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MRI-Confirmed Partial PCL Injury Managed Conservatively in a Football Player: A Case- Based Insight

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Abstract: Injuries in Posterior cruciate ligament (PCL) is less comparatively with other ligaments injury in knee, can still significantly disrupt knee joint function and athletic performance. This report presents the clinical course of a 21-year-old football player who suffered a partial tear of the PCL after sustaining direct trauma to the anterior aspect of the tibia. MRI imaging confirmed partial fiber disruption, localized edema, lateral meniscal changes, and mild collateral ligament involvement. The patient was managed conservatively with physiotherapy, NSAIDs, rest, and bracing. The case emphasizes the importance of detailed assessment and strategic treatment planning for PCL injuries, especially in athletes. It also discusses current classification, conservative vs. operative indications, and rehabilitation. The MRI sequences used for diagnosis included T1-weighted imaging, Proton Density Fat-Saturated (PD FS), T2-weighted imaging, Short Tau Inversion Recovery (STIR), and 3D Dual-Echo Steady-State (3D DESS).

Keywords: *Posterior Cruciate Ligament, Knee Trauma, Sports Medicine, Conservative Therapy, Ligament Reconstruction.*

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I. INTRODUCTION

The posterior cruciate ligament (PCL) plays a central role in stabilizing the knee by preventing tibia backward displacement with respect to femur . It originates from the medial femoral condyle and attaches to the posterior tibial plateau. Structurally, it contains two bundles—the anterolateral and the posteromedial—each contributing to stability during different knee positions. Despite PCL being stronger and much thicker than the anterior cruciate ligament (ACL), PCL injuries do occur as like this case, commonly due to trauma during contact sports or vehicular accidents. The main objective of this case report is to shed light on the presentation and management of an isolated PCL tear in a young athlete and to highlight decision-making strategies for conservative versus surgical approaches.

II. CASE DESCRIPTION

A 21-year-old male footballer presented with persistent left knee discomfort following trauma sustained during play. He experienced difficulty with squatting, kneeling, and ascending stairs. Clinical examination demonstrated posterior sag and localized tenderness. MRI imaging was performed using T1, PD FS, T2, STIR, and 3D DESS sequences. It revealed a partial PCL tear near its femoral attachment (approximately 3.1 mm of fiber disruption), surrounding soft tissue edema, mild effusion, and inflammation in the posterior horn of the lateral meniscus. The ACL, MCL, and cartilage surfaces appeared normal. Conservative treatment was chosen, which included rest, cold therapy, nonsteroidal anti-inflammatory medication, use of a knee immobilizer, and a tailored rehabilitation program focused on quadriceps strengthening and neuromuscular re-education. A follow-up MRI was scheduled at 6 weeks.

III. DISCUSSION

The PCL contributes primarily to posterior tibial stability between 30° and 90° of flexion. It receives vascular supply from the middle geniculate artery and is innervated by the tibial nerve. Most sports-related PCL injuries affect the anterolateral bundle due to flexion-based trauma. In this case, the injury likely resulted from hyperflexion and direct anterior force. Clinical diagnosis relies on a combination of physical examination findings such as the Drawer Test (posterior), Sag Test, Quadriceps Active Test, and the Dial Test. The Dial Test is especially useful in differentiating isolated PCL injuries from those involving the posterolateral corner.

- *Classification of PCL Injuries:*

- Grade 1: Partial tear (1–4.9 mm posteriorly)
- Grade 2nd: Complete isolated tear (5–10.1 mm)

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- Grade 3rd: Complete tear with associated ligamentous or capsular involvement (>10 mm)

➢ *Conservative Treatment Options Include:*

- RICE protocol (Rest, Ice, Compression, Elevation)
- Immobilization (especially in Grade 3 injuries for initial 2–4 weeks)
- Physiotherapy with focus on passive ROM, quadriceps strength, and proprioception
- Activity modification and progressive return-to-play plans

➢ *Operative Intervention is Considered when:*

- Posterior tibial displacement exceeds 12 mm
- There are combined ligament injuries (e.g., ACL or PLC involvement)
- Conservative measures fail to improve functional stability
- The patient is an elite athlete requiring full functional restoration

➢ *Surgical Options Include:*

- Arthroscopic or open PCL reconstruction
- Graft options: autografts (patellar or hamstring tendon) or allografts (Achilles, tibialis anterior)
- Fixation methods: interference screws or cortical button
- There are Reconstruction techniques for tibial inlay approach

The patient in this case responded well to non-surgical management with progressive improvement in movement of knee with no pain, indicating favour of conservative care for low-grade, isolated PCL injuries.

➢ *Outcome*

By the 6-week follow-up, the patient demonstrated improvement in knee function, strength, and range of motion. He tolerated rehabilitation well, with no signs of recurrent instability or worsening symptoms. A decision regarding future surgical intervention was deferred, pending reassessment based on clinical progression and repeat MRI findings.

IV. CONCLUSION

This case outlines the clinical pathway of a young footballer with an isolated PCL injury. It reinforces the utility of thorough imaging, accurate injury grading, and individualized treatment selection. Conservative treatment remains effective in selected cases, particularly Grades 1–2. Surgical reconstruction should be reserved for cases with significant instability, combined ligament injuries, or failure of conservative therapy. Preventive strategies such as neuromuscular training, strength conditioning, and appropriate protective gear are essential, particularly for athletes involved in high-impact sports.

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