

Regarding “*Editorial Commentary: Thank You, Thank You, Thank You...for Demonstrating Histologic Evidence of Shoulder Bicipital Tunnel Disease in the Absence of Magnetic Resonance Imaging Findings*”



We read the editorial comment by Taylor¹ with great interest, and we agree that the recent publication from Nuelle et al.² entitled “Radiologic and Histologic Evaluation of the Proximal Bicep Pathology in Patients With Chronic Biceps Tendinopathy Undergoing Open Subpectoral Biceps Tenodesis” furthers the notion that the decision to perform surgery for long head of the biceps tendon (LHBT) pathology should not rely exclusively on imaging or, indeed, on the macroscopic appearance of the tendon intraoperatively. Our clinical experience mirrors the observations made by Nuelle et al. that in patients with chronic long head of the biceps (LHB) tendinopathy who undergo open subpectoral tenodesis, preoperative magnetic resonance imaging and intraoperative assessment often do not show significant abnormalities. However, we do not agree with the statement by Taylor that direct visualization of the bicipital tunnel is not possible. Previously, Bhatia et al.³ reported the ability to perform biceps tenoscopy to visualize the intra-articular and intertubercular regions of the tendon. We have also shown that biceps tenoscopy can be successful in allowing full visualization of the extra-articular LHB.⁴ However, because of our experience, confirmed by Nuelle et al., that the macroscopic appearance of the LHBT does not correlate with symptoms, we do not advocate performing biceps tenoscopy routinely. Instead, we agree that the decision on LHB management should be made preoperatively.

However, preoperative assessment of LHB pathology has its challenges. In 2017, we reported that the sensitivity and specificity data reported for many imaging studies and physical examination tests were invalid because of the reliance on arthroscopy as the gold standard.⁵ We have previously advocated that arthroscopy should no longer be considered the gold standard because several authors, including ourselves, have shown that standard arthroscopic techniques fail to adequately visualize the LHBT. In our systematic review, we reported that the visualization of the overall tendon length in these studies varied between only 34% and 48%. Therefore, a “normal” arthroscopy does not exclude pathology. This is further evidenced by Murthi et al.⁶ and Gilmer et al.,⁷ who have reported that arthroscopic assessment missed LHBT pathology in between 33% and 51% of cases when compared with open assessment. Although the “3-pack”

examination advocated by Taylor et al.⁸ has the advantage of sensitivity and specificity data derived from visualization from the subdeltoid arthroscopic portal, which provides greater visualization of the overall tendon length compared with standard posterior portal viewing, it remains a limitation that the macroscopic appearance of the tendon does not necessarily correlate with patient symptoms.

In closing, we would like to state that we agree with Taylor¹ with respect to the message that the decision to perform tenotomy or tenodesis should be made preoperatively. In our opinion, this should be based on the patients’ symptoms and by holding an appropriate index of suspicion for pathology based on the presence of concomitant pathologies. We do not discredit physical examination tests and imaging modalities because important roles have been defined for each, but we do believe that the limitations of each must be highlighted and clearly understood to avoid the high rate of missed diagnoses of LHBT pathology. We also believe that it is particularly important to emphasize that a normal arthroscopy, even with advanced arthroscopic techniques such as biceps tenoscopy, does not exclude important symptomatic pathology because macroscopic changes are not always present.

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**Author Reply to
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We appreciate the interest and comments from Saithna and Jordan regarding our recent study¹ and the corresponding editorial comments by Taylor.² We would like to thank them for documenting further studies that also add to our understanding and management approach in patients with chronic long head of the biceps tendon pathology.

Regarding the ability to fully visualize the extra-articular tendon arthroscopically, multiple studies have been published recently.³⁻¹⁰ Whereas Bhatia et al.³ and Saithna et al.⁴ have reported techniques to evaluate the tendon arthroscopically, there have been other studies documenting the limitations of diagnostic arthroscopy.⁵⁻⁸ Sheean et al.⁹ showed improved visualization of the bicipital groove (zone 1) with the aid of a 70° arthroscope, but zone 2 and zone 3 (subpectoral region) remained poorly visualized. Therefore, there may remain more distal "hidden" lesions⁵ that go unrecognized with routine arthroscopy with either a 30° or 70° arthroscope.

We believe our recent study provides data that support our clinical thought, which is that there may often be pathology present further distal than the groove itself (past zone 1 and into zone 2). In addition, as Saithna and Jordan stated in their letter and as supported by our study results, even if you can perform a thorough intraoperative evaluation of the tendon, macroscopic changes in the long head of the biceps tendon do not always correlate with preoperative symptoms or imaging. In conclusion, I think we all agree that a thorough preoperative evaluation, inclusive of the history, appropriate physical examination maneuvers,¹⁰ and diagnostic imaging to evaluate concomitant pathologies, should all be considered, but the decision to perform a tenotomy or tenodesis should be made preoperatively to avoid potentially false-negative diagnostic arthroscopic findings.

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