

Background

Rotator cuff pathology is common, with a prevalence of 62% in individuals aged 80 and older¹. Biceps tendon bridging is increasingly used as a successful and cost-effective adjunct for surgical repair of massive rotator cuff injuries². Currently, there are no published anatomical studies evaluating the critical tendon length required to accurately perform and tension a biceps bridge technique. The objective of this project was to gather population-representative data that could be used to determine the appropriate biceps tendon length for biceps tendon bridge and tenodesis using standard, reproducible bony landmarks.

Clinical Relevance

The biceps bridge technique is used to augment repair of massive rotator cuff tears by preserving the long head of the biceps tendon (LHBT) at its glenoid origin and rerouting it to the greater tuberosity³.

Appropriate tensioning of the biceps tendon is critical.

- Overtensioning can lead to persistent pain and cramping
- Undertensioning may result in a cosmetic Popeye deformity as well as weakness in elbow flexion and supination.

Identifying reliable anatomic landmarks can aid in proper tensioning which is necessary to restore normal shoulder biomechanics and optimize outcomes. This study is the first to describe the critical length needed to successfully perform this procedure.

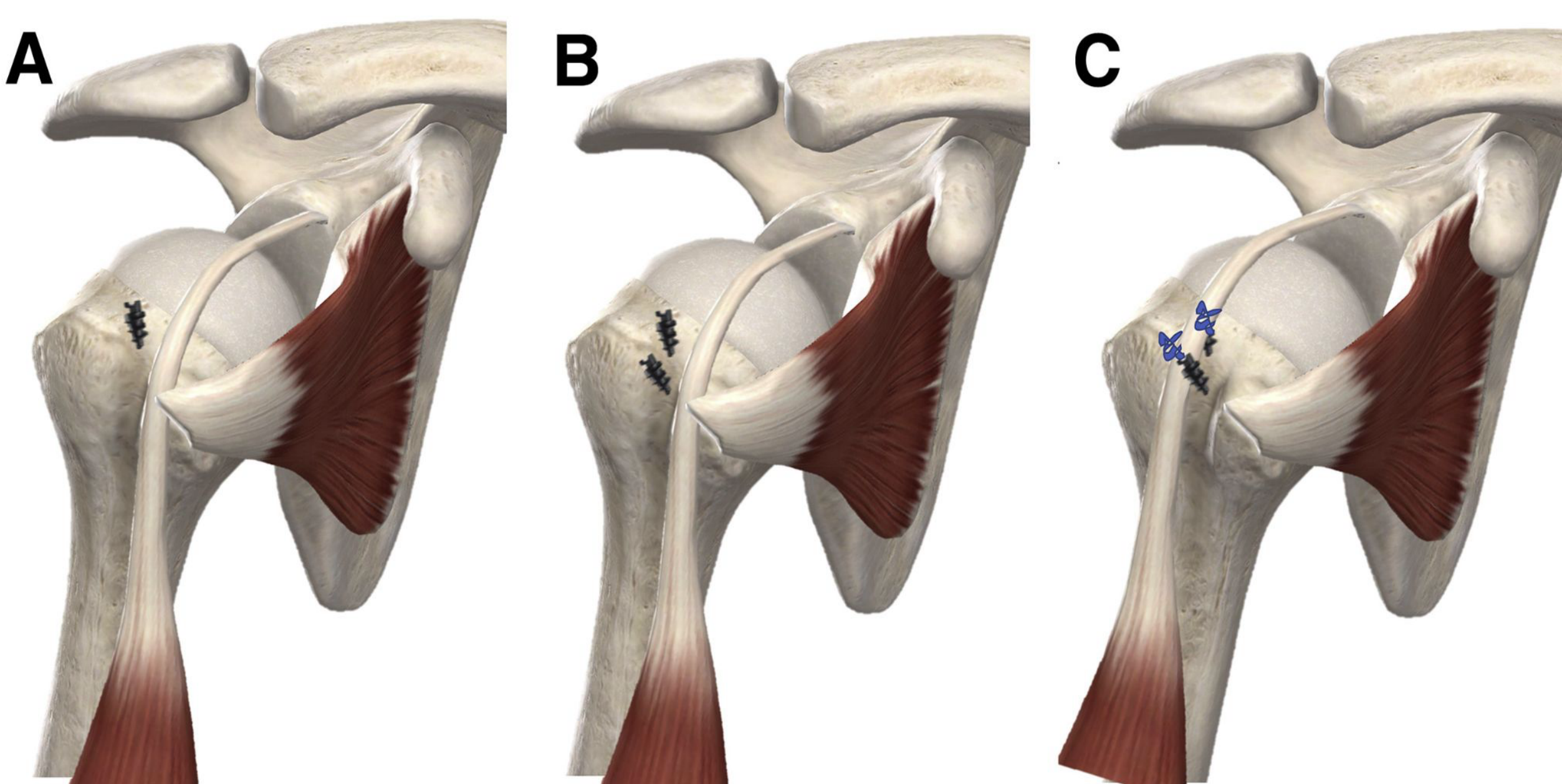


Figure 1. Graphical representation of Arthroscopic partial Superior Capsular Reconstruction using the Long Head of the Biceps Tendon-Technique

Terra et al. Arthroscopic partial Superior Capsular Reconstruction using the Long Head of the Biceps Tendon-Technique Description. Arthrosc Tech. 2021 Feb 19;10(3):e669-e673.

Methods

Cadaveric dissections performed on 35 formalin-embalmed donors (a total of 68 shoulders)

- The distal medial aspect of the bicipital groove was identified and marked on the LHBT
- LHBT was translated to the midpoint (“50-yard line”) of the greater tuberosity; the second reference point was marked.
- LHBT was released from the supraglenoid tubercle
- Measurements were obtained to determine biceps bridge and tenodesis distances
- Distance from lesser tubercle to the distal medial aspect of the bicipital groove measured to define relevant anatomic landmarks

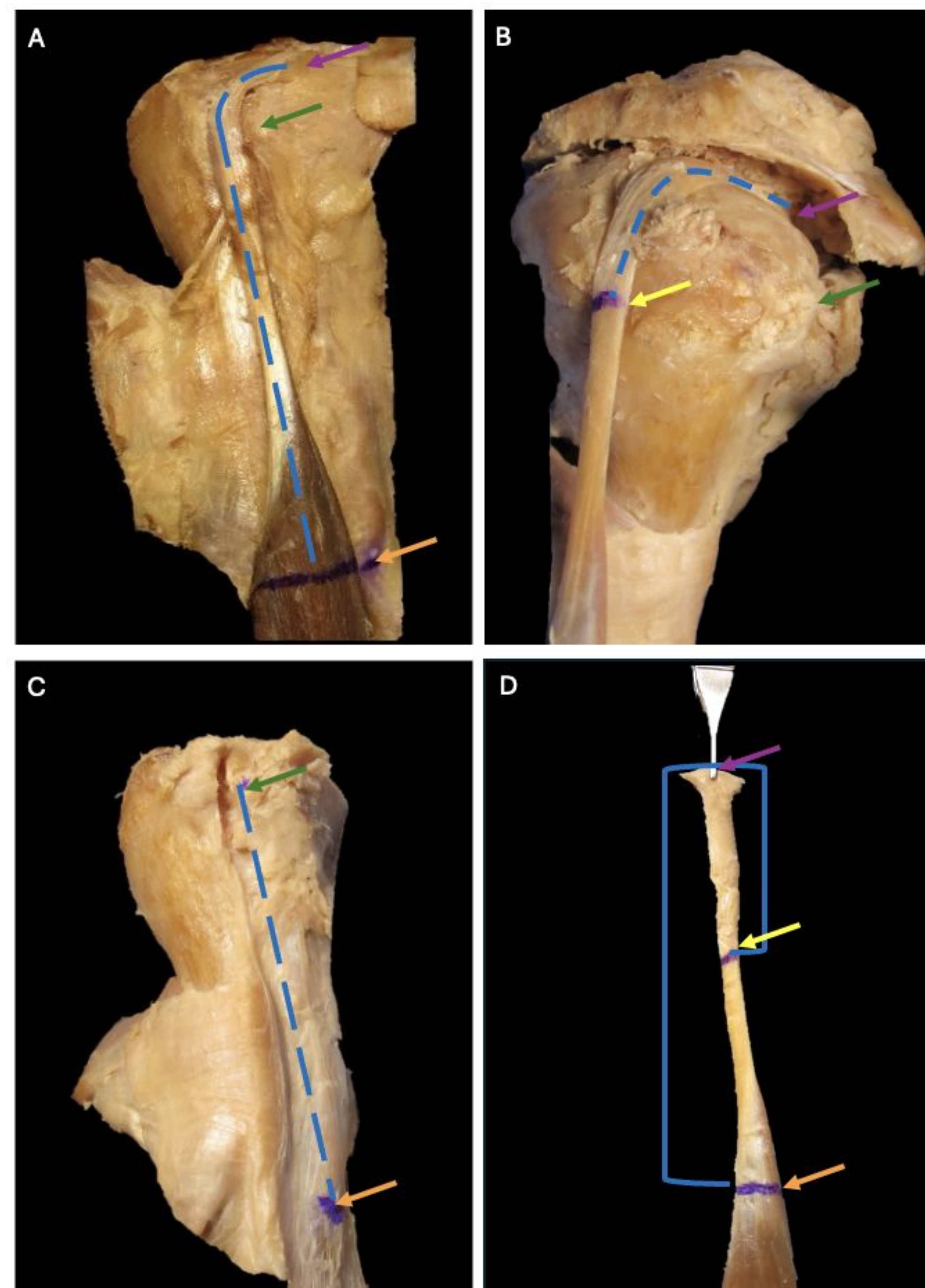


Figure 2. Visual representation of Measurements Described in the Results (A) Course of the LHBT that was measured from the supraglenoid tubercle (purple arrow) to the distal end of the medial lip of the bicipital groove (orange arrow). (B) Course of the LHBT that was measured from the supraglenoid tubercle to the 50-yard-line of the greater tuberosity of the humerus (yellow arrow). (C) Course of the bicipital groove that was measured from the lateral aspect of the lesser tubercle of the humerus (green arrow) to the distal end of the medial lip of the bicipital groove. (D) Representation of how the tendon measurements were acquired.

Results

The average length from the supraglenoid tubercle to the 50-yard line of the greater tuberosity of the humerus was 52.42 +/- 7.18 mm. The average length from the supraglenoid tubercle to the distal end of the bicipital groove was 128.06 +/- 13.72 mm. The average length of the bicipital groove was 82.12 +/- 8.92 mm. A statistically significant difference was identified for all measurements when comparing male to female donors.

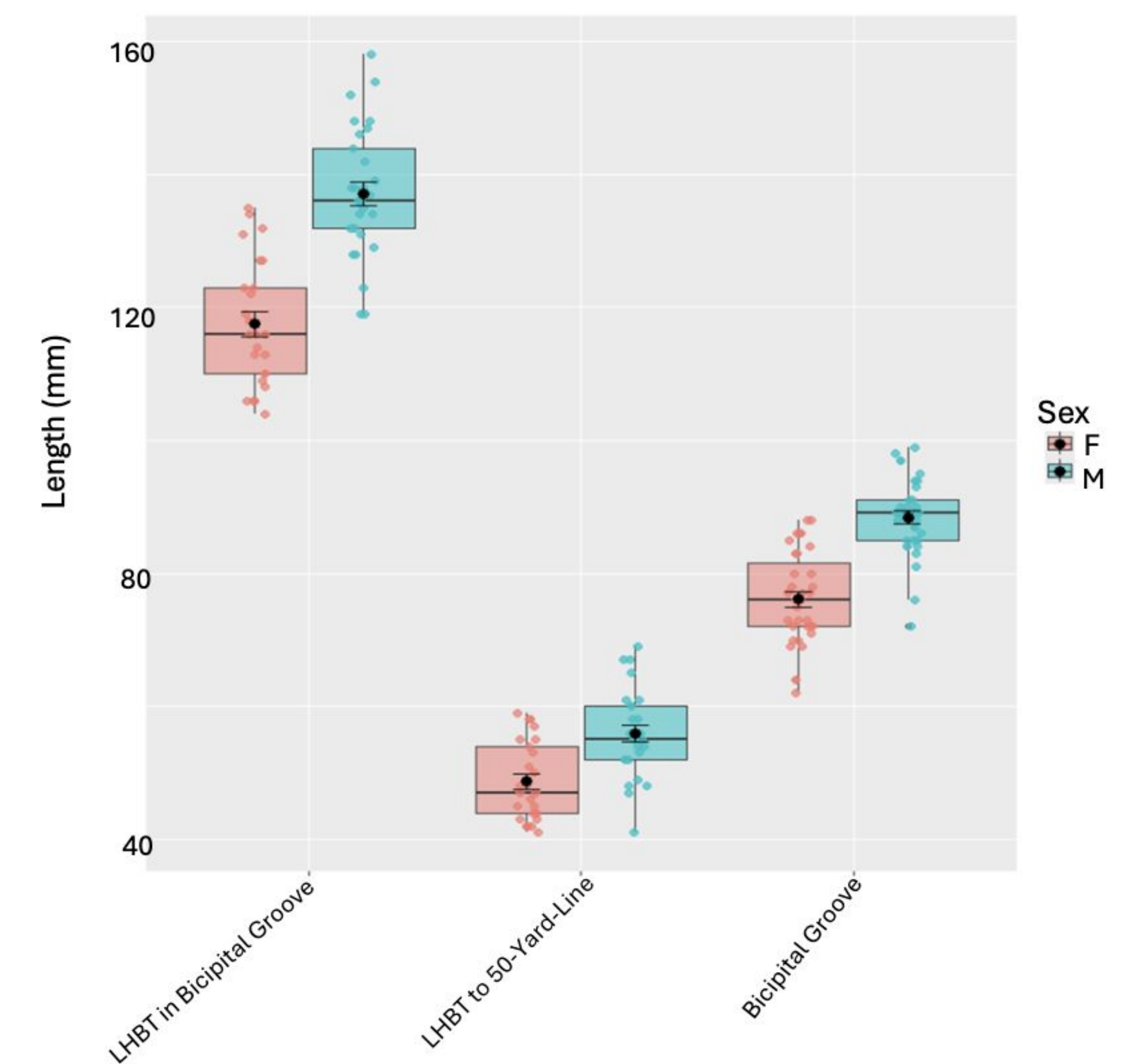


Figure 3. Box and whisker plot comparing the donor average measurements between males and females including: the length from the supraglenoid tubercle to the distal end of the medial lip of the bicipital groove (LHBT in Bicipital Groove), the supraglenoid tubercle to the 50-yard-line of the greater tuberosity of the humerus (LHBT to 50-Yard-Line), and the lateral aspect of the lesser tubercle of the humerus to the distal aspect of the medial lip of the bicipital groove (Bicipital Groove)

Conclusion

These findings may aid in estimating the length of the LHBT required for these procedures. Caution should be exercised when generalizing these results to younger, living individuals, as they were obtained from a limited sample of white donors with an average age of 81.55 +/- 12.90 years.

References & Acknowledgements

References are found in the QR code provided.

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