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Biomechanical Changes In Posterior Root Avulsion Of The Lateral Meniscus

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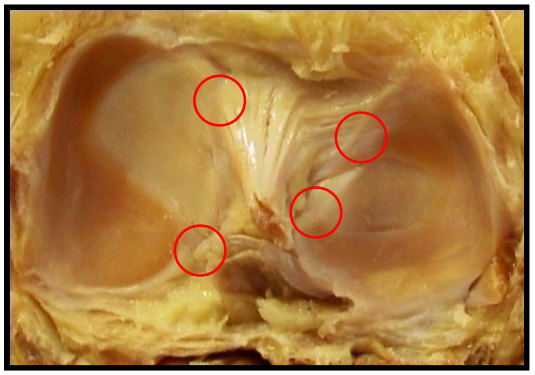
Disclosures

The authors of this study have no financial conflicts to disclose

Introduction

Meniscal roots: direct insertion into the bone

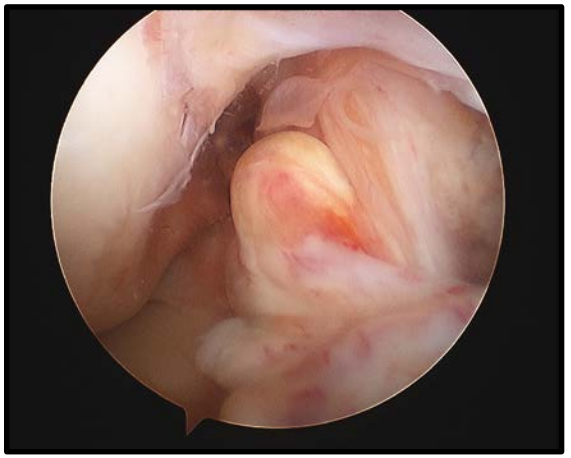
Main restrictors of meniscal extrusion



Posterior root avulsion (PRA)
(medial meniscus)

- Extrusion ≥ 3 mm on MRI
- ↑maximum pressure
- ↓contact area

Lateral meniscus (LM): 12.4% with ACL tears; may pass unnoticed



Purpose

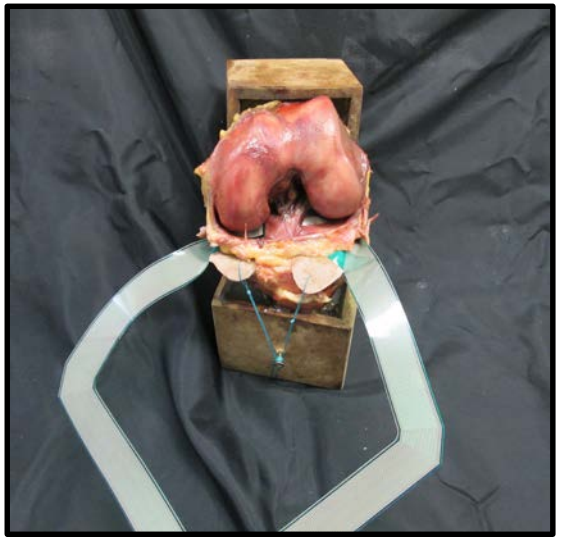
To check changes in pressure and contact area after PRA of LM and after repairing this injury

To compare this results with a healthy knee and with a knee after total meniscectomy

Methods

Eight fresh-frozen healthy cadaveric human knees

Coronary ligament sectioned: pressure sensor between the tibia and the menisci

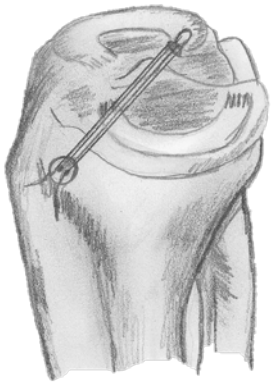


Four different situation were tested

1. Intact meniscus (IM)
   (reference condition)

2. Posterior root avulsion (PRA)

3. Transosseous reinsertion (TR)



4. Total meniscectomy (TM)

Methods

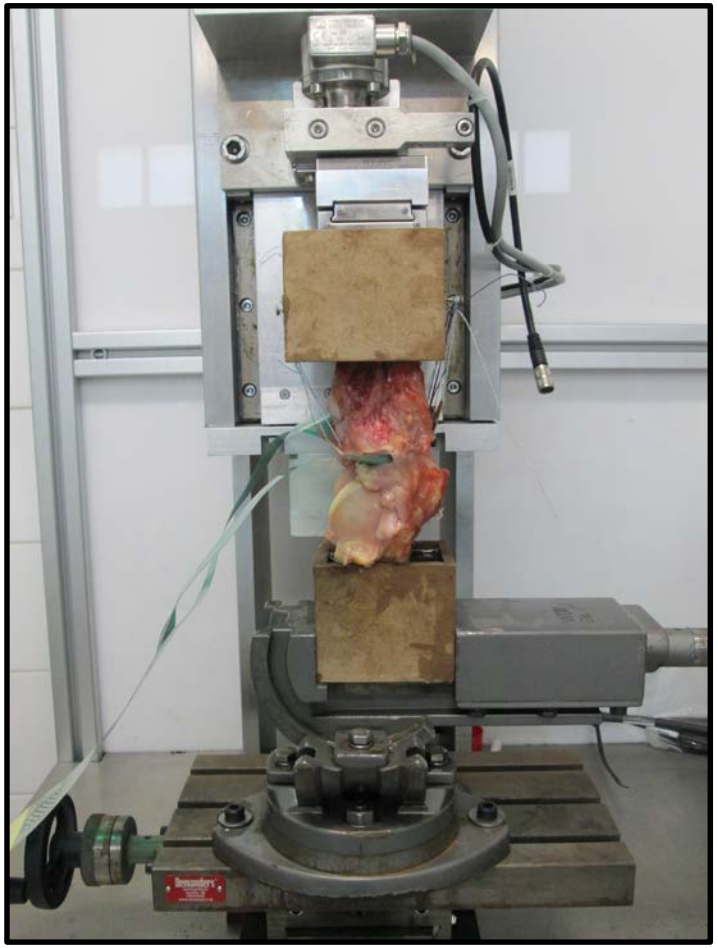
1000 N compressive axial load

Load cell (5 KN)

(HBM, Darmstadt, Germany)

Knee pressure sensors

(K-scan4000, Tekscan Inc, Boston, MA)



Methods

Variables measured

(medial and lateral compartments)

Peak pressure (MPa)

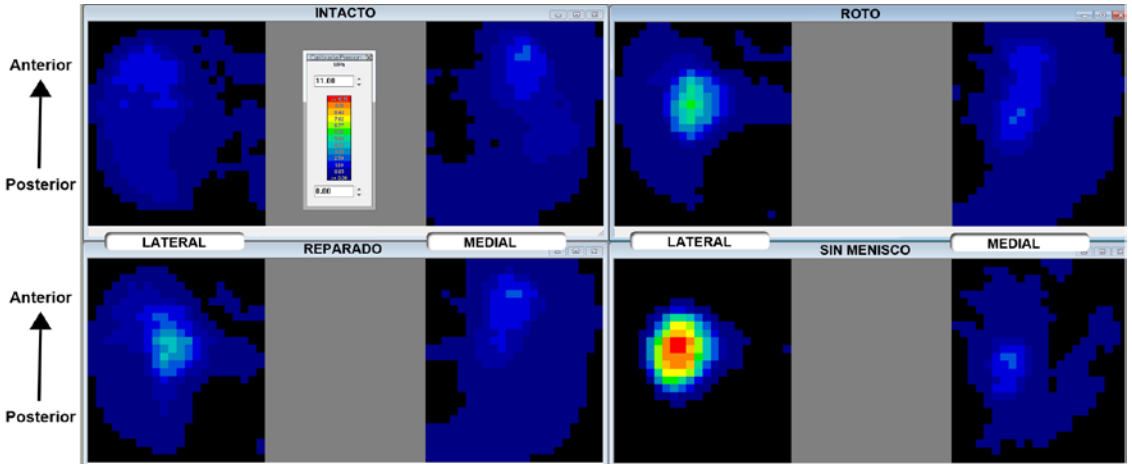
Contact area (mm^2)

Statistical analysis

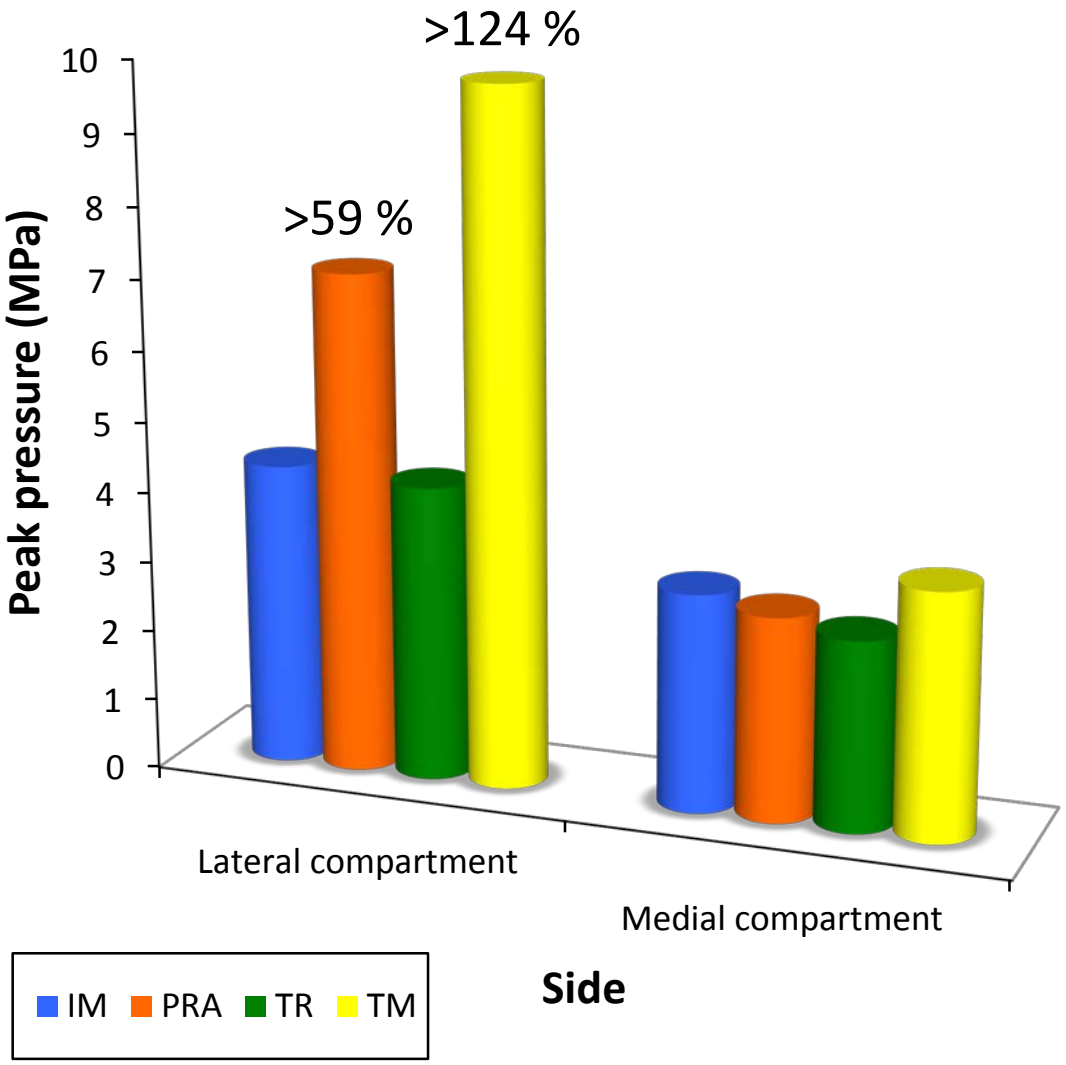
Friedman and Wilcoxon tests

SPSS Statistics v.20, IBM Corp, 2011

Significant p value: ≤ 0.05



Peak pressure



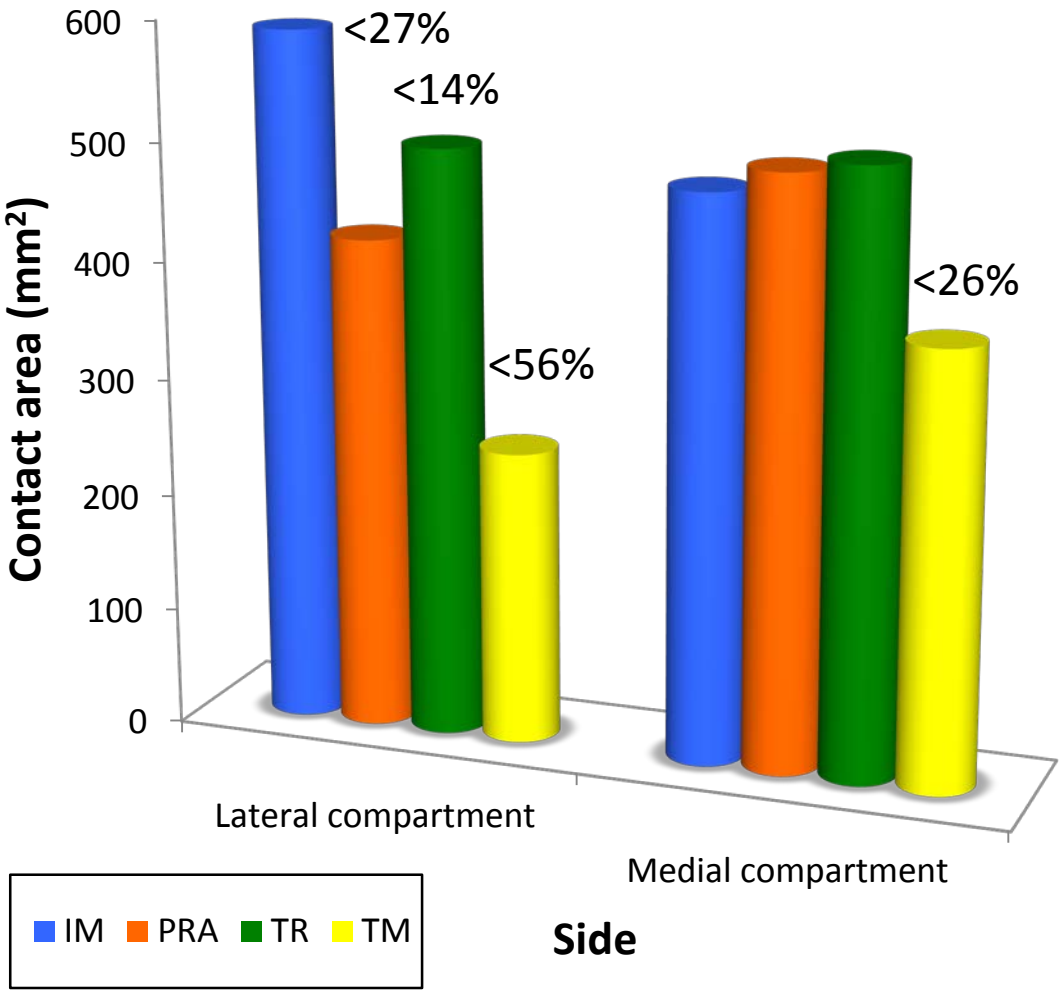
LATERAL COMPARTMENT

PRA > IM (p=0,046)	TM > IM (p=0,046)
PRA > TR (p=0,028)	TM > TR (p=0,028)

MEDIAL COMPARTMENT

No significant differences

Contact area



LATERAL COMPARTMENT

PRA < IM (p=0,046)

TM < IM (p=0,04)

TM < TR (p=0,028)

TM < PRA (p=0,028)

MEDIAL COMPARTMENT

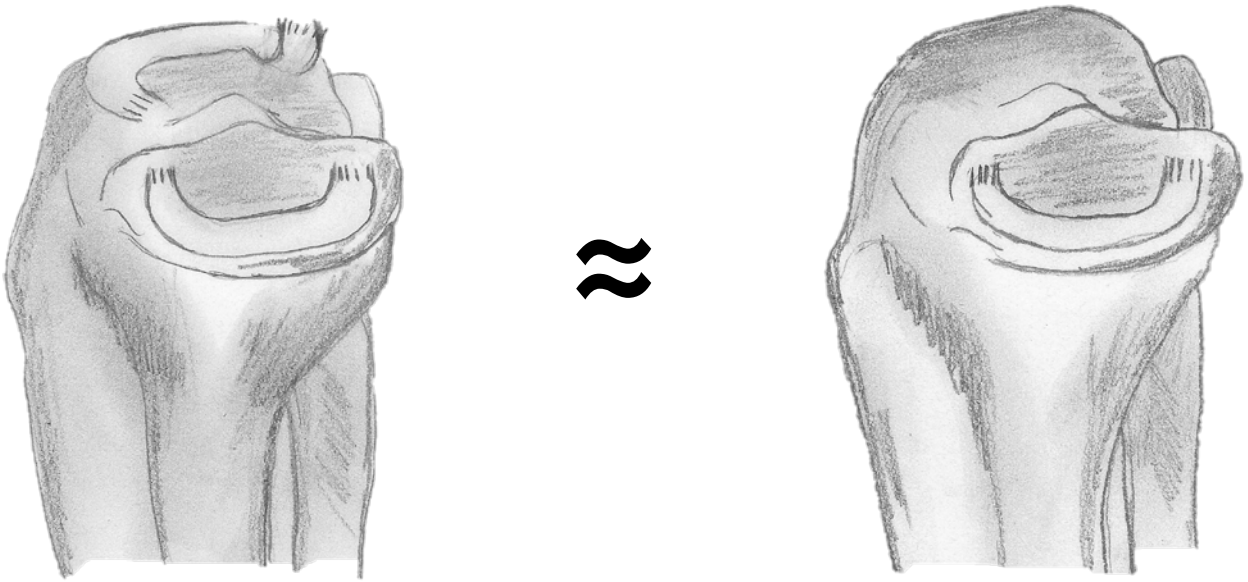
TM < IM (p=0,028)

TM < TR (p=0,028)

TM < PRA (p=0,046)

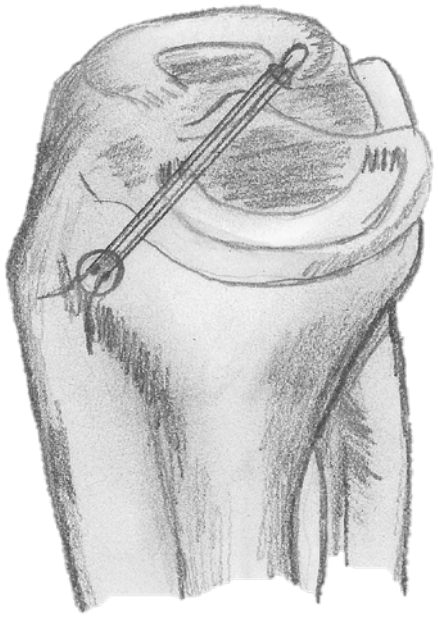
Conclusions

PRA of the lateral meniscus yields similar biomechanical changes to those that occur in a knee with a TM



Conclusions

Repairing PRA restores joint biomechanics to a situation similar to the healthy knee with IM



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