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Effects of Incremental Scaphoid Proximal Pole Excision on Carpal Kinematics

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COLLEGE OF ENGINEERING

School of Mechanical, Industrial, and Manufacturing Engineering

Background

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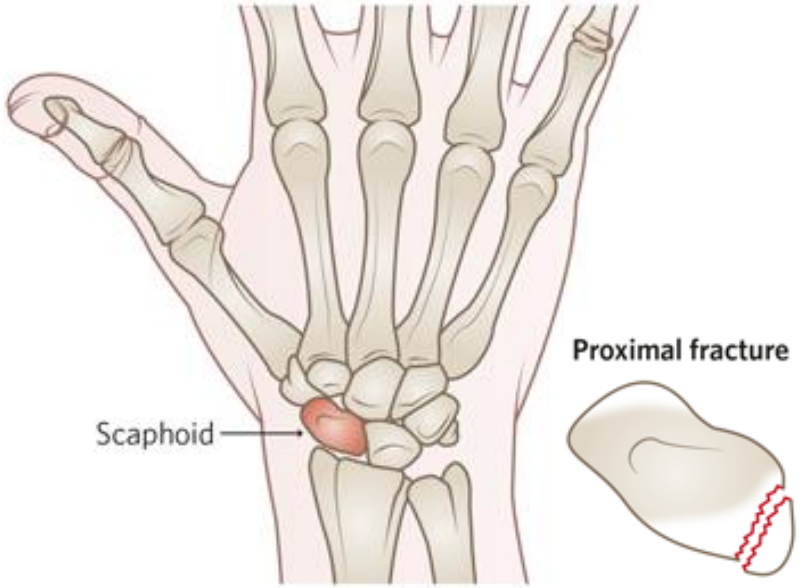
- Most fractured carpal bone (10% of hand fractures)
- 15% of fractures are to the proximal pole
- Scaphoid nonunion is common
- Limitations to the standard of care using bone grafts



Objective

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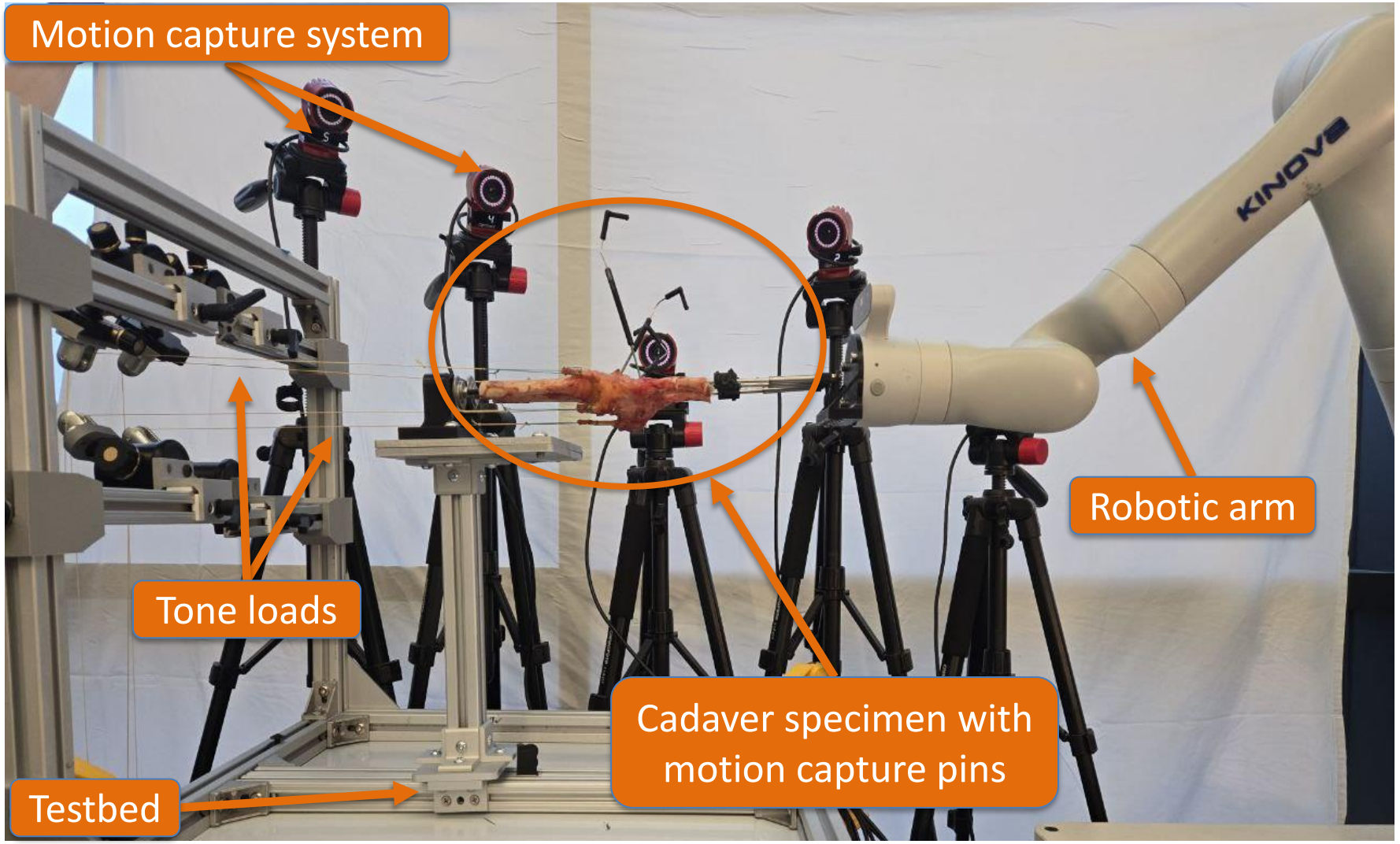
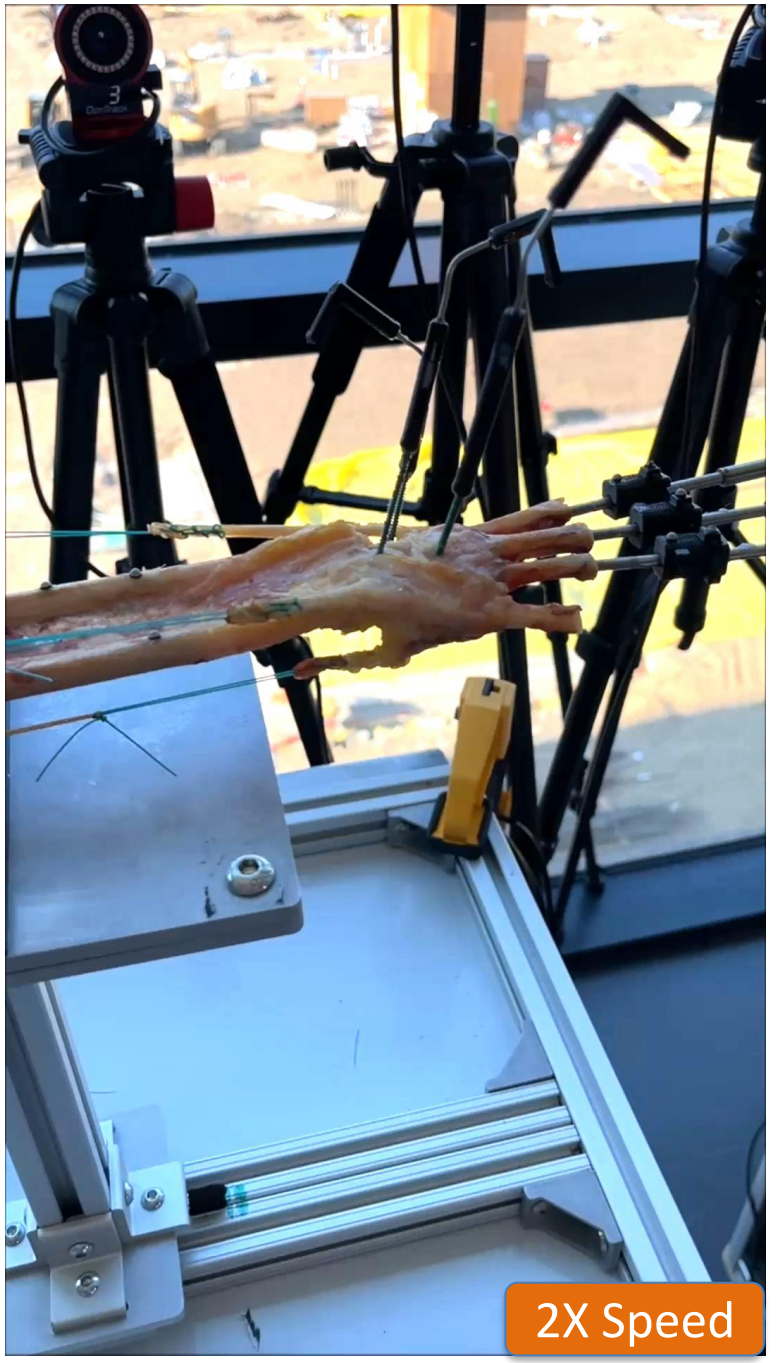
- To examine the effects of incremental scaphoid proximal pole excisions on carpal kinematics
- This offers insight on an alternative to the current standard of care

Experimental Setup





Methods

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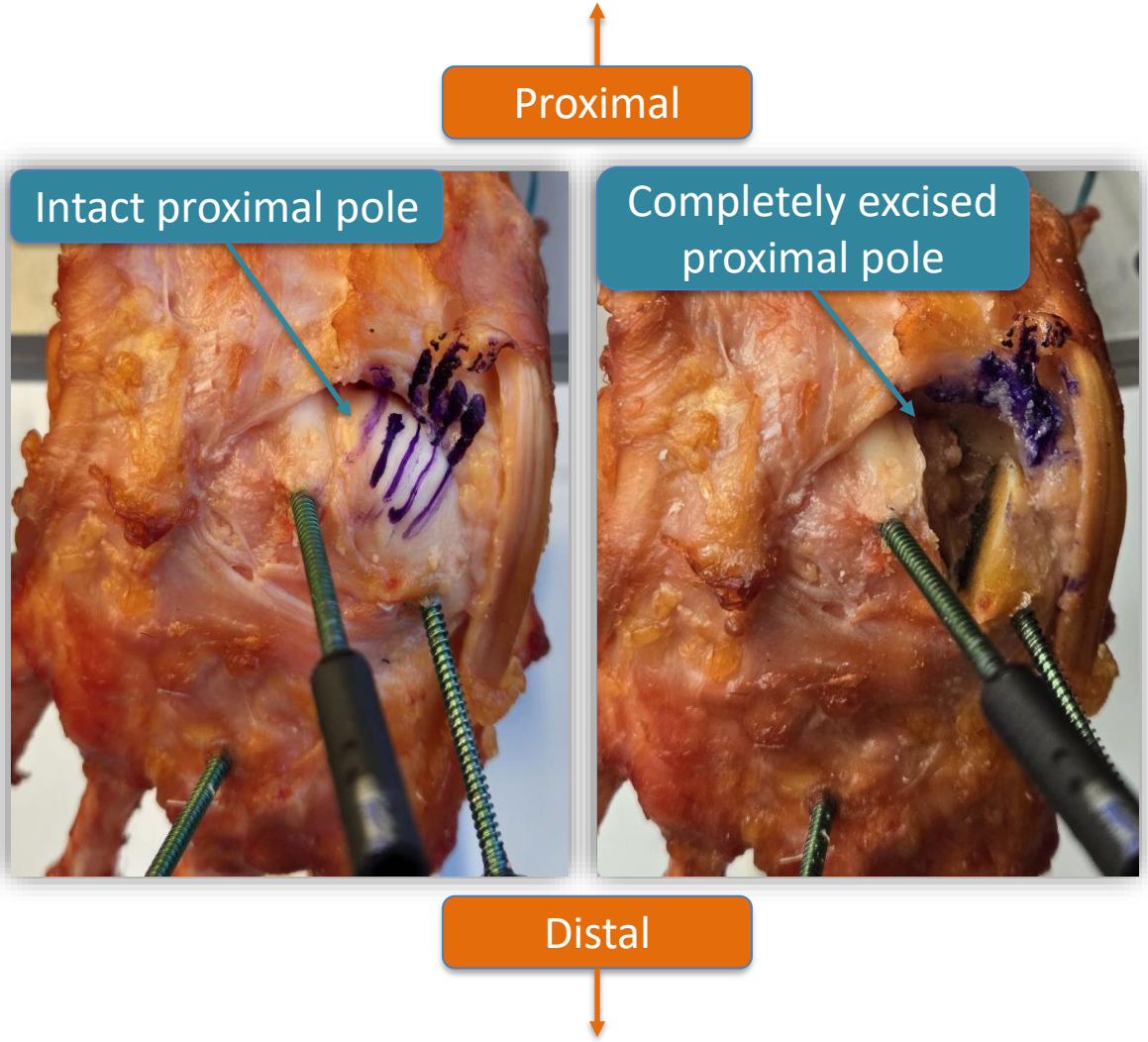

Scapholunate and Capitolunate angles (n=3 cadaver specimens) computed for the following conditions:

1. Baseline
2. Scapholunate ligament excision
3. Four incremental 2mm excisions of the proximal pole

Sample Data (n=1)

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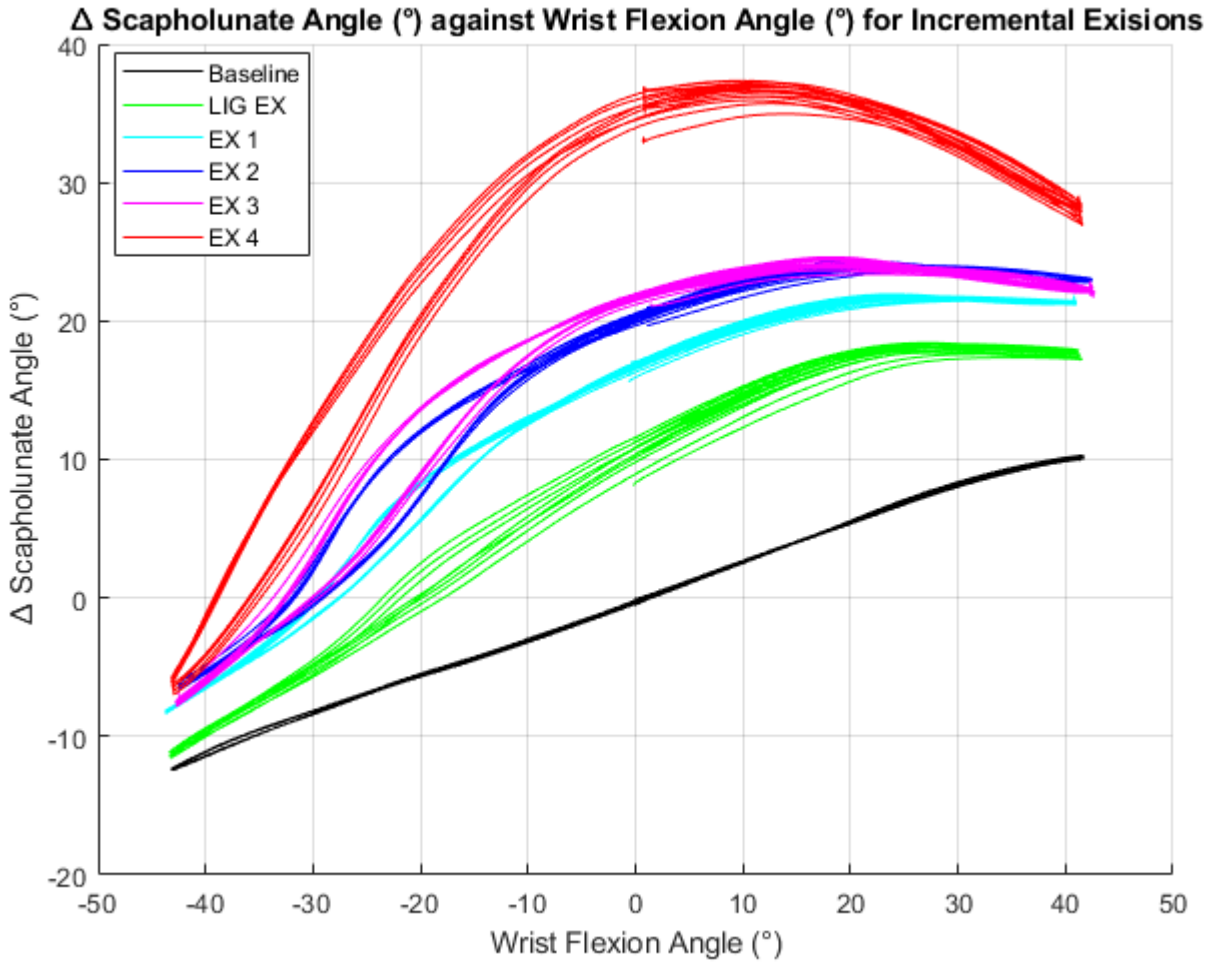

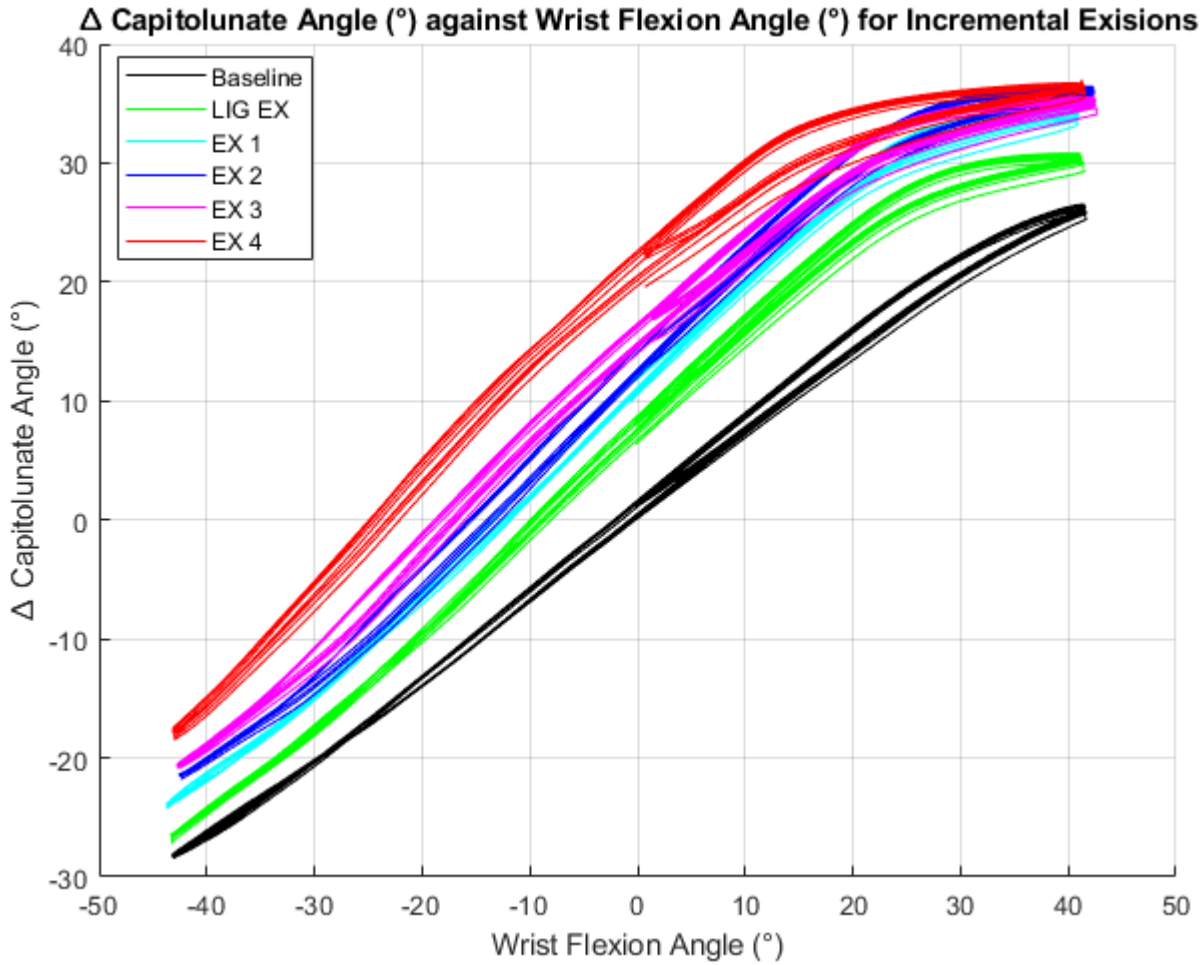

Scapholunate Angle

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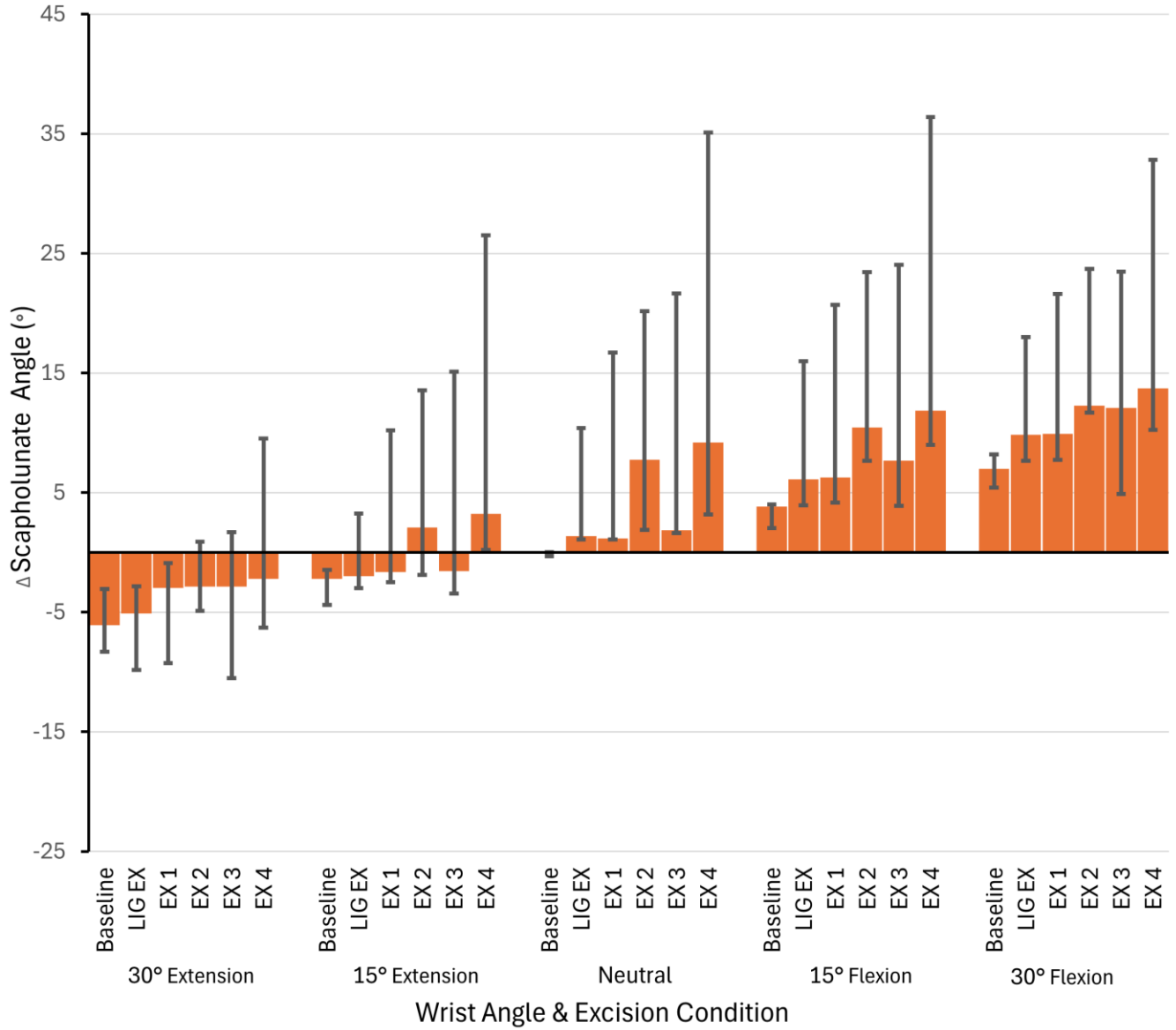

Capitolunate Angle

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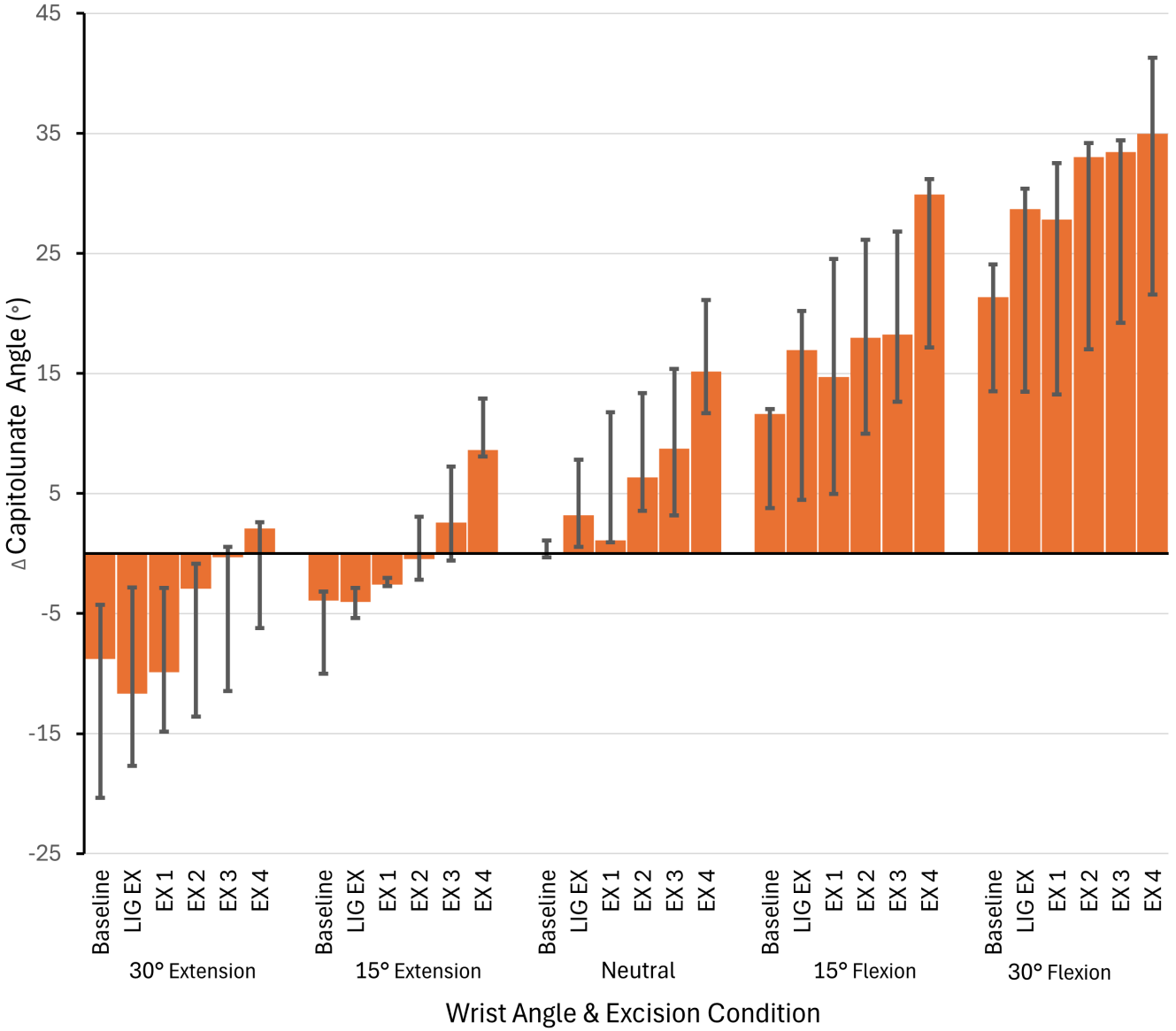

Conclusion

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- Current findings suggest that up to 2mm of the scaphoid proximal pole can be excised without notably affecting carpal kinematics

- **Proximal pole excision may thus be a viable alternative to bone grafting under these conditions**

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