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Influence of the pattern rotator cuff tear pattern in the stability obtained after arthroscopic superior capsular reconstruction: A computational analysis

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Mandatory faculty disclosure

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I have no financial conflicts to disclose.

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I have no financial conflicts to disclose.

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I have no financial conflicts to disclose.

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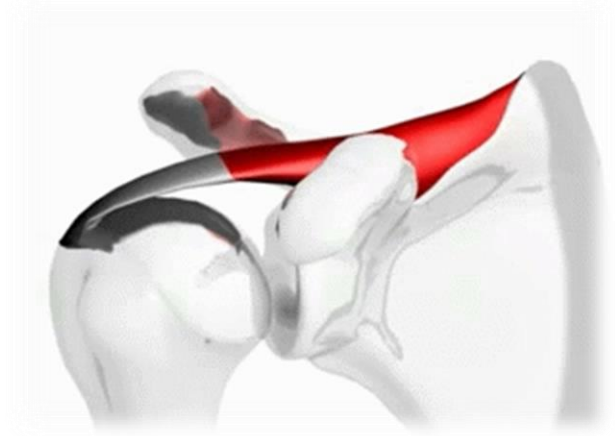
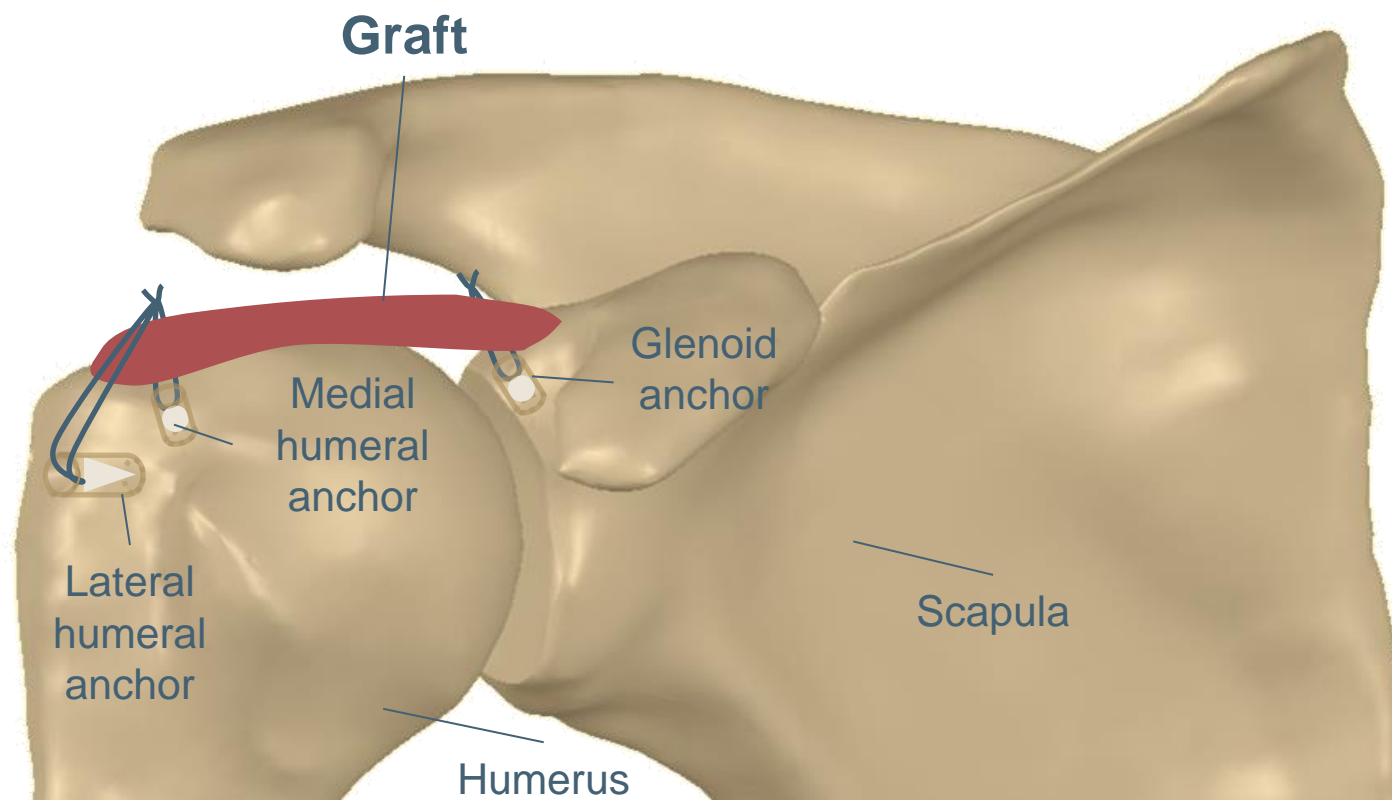
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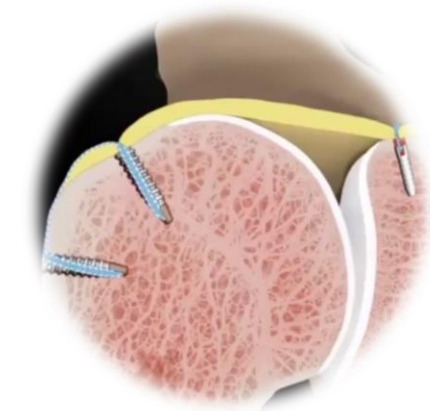


Background

Arthroscopic Superior Capsular Reconstruction (ASCR)



Adapted from Wikipedia



Adapted from Arthrex



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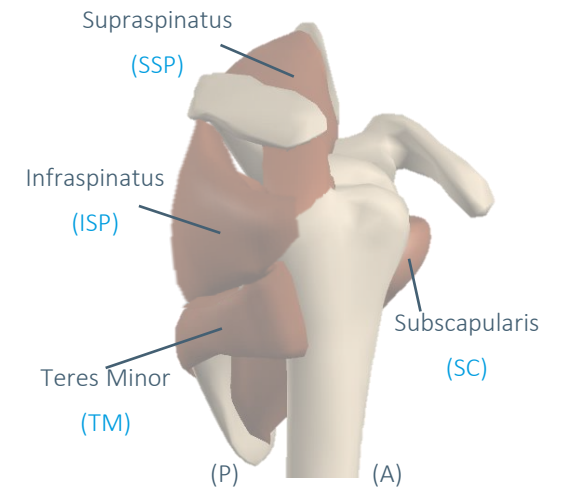


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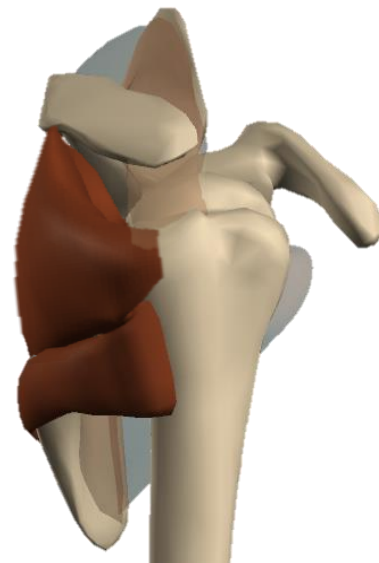
Background

Arthroscopic Superior Capsular Reconstruction (ASCR)

Preoperative patterns of Rotator Cuff Tears (RCTs)



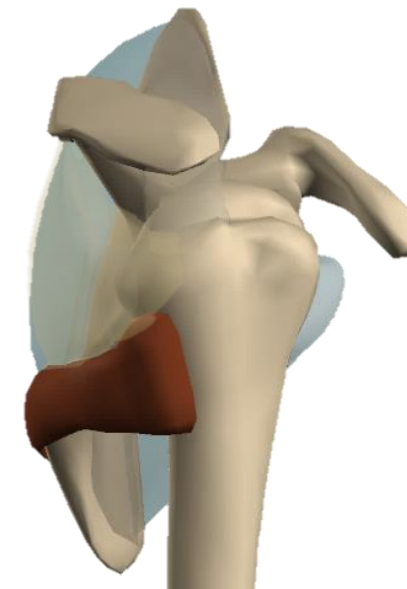
Irreparable tear of SSP tendon



Irreparable tear of SSP and SSC tendon



Irreparable tear of SSP and ISP tendon



Irreparable tear of SSP, SSC and ISP tendon

Objectives

Purpose of the study

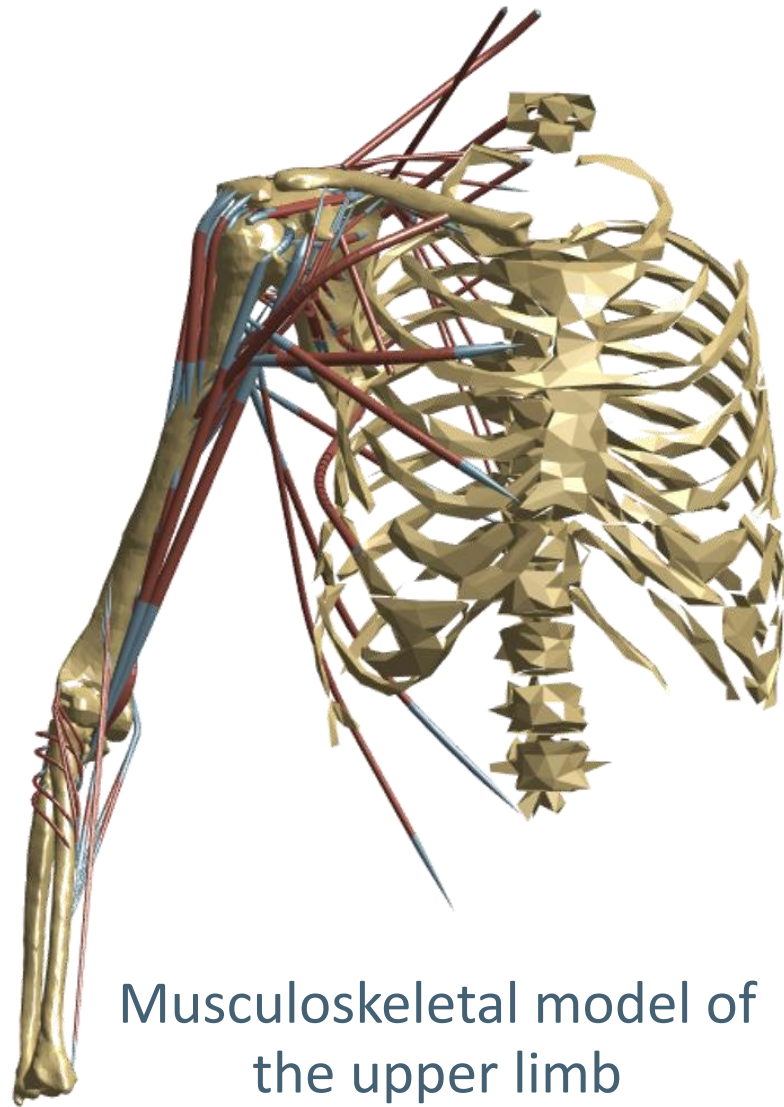
Determine the influence of the positioning of the graft in ASCR on shoulder stability, considering different patterns of RCTs.

Hypothesis of the study

ASCR alone would not increase the stability of the shoulder for preoperative RCTs extending beyond the supraspinatus.



Methods – Musculoskeletal Model



4 parallel segments

Material properties

45 Shoulder positions of graft fixation

4 most common patterns of RCTs

	SSP	SSC	ISP
1	x	✓	✓
2	x	x	✓
3	x	✓	x
4	x	x	x

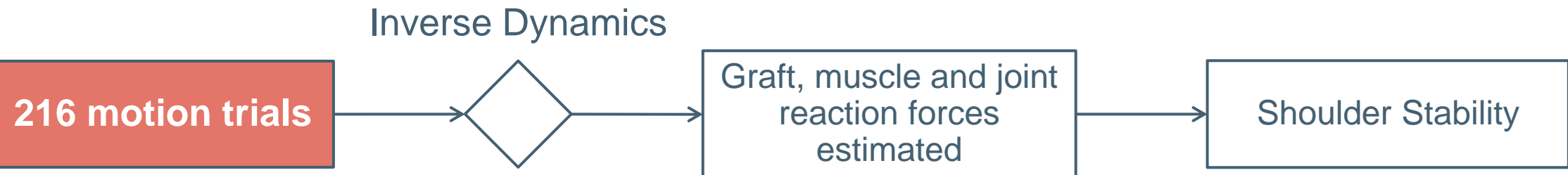


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Methods – Kinematic Data



Kinematic data of 18 subjects
(7 males and 11 females)
Mean age: 24.5 ± 8,4 years

4 movements (3 trials each)



Abduction in the frontal plane



Forward flexion in the sagittal plane



Reaching behind the back



Combing the hair

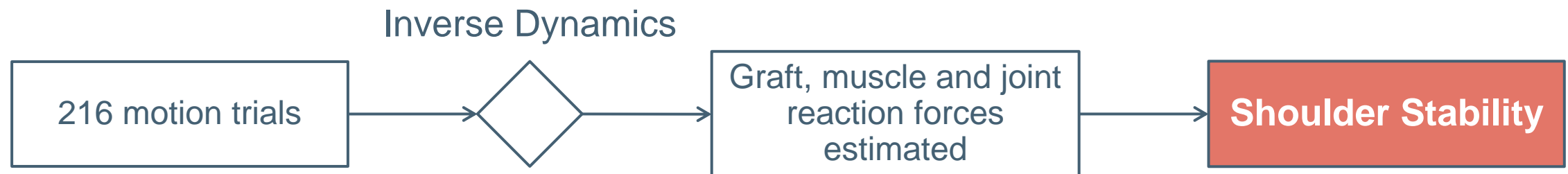


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Methods – Shoulder Stability



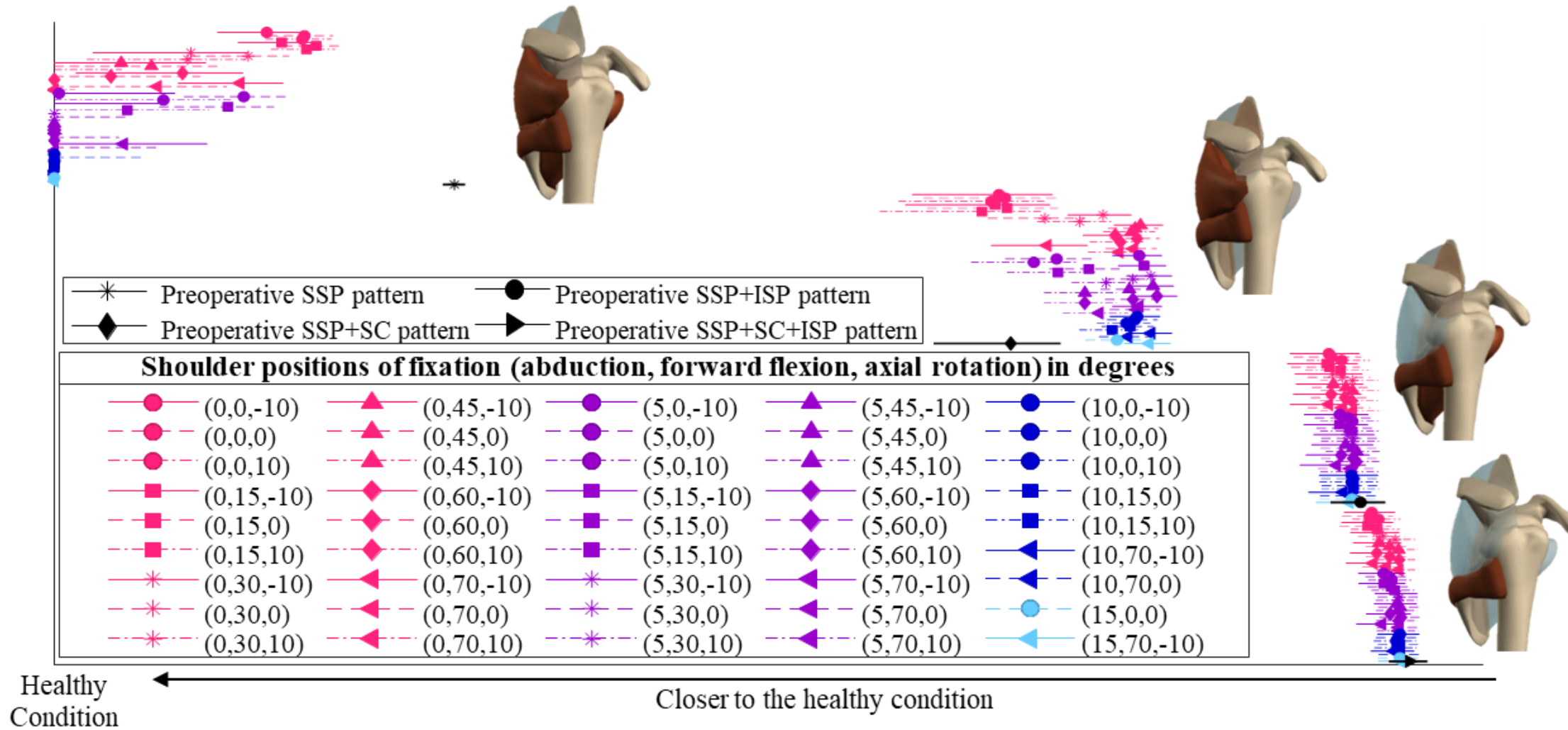
Analysis of variance (ANOVA)

Tuckey's test

Statistical significance

$p < 0.05$

Results



Main Conclusions

- ASCR for isolated SSP tears improved shoulder stability, regardless of the shoulder position of fixation.
- For tears that extended to the SC and ISP tendons, ASCR did not significantly improve shoulder stability, and the graft did not restore the anterior and posterior stability lost with the RCT.



Clinical Relevance

- This study supports the relevance, for an isolated SSP tear, of the position of the shoulder during graft fixation for shoulder stability after ASCR.
- New studies should investigate the necessity and relevance of concomitant procedures to restore the action of the remaining torn rotator cuff tear tendons.



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