

Rotator Cuff Repair

Single Row vs. Double Row

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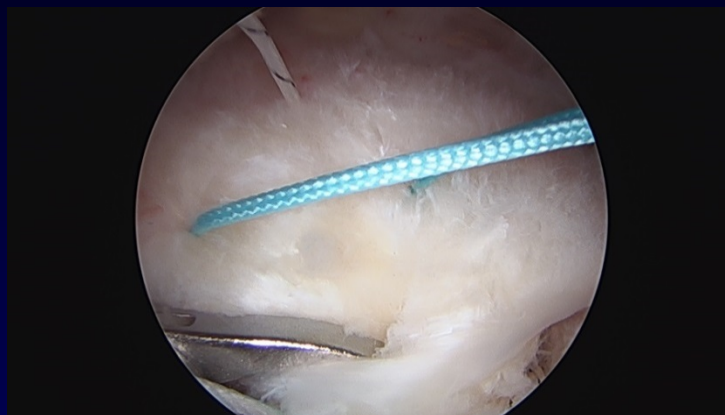


Disclosure

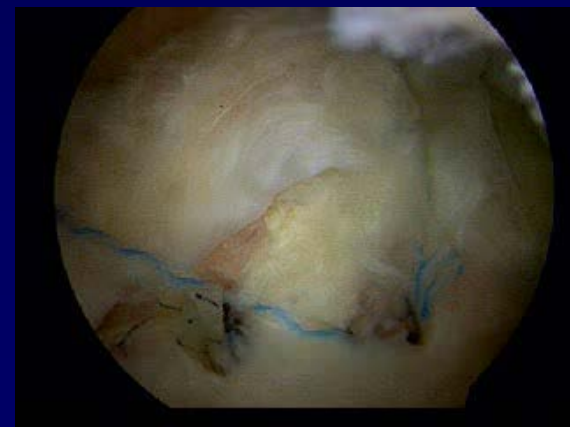
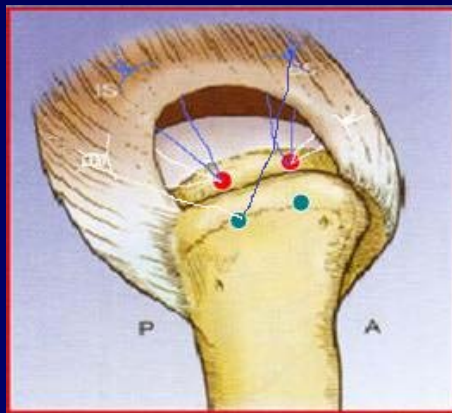
- Smith and Nephew Endoscopy –
– Fellowship support

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

Systematic Review

Is Double-Row Rotator Cuff Repair Clinically Superior to Single-Row Rotator Cuff Repair: A Systematic Review of Overlapping Meta-analyses

Randy Mascarenhas, M.D., F.R.C.S.C., Peter N. Chalmers, M.D., Eli T. Sayegh, B.S., Mohit Bhandari, M.D., M.Sc., Ph.D., Nikhil N. Verma, M.D., Brian J. Cole, M.D., M.B.A., and Anthony A. Romeo, M.D.

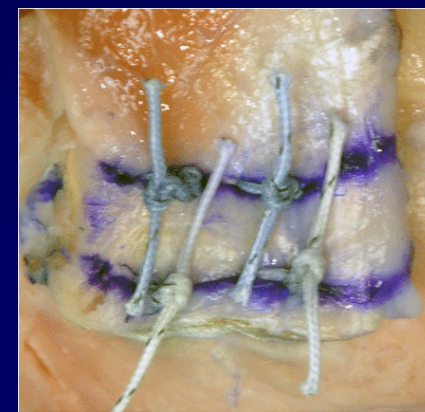
Purpose: Multiple meta-analyses of randomized clinical trials, the highest available level of evidence, have been conducted to determine whether double-row (DR) or single-row (SR) rotator cuff repair (RCR) provides superior clinical outcomes and structural healing; however, results are discordant. The purpose of this study was to conduct a systematic review of meta-analyses comparing SR and DR RCR to elucidate the cause of discordance and to determine which meta-analysis provides

- 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





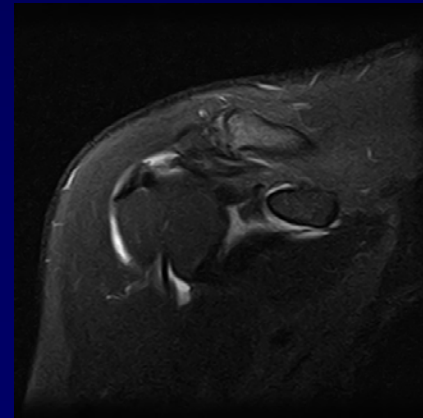
Blood Supply

- 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

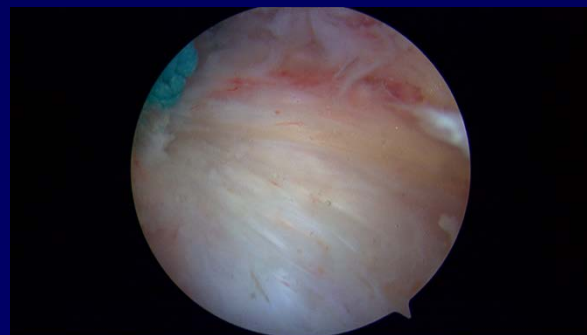
- Re-tear patterns can be different in double-row as compared to single-row
- Gerhardt, et al., AJSM
 - Single-row failed laterally at bone
 - Double-row 80% of failures were medial within tendon or muscle-tendon junction





Important Reason for Rotator Cuff Repair Failure

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





Cost

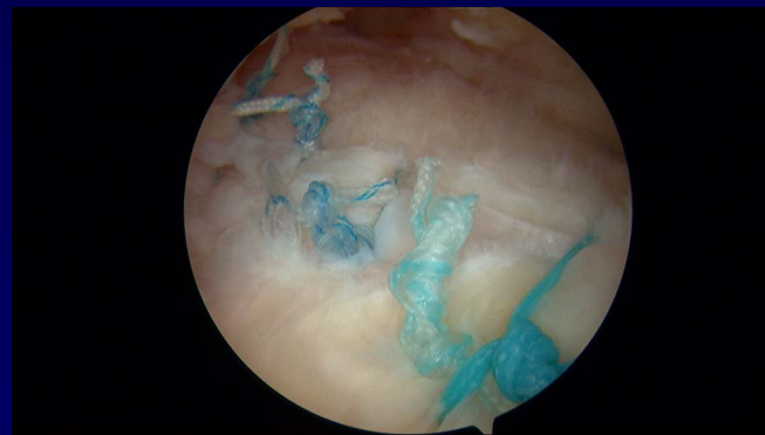


- Studies on societal costs
 - Need to save 1 of 17 cases from revision to make double-row cost effective
- Practical standpoint
 - Anchors cost at least \$300
 - Single-row 1-2 anchors, double-row 3-4 anchors
- >2 anchors, surgery center loses money on case?



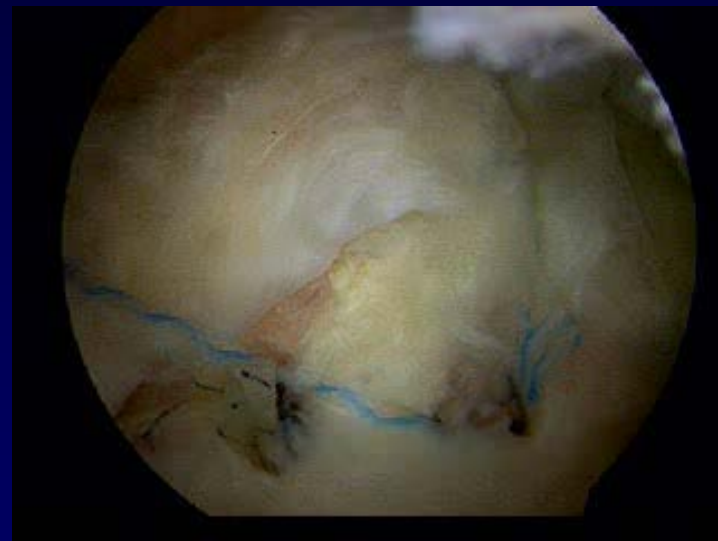
My Theory

- Every tear is different
- This is what makes rotator cuff repair fun





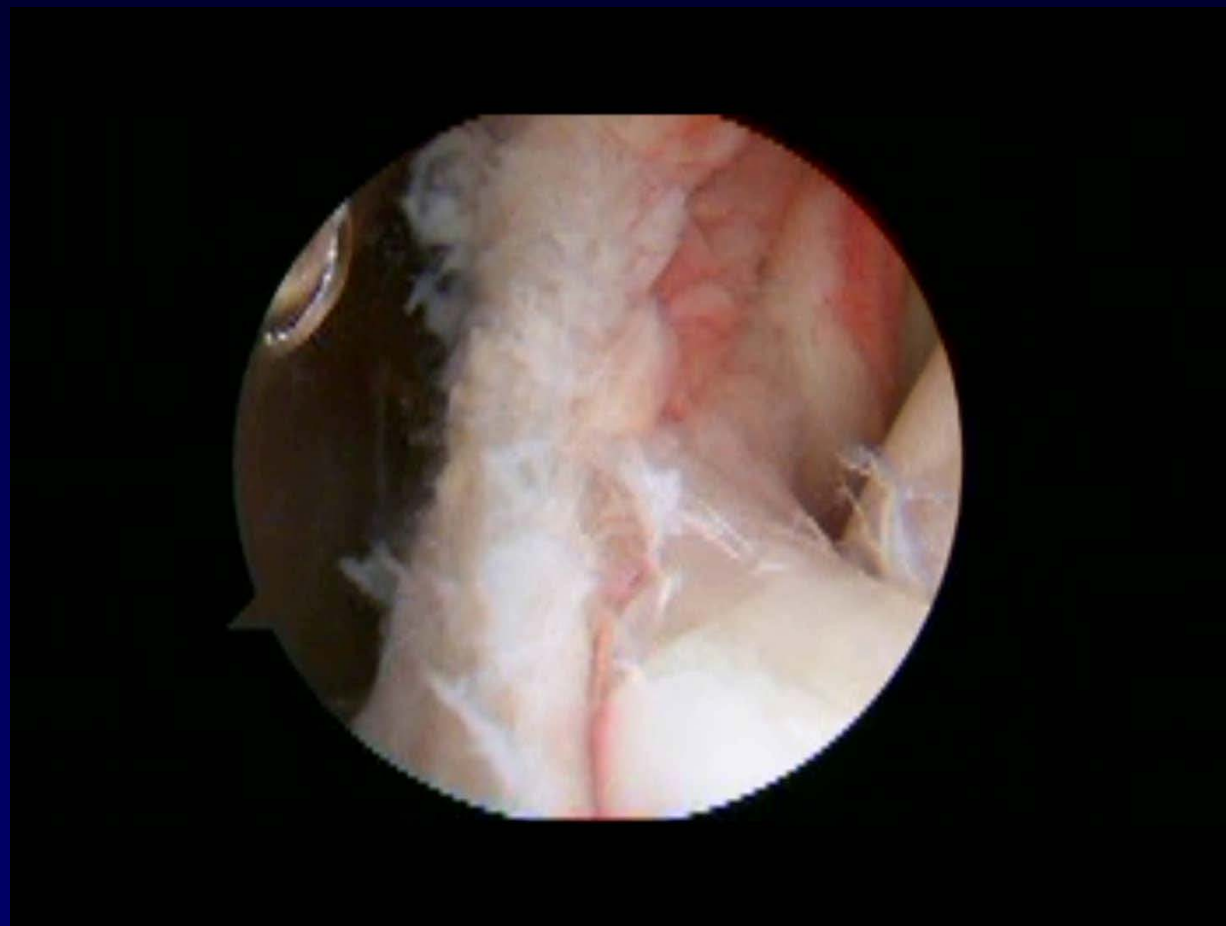
Some Tears Amenable to Double-Row Repair





Tears That Need Margin Convergence

Double-Row Makes Less Sense





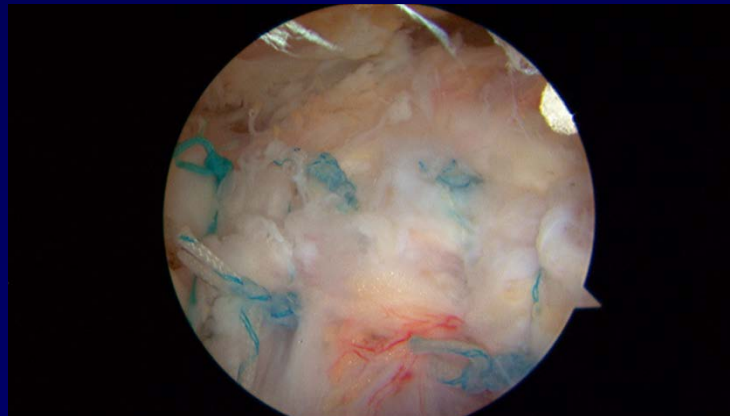
Single vs. Double Row

- 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



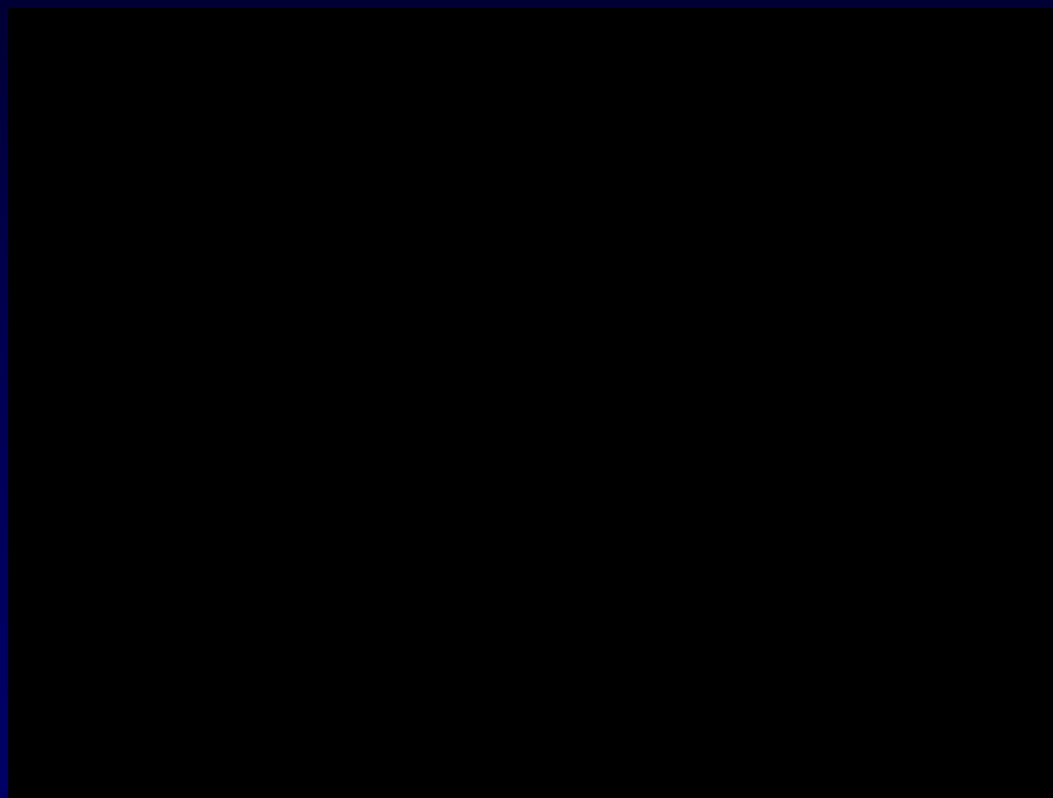
Conclusions

- 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

