

Surgical Treatment of Long Head Biceps Pathology: Analyzing Trends in the United States from 2010 to 2019

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INTRODUCTION: The long head of the biceps tendon (LHBT) is a common cause of anterior shoulder pain. Symptomatic LHBT pathology is commonly encountered in the setting of a rotator cuff tear. Surgical management options include a tenotomy or tenodesis, but no gold standard exists. The purpose of this study was to determine the trends in the incidence of tenotomy and tenodesis for symptomatic LHBT as isolated procedures and in the setting of rotator cuff repair (RCR).

METHODS: The MarketScan database was queried from 2010 to 2019 by using Current Procedural Terminology (CPT) codes to identify patients that underwent biceps tenotomy and tenodesis (both open and arthroscopic) in the United States (U.S.). Patients that underwent total shoulder arthroplasty (TSA) were excluded. Additionally, patients that underwent RCR were excluded if they received their RCR on a different date than their tenodesis or tenotomy. Demographic information was collected for all patients. IBM MarketScan discharge weights were used to determine national estimates of procedure volumes with a 95% confidence interval. Population estimates from the U.S. Census Bureau were then used to estimate the annual incidence of these procedures. Further subgroup analysis included procedure volumes stratified by gender, age, and geographic region. All statistical analysis was completed using SAS and SPSS.

RESULTS SECTION: We identified 149,488 isolated open biceps tenodeses, 111,540 isolated arthroscopic biceps tenodeses, and 23,013 isolated biceps tenotomies between 2010-2019. With concomitant RCR, we identified 209,951 open biceps tenodeses, 299,917 arthroscopic biceps tenodeses, and 30,704 biceps tenotomies over the same time period. Open tenodesis remains the most common procedure in the U.S. for isolated LHBT management, with the incidence increasing by 180% from 2010 to 2019. The incidence of isolated arthroscopic tenodesis also grew by over 100%, whereas tenotomy only increased by 28%. Conversely, in the setting of RCR, arthroscopic tenodesis is most common and its incidence grew by 138%. Open tenodesis is still widely used in the setting of RCR and its incidence grew by 126%, whereas tenotomy decreased by 46%. Of note from the subgroup analyses, we found that all age cohorts experienced significant increases in the volume and incidence of open and arthroscopic tenodesis in the setting of RCR and significant decreases in volume and incidence for biceps tenotomy concomitant to RCR, even in the age >65 cohort.

DISCUSSION: Overall, the volumes of procedures aimed to ameliorate LHBT pathology increased from 2010-2019. Open tenodesis is the preferred procedure in the setting of isolated LHBT pathology, but in the setting of RCR this preference shifts to arthroscopic tenodesis. We chose to use national trends to understand current standards of practice. No gold standard exists for management of symptomatic LHBT as an isolated issue or in the setting of RCR. Surgeons will cite less cramping, superior supination strength, and avoidance of a “Popeye” deformity for tenodesis techniques. However, others believe tenotomy to provide quick, reliable, low risk outcomes for patients. Furthermore, tenodesis can be completed open or arthroscopically. Arthroscopic technique can be challenging, but proponents cite decreased infection risk. Finally, there are differences in cost and reimbursement between the various procedures.

SIGNIFICANCE/CLINICAL RELEVANCE: Clinical practice is constantly evolving as new evidence of outcomes and improved surgical techniques are introduced. Therefore, documenting the latest procedural trends may help us better understand standards of practice across the country, fuel research on factors that should influence surgical choice, and ensure postgraduate training is mirroring up-to-date trends in procedures that trainees are likely to encounter in independent practice.

