Case Report

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Orthopaedics Section

Management of Neglected Lateral Patellar Dislocation with Osteochondral Fracture and Dejour Type D Trochlear Dysplasia in the Setting of Venous Thromboembolism: A Rare Case Report

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ABSTRACT

Neglected lateral patellar dislocation, characterised by sustained lateral displacement beyond three weeks, is a multifaceted syndrome marked by progressive periarticular fibrosis, adaptive shortening, and osteochondral injury, leading to discomfort, instability, and functional limitations. This case report illustrates the management of neglected lateral patellar dislocation with displaced osteochondral fracture accompanied by Dejour type D trochlear dysplasia in a young male complicated by Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE). Surgical intervention was postponed for six weeks because of PE, requiring anticoagulant therapy. Subsequent to the partial clearance of the thrombus, the patient underwent single-stage surgery that included fixing of the osteochondral fragment, deepening of the sulcus using trochleoplasty, lengthening of the lateral retinaculum, and reconstruction of the medial patellofemoral ligament using a gracilis autograft. Postoperative therapy involved early full weight-bearing and range of motion exercises, resulting in positive early outcomes at two weeks, including 0°-60° knee flexion and one-year follow-up demonstrating pain-free knee ROM 0°-120° and return to daily activity at six weeks and resumed work at eight weeks. This example underscores the essential need for a customised therapy strategy that effectively addresses both soft tissue and bony pathology, even when surgery timing is confounded by significant systemic concerns, to attain favourable functional outcomes.

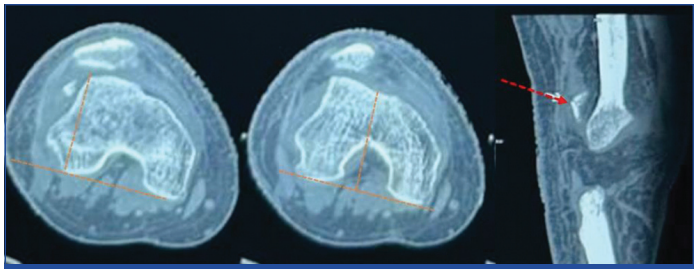
Keywords: Medial patellofemoral ligament tear, Trochlear dysplasia, Trochleoplasty

CASE REPORT

A 29-year-old male presented with a history of right knee injury which he had suffered six weeks earlier following a slip and fall. Immediately after the injury, he was unable to completely extend the knee. The patient went to a nearby hospital, where he was treated with tube slab for six weeks, the details of which were not available. Patient came after six weeks due to persistent anterior knee pain (VAS 7/10). At presentation, tube slab was still present. Upon removal, local examination revealed knee effusion, laterally displaced patella, parapatellar tenderness, active knee ROM was 10°-20°, difficulty in weight-bearing. His Beighton score was 2/9 [1], suggesting the absence of generalised ligament laxity. There was calf oedema compared with the contralateral side, with a positive Homans' sign, which raised suspicion of DVT, which was subsequently confirmed on venous Doppler ultrasonography [Table/Fig-1]. The patient had no history of smoking, malignancy, prolonged travel, prior thromboembolic events, or known hypercoagulable disorders. There was no family history of thromboembolism.

[Table/Fig-1]: X-ray: The trochlear spur (yellow arrow) and double contour sign (green arrow) validate trochlear dysplasia; the Insall-Salvati ratio (1.0) signifies normal patellar height and skyline view showing lateral dislocation of patella.

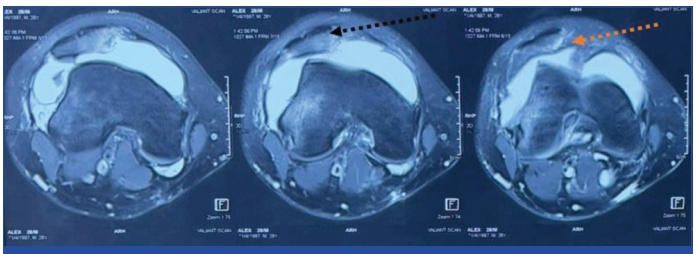
Plain radiographs were taken which showed a laterally subluxed patella, and a displaced osteochondral loose body in the lateral gutter. Further MR imaging with CT screening showed that the loose. The fragment was an osteochondral fracture arising from the medial facet of the patella, associated with Dejour type D trochlear dysplasia and a laterally displaced patella [Table/Fig-2]. MRI demonstrated preservation of fragment morphology with maintained subchondral bone attachment and preserved signal intensity without fragmentation, cystic degeneration, or collapse, suggesting that the osteochondral fragment remained viable and was suitable for fixation [Table/Fig-3].



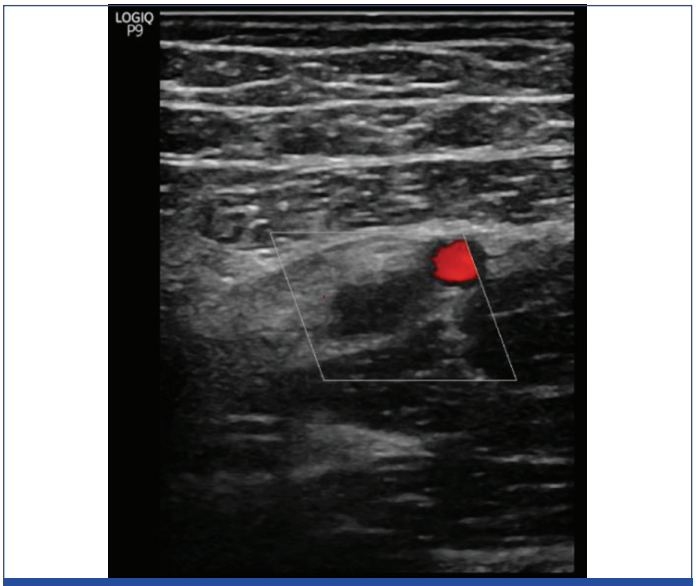
[Table/Fig-2]: CT imaging demonstrated characteristics of Dejour type D trochlear dysplasia, affirming atypical shape. A displaced osteochondral fragment measuring (2.8×1.3 cm) was seen in the lateral suprapatellar recess (red arrow). The TT-TG gap measured 23 mm (orange lines), over the typical threshold (<20 mm), showing lateralisation that contributes to instability.

Venous doppler ultrasonography was performed which revealed acute DVT affecting the right superficial femoral, popliteal and tibial veins [Table/Fig-4]. CT Pulmonary Angiography (CTPA) was taken subsequently which revealed a partial filling defect indicative of acute Pulmonary Thromboembolism (PE) in the distal right pulmonary artery and its branches [Table/Fig-5]. In view of the DVT/PE surgical intervention was postponed and anticoagulant therapy was initiated. Injection Enoxaparin 0.6 mL subcutaneous twice daily was started for two weeks which was then changed to oral Rivaroxaban 20

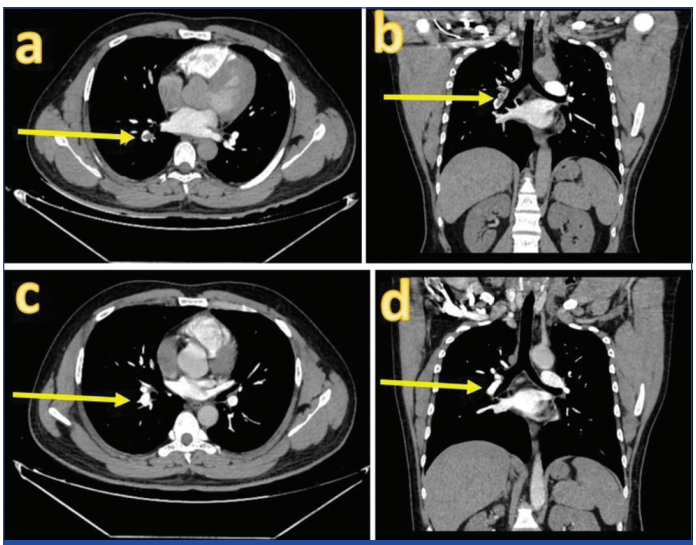
mg daily for four weeks with regular monitoring of his coagulation parameters. After six weeks, CTPA and doppler investigations were done to check for resolution of thrombus. Reports revealed partial resolution of the thrombus, and subsequent vascular clearing allowed the patient to be taken up for scheduled surgical procedure. Rivaroxaban was switched to enoxaparin before surgery.



[Table/Fig-3]: The Magnetic Resonance Scan (MRI) reveals a tear in the Medial Patellofemoral Ligament (MPFL) (shown by the orange arrow). Characteristics of Dejour type D trochlear dysplasia were apparent. The patella exhibited an elevated inclination of 23° (normal range: 13°-15°) (Black arrow).



[Table/Fig-4]: Doppler ultrasound image showing mildly echogenic intraluminal thrombus extending throughout the superficial femoral vein, consistent with Deep Vein Thrombosis (DVT).



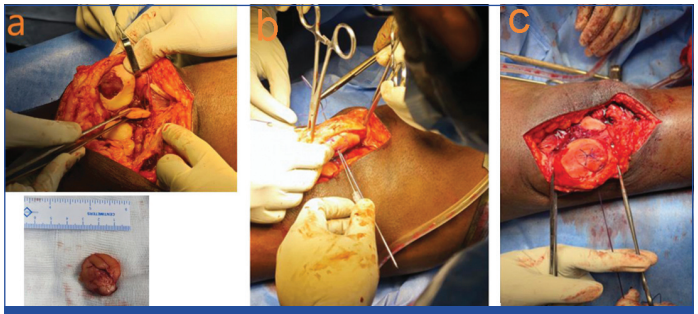
[Table/Fig-5]: Initial CT pulmonary angiogram: (a,b) demonstrating a partial filling defect in the distal right pulmonary artery (yellow arrow) consistent with Pulmonary Embolism (PE) and follow-up scan; (c,d) after six weeks showed partial resolution of the thrombus.

SURGICAL TECHNIQUE

The patient had Dejour type D trochlear dysplasia, chronic lateral subluxation of the patella, and a stiff knee. After discussing all options with the patient, he was scheduled for manipulation under anaesthesia followed by sulcus deepening trochleoplasty, lateral retinacular lengthening for tight retinaculum, MPFL reconstruction and osteochondral fragment fixation.

Under regional anaesthesia, with the patient in the supine position, knee manipulation was done and full Range of Movement (ROM) was obtained following which the patella was noted to have maltracking with inverted J sign.

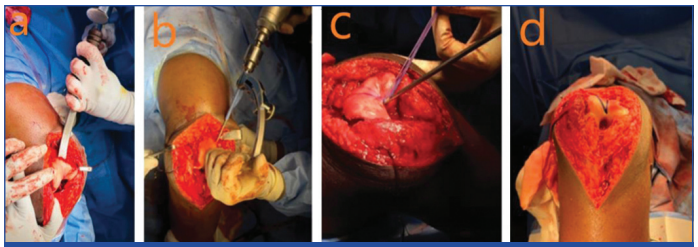
Under aseptic precautions, through a medial parapatellar approach, arthrotomy was done. The osteochondral fragment found at the lateral gutter was retrieved and the edges were freshened [Table/Fig-6a,b]. Using absorbable No. 1 Polyglactin (vicryl) sutures and trans-osseous drill holes the fragment was reduced anatomically and fixed to the patella [Table/Fig-6c].



[Table/Fig-6]: Osteochondral fragment fixation: fragment retrieved (a); freshened and repositioned (b); fixed with absorbable Vicryl sutures (c).

The proximal and lateral periosteum over the trochlea was incised and elevated. The trochlear cartilage flap was detached using a curved osteotome leaving 1-3 mm of subchondral bone. The flap was carefully mobilised off the lateral femoral condyle in one piece from proximal to distal, with the proximal 5 mm fully released. Using dedicated trochleoplasty jig (Arthrex™), sulcus-deepening trochleoplasty was performed after defining the final trochlear groove using the anatomical axis. The jig uses an offset burr which removes subchondral bone leaving the flap of trochlear cartilage that can be moulded to the desired trochlear surface. Adequate care was taken while using the burr as inadvertent lifting of the jig can result in fracture of the cartilaginous flap. Trochlear spur seen superior to the lateral trochlear cartilage was osteotomised making sure to prevent notching. The flap was moulded using finger and soft instruments to get the desired trochlear shape.

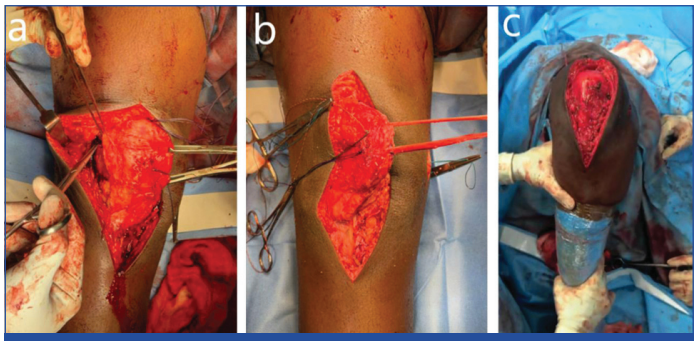
At the base of the trochlear groove, a 3.5 mm knotless pushlock® anchors (Arthrex™) with four No 1 vicryl sutures was inserted, similarly two 3.5 mm knotless pushlock® anchor were used one at the superior edge of the new trochlear groove and the other at the anterolateral corner of lateral trochlear cartilage loaded with the tails of vicryl sutures from the central anchor. The sutures were tensioned before insertion to mould the trochlear surface to the desired contour [Table/Fig-7].



[Table/Fig-7]: Trochleoplasty: Trochlear sulcus deepened (a); elevated around 3 mm (b); fixed with Arthrex™ 2.9 and 3.5 mm knotless suture anchors (c,d).

Then Z lengthening of lateral retinaculum was done. Gracilis autograft was harvested and prepared, the graft was measured to be 6 mm after doubling. Under c-arm guidance the Schottle point was identified and reamed using 6 mm reamer. Two drill holes were made one at superior third and other at the middle third of the medial border of patella exiting on the anterior surface making sure the vicryl sutures used for fragment fixation are undisturbed and the medial border of patella was freshened to receive the graft. Two No 2 non-absorbable UHMWPE sutures were tied 5 mm equidistant to the

centre of the graft and the graft was attached to the medial border of patella with fibre wires pulled through the drill holes which were tied on to the anterior surface of patella [Table/Fig-8a]. After fixation of the graft, the osteochondral fragment was confirmed to be securely fixed to the patella. The MPFL graft was passed between the second and third layer of the medial side of knee, pulled through the tunnel at the Schottle point and fixed with 6 mm PEEK interference screw [Table/Fig-8b]. The retinaculum was closed using No 1 vicryl sutures patella tracking was checked which showed proper tracking with no subluxation [Table/Fig-8c] wound closed in layers over drain.

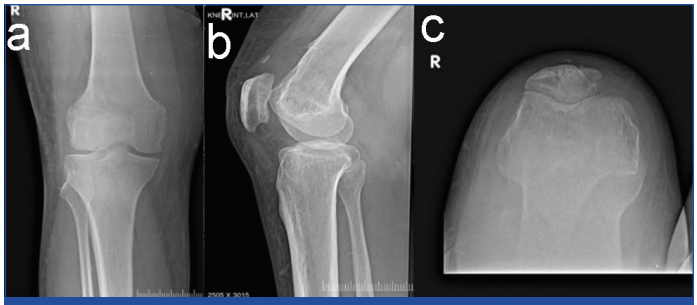


[Table/Fig-8]: Lateral retinacular lengthening (a); Medial Patellofemoral Ligament (MPFL) reconstruction: gracilis autograft (28 cm) fixed to patella with fibre wire (b); Intraoperative knee flexion- no subluxation (c).

Postoperatively, the patient was mobilised with full weight-bearing using a walker and knee brace from the second day [Table/Fig-8]. Continuous Passive Motion (CPM) was initiated from 0° to 45° for 30 minutes, three times daily, along with ankle pumps and quadriceps and hamstring strengthening. Range of motion was progressed by approximately 15° every two days with supervised physiotherapy. At two weeks, knee ROM improved to 0°-60°, with intact extensor mechanism and straight leg raising. By one month, knee ROM reached 90°, with comfortable full weight-bearing. Anticoagulation prophylaxis was continued with injection enoxaparin 0.4 mL subcutaneous twice daily followed by Tablet Rivaroxaban 10 mg daily for three months under vascular surgeon advice. No recurrence of thromboembolic symptoms was noted.

At one-year follow-up the patient demonstrated pain-free knee ROM 0°-120° with no instability or extensor lag. Good patellar tracking without lateral subluxation or J sign was seen. Functional outcome was assessed using the International Knee Documentation Committee (IKDC) score [2], which improved from preoperative 38 to 78 postoperatively, indicating significant functional recovery. The patient was able to return to routine daily activities by six weeks and resumed work by eight weeks. Radiographs taken at one year postoperative period showed stable centralised patella, with healed trochleoplasty and osteochondral fractures and no signs of early arthritis [Table/Fig-9]. One-year post-operative follow-up is given in [Table/Fig-10].

[Table/Fig-9]: Immediate postoperative X-ray with drain in situ.



[Table/Fig-10]: One-year postoperative follow-up X-ray {(a) Antero-Posterior; (b) Lateral; (c) Skyline views}.

DISCUSSION

Chronic patellar dislocation with high-grade trochlear dysplasia is uncommon and delayed presentation complicates management. With time, adaptive changes such as lateral soft-tissue contracture, capsular stiffness and fibrosis develop often accompanied by osteochondral injury. These factors contribute to persistent pain, stiffness, and instability if not addressed effectively. Similar patterns have been described in neglected patellar dislocations, where abnormal tracking and progressive cartilage damage are common findings [3,4].

In this case, treatment was further complicated by the presence of acute DVT and PE. Because major lower-limb surgery carries an inherent risk of perioperative venous thromboembolism, particularly in the knee, definitive surgical correction was deferred until medical stabilisation was achieved [5,6]. Reports have also shown that patellar procedures are not exempt from postoperative DVT risk, supporting the decision to delay surgery until anticoagulation and vascular clearance was completed [7].

The osteochondral fragment was large (2.8×1.3 cm) and preoperative MRI demonstrated preservation of subchondral bone and maintained signal intensity of the osteochondral fragment suggesting viability. The fragment originated from the medial facet of the patella which is the region contributing to articular congruity. Therefore, fixation was preferred over excision.

The fragment involved the medial patellar facet, an important articular contact region of the patellofemoral joint rather than a purely non-weight-bearing surface. Despite the delayed presentation, preservation of fragment morphology and MRI viability characteristics supported an attempt at fixation. Although delayed presentation may reduce healing potential, preservation of fragment morphology and subchondral bone integrity favoured fixation over excision in this young patient. Excision of a large osteochondral fragment in a young patient may predispose to persistent anterior knee pain and early degenerative changes.

Preserving the patellar articular surface helps restore joint congruity and may reduce long-term degenerative changes. Studies have demonstrated good clinical and radiological outcomes following fixation of osteochondral fragments after patellar dislocation [8,9].

Severe Dejour type D trochlear dysplasia was a major contributor to the chronic instability in this patient. Trochlear dysplasia is a well-established anatomical risk factor for recurrent patellar dislocation, and high-grade deformity often necessitates bony correction [10]. Sulcus-deepening trochleoplasty was performed to restore a functional trochlear groove, a technique that has shown satisfactory long-term outcomes in similar cases [11]. Although the TT-TG distance was increased (23 mm), isolated Tibial Tuberosity Transfer (TTT) was not performed as trochlear dysplasia- Type D was considered the primary pathology. Several authors have emphasised that combining trochleoplasty with MPFL reconstruction provides better stability than either procedure alone in patients with severe dysplasia [12-14]. In this case, MPFL reconstruction using a gracilis autograft was performed, and lateral retinacular lengthening was added to reduce excessive lateral tethering and improve patellar

tracking [15]. Trochleoplasty directly corrects the abnormal trochlear morphology, thereby centralising the patella. Combined procedures were considered, but as adequate intraoperative patellar tracking was achieved following trochleoplasty, MPFL reconstruction and lateral retinacular lengthening, TTTs were not done.

Although the TT-TG distance was elevated (23 mm), tibial tubercle transfer was not performed because intraoperative patellar tracking normalised after trochleoplasty, MPFL reconstruction, and lateral retinacular lengthening. In chronic patellar instability associated with severe Dejour type D trochlear dysplasia, trochlear morphology is often considered the dominant pathological factor. Excessive distal realignment in such cases may increase the risk of overcorrection, altered patellofemoral contact pressures, and postoperative stiffness. Therefore, isolated correction of the trochlear dysplasia with soft-tissue balancing was considered adequate in this patient.

Trochleoplasty is technically demanding and associated with potential complications including cartilage injury, inadequate sulcus deepening, residual instability, arthrofibrosis, persistent pain, and progression of patellofemoral osteoarthritis. Careful elevation of the osteochondral flap with preservation of subchondral bone thickness is essential to reduce the risk of cartilage compromise and flap necrosis. In the present case, no intraoperative cartilage complications or postoperative instability were observed at one-year follow-up.

Postoperative rehabilitation focused on early mobilisation to restore knee motion while minimising thromboembolic risk. Early weight-bearing and range-of-motion exercises help reduce venous stasis and stiffness, which is particularly important in patients with a recent history of venous thromboembolism [16].

Early supervised rehabilitation with protected full weight-bearing, gradual range-of-motion exercises, and thromboprophylaxis was initiated postoperatively. At one-year follow-up, the patient demonstrated stable patellar tracking, pain-free knee motion from 0°-120°, and significant functional improvement with IKDC score improvement from 38 to 78.

Overall, this case demonstrated that chronic patellar dislocation with severe trochlear dysplasia can be managed successfully through a staged and comprehensive approach. Addressing medical comorbidities first, followed by correction of both bony and soft-tissue pathology, results in stable patellar tracking and good early clinical improvement.

CONCLUSION(S)

This case illustrated the effectiveness of a phased surgical approach for addressing persistent patellar dislocation exacerbated by significant trochlear dysplasia, MPFL insufficiency, and venous thromboembolism. The comprehensive surgical technique encompassing osteochondral fragment fixation, trochleoplasty, lateral retinacular lengthening and MPFL reconstruction using a gracilis tendon autograft targeted both osseous and soft-tissue abnormalities.

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