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Case Report

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Right recurrent patellar dislocation treated surgically via the Campbell method: an illustrative case report

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ABSTRACT

Background: Recurrent patellar dislocation is a disabling condition, particularly prevalent among adolescents and young adults, often caused by anatomical abnormalities such as trochlear dysplasia or prior trauma. Surgical intervention, including the Campbell technique, is indicated when conservative management fails. A 24 years old male with recurrent right patellar dislocation and trochlear dysplasia (Dejour type B) underwent proximal realignment via the Campbell technique. The procedure involved creating a medial capsular flap, reinforcing it with Fiber wire sutures and repositioning it to stabilize the patella. Postoperative immobilization and rehabilitation were implemented. Surgical stabilization using the Campbell technique is a viable option for recurrent patellar dislocation, offering excellent functional outcomes in anatomically predisposed patients. Comprehensive evaluation and tailored surgical planning remain essential for optimal results.

Keywords: Campbell technique, Patellofemoral instability, Recurrent patellar dislocation

INTRODUCTION

The articulation between patella and femoral trochlear groove, forms the patellofemoral joint. This articulation plays a vital role in the stability of Knee joint. In extended Knee, patella lies above the trochlear groove and on flexion, the patella tendon pulls the patella into the trochlear groove.[1] Though patellar dislocation is a common injury, recurrent patellar dislocation isn't. It is mostly prevalent among children and adolescent age groups.[2] Its incidence falls within a range of 23 to 43 per 1 lakh population, per year.[3]

Some of the risk factors leading to this condition include skeletal immaturity, medial patella-femoral ligament laxity, increased patellar height, trochlear dysplasia and a history of contralateral patellar dislocation.[4] Though a common and easily treatable orthopaedic problem, its recurrence causes chronic instability. The typical symptoms of the condition include pain, swelling and a sense of apprehension or instability during certain movements.[5] The condition often leads to functional limitations, significantly impacting quality of life and restricting participation in physical activities. Diagnostic modalities include clinical evaluation along with imaging such as X-ray imaging and CT scan. X-rays detect recurrent patellar dislocation in the Antero-posterior view. However, X-rays may not detect soft tissue injuries or subtle cartilage damage.[6,7]

Recurrent patellar dislocation requires surgical intervention when conservative management fails. Common surgical techniques include medial patellofemoral ligament (MPFL) reconstruction, tracheoplasty, tibial tubercle transfer and lateral retinacular release or lengthening.[8] MPFL reconstruction has become the most widely accepted procedure due to its role in restoring the primary medial restraint of the patella, showing good outcomes in reducing recurrence and improving function.[9] Thus, we present a case on right

recurrent patellar dislocation managed surgically by Campbell technique.

CASE REPORT

A 24 years old male presented with complaints of right knee joint instability for the past 25 days and right knee pain persisting for the last two years. The pain initially began following a fall sustained while playing two years ago. At that time, the patient experienced dull aching pain localized to the right knee, which was non-radiating and gradually progressive, occasionally exacerbated by physical activity. He did not seek any medical intervention at that time and managed conservatively.

However, approximately 25 days ago, he had a second episode of trauma to the same knee due to another fall, after which he began experiencing a sensation of instability in the joint, particularly while walking or bearing weight. Since then, the pain has worsened and he feels that the knee occasionally gives way during movement. Initially, the patient experienced dislocation of the kneecap only during running or strenuous activity. However, over time, the condition has progressed and he now reports episodes of knee dislocation even while walking or performing routine activities, indicating worsening joint instability. He denies any history of joint locking, swelling, redness or fever.

There is no history of any episodes of bleeding from the ear, nose or mouth, vomiting or loss of consciousness associated with either fall. On general examination, the patient was alert and oriented to time, place and person. His vital signs remained stable throughout the assessment. The recorded temperature was 98.4°F, pulse rate was 84 beats per minute, blood pressure measured 112/76 mmHg, respiratory rate was 16 breaths per minute and oxygen saturation (SpO_2) on room air was 98%. Systemic examination revealed no significant abnormalities. Cardiovascular, respiratory and central nervous systems were within normal limits. Auscultation of the chest did not reveal any added or adventitious sounds and no signs of distress or systemic involvement were noted.

On inspection and palpation, there was tenderness noted over the inferolateral aspect of the right patella, suggesting localized inflammation or soft tissue involvement in that region. Patellar mobility was preserved, indicating that there was no restriction in its movement and the patella was freely gliding over the femoral condyles. Distal pulses, including dorsalis pedis and posterior tibial pulses, were palpable and symmetric, indicating intact peripheral circulation to the limb. Superficial and deep sensations were intact over the entire right lower limb, suggesting that there was no associated nerve involvement. Local temperature over the right knee joint was not raised, ruling out any ongoing acute inflammatory or infective process in the joint. There was no visible swelling, redness or effusion noted around the joint.

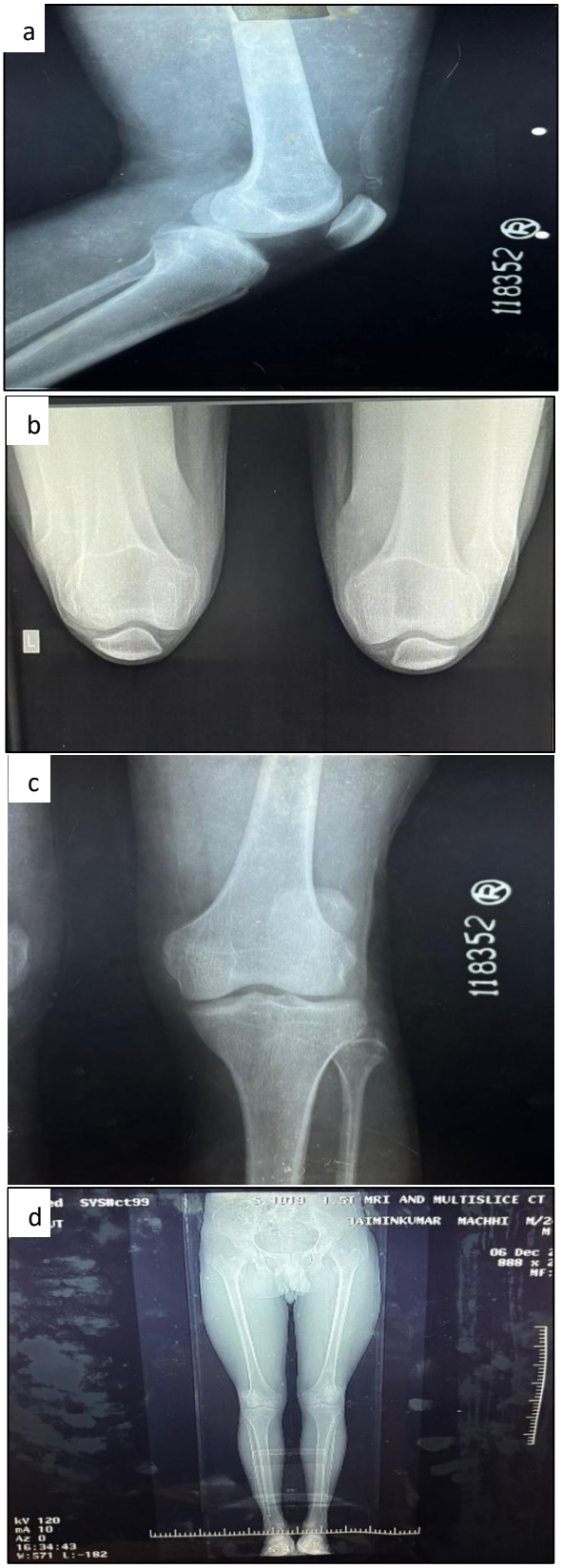

Figure 1: (a) Lateral view of right knee joint. (b) Pre-op Skyline view showing no deformity. (c) Antero-posterior view of right Knee joint showing subluxation of patella. (d) CT scanogram showing trochlear facet asymmetry with suprapatellar bursa effusion and lateral subluxation of patella.

Figure 2: Lateral dislocation of patella in flexion.

Figure 3: Medial capsular flap being passed over and redirected beneath the quadriceps tendon to be anchored laterally.

Figure 4: Suturing of the medial capsular flap.

Figure 5: Intraoperative assessment phase following a proximal realignment surgery (Campbell technique).

On pre-op lateral and skyline radiograph, no abnormality is noted in the Knee joint as seen in Figure 1a and 1b. Whereas, in the Antero-posterior view subluxation of patella is noted as seen in Figure 1b. Mild suprapatellar bursa effusion and lateral subluxation of patella was also noted (Figure 1c). A CT scan was performed thereafter, which showed asymmetry of Trochlear facet, with high lateral facet and hypoplastic medial facet which suggests type B Dejour trochlear dysplasia (Figure 1d). A diagnosis of right recurrent patellar dislocation was made.

Treatment plan

In accordance with the clinical diagnosis as seen in figure 2, a proximal realignment procedure using the Campbell technique was performed. After obtaining written informed consent, the patient was taken to the operating room. The procedure was conducted under spinal anesthesia, with the patient positioned on a radiolucent table. Standard aseptic painting and draping were carried out.

A 12.5 cm anteromedial incision, parallel to the quadriceps tendon, was made. At the level of the articular surface of the proximal tibia, a capsular strip measuring 12.5 cm in length and 1.3 cm in width was identified and incised, maintaining its proximal attachment. The free medial margin of the strip was reinforced using fiber wire sutures. The proximally based capsular flap was then mobilized and passed over the quadriceps tendon at the superior pole of the patella in a medial to lateral direction. Subsequently, the flap was redirected medially beneath the quadriceps tendon and securely anchored to the fascia near the adductor magnus tendon (Figure 3 and 4). The knee was then gently flexed and extended to assess patellar alignment and tracking. Smooth and central tracking of the patella within the trochlear groove was confirmed.

Hemostasis was achieved and the tourniquet was released. Layered wound closure was performed and the skin was closed using subcuticular sutures (Figure 5). Postoperatively, the knee was immobilized in extension for four weeks. Gradual initiation of quadriceps strengthening exercises was advised thereafter. The patient achieved full return to activity within five months. The postoperative functional outcome of the patient was promising, with significant improvement in knee stability, reduction in pain and restoration of mobility, allowing the patient to resume daily activities without episodes of dislocation.

DISCUSSION

Recurrent patellar dislocation is marked by extreme pain and discomfort of the Knee joint. In the case, the patient presented with knee joint instability precipitated by a history of fall 2 years back. Similar patient history was noted in a case report published in 2010, which portrayed how a first-time patellar dislocation subsequently developed into recurrent dislocation. This case was also precipitated by previous history of trauma.[10] Another case report showed habitual dislocation of patella post 40 years of trauma.[11]

Recurrent patellar dislocation is a multifactorial condition, often resulting from anatomical anomalies such as trochlear dysplasia, patella alta and increased TT-TG distance. Management strategies encompass both conservative and surgical approaches, with the choice of treatment tailored to individual patient factors and risk profiles.[12] In this case, the patient had an increased TT-TG distance due to the trauma incurred previously. In this case report, the patient was managed surgically, where as some case reports have shown conservative management of the condition by quadriceps strengthening and taping and mobilization of patella.[13] This shows the case-based need for management.

Surgical options, particularly MPFL reconstruction, have shown superior outcomes in preventing re-dislocation and improving function in patients with anatomical predispositions.[14] A Cochrane review noted reduced recurrence rates with surgery but found no significant difference in functional scores compared to conservative treatment.[15] For, this case Campbell technique was used to stabilize the Knee joint. This technique yielded positive results in the patient. Several case reports have produced promising results post this surgery technique. For instance, a study published in 2020, showed Campbell technique as a safe and effective procedure for the treatment of recurrent patellar dislocation.[16]

Similarly, another study showed patients operated by Campbell technique to have good results. It further stated that Campbell's technique has shown favourable outcomes in cases of recurrent patellar dislocation requiring proximal realignment of the extensor mechanism.[17] Therefore, management should be individualized, with surgical intervention favored for high-risk cases and conservative therapy reserved for select low-risk patients. Thus, risk stratification becomes crucial determining the appropriate management strategy.

CONCLUSION

Recurrent patellar dislocation is often rooted in underlying abnormalities and prior trauma. The case discussed highlights the essentiality of individualized treatment planning. Comparative literature supports both conservative and surgical approaches, with evidence favoring surgical management, particularly MPFL reconstruction, in high-risk cases. Hence, a comprehensive clinical evaluation and risk stratification are essential to guide optimal, personalized treatment and ensure the best possible functional outcomes.

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