Primary Tunnel Dilatation in Tibia, An Unrecognised Complication of ACL Reconstruction

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AIM

To study primary tunnel dilatation in tibia as an intra-operative complication during anterior cruciate ligament reconstruction.
Background

Several methods of ACL reconstruction exist, the two most common are ACL reconstruction with BTB graft and reconstruction using a hamstring tendon (HT) graft\(^1\).

Among the related complications, tunnel enlargement has been reported as a long term complication in recent years regardless of the technique used\(^2-5\).

Primary tunnel dilatation can be described as widening of bone tunnel intra-operatively while fixing the graft with interference screws.

This complication is more common in tibia and rarely happens in femur owing to the compactness of bone in femur. It is not well understood nor discussed in arthroscopy literature.

We describe primary tunnel dilatation as an unnoticed intra-operative complication during ACL reconstruction.
Materials & Methods

Study design: Prospective study in single centre

Study period: 2008 - 2017

Total patients: 1543

Patients were grouped according to chronicity

**Group 1**: Acute (3 weeks)

**Group 2**: Sub-acute (3-6 weeks)

**Group 3**: Chronic (>6 weeks)

All patients undergoing primary ACL reconstruction irrespective of the graft choice were studied for the occurrence of primary tunnel dilatation. Occurrence was noted during fixation of ACL graft in the femoral & tibial tunnel and recorded.
Surgical technique for all cases

General anaesthesia.

Diagnostic arthroscopy.

ACL tear confirmed.

<table>
<thead>
<tr>
<th>Group 1: BTB graft</th>
<th>Group 2: Hamstring graft</th>
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<tbody>
<tr>
<td>1. BTB graft harvested through a mobile window technique.</td>
<td>1. Hamstring graft harvested through a vertical incision over per anserinus.</td>
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<td>2. Transtibial drilling technique for femoral bone tunnel</td>
<td>2. Transportal drilling technique for femoral bone tunnel</td>
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<tr>
<td>3. Graft fixation with metal or bioabsorbable fixation</td>
<td>3. Graft fixation with femoral endobutton &amp; metal or bio-absorbable interference fixation in tibia</td>
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Tibial tunnel was made using impaction reamer.

Primary tunnel dilatation was observed while fixation of tibial interference screw and tackled with a larger diameter screw or secondary fixation with suture button or post.
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<th>Inclusion criteria</th>
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<td>• Age of 18 to 55 years</td>
<td>• Age of &lt;18 or &gt;55 years</td>
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<tr>
<td>• Isolated ACL reconstruction</td>
<td>• Concomitant injury (including collateral, posterior cruciate ligament, meniscal &amp; chondral injury)</td>
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<tr>
<td>• Unilateral ACL reconstruction</td>
<td>• Previous knee surgery</td>
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<td>• No signs of grade ≥II osteoarthritis on radiographs.</td>
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Results

- n=1543

- **Male** 85.98% | **Female**: 14.01%

- **Age**: 18-30 years: 56.19% | 30-40 years: 28.48% | 40 years & above: 15.31%

- **Chronicity**
  - Acute: 109 cases (7.1%) | Sub-acute: 737 cases (48.04%) | Chronic: 688 cases (44.86%)

- **Primary tunnel dilatation**: 129 patients (8.37%)

- **Further analysis**:
  - **Primary tunnel dilatation**:
    - Chronic (73 cases - 56.58%) Sub-acute (37 cases - 28.68%) Acute (19 cases - 14.72%)
Discussion

• Many studies have observed graft tunnel dilatation following ACL reconstruction as a mid-term, long term complication of ACL reconstruction\textsuperscript{2-5}.

• The tunnel enlargement observed has been greater with use of STG graft than BTB graft\textsuperscript{3}.

• However the primary tunnel dilatation has never been described in literature to our knowledge and we feel its a important intra-operative complication to be noted.

• Long term followup and its correlation to secondary tunnel dilatation needs to be studied in detail.
Conclusion

- Primary tunnel dilatation is a unrecognised complication in ACL reconstruction.
- Bone quality should be given due importance while performing such surgeries.
- ACL reconstruction performed in sub-acute stages can avoid this complication.
References


