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Intra-articular lipoma, a rare case presentation

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Abstract
Lipomas are the most frequent benign soft-tissue tumours; however, their intra-articular occurrence is exceptionally rare compared to lipoma arborescens, which is more often a reactive synovial process linked to degenerative or inflammatory joint disease. The knee is the most common site, though occasional cases have been reported in the hip, elbow, wrist, shoulder, and spine. We present the case of a 48-year-old male who reported a progressively enlarging, painless swelling in his right knee, which later caused discomfort during deep flexion. Clinical examination revealed a mobile, non-tender suprapatellar mass without inflammatory changes. Radiographs demonstrated soft-tissue opacity, and MRI revealed a well-defined, high-intensity lesion with fibrous septa consistent with fatty tissue. The patient underwent medial parapatellar arthrotomy, during which a large encapsulated lipoma measuring 13 × 8.5 cm was excised in toto. Histopathological examination confirmed mature adipose tissue with fibrous septa, establishing the diagnosis of a true intra-articular lipoma. Postoperative recovery was uneventful, with complete restoration of knee motion and no recurrence at follow-up. Intra-articular lipomas are diagnostically challenging due to their rarity and non-specific radiographic findings. MRI is the imaging modality of choice, facilitating differentiation from mimics such as lipoma arborescens, liposarcoma, pigmented villonodular synovitis, and Hoffa's disease. While arthroscopic excision is suitable for small lesions, large tumours may require open arthrotomy for complete removal. This case underscores the importance of considering intra-articular lipoma in the differential diagnosis of intra-articular knee masses and demonstrates that surgical excision provides excellent functional and oncological outcomes with a negligible recurrence rate.

Keywords: Intra-articular lipoma, knee joint, MRI diagnosis, surgical excision, case report

Introduction
Lipomas are recognized as the most frequent benign tumours of soft tissue, but their occurrence inside a joint cavity is exceptionally rare. This is in contrast to lipoma arborescens, which is a better known entity and typically represents a reactive synovial process related to degenerative or inflammatory joint disease rather than a true tumour [1]. The knee is the joint most often involved, though similar lesions have occasionally been identified in other locations such as the hip, elbow, wrist, shoulder, and lumbar spine [2]. In this report, we describe a patient who presented with an intra-articular lipoma of the knee.

Case presentation
A 48-year-old male, with no significant past medical history, reported to our out-patient clinic due to a gradually enlarging mass in his right knee. He had first noticed the swelling several months earlier but did not seek care initially, as it was painless and caused no functional limitation. With time, the mass increased in size and deep knee flexion began to cause discomfort. There was no history of trauma.

On examination, a soft-to-firm, non-tender swelling was palpable in the superolateral region of the left knee. It was mobile over the deeper planes and not adherent to skin. There was no warmth, erythema, or joint effusion. Range of motion was 0-110°, but terminal flexion elicited pain. No muscle wasting was evident. Blood investigations were normal. Weight-bearing radiographs demonstrated only soft-tissue opacity with minimal degenerative changes. MRI (T_1- and T_2-weighted) revealed a high-intensity lesion with internal fibrous septa, consistent with fatty tissue, located in the suprapatellar pouch and extending into the lateral gutter and patellofemoral compartment (Fig 1 and Fig 2).

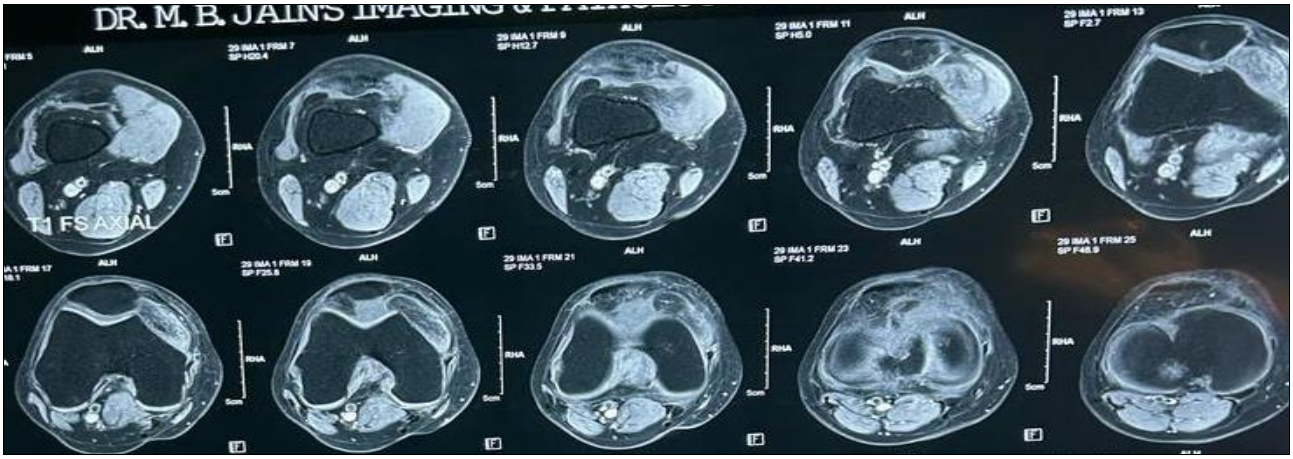

Fig 1

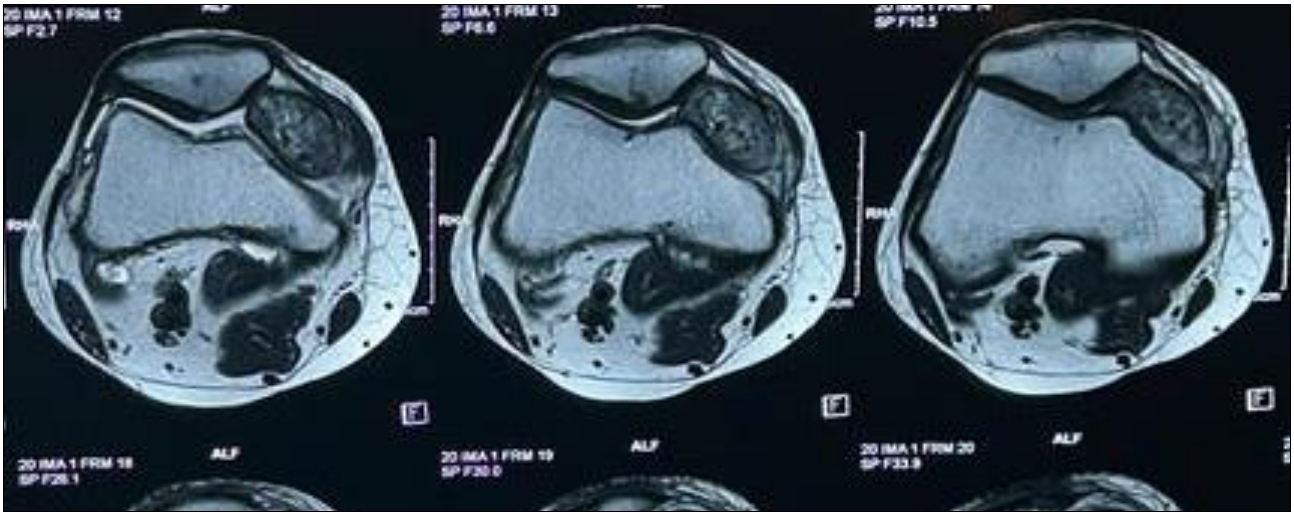

Fig 2

Treatment

The patient underwent excision through a medial parapatellar arthrotomy. Intra-operatively, an encapsulated ovoid mass measuring 13 × 8.5 cm was identified. It was loosely attached by a fibrous band to the suprapatellar bursa but otherwise free from deeper attachments. The portion projecting into the patellofemoral joint was carefully mobilized and the lesion was completely excised. The fibrous tract was cauterized to reduce recurrence risk. Histopathological examination revealed mature adipose tissue separated by fibrous septa, confirming the diagnosis of a true intra-articular lipoma.

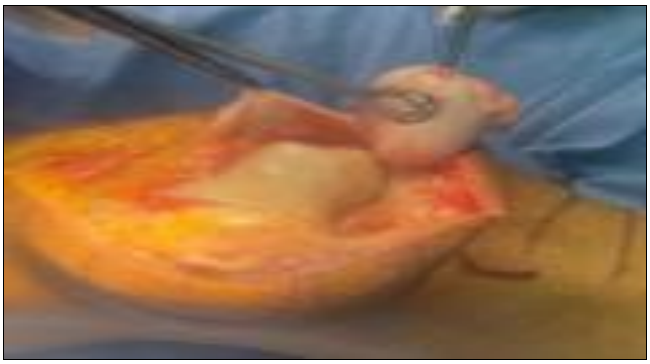

Fig 3

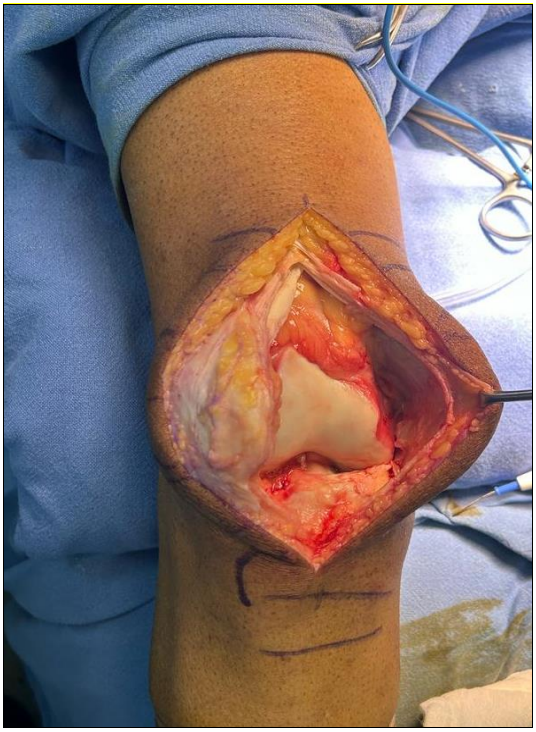

Fig 4

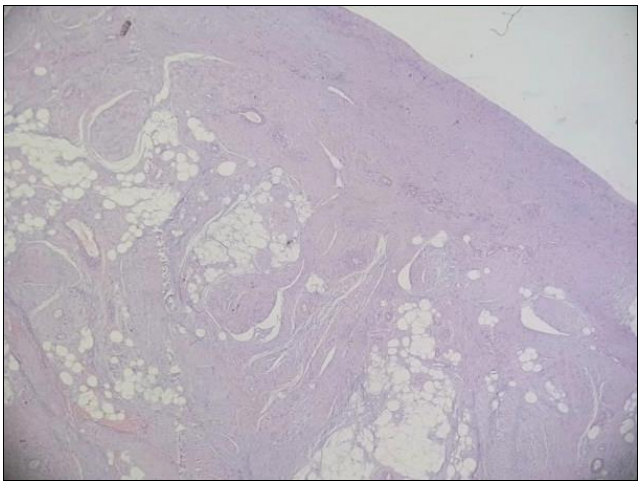

Fig 5

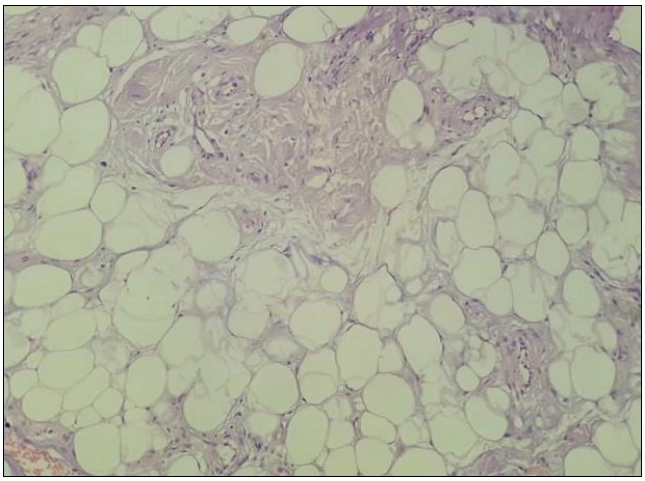

Fig 6

Outcome and follow-up

Postoperatively, recovery was uneventful. The incision healed well without infection or wound-related issues. Intensive physiotherapy was initiated to maintain motion and prevent quadriceps atrophy. By discharge, the patient had regained near-complete range of movement with no residual symptoms.

Discussion

Soft-tissue lipomas are frequently encountered in clinical practice [3]; however, intra-articular forms are distinctly uncommon, with fewer than 30 cases described in the literature, most of them affecting the knee [4]. Small intra-articular lipomas may initially escape diagnosis, particularly when plain radiographs appear normal. When visible, they usually appear as a well-defined radiolucent lesion. Magnetic resonance imaging (MRI) is regarded as the preferred modality for evaluating intra-articular tumours, as it allows differentiation from meniscal and ligamentous pathology [5]. Typically, lipomas demonstrate high signal intensity on both T_1- and T_2-weighted images, resembling subcutaneous fat. In some cases, alterations such as mucoid degeneration may lead to atypical signal patterns [6].

The differential diagnosis includes lipoma arborescens, intra-articular liposarcoma, pigmented villonodular synovitis (PVNS), and Hoffa's disease [7]. Lipoma arborescens is characterized by villous fatty proliferation of the synovium and is often associated with previous trauma, osteoarthritis, or chronic inflammatory conditions. MRI usually shows "hair-like" frond-like projections with high signal on T1 and T2 sequences, suppressed on STIR images [8]. In contrast, intra-articular liposarcoma, although very rare, presents as a large, locally aggressive lesion with thick septa and non-lipomatous areas [9]. PVNS generally exhibits low signal intensity on both T1 and T2 sequences, with a blooming effect due to hemosiderin deposition [10]. Hoffa's disease, on the other hand, results from hypertrophy and fibrosis of the infrapatellar fat pad following trauma, showing variable low-intensity signals on MRI, sometimes with associated ossification [11].

Histologically, intra-articular lipomas are composed of mature adipose tissue surrounded by a fibrous capsule, confirming their nature as true neoplasms rather than reactive lesions. Although their biological behaviour appears benign, they tend to enlarge slowly and cause symptoms once they occupy significant intra-articular space.

There is no universally accepted treatment protocol. Both arthroscopic excision and open resection have been reported. While arthroscopy is less invasive and effective for small lesions, larger tumours may necessitate open arthrotomy to achieve complete removal. Recurrence after excision is extremely uncommon, highlighting the effectiveness of surgical management.

The gold-standard treatment has not yet been established for intra-articular lipoma. Arthroscopic excision has been performed as well as open arthrotomy. There have been no recurrences of the lesion following arthroscopic excision in previous studies, which suggests this treatment is valid so long as it is practicable. Arthroscopy did not seem to be an option in our case given the large size of the patient's lesion, so we chose arthrotomy to be a much more realistic option.

Conclusion

Thorough clinical evaluation and appropriate imaging are essential for diagnosing intra-articular lipomas and distinguishing them from other intra-articular pathologies. MRI plays a central role both in differential diagnosis and in planning surgical management. Complete excision, either arthroscopically or through open arthrotomy depending on lesion size, is an effective treatment with very low recurrence rates.

Clinical examination is essential in the diagnosis of the lesion. MRI is important for both differential diagnosis as well as preoperative planning for surgical intervention. Excision can be performed by open arthrotomy or arthroscopy, depending on the size of the lesion.

Conflict of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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