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IAS NEWSLETTER

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ARTICLES IN THIS ISSUE

EXPERTS OPINE

Dr Swarnendu Samanta

Posterolateral Corner Knee Injuries

Anatomy:
Three important structures of PLC- LCL, popliteus & popliteofibular ligament.

Important clinical tests:
Varus stress(in extension & 30-degree flexion), External rotation recurvatum, Dial test, Posterolateral drawer test & reverse pivot shift test.

Surgical technique:
La Prade's technique, Larsons & Arcerio technique

LA Prades' technique: Anatomical reconstruction of LCL, Popliteus with Popliteofibular ligament using two femoral, one fibular and one tibial tunnel.

Repair versus Reconstruction:
PLC Repair: 37-40% revision rate
PLC Reconstruction: 6-9% revision rate

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ACL RECONSTRUCTION WITH REMNANT PRESERVATION

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Abstract:

ACL reconstruction is one of the most common procedures in orthopaedics. Surgical techniques are vastly evolving to give better functional outcomes. Apart from stability, proprioception and ligament healing are important factors for return to sports. The presence of remnant containing mechanoreceptors and free neural endings can help reinnervate the ACL autograft.

The aims and objectives of our study were to evaluate clinical outcomes in patients undergoing ACL reconstruction with remnant preservation.

Methodology:

From April 2014 to March 2019, 80/106 patients underwent remnant preservation technique. The rest of the patients had concomitant meniscus or other ligament injury and or did not have any ACL remnant.

Clinical outcome was analysed using Lachman test, Anterior drawer test, Pivot shift test, Range of movement of the knee, International Knee Documentation Committee Score (IKDC), Modified Cincinnati Knee Rating System (MCKRS) &Tegner-Lysholm Scoring System
Patients were followed-up for a minimum of 2 years

Operative technique:

An accessory anteromedial portal was used to achieve an anatomical femoral tunnel. To establish the femoral bone tunnel, we carefully resected the necessary femoral fibres of the torn parts ACL to visualize the femoral insertion site. After using the 4.5 mm drill the final diameter of the femoral bone tunnel was established by serial reaming to prevent damage to the intact ACL remnants by the head of the drill. Usually, the length of the femoral bone tunnel was between 32-40 mm. Consequently, we chose a 15 or 20 mm long endobutton for femoral fixation. On the tibial side, the ACL stump was usually intact. Fixation on the tibial side was performed with a bioabsorbable screw(Fig 1).

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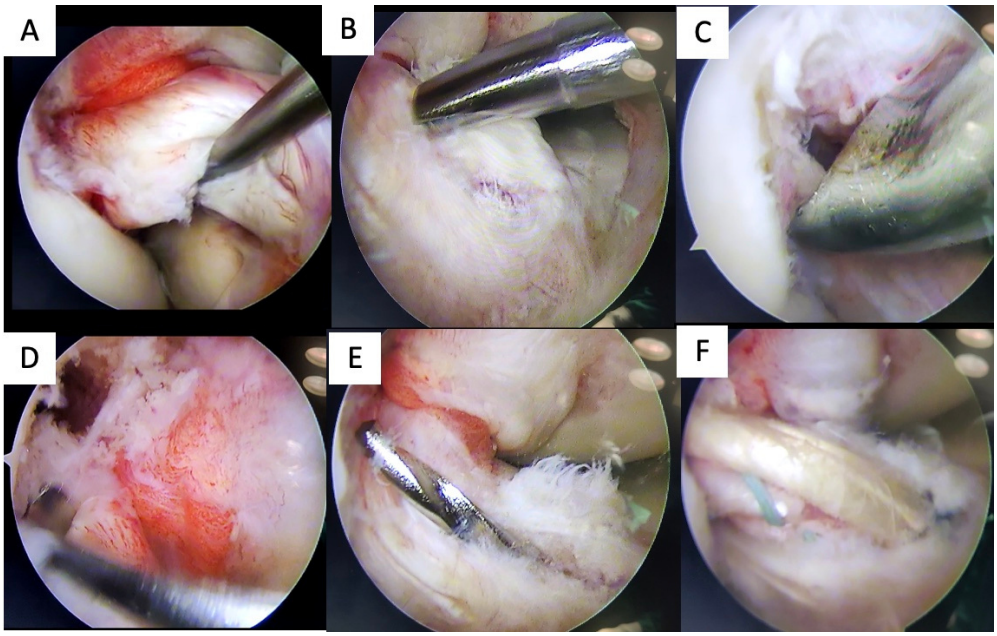

Fig 1: Intraoperative images. A: ACL remnant, B: Identification of the tibial footprint, C: Notchplasty, D: Femoral tunnel with remnant, E: Tibial guide pin, F: Reconstructed graft through the remnant

Results:

Lachman test was negative in 98% of patients at 12 weeks and in all the patients at 24 months postoperatively.74 patients had near-total range of movement post-operatively. 5 patients had ≤15° lag in flexion & ≤5° in extension.1 patient had 10° restriction in extension. The average flexion was 0° to 120°. No instability was seen after primary surgery. No retears were encountered. With proper rehabilitation, athletes returned to sports activity within a mean period of 4-6 months. The functional scores are summarized in Table 1.

Scoring system	Pre-operatively	Post-operatively
IKDC score	35	95
MCKR system	29	93
Tegner-Lysholm scoring system	58	92

Table I: Summary of post-operative improvement of functional scores

Discussion:

Remnant preservation ACL reconstruction results in excellent post-operative knee scores, good knee stability and early return to sports but full extension was not achieved in 1.25% of patients. This is maybe due to cyclops lesion, inadequate physiotherapy or both. The remnant-preserving technique reduces the amount of bone tunnel enlargement following ACL R, hence this technique is recommended(1). Clinical scores were statistically significantly higher at 6 months postoperatively in the remnant preservation group(2). Remnant preservation during hamstring autograft ACL reconstruction may enhance tissue healing; however, retention of the remnant with its full volume might result in an increased incidence of postoperative extension loss(3)

Conclusion:

ACL reconstruction with remnant preservation should be considered in indicated cases as:
Graft healing is faster.
Chances of re-rupture are minimised.
Early return to sporting activity.
Marked increase in proprioceptive function.
Biomechanically superior outcome of the knee.

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ACL RECONSTRUCTION WITH LATERAL EXTRA-ARTICULAR TENODESIS

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Abstract:

There is a renewed interest in the Anterolateral complex (ALC) in the past decade owing to the anatomical study by Claes et al. Increased graft ruptures seen in patients exhibiting high grade pivot shift led to a necessity to combine an extra-articular procedure along with arthroscopic ACL reconstruction (ACLR). In this article we describe a case involving a young patient with hyperlaxity who underwent a primary arthroscopic ACLR with Lateral extra-articular tenodesis (LET) along with review of literature.

Introduction:

Seebacher et al was the first to describe the layered anatomy of the anterolateral knee in 1978. Claes et al in 2013 reconfirmed the existence of ALL in the ALC(1). Many studies have proved that additional LET offers better rotational control of the knee reducing the incidence of ACL graft rupture postoperatively(2). Hence it may be necessary to add a LET in carefully selected patients.

Case:

A 25-year-old lady presented to us with pain, giving way and locking of her right knee for 6 years. She had a history of twisting injury 6 years back. Examination revealed a Beighton score of 8/9 indicating hyperlaxity. She also exhibited a grade III Lachman/Anterior drawer test and a grade II pivot test. Her Scanogram showed a normal limb alignment without arthritic changes. MR imaging revealed a chronic ACL tear along with a bucket handle tear of medial meniscus (Fig 1). Hence, we planned an arthroscopic ACLR along with LET.

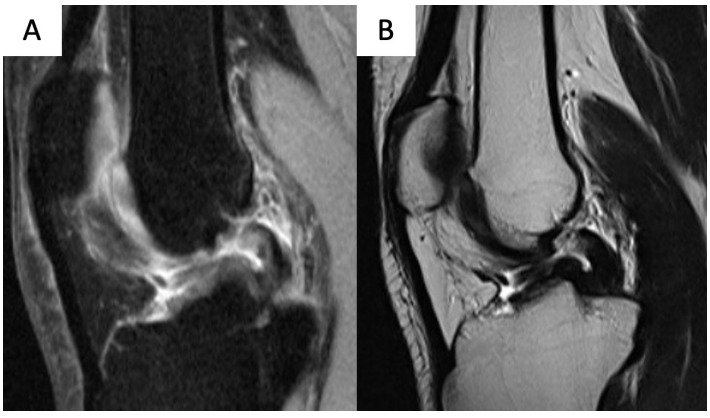

Fig 1: MR imaging of left knee.
A, B: Chronic ACL Tear with bucket handle tear of medial meniscus

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Operative technique:

Arthroscopic ACLR was done using standard transportal technique. Graft was prepared using five strands technique using both Semitendinosus and gracilis. ACL graft was fixed using an adjustable loop at the femoral end and interference screw at the tibia(Fig 2). This was followed by LET reconstruction using modified Lemaire's technique. Knee was flexed to 90 degrees. Three bony landmarks namely Lateral femoral epicondyle (LFE), Gerdys tubercle and femoral head were palpated and marked. Skin incision was given starting 2 cm proximal to Gerdys tubercle extending 2cm proximal to the LFE. 15mm(width)x 80mm(length) of iliotibial tract (ITB) was marked and dissected out keeping the distal attachment to the Gerdys tubercle intact. Lateral collateral ligament (LCL) was identified & the ITB strip was routed under the LCL using a hemostat. Femoral insertional was marked just proximal and posterior to the LFE. Guide pin was then inserted directing it anteriorly to avoid coalition with the ACL femoral tunnel. Tunnel was reamed using 6mm reamer, graft was shuttled across using beath pin and fixed using 6x25mm interference screw at 60 degree of knee flexion maintaining the limb in internal rotation(Fig 3).

Discussion:

The Anterolateral complex described by seebacher et al was re-explored by claes et al in 2013 who reconfirmed the presence of a distinct ligament occurring as a condensation of the capsular layer extending from the lateral epicondyle to the tibia(1). Existence of this ligament has been verified by various other anatomical and biomechanical studies thereafter(3). Though tibial insertional point remains fairly constant across studies, femoral insertion point varies. The ALL Expert group arrived at a consensus of femoral insertion to be proximal and posterior to the lateral epicondyle as shown in most of the recent studies(4). Though imaging on 3T MRI clearly depicts the ALL, especially when associated with a Segond fracture, clinical examination remains the cornerstone for diagnosing ALC injury(5). Grade III Pivot shift test with an Increased anterior drawer at 30-degree internal rotation (Slocum test) are pointers in the clinical examination suggestive of ALC injury.

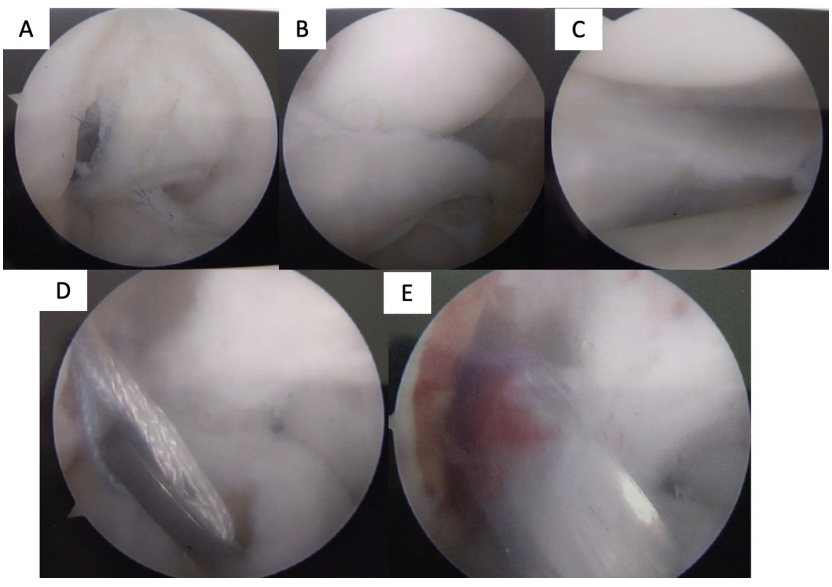

Fig 2: Arthroscopic images A: Torn ACL, B: Chronic bucket handle tear of medial meniscus, C: Partial medial meniscectomy, D: Shuttling the adjustable loop, E: ACL graft in situ with notchplasty

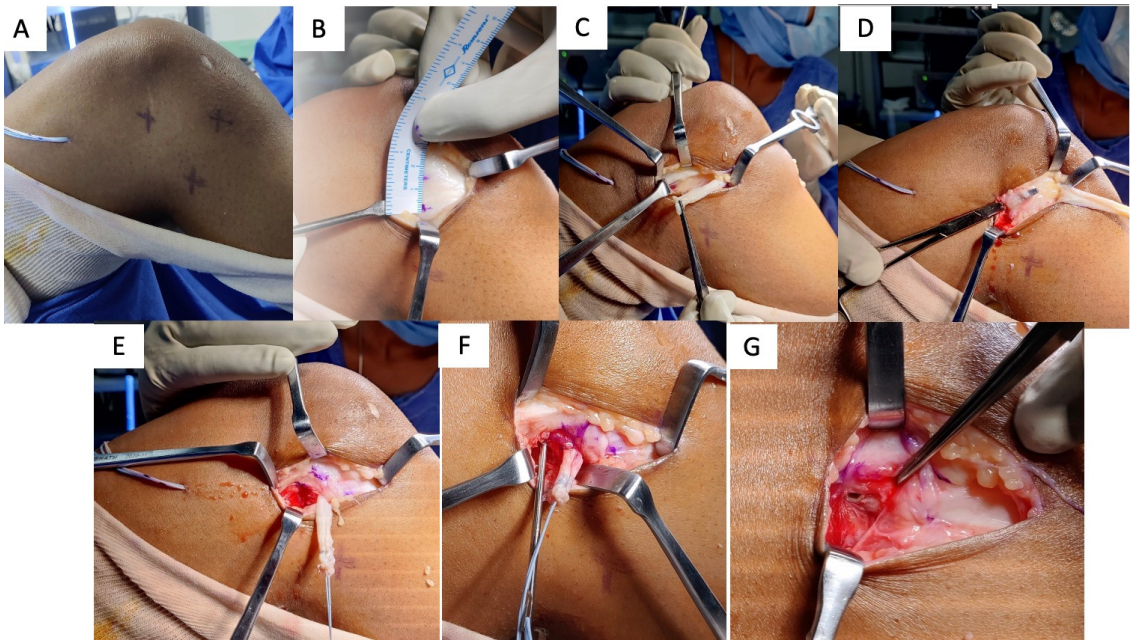

Fig 3: Lateral extra-articular Tenodesis. A: Surface landmarks, B: Marking the ITB, C: Isolating ITB strip, D: LCL, E: ITB strip passed under LCL, F: Shuttling the ITB strip across the femoral tunnel, G: ITB fixed at femoral tunnel using interference screw.

Both LET (Lateral Extra-articular Tenodesis) and ALL reconstruction are widely used in addressing ALC injury after a standard arthroscopic ACL reconstruction. The indications for adding LET/ALL after ACL reconstruction have been outlined in Fig 4(4). LET reconstruction techniques have evolved over many decades to the current widely followed technique as described in this case. ALL reconstruction technique involves shuttling of a separate graft through a tunnel in the tibia with a common insertion point proximal and posterior to the LFE. Many authors also recommend a combined technique for reconstructing ACL with ALL with good outcomes(6).

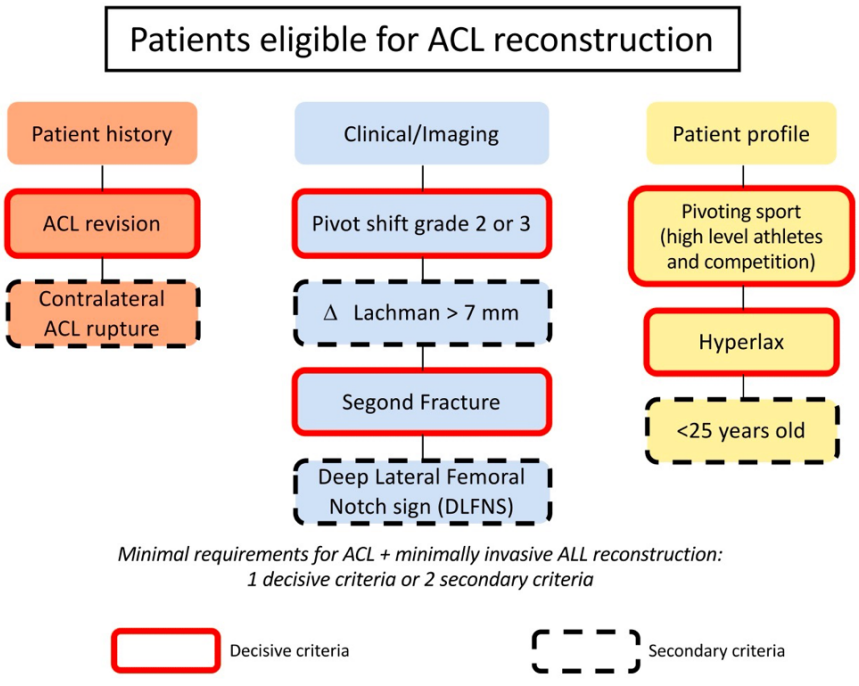

Fig 4: Decision making algorithm for adding an LET/ALL reconstruction following ACLR

LET scores over ALL reconstruction in terms of fewer tunnels & also that a separate graft is not required for reconstruction. Getgood et al recently concluded in their randomized study of 618 patients that adding an LET for individuals at high risk significantly reduces graft rupture rates and rotatory laxity at 2 year follow up(2). A systematic review of 16 studies by Ra et al., suggested that while rotational stability is similar with both LET & ALL reconstruction, anterior laxity is slightly worse in patients undergoing LET(7).

Conclusion:

ACL+ LET/ ALL result in good functional outcome and decreased graft rupture in carefully selected patients.

Whether to do LET/ ALL is still debatable - high level evidence is required!

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