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Case report

Substantial medial para-meniscal cyst with a complex meniscal tear: A case report

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ABSTRACT

Introduction and importance: Meniscal cysts, while infrequent with a prevalence of 1 %–8 %, may result in considerable knee discomfort and functional limitations. The cysts are categorized according to their position in relation through the meniscus, labeled as either intrameniscal or parameniscal. Although parameniscal cysts are often small and asymptomatic, they may expand and become painful with time. This case report describes an uncommon instance of a medial parameniscal cyst.

Case presentation: A 28-year-old male presented with persistent pain and swelling in the medial aspect of his left knee, lasting for 8 months. His symptoms were exacerbated by activities such as stair climbing and general mobility. On physical examination, a firm, fluctuating mass measuring 5 × 3 cm was noted. MRI revealed a complex tear in the posterior horn of the medial meniscus, along with a cyst measuring 4.9 × 3.2 × 2.0 cm. Arthroscopy identified a degenerative medial meniscus tear, and the cyst was excised through open surgery. The patient's recovery was uneventful, with full restoration of knee function within three months.

Clinical discussion: Parameniscal cysts often coexist with horizontal meniscal tears, influenced by factors like knee laxity, trauma, and degeneration. MRI is the preferred diagnostic tool, but high-resolution ultrasound can be beneficial. Treatment options include conservative management and surgical interventions like partial meniscectomy, emphasizing the need for comprehensive diagnosis and appropriate management.

Conclusion: This unique case of a medial parameniscal cyst highlights the critical need for timely diagnosis and intervention. Surgical treatment, including meniscectomy or meniscal repair, offers significant pain relief and functional improvement, demonstrating its effectiveness in managing such cases.

1. Introduction

Meniscal cysts are a rare condition, with an incidence of 1 %–8 %, and can cause knee pain and impairment. Depending on the location of the cyst relative to the meniscus, a meniscal cyst may be classified as either intrameniscal or parameniscal cyst [1]. Parameniscal cysts are small cystic lesions that develop around the peripheral margin of the meniscus and range in size from 0.3 to 9 mm in diameter. Although most para-meniscal cysts are very small and patients never exhibit a mass around the knee, they seldom surpass 2 cm or manifest as a painful mass [2]. According to our knowledge, this was the first time a case of a medial parameniscal cyst originating from the knee was reported in Pakistan. The incidence of meniscal cysts is relatively low but significant among individuals with meniscal injuries. They are predominantly located on the lateral meniscus, with 92.5 % of cysts found in this region. Meniscal tears are often co-occurring with cysts, with 97.3 % of cases involving a meniscal tear. Horizontal cleavage tears are the most commonly associated tear morphology, accounting for 57 % of cases [12]. The treatment for meniscal tear can be done operatively, by meniscectomy, or by meniscal repair. Non-operative management via supervised strengthening exercises is shown to bear fruitful results for degenerative tears [6]. This disease is extremely rare and has an uncommon site of origin making this an enthralling case to report. Here we present a case of a 28-years-old male who presented with the complaint of pain and swelling on the medial side of the left knee and was diagnosed as a case of medial parameniscal cyst with an associated medial

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meniscal tear.

2. Case report

A 28-year-old male with no known co-morbidities, presented to the Outpatient Department of Tertiary Care Hospital on 25th March 2021 with complaints of pain and swelling on the medial aspect of the left knee for 8 months. Initially, the pain was mild, and the swelling was less protuberant. Later, both the swelling and the pain increased progressively over time. The pain was aggravated by climbing up and down the stairs and mildly interfered with the mobility of the patient causing discomfort in movement. A history of trauma was reported while playing cricket one year ago. There was no significant past medical or family history. On general physical examination, the patient appeared healthy-looking, well-oriented, and was afebrile. A solitary swelling was noted on the medial aspect of the left knee, which was firm, immobile, and had a fluctuant consistency with no signs of local inflammation. The size of the swelling was 5 × 3 cm (length × breadth). Anterior and Posterior Drawer tests of the knee were negative and mild to moderate joint effusion was present anteriorly. Medial joint line tenderness was present and knee flexion range of motion was limited to 0°-130°. McMurray's test was positive for medial meniscal tear and distal neurovascular structures were intact. Systemic examination was unremarkable. Routine blood investigations were carried out, the reports of which came out as normal. Imaging studies were done. The X-ray revealed no bony pathology.

Thereby, an MRI scan was ordered and multiplanar, multi sequential images through the left knee joint were acquired without IV contrast administration (Fig. 1) which revealed a complex tear of the posterior horn of the medial meniscus. Abnormal signal intensity multiloculated lesion along the medial aspect of the knee joint adjacent to the medial collateral ligament measuring 4.9 × 3.2 × 2.0 cm was found. It appeared hypointense on T1W and hyperintense on T2W, Proton Density (PD), and Short Tau Inversion Recovery (STIR) sequences.

Based on history, clinical examinations, and imaging findings, the diagnosis of medial parameniscal cyst associated with a meniscal tear was made. To confirm the diagnosis, the patient underwent arthroscopy using two small incisions, which revealed a horizontal degenerated medial meniscus tear (Fig. 2), which was then subsequently debrided by an arthroscopic approach. A medial vertical incision was made. The cyst was excised together with its entire stalk using an open surgical approach (Fig. 3).

The wound was stitched with prolene sutures 2/0 after surgical excision. The patient was admitted to Orthopaedics' Ward-1 following the operation. Cefuroxime 750 mg injection was given intravenously three times a day for two days and oral Paracetamol BP 650 mg + Orphenadrine Citrate BP 50 mg was prescribed for 2 weeks as post-operative medications. He was then discharged from the hospital 2 days after the operation. Decrease VAS pain scale scores and improved range of motion (ROM) outcomes during the follow-up period, along with regular follow-up intervals as suggested (3, 6, 9, and 12 months).

The patient did not develop any complications post-operatively. The rehabilitation team was called, and weight-bearing exercises were started immediately on the first postoperative day. Static quadriceps strengthening exercises began on the first postoperative day and continued for six weeks. Sutures were removed after two weeks. After the sutures were removed, an active range of motion was started 2 weeks later. At 3 months of follow-up, the patient regained the full function of his knee. The patient was doing well so far, with no evidence of recurrence, pain, or limitation of joint movements.

3. Discussion

Exudation of synovial fluid through the adjacent meniscal tear is a widely accepted hypothesis regarding the etiopathogenesis of parameniscal cysts, as they are usually (98 %) associated with horizontal

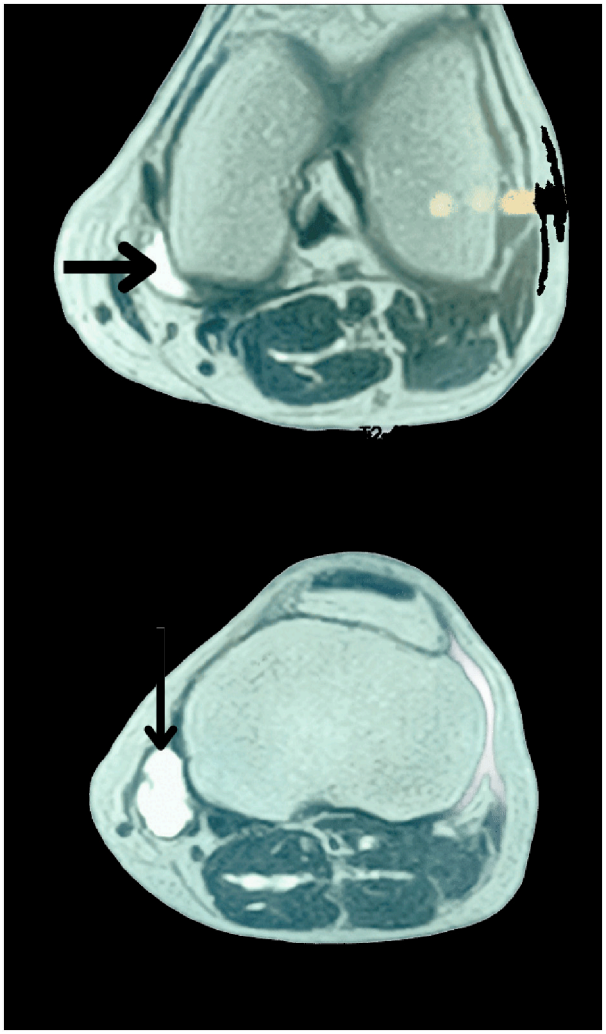

Fig. 1. Pre-operative T2 weighted (non-contrast) axial MRI of the left knee joint showing complex medial meniscal tear with parameniscal cyst (black arrow).

meniscal tears [2].

Trauma history is a significant risk factor for cyst formation, with 37.5 % of patients with meniscal cysts having a documented history of knee trauma. However, most cases may still arise from chronic degenerative changes, especially in older individuals. Meniscal cysts are important in the differential diagnosis of knee pain, especially those with a history of lateral meniscus tears [12].

In addition to a detailed history and clinical evaluation, radiological interventions are necessary for the definitive diagnosis of parameniscal cyst and meniscal tears. MRI remains the investigation of choice for establishing a diagnosis of parameniscal cyst of the knee. Chen et al. while reporting two cases of meniscal cysts, hinted towards the practicality of CT scan along with arthrography in determining the size, site, content, and connections of the cyst with surrounding structures — the menisci and peripheral tissues [4]. Furthermore, the limited availability of MRI and its contraindication in a subset of patients pushed clinicians to utilize other radiological modalities. Rutten et al. reported high-resolution ultrasonography as an excellent alternative to conventional MRI. As per their research, high-resolution ultrasound had a sensitivity, specificity, accuracy, positive predictive value, and negative predictive value of 97 %, 86 %, 94 %, 94 %, and 92 %%, respectively. Ultrasound scan was able to pick up meniscal tears associated with a meniscal cyst in 89 % of the cases however, it is not a modality widely used [5].

Meniscectomy can either be total meniscectomy — involving

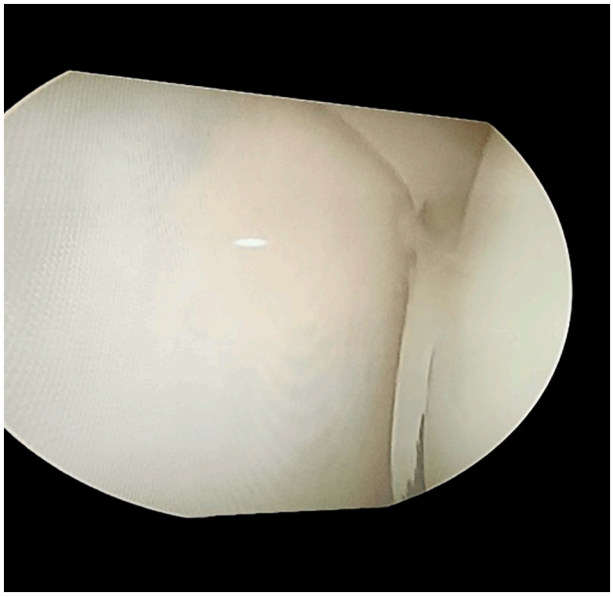

Fig. 2. Arthroscopic image of the left knee joint showing a medial meniscal tear.

removal of the whole meniscus or partial meniscectomy — removes only the torn part with retention of most of the meniscus. It can be done via an arthroscopic or open surgical approach. In a cohort study, Roos et al. followed up 107 patients for 21 years who underwent total meniscectomy and found that 48 % of the people demonstrated advanced changes suggestive of tibiofemoral Osteoarthritis (OA) on radiographs [7]. On the contrary, all patients that undergo arthroscopic partial meniscectomy briefly depend on walking aids, return early to sporting activities and bear better prognostic results (90 %) after the surgery [8]. Our patient underwent the same procedure which gives us a clue that partial meniscectomy with early mobilization and strengthening exercises bear fruitful results to the patient. Finally, a meniscal repair can be done by an arthroscopic or open procedure using inside-out or outside-in repair techniques [6].

Just like a meniscal tear, parameniscal cysts can be treated operatively or non-operatively. The former can be done via an open surgical approach, open surgical approach plus open meniscectomy, or arthroscopically with partial meniscectomy and intraarticular cyst decompression [2,3]. The conservative management of meniscal cysts was first proposed by Muddu et al. They treated 19 patients by aspirating the cyst content in a sterile environment with a wide-bore needle. They then injected 40 mg methylprednisolone depot suspension into the cystic space. Of these patients, 13 remained asymptomatic on follow-up for one to four years [9]. McMahon et al. published a case series of 18 patients and aspirated meniscal cysts under ultrasound guidance. A probe of 7.5 MHz was used. 1 % lignocaine was administered subcutaneously to provide local anaesthesia. A 16-gauge needle was used, and the cysts were aspirated completely. This was followed by injection of 40 mg methylprednisolone acetate and 1 ml 0.5 % bupivacaine in and around the menisci. The majority of the patients showed complete recovery in this study [10].

Tha protocols and standards are utilized and approved by authors, to improve surgical case reporting robustness and openness using Surgical Case Report (SCARE) guidelines [11].

4. Conclusion

The occurrence of a medial parameniscal cyst is a rare condition and the most common cause is a knee injury. Excision of the meniscus along with arthroscopic meniscectomy or repair is a standard of care for the best possible outcome with relief of pain and improvement in function.

Author contribution

MIR and MWK, worked on the conception and designing, while RJ BS and NH performed drafting, data collection, acquisition, analysis, and interpretation of data. MIR, MWK and JGM played a role in critical revision and appraisal and contributed equally in all the tasks.

All the authors approved the final draft and stand accountable for validity of data.

Consent for publication

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

Ethical approval for this study was provided by the Ethical Committee DUHKS of Dow University of health science Hospital/Civil Hospital Karachi, Pakistan, Grant number is 7703 dated 10-06-2021.

Guarantor

Dr. Muhammad Irfan Rajut.

Fig. 3. Image of the left knee joint showing a medial parameniscal cyst.

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Conflict of interest statement

There is no conflict of interest between authors.

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Data availability

All data were obtained from Orthopedic Surgery Department of Dr. Ruth KM Pfau Civil Hospital Karachi, Pakistan.

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