Anatomic Reconstruction of the Native Ligamentum Teres

Brady, AW; Chahla, J; Mikula, JD; Slette, EL; Locks, R; LaPrade, RF; Philippon, MJ

ISHA
Annual Scientific Meeting
San Francisco, CA - 2016

THE STEADMAN CLINIC AND STEADMAN PHILIPPON RESEARCH INSTITUTE

U.S. OLYMPIC NATIONAL MEDICAL CENTER

Disclosures

- **Dr. Robert F. LaPrade:**
  - Arthrex[a], Ossur[a] and Smith & Nephew[a].

- **Dr. Marc J. Philippon:**
  - Smith & Nephew[a,b], Arthrosurface[b], HIPCO[b], MIS[b], ConMed Linvatec[a], Bledsoe[a], Slack[a], ElSevier[a], DonJoy[a], Ossur[b], Arthrex[b], Siemens[b], Vail Valley Surgery Center[c], SPRI[c], ASIAM[c], Vail Health Services[c], ISHA[c]

    A. Consulting/Royalty
    B. Research Support
    C. Board Member

The remaining authors have no disclosures.

Background

- As arthroscopic reconstruction of the ligamentum teres (LT) gains acceptance among surgeons, a clear understanding of LT's anatomy and relationship to the femur and acetabulum is necessary to guide anatomic LT reconstructions.

- Currently, there is a paucity of published literature describing the tunnels for an anatomic LT reconstruction.

Purpose

- To provide a quantitative description of the orientation of an anatomic LT reconstruction tunnel on the femur and the acetabulum to guide tunnel placement during an anatomic LT reconstruction.

Purpose

- **Specific aims:**
  - Describe an entry point on the lateral femur allowing for safe tunnel passage through the femoral neck and out the fovea capitis
  - Describe guidelines for femoral orientation that results in safe acetabular tunnel placement.

Methods

- Nine human cadaveric hemi-pelvises with femurs (mean age: 59.6; range: 47-65) were studied.
- Prior to dissection, a 3-D coordinate measuring device was used to record the neutral orientation of the femur in the acetabulum.
- The specimens were dissected, dislocated and digitized, and the collected points were then projected into the previously recorded neutral position.

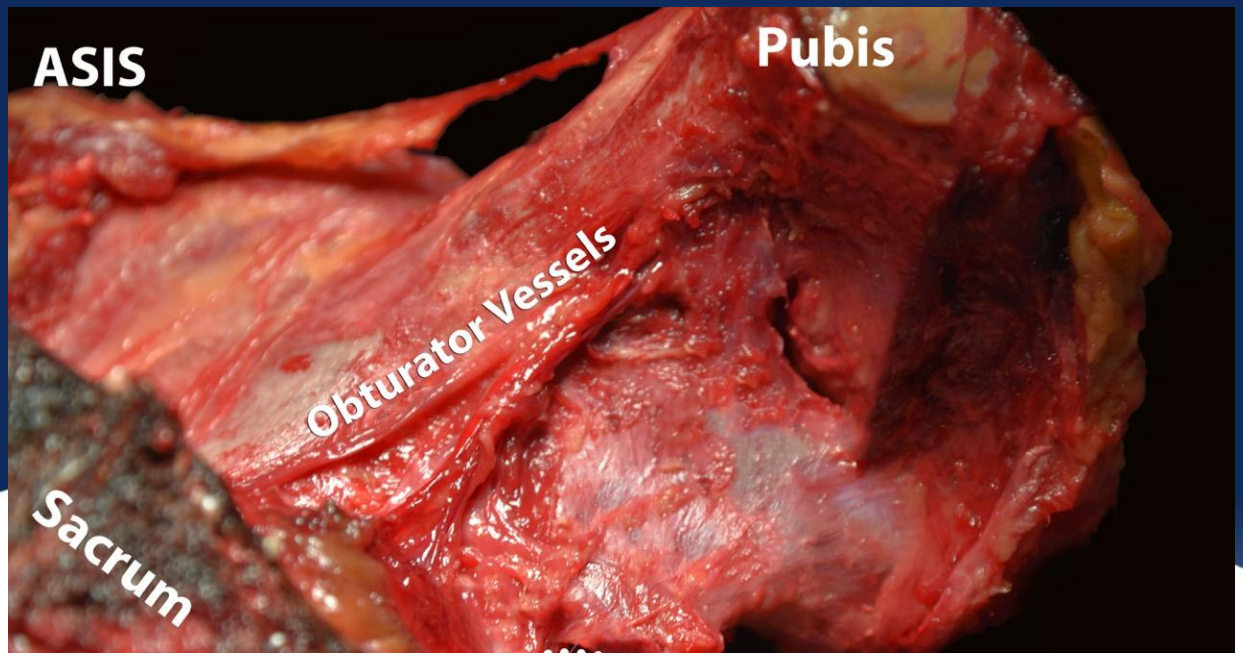
Methods

- The femur was digitally lateralized by 4 mm and distallized by 8 mm to reflect the clinical setting of distraction during an arthroscopic hip procedure.

- An axis originating at the center of the femoral LT attachment and passing through the center of the femoral neck was defined to simulate a reconstruction tunnel of a 7mm diameter, and its exit location on the lateral aspect of the femur was measured.

Methods

- The acetabular tunnel had a diameter of 2.9 mm, and was simulated along the same axis as the femoral tunnel.
- The femur was digitally rotated in increments of 1 degree and the clearance from the tunnel to the obturator bundle and the cotyloid fossa was measured

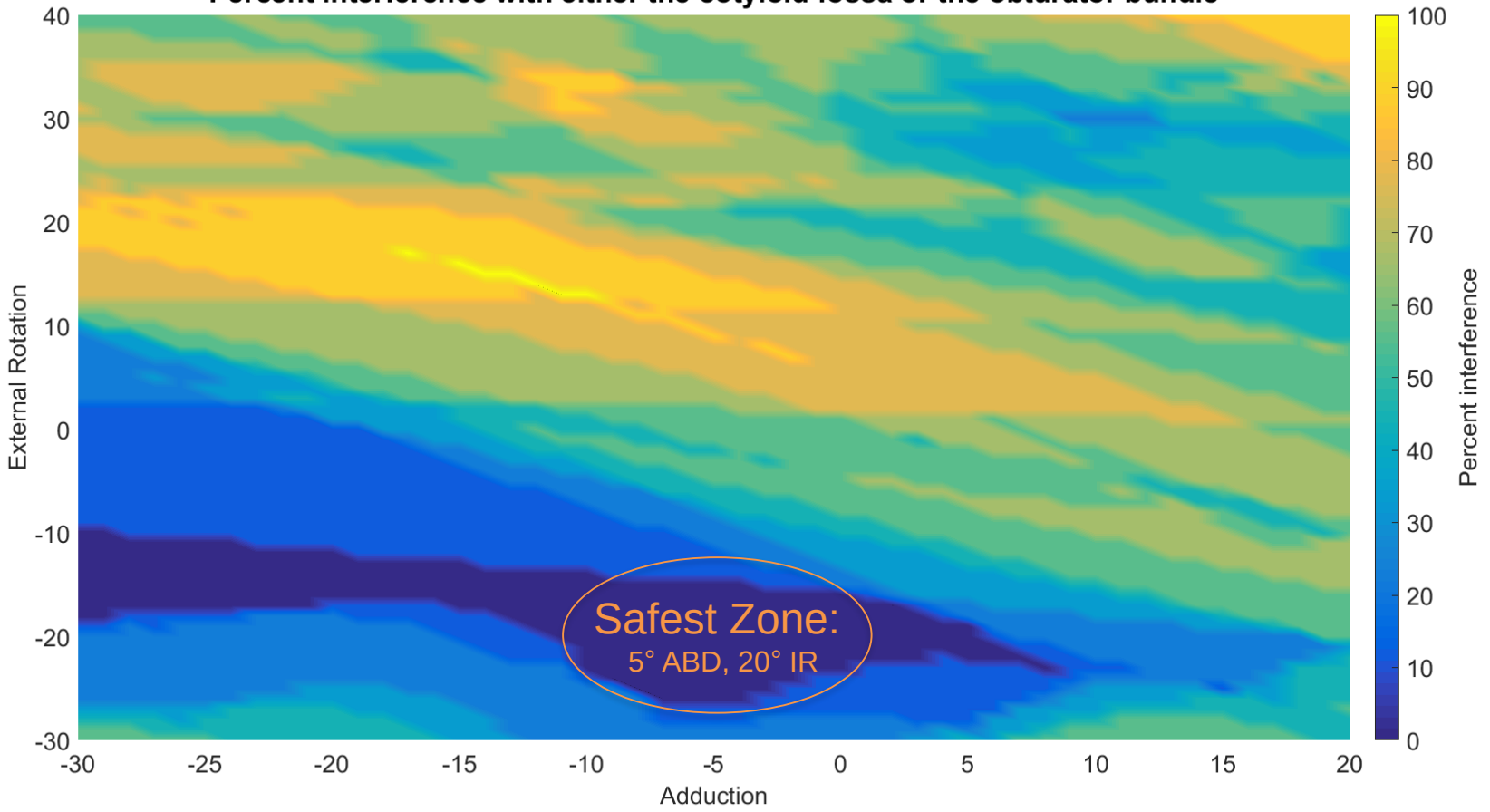


Results

- The entry point of the anatomic reconstruction tunnel on the lateral side of the femur was located at a mean distance of 7.0 mm [+/- 1.9 mm] distal and 5.8 mm [+/- 4.5 mm] anterior from the center of the vastus ridge.

- By abducting the femur 5° and internally rotating it 20°, the acetabular tunnel could be placed within the acetabular fossa, without interfering with the obturator neurovascular bundle in all specimens studied.

Results


Percent interference with either the cotyloid fossa or the obturator bundle
External Rotation
40
30
20
10
0
-10
-20
-30
-30
-25
-20
-15
-10
-5
0
5
10
15
20
Adduction
100
90
80
70
60
50
40
30
20
10
0
Percent interference
Safest Zone:
5° ABD, 20° IR

Conclusion

- An anatomic LT reconstruction tunnel of diameter 7mm can be safely reamed through the femur.

- A LT reconstruction tunnel of diameter 2.9 mm can be safely drilled through the acetabulum arthroscopically by angling the femur at 20 degrees of internal rotation and 5 degrees of abduction.

- These quantitative anatomic reconstruction parameters can be applied intraoperatively to guide tunnel placement during an anatomic LT reconstruction.

Thank you!

Keeping people active.