Lateral extra-articular tenodesis (LET) does not increase lateral compartment contact pressures even in the face of subtotal meniscectomy

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Residual anterolateral laxity may persist following ACL reconstruction and may contribute to ACLR failure or early onset of osteoarthritis (OA)\(^1\)

An ACL reconstruction in combination with an LET has shown to be effective in reducing the pivot shift\(^2,3\)

However, there are concerns that the LET may cause over-constraint

In addition, lateral meniscectomy may also increase the contact pressure, further increasing the risk of OA
Purpose and Hypotheses

Quantify changes in tibiofemoral joint contact pressures following isolated ACLR and combined ACLR/LET with varying states of lateral meniscal injury

We hypothesized that: i) an LET in combination with an ACLR would not increase the lateral compartment pressures; and ii) a lateral meniscectomy following an LET would not increase the lateral compartment pressures
Specimen Preparation

- Eight fresh-frozen cadaveric knees
  Mean (SD) age =60 (3.4 years)
  Mid-tibia to Mid-femur
- Tekscan® pressure sensor arthroscopically inserted under the lateral meniscus
Methods

**Experimental Conditions**

- **Baseline** (ALL deficient ACL deficient)
- **ACLR** (tibialis anterior allograft)
- **ACLR/LET** (Modified Lemaire at 20N and 70°)
- **ACLR/LET/Partial lateral meniscectomy**
- **ACLR/LET/Subtotal lateral meniscectomy**
- **ACLR/total/LET release**

![Images of experimental conditions](image_url)
Experimental Setup and Loading Protocol

• Specimens secured within an Instron® materials testing system

• Pressure data collected when axially loaded at: 735N – mean body weight force simulating single leg standing

• Loads applied at knee flexion angles between 0°- 90° at 30° increments

• Peak contact pressure, mean contact pressure and location of center of pressure measured for all conditions
**Results**

**Mean and Peak Contact Pressure**

- Significant difference in the mean contact pressure between baseline and ACLR/LET/Total and baseline and ACLR/Total/LET at 0° (*p<0.05*)

- Significant difference in the mean contact pressure between baseline and ACLR/LET at 30° (*p<0.05*)
Results

Centre of Pressure Location

- The center of pressure was observed to be located significantly more anterior following partial meniscectomy (0°,30°), subtotal meniscectomy (0°, 60°), and when the LET was released (0°,30°,60°)
• Overall there was no increase in the lateral compartment pressure following an LET with and without various stages of meniscectomy

• This suggests that the LET does not over-constrain the lateral tibiofemoral compartment

• The LET was tensioned as per, Inderhaug et al., who found that the lateral compartment contact pressure did not increase when fixation of LET at 20N

• These results are supported by long-term outcomes of LET that show no association between LET and lateral compartment OA at 20-years

• Therefore, it may be safe to perform an LET in conjunction with ACLR with graft fixation at 70° flexion and 20N tension without significantly altering lateral compartment pressures
References


