Complications of Proximal Biceps Tenotomy and Tenodesis

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KEYWORDS

• Biceps tenotomy • Biceps tenodesis • Complication

KEY POINTS

- Tenotomy of the LHBT tendon is a safe and quick procedure but can result in cosmetic deformity and cramping or soreness in the biceps muscle.
- Tenodesis of the LHBT provides a new, distal level of fixation for the tenotomized tendon and results in lower risk of cosmetic deformity or cramping in the biceps muscle.
- Tenodesis of the LHBT has an overall low complication rate but complications can be severe and include neurologic injuries, proximal humerus fracture, reflex sympathetic dystrophy, and infection.

INTRODUCTION

The long head of the biceps tendon (LHBT) has a unique anatomy, but with a less understood functional role in glenohumeral joint stability.[1] The proximal part of the LHBT is relatively fixed at its origin on the supraglenoid tubercle and the superior labrum. After a brief intra-articular course where it is mobile, the tendon makes a sharp turn into the bicipital groove. Within the bicipital groove, the tendon is again relatively anchored. This relative fixation of the proximal part of the LHBT at two sites in the setting of extensive mobility of the glenohumeral joint predisposes the LHBT to high stresses. The LHBT can be affected by inflammation, trauma, impingement, instability (typically associated with subscapularis tears), intrinsic degeneration, and fibrosis in the rotator interval.[2,3]

The functional significance of the LHBT remains a topic of debate, but the LHBT is a recognized source of anterior shoulder pain.[3] Pathologic involvement of the LHBT is

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usually seen in association with rotator cuff tears, shoulder arthritis, shoulder trauma, and labral pathology, which makes it challenging to determine the contribution or role of the LHBT in shoulder pain. The clinical tests for the LHBT pathology are neither sensitive nor specific.[4]

Tenotomy and tenodesis of the LHBT are two surgical treatment options for addressing the LHBT pathology.[5–10] Tenotomy of the LHBT relieves pain by preventing traction insult to the inflamed, torn, or degenerated biceps tendon. Proponents of the biceps tenotomy believe that it is a simple and safe procedure that consistently relieves pain and allows quicker rehabilitation compared with biceps tenodesis.[11,12] In contrast, tenodesis eliminates proximal tendon angulation, provides a new fixation anchor for the tenotomized tendon in the proximal humerus, and thus maintains the length-tension relationship of the LHBT musculotendinous unit.[13,14] However, the tenodesis site has to be protected and requires an initial period of immobilization. Biceps tenotomy and tenodesis are associated with specific limitations and complications, which can affect the clinical outcome and influence patient satisfaction postoperatively.

COMPLICATIONS OF BICEPS TENOTOMY

Multiple studies have reported a high satisfaction rate after biceps tenotomy.[5,11,12,15,16] Cosmetic deformity of the arm, cramping or soreness in the biceps muscle, and strength deficits in elbow flexion and supination are the three most commonly reported adverse events associated with the biceps tenotomy.[5,11,12,16] Tenotomizing the LHBT results in variable degrees of distal migration of the biceps tendon, which can result in cosmetic deformity including the "Popeye" sign (**Fig. 1**). The severity of cosmetic deformity after biceps tenotomy varies and patient perception of the deformity is also variable. Elderly patients are less affected by the cosmetic outcome compared with younger patients.[11,12] Cramping, soreness, or fatigue sensation in the biceps muscle can also occur after biceps tenotomy and is probably related to loss of proximal anchorage of the LHBT. However, not every biceps tenotomy is associated with a Popeye sign or biceps cramping and prevalence of these complications is variable in the reported literature.[5,11,12,15,16] Biceps tenotomy can result in perception of weakness of elbow strength. Objective strength measurement studies have demonstrated loss of elbow flexion and supination strength in the operative arm compared with the contralateral arm or nonoperative control arms.[17,18] However, the weakness in elbow strength after biceps tenotomy is more of a concern in the

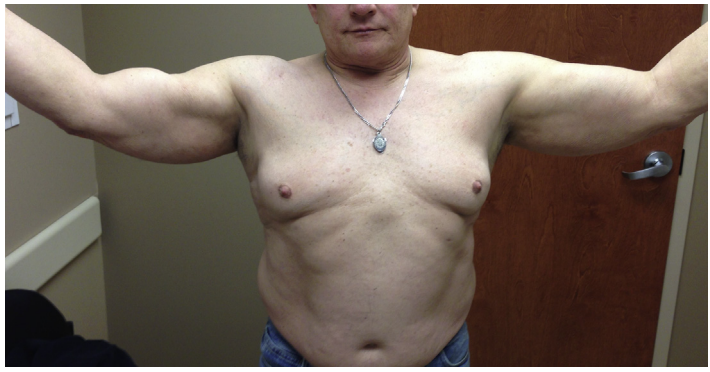

Fig. 1. Posttenotomy Popeye deformity in the arm.