

Single Row or Double Row Rotator Cuff Repair "How I Choose"

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Disclosures

- ZimmerBiomet- Royalties
- Wright Medical –Consulting
- VuMedi
- ***I routinely use double row transosseous knotless techniques whenever possible***



The issues

- Science
- Technology
- Pathologic Anatomy



"The Science" Clinical Problems

Rotator Cuff repairs fail to heal in an alarmingly high rate

- Harryman '91
 - Gerber '00
 - Galatz '04
 - Fealy'06
- 20-50% for large-massive tears

Do radiologic failures correlate with patient outcomes

- Dodson '10
 - Harryman '91
 - Galatz '04
- Most happy but,
– Deteriorated over time
– Tear size increased
– Better if healed



What We Know

- Patients can do well after an anatomically failed repair
 - Pain operation
 - Small tears (supra and some infra)
 - Older patients
 - More sedentary
- However, in younger, higher demand patients, cuff healing is essential to a good result.



Optimum Rotator Cuff Repair

- Tension-free repair-
- Optimize the biology of tendon to bone healing interface- "cuff heals to bone"
- **High initial fixation strength**
 - Minimal gap formation
 - Maintain stability under cyclic load
- Proper Rehab

Double Row Repairs address only one of these factors



Double vs.. Single Row

- Double-row vs.. single-row rotator cuff repair: A review of Biomechanical evidence. Wall et al JSES 2009
- "Single –row versus Double-row Rotator Cuff Repair; Techniques and Outcomes" Dines, J, Bedi,A, El Attrache, N, and Dines DM JAAOS 2010

- **ADVANTAGE DOUBLE ROW- When Possible!**
 - **BETTER BIOMECHANICAL STRENGTH**
 - **FAILURE**
 - **GAP FORMATION**
 - **BETTER FOOTPRINT RESTORATION**



Double Row vs Single Row: Biomechanical Testing

Double-row vs single-row rotator cuff repair: A review of the biomechanical evidence

Wall JSES 2009

- **5 studies looked at footprint restoration.**

Study	Repair	Outcome Variable	Footprint Coverage
Brady 2006	SR vs DR	M->L coverage	SR = 47% DR=100%
Mazzocca 2005	SR vs DR	Mean area	SR=52% DR Diamond=102% DR MDA=81% DR MMDA=89%
Meier 2006	SR vs DR (vs TOS)	Mean Area	SR=46% DR=106%
Nelson 2008	SR vs DR	Mean Area	DR 74% more than SR
Tuoheti 2005	SR vs DR (vs TOS)	NA	DR 60% more than SR

Double Row better at footprint restoration in all studies

Does Footprint Restoration Correlate to Improved Clinical Results?

Outcomes of single-row and double-row arthroscopic rotator cuff repair: A systematic review

Saridakis JBJS-Am 2010

- **Review of 6 papers**
 - **No differences in functional scores in any of the studies**
 - **However, Parks et al found better functional scores with DR in patients with large (>3cm) tears.**
 - **2 of 4 showed improved radiographic healing**



Double Row vs. Single Row

Outcomes of single-row and double-row arthroscopic rotator cuff repair: A systematic review

Saridakis JBJS-Am 2010

Study	Failure Rate	Imaging	P-value
Burks SR DR	10% 10%	MRI	NR
Cherousset SR DR	40% 22.6%	CT Arthro	0.03
Franceschi SR DR	46.2% 30.7%	MRI	>0.05
Sugaya SR DR	25.6% 9.8%	MRI	<0.01

Double Row vs. Single Row

Am J Sports Med. 2010 Apr;38(4):836-41. doi: 10.1177/0363546509359670.

Which method of rotator cuff repair leads to the highest rate of structural healing? A systematic review.

Duquin TB¹, Boyer C, Blason LJ.

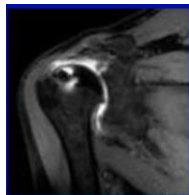
- Systematic Review of 1252 Rotator Cuff Repairs

- Tears < 1cm
 - No difference
- Tears 1-5cm
 - SR: 17% retear
 - DR: 7%
- Tears >5cm
 - SR: 69%
 - DR: 41%



Potential Downside of DR

- May compromise vascularity of cuff
- Potential to over-tension the cuff
- May lead to muscle-tendon junction tear
 - No bail out -> RSA



Potential Downside of DR

- Can cost \$1000 more per case when compared to SR
- What do we gain for that?
- Is that economically viable
- Paucity of data on cost effectiveness on SR vs. DR



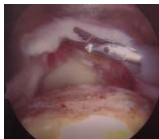
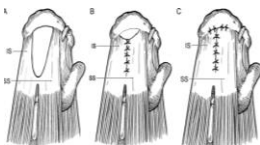
Conclusions

- Tension-free repair and maximizing biology more important than fixation type.
 - DR results in better mechanics, but that is least important

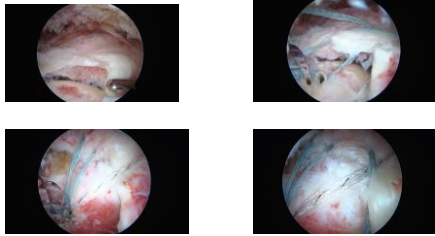


TEAR CONFIGURATION MATTERS!
"CAN'T MAKE A ROUND PEG FIT INTO A SQUARE HOLE"

Tear configuration dictates type of repair in many cases



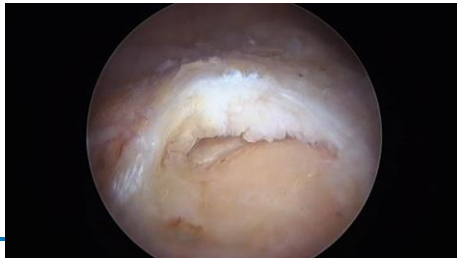
Therefore I prefer a Suture Bridge Double Row Repair
Especially in younger patients when possible



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TO GET BACK
IN THE GAME

Conclusions

- SR for small tears (<1cm)



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Conclusions

- For medium tears (1-5cm)
 - Healing trends towards better with DR
 - Difficult to show better clinical results
 - Therefore, SR may be fine in older, more sedentary patients
 - DR in more active patients
- Large tears (>5cm)
 - Studies show better results with DR
 - However, can be technically difficult to achieve

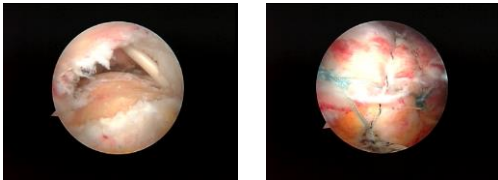
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Thank You



HOOPA WHERE THE WISDOM LIVES TO GET BACK TO THE GAME SPECIAL SURGERY

Transosseous Equivalent: "Suture Bridge"



HOOPA WHERE THE WISDOM LIVES TO GET BACK TO THE GAME SPECIAL SURGERY
