นไขว้หน้า และเอ็นไขว้หลัง ทำการตัดคุณน้ำหนอนรองเข่าออก และฉีดยาคีนากอต (Kenacort) 40 มิลลิกรัมผสมกับ 0.1% นาเคน (Marcaine) 10 มิลลิลิตรเข้าข้อเข่าข้อเข้าข่าว ผลลัพธ์เป็น fibrocartilaginous-fatty tissue และเยื่อหุ้มข้อ หลังผ่าตัดผู้ป่วยมีเข้าบวมประมาณ 2 สัปดาห์ ไม่พบการติดเชื้อ หลังผ่าตัดประมาณ 2 สัปดาห์ พิสัยการเคลื่อนไหวข้อเข่าสมบูรณ์ และผู้ป่วยสามารถกลับไปเล่นกีฬาในเวลาประมาณ 2 เดือน ไม่พบร่องรอยเป็นช้ำจากการติดตามอาการครับ 1 ปี

พบทวนบทความที่เกี่ยวข้อง เชื่อว่ากลไกการเกิดโรคคุณน้ำหนอนรองเข่า เกิดจากการที่หนอนรองกระดูกเกิดการฉีกขาดขึ้นและมีลักษณะเป็นทางเข้าของน้ำไขข้อทางเดียว ไม่มีทางให้หลอดออก จึงทำให้เกิดเป็นคุณน้ำขึ้น อย่างไรก็ตาม มีรายงานการเกิดคุณน้ำหนอนรองเข่า แม้จะไม่พบการฉีกขาดของหนอนรองกระดูกก็ตาม เช่นเดียวกับผู้ป่วยรายนี้ โดยการรักษาในปัจจุบันเป็นวิธีผ่าตัดลอกกล้องเพื่อลอกอันตรายต่อเนื้อเยื่อข้างเคียง ผลการรักษาในหลายรายงานพบว่า ได้ผลลัพธ์ดี โอกาสการเกิดโรคช้ำต่อ พบรายงานเกิดโรคช้ำหลังผ่าตัดประมาณ 1 ปี ในผู้ที่อายุ 55 ปี โดยทำการรักษาอีกครั้งด้วยการใช้เข็มเจาะและฉีดยาสีดีรอยด์ผ่านเครื่องอัลตราซาวน์นำทาง ได้ผลลัพธ์ที่ดีแต่อย่างไรก็ตามวิธีนี้เป็นวิธีที่อาจมีความชำนาญของแพทย์สูง
