STRENGTH EVALUATION OF THE LATERAL CALCANEAL WALL WITH CIRCULAR EXTERNAL FIXATION APPLICATION IN CADAVERIC SPECIMENS

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Disclosure

Strength Evaluation of the Lateral Calcaneal Wall with Circular External Fixation Application in Cadaveric Specimens

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Study Objective

Determine yield point of lateral calcaneal wall:

1. Pull through resistance with olive wires

2. Cut through resistance smooth wires
Methods Construct

- The lateral calcaneal soft-tissue denuded
- Two tests performed:
  - “Direct pull through”
    - Olive wire
  - “Walked wire”
    - Smooth wire
Methods Testing (Olive wire)

- Olive wire from lateral was inserted to the calcaneal wall.
- Slotted bolt from lateral was hand tightened to allow the wire to slide freely.
- Medially the slotted bolt rotated (Russian tensioned)
  - At failure tensioning was halted.
Methods Testing (Olive Wire)

• A tractograph used to measure amount of rotation of the bolt.
Methods Testing (Smooth Wire)

• Same set up was performed for smooth wire walking.
• Smooth wire walked 4 holes anteriorly and tightened medially slotted bolt.
• Lateral bolt was rotated (Russian tensioned) laterally until failure.
• Amount of rotation recorded.
Results

• Olive pull-through
  79.8° or 140kg+-55

• Wire walking
  50.5° or 88kg+-50

• Demographics
  – 4 right, six left
  – Mean age 78.7
  – 6 Males, 4 Females
Conclusion

• Goal: Maximize wire tension without cortical failure
• Maximum amount of bolt rotation is 80°
• We found:
  – 79.8° olive wire
  – 50.5° smooth wire
References


