Rotator Cuff Repair
Single Row vs. Double Row
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Disclosure

- Smith and Nephew Endoscopy – Fellowship support
Definition

- Single-Row

- Double-Row
Biomechanical Studies

- Double-Row superior
  - Biomechanical strength
  - Load to failure increased
  - Decreased gap formation
- Recreates footprint better
  - Normal 14-20 mm
Early Comparative Studies
Single-Row vs. Double-Row

• Inconclusive
  – Results varied, often poor science
• Eventually prospective randomized trials
  – At least 7 currently in the literature
• Still unclear which is better for outcomes
Meta-analysis

- Pool all the data from randomized trials
- At least 9 meta-analyses performed
- Conclusions still conflicting
  - Some say no difference
  - Others say better healing with double-row (MRI or U/S)
    - Some only with massive tears
  - Generally no difference in patient outcomes
Meta-analysis of Meta-analyses

- Double-row provided better healing by MRI or ultrasound
- Clinical outcomes not better
Is it truly the “second row” that makes the construct better biomechanically?

• Jost PW, et al., JBJS, July 2012
• Biomechanical study, sheep rotator cuff
• Looked at suture number
  – Single row with 2, 4, or 6 mattress sutures
  – Double row with 4 mattress sutures
• Load to failure = when both had 4 sutures
• Single row with 6 sutures was superior
Potential Concerns about Double-Row

- Blood Supply
- Medial Tears
- Cost
Blood Supply

- Blood supply to healing tendon comes from humeral head
- Decreased by double-row?
  - More anchors in humeral head
  - Greater area of compression of tendon to bone
- Liem, et al. – sheep, not significant but less blood flow in DR group at time of repair, not true at 12 weeks
- Christoforetti, et al. – patients undergoing cuff repair, laser doppler flow after tying medial row, then after second row
  - Blood flow decreased 45% after tensioning second row
Medial Tears

- Re-tear patterns can be different in double-row as compared to single-row
- Gerhardt, et al., AJSM
  - Single-row failed laterally at bone
  - Double-row 80% of failures were medial within tendon or muscle-tendon junction
Important Reason for Rotator Cuff Repair Failure

- Failure to reproduce anatomy
- Every tear is different
  - Must determine where the tissue belongs
Cost

- Studies on societal costs
  - Need to save 1 of 17 cases from revision to make double-row cost effective

- Practical standpoint
  - Anchors cost at least $300
  - Single-row 1-2 anchors, double-row 3-4 anchors

- >2 anchors, surgery center loses money on case?
My Theory

• Every tear is different
• This is what makes rotator cuff repair fun
Some Tears Amenable to Double-Row Repair
Tears That Need Margin Convergence
Double-Row Makes Less Sense
Single vs. Double Row

- No studies have shown better outcomes with double row repair
- Potential concerns about double row:
  - Blood supply
  - Medial re-tears
  - Cost
- Many tears are not amenable to double row repair
Conclusions

• In certain situations, double row makes the most sense.
• Most important concepts:
  – Determine where the tissue belongs.
  – Take tension off repair with side-to-side sutures.
  – More sutures = More secure repair.
Final Word
Thank You