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A case of combined posterolateral corner (PLC) injury and anterior cruciate ligament (ACL) injury treated by arthroscopic reconstruction

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Abstract

The combined injuries involving anterior cruciate ligament and posterolateral corner are the rarest among knee injuries with an incidence of about 9.1% and there is a paucity of literature focussing on its management. Here we have an interesting case of one of the rarest knee injuries, combined PLC and ACL injury of knee. Patient presented with pain in right knee for 3 months. Patient gave an alleged history of road traffic accident with an injury sustained to the right knee 3 months back. He underwent surgery immediately after fall elsewhere, now presented with complaints of pain over right knee and difficulty in walking. All the clinical features to substantiate the diagnosis such as antalgic gait, varus thrust gait, Lachman test positive, Dial test positive were present. On Varus stress, lateral Opening was typically present. He was assessed and treated surgically by adopting Laprade's technique of arthroscopic reconstruction. The range of movements was restored and the patient became symptom free after the surgery. As combined injuries involving PLC & ACL are rare, we think that they are often missed out from diagnosis resulting in failure of the management. Hence they are to be evaluated and timely surgical intervention is required.

Keywords: Posterolateral corner (PLC) of knee, anterior cruciate ligament (ACL) injury, arthroscopic reconstruction, Laprade's technique

Introduction

The combined injuries involving Anterior cruciate ligament and Posterolateral corner are the rarest among knee injuries with an incidence of about 9.1%^[1] and There is a paucity of outcome data to guide the surgical treatment of combined grade III Posterolateralcorner (PLC) and Anterior cruciate ligament knee injuries. We report an interesting case of combined Posterolateral corner (PLC) injury and Anterior cruciate ligament (ACL) injury focusing on its management by Laprade's method of Arthroscopic Reconstruction.

Case presentation: A 42 years old male presented with pain in right knee & difficulty in walking since three months. He gave an alleged history of Road traffic accident three months back and sustained injury to right knee. He had undergone surgical treatment for the same complaint elsewhere immediately after fall. On examination, Antalgic gait & Varus thrust gait were present. Lachman test positive & Dial test were found to be positive. On Varus stress, lateral opening is present. Xray revealed delayed union fracture proximal tibia (with posteromedial fragment) (Fig: 1). MRI right knee revealed partial avulsion of foot print of PLC-Grade III PLC injury/Grade III ACL injury (Fig: 2). So the interpretations from the above were the presence of Delayed union proximal tibia fracture, Posterolateral instability due to PLC injury and, Anterior instability due to ACL injury. After anesthetic fitness, patient was taken up for the surgery. Removal of the screws that were fixed during the previous procedure was done. Open Reduction with Plate & screw (Posteromedially) was done for the Medial condyle Tibia fracture under C-Arm Imaging. Arthroscopic Reconstruction of Anterior cruciate ligament Diagnostic arthroscopy-ACL Lax, ACL reconstruction with semitendinous harvested from the same side (Tibial side peak 9x28mm, Femoral side on Button) was done (Fig: 3).

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We prefer to use allograft tissue for reconstruction in these cases because of the strength of these large grafts and the absence of donor site morbidity [2]. Posterolateral ligament injury was reconstructed by LaPrade’s technique. After surgery the patient was relieved off the symptoms and didn’t have any post op complications (Fig: 4). At 1 month follow up – Knee pain nil, ROM 0-100 degree and the Patient is comfortable.



X-ray shows delayed union fracture proximal tibia (with posteromedial fragment).

Fig 1: Xray taken when the patient presented to our hospital



MRI right knee revealed partial avulsion of foot print of PLC-Grade III PLC injury/Grade III ACL injury

Fig 2: Pre Op CT & MRI



Removal of screws+ORIF with Plate & Screw (Postero Medially) Medial Condyle Fracture Tibia +PLC & Anterior cruciate Ligament Reconstruction

Fig 3: POST OP X-ray



Fig 4: Post Op Wounds Showing Healed Scars Of The Incision.

Discussion

Sports injuries/ high energy trauma account for most mechanisms of combined PLC & ACL injury. Posterolaterally directed blow to the medial tibia with the knee in extension is the most common mechanism of PLC injury (results in forceful hyperextension with external rotation varus). Noncontact hyperextension, external tibial rotation and varus stresses are also common mechanisms. Physical examination of patients with PLC injuries may vary, All the patients may not have all the typical signs and symptoms but increased varus, external rotation, and recurvatum laxity are typically observed. Fortunately Our case has almost all the classical signs and symptoms of the injury. In 2004, LaPrade *et al.* [3] elaborated the PLC injury described an anatomic reconstruction of the PLC using the native attachments of the FCL, PLT, and PFL. This technique restores near native varus and rotational stability to the knee. Outcomes studies have shown significant postoperative improvement in knee outcome scores. As a result of these findings, we recommend anatomic reconstruction of acute PLC injuries with treatment of concomitant injuries (Anterior cruciate Ligament) in a single surgery. This recommendation holds true in chronic situations; however, caution should be taken with chronic injuries to evaluate for varus malalignment, which should be addressed prior to any reconstructive procedure for the PLC. The commonly encountered complications are Missed PLC injury (Failure to identify a PLC injury combined with an ACL injury will lead to failure of the ACL reconstruction), Arthrofibrosis, Peroneal nerve injury (15-29%), Deep vein thrombosis (DVTs), Infection, Blood loss, Nerve/artery damage. Thus Although this method is the evidentially the best method of reconstruction it has its own “Pearls” as well as “Pit falls”

Conclusion

Patients with combined PLC & ACL injuries have positive outcomes when they undergo anatomic reconstruction of the damaged structures^[4]. Long-term studies should be performed to ensure maintenance of both stability and functionality, restored after surgery. Results from the cadaveric studies by the surgical correction of PLC Grade III injury and ACL always provides better biomechanical stability than Nonsurgical Correction^[3, 5-7].

Clinical message: The surgical management of this combined knee injury may be challenging but early and prompt diagnosis added with surgical correction of the combined posterolateral corner (PLC) and Anterior cruciate ligament injury (ALC) together provides better biomechanical stability improved knee outcome score. Further evaluation of the validity of this technique and researches are under proceedings.

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