Zagazig University Medical Journal
www.zumj.journals.ekb.eg
https://doi.org/10.21608/zumj.2025.348441.3763 Volume 31, Issue 3, March. 2025
Manuscript ID ZUMJ-2412-3763
DOI 10.21608/ZUMJ.2025.348441.3763
ORIGINAL ARTICLE

Tenotomy versus Tenodesis: Optimal Treatment for Lesions of the Tendon of Long Head of Biceps in Repairable Rotator Cuff Tears: A Retrospective Comparative Study

Hossam Fathi mahmoud,M.D.*, Mohamed Hassan Abd-Ellatif, MD, Ahmad Hatem Farhan Imam, MD
Orthopedic surgery Department, Faculty of Medicine, Zagazig University, Zagazig, Egypt

***Corresponding Author:**
Hossam Fathi Mahmoud

E-mail:
Hossam.salem33@yahoo.com

Submit Date 04-01-2025
Revise Date 11-01-2025
Accept Date 12-01-2025

ABSTRACT

Background: This retrospective cohort study was done to assess shoulder and elbow functions after rotator cuff tear operations and find the best method to manage accompanying biceps lesions.

Methods: Fifty-four shoulders of 52 with range of age between 28-64years old. Participants in this study were classified into two groups: one received treatment through biceps tendon tenotomy, while the other underwent tenodesis. Regular clinical and radiological assessments were conducted to monitor their progress over Two years' period were included in this study. The study aimed to compare the outcomes and complications experienced by both groups.

Results: There was no noteworthy difference between the two groups concerning function and pain scores. The tenotomy group showed a ominously higher rate of Popeye deformity and the tenodesis group showed prolonged postoperative rehabilitation time.

Conclusion: Shoulder complaints are improved after treating the biceps tendon thru repair of rotator cuff. Tenotomy and tenodesis are reliable methods to treat long biceps tendon lesions. We would recommend tenotomy for patients above 55 years old and inactive patients. Tenodesis is recommended to athletes, patients under 55 years old, and females, who would worry about cosmetic deformity.

Level of evidence: retrospective cohort, level of evidence (IV)

Keywords: Long head of biceps lesions, tenotomy, tenodesis

INTRODUCTION

The long head of the biceps tendon (LHBT) is known add stability of the shoulder both structurally and functionally. However, there is a general agreement that its stabilizing effect on the glenohumeral joint is most significant when the arm is raised and rotated outward.[1]

Rotator cuff tears frequently co-occur with injuries to the long head of the biceps tendon (LHBT)[2]his may be attributed to the fact that these tears can cause increased friction and pressure on the long biceps tendon.[3]

Injuries to the long head of the biceps tendon can involve various issues, including partial tears, subluxations, dislocations, and SLAP (Superior Labrum Anterior to Posterior) lesions, as well as damage to adjacent structures., are often visible during rotator cuff repair procedures. These conditions can cause ongoing pain even after surgery for the rotator cuff, making them a significant consideration for treatment.[4]

Debridement has been utilized to treat lesions of the long head of the biceps tendon (LHBT), but its application is somewhat limited. This treatment is primarily indicated for partial tears that affect less than 25% of the tendon, making its use somewhat narrow and not entirely clear-cut.[5]

Recently, there has been a shift toward using tenotomy or tenodesis as a more common approach for managing ongoing pain after surgery, moving away from previous methods that focused on preserving the long head of the biceps tendon.[6]

During a tenotomy procedure, the origin of the long head of the biceps tendon (LHBT) is detached at the point where it meets the superior labrum. This is typically done using a Vapour cautery or curved scissors.[7]

There are several methods to perform LHBT tenodesis. Typically, the procedure begins with detaching the biceps tendon at its origin and securing the upper end of the released tendon with stitches. After that, the tendon is secured in the bicipital groove, which can be achieved either through an arthroscopic interference tenodesis or by using a suture anchoring technique.[8]

While both tenotomy and tenodesis for LHBT lesions have shown satisfactory clinical outcomes, there is now no agreement on the specific indications for choosing one method over the other. The decision often depends on individual patient factors, such as the extent of the injury, the patient's activity level, age, and preferences regarding postoperative outcomes, including cosmetic considerations and potential for complications, such as cramping or pain associated with tenotomy. As a result, the choice between tenotomy and tenodesis may vary among surgeons and clinical scenarios.[9]

Some authors advocate for tenotomy due to its advantages, such as being quicker, simpler, and more cost-effective, allowing for an earlier return to activity. Additionally, tenotomy may reduce the risk of certain Complications related to biceps tenodesis can encompass a range of issues. These include technical difficulties and problems with the hardware used during the procedure, ongoing shoulder pain, the risk of humeral fractures, neurovascular injuries, and conditions like complex regional pain syndrome. Additionally, there is the possibility of delayed failure of the surgery, as well as other typical surgical risks. These factors contribute to the consideration of tenotomy as a viable option for managing LHBT lesions, especially in specific patient populations or situations where a less invasive approach is preferred. Ultimately, the choice between tenotomy and tenodesis should be tailored to each patient's situation and the surgeon's clinical judgment.[6]

Alternative authors advocate for tenodesis because of its benefits in reducing cosmetic concerns such as the Popeye deformity, along with alleviating muscle cramping, pain, shoulder discomfort, and weakness in the biceps during specific activities. They contend that maintaining the long head of the biceps tendon through tenodesis is associated with a greater load to failure when compared to those undergoing tenotomy. This implies that tenodesis might provide improved functional results regarding strength and stability.[10]

The hypothesis of the this study is the patients with repairable rotator cuff tears with long head of biceps tendon performing tenodesis may lead to better movement, less pain after surgery compared to tenotomy. This achieved without adding extra surgery time or increasing risk of complications

The study aimed to compare the outcomes and complications experienced between tenodesis group and tenotomy group in repairable rotator cuff tears with LHB lesions

METHODS

A retrospective study was conducted at Zagazig University Hospital from January 2020 to May 2024, involving 54 shoulders from 52 patients who underwent arthroscopic rotator cuff repair with two years follow-up. This included 27 shoulders that received tenotomy and 27 shoulders treated with tenodesis of the long head of the biceps tendon, as the injuries were associated with rotator cuff tears and biceps tendon lesions that caused pain and restricted motion, impacting daily activities. The average age of the surgical patients was 46 years, with ages ranging from 28 to 64. In the tenotomy group, the average age was 49 years (ranging from 43 to 64 years), while the tenodesis group had a lower average age of 39 years (ranging from 28 to 50 years). The study included a total of 52 patients, comprising 36 males (69%) and 16 females (31%). Within the tenotomy group, there were 15 males (55.56%) and 12 females (44.44%), while the tenodesis group included 22 males (81.5%) and 5 females (18.5%). The patients underwent a thorough clinical assessment, which included taking a detailed history covering factors such as age, gender, the nature of their injury, any past surgeries, their level of overhead activity, and whether their condition affected one or both shoulders. A physical examination was also conducted, utilizing various tests including the Empty Can test, Drop Arm test, Lift-Off test, and the External Rotation Lag sign, along with evaluations for ligamentous laxity. Before surgery, all patients were examined using X-rays in both anteroposterior and axillary views. Additionally, MRI scans were performed on each patient to evaluate the condition of the rotator cuff [11-12].

Patients were evaluated before surgery and at 3- and 6-months post-operation using two assessment

tools: the Simple Shoulder Test (SST) and the Simple Shoulder Constant Score (SSCS).

Inclusion criteria: During the surgery, various intraoperative findings were noted, including small to large rotator cuff tears. Additionally, there were associated degenerative conditions affecting the long head of the bicep's tendon. These included degenerative tears, tenosynovitis, subluxation at the medial edge of the bicipital groove, and superior labral anterior-to-posterior (SLAP) lesions. These findings were observed in patients aged from 28 to 64 years.

Exclusion criteria: Patients with active infection, patients who are not fit for surgery, radiological signs of severe glenohumeral arthritis, irreparable massive rotator cuff tears, or prior shoulder surgery

Ethics Considerations:

This study was ethically approved by the Institutional Reviewer Board (IRB #951/31) with approval date31-december-2024 in the Faculty of Medicine, Zagazig University Hospital, and patient consent from every case that participated in this research was taken. The study was done according to The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Anesthesia, positioning, and surgical technique for both groups

General anesthesia was used in all cases after the interscalene block. The Patients were positioned in a beach chai **Figure (1)**.

The usual posterior portal was performed 2 cm inferior and 1 – 2 cm medial to the postero-lateral edge of the acromion in all study cases. A 30° 7mm Arthroscope was introduced in the shoulder joint. In all cases, the anterior portal was established using an outside-in technique, positioned just lateral to the coracoid process and entering the joint above the lateral half of the subscapularis tendon. The lateral portal was created slightly posterior and 2 to 3 cm lateral to the anterior edge of the acromion to facilitate subacromial decompression and supraspinatus repair. This placement, more anterior than a typical lateral portal located at the midpoint of the acromion, enhances visibility of the bicipital groove. Both anterior and lateral portals were equipped with a working cannula. The procedure began with standard diagnostic arthroscopy, which involved visualizing the subscapularis and the middle glenohumeral ligament (MGHL). The long biceps tendon was examined, followed by the pulley region and the supraspinatus tendon. To thoroughly assess the biceps tendon, it was gently retracted into the joint with a probe, allowing for a comprehensive evaluation of the segment within the groove. Additionally, the biceps anchor was inspected, and if a SLAP lesion was suspected, the anchor was manipulated using a trocar for further assessment.

Surgical technique for tenotomy

Tenotomy of the biceps tendon was performed either with electro-cautery or curved scissors 0.5-1 cm from the anchor. The biceps tendon is left to fall in the bicipital groove. **(Fig. 2).**

Surgical technique for tenodesis

Suturing of the tendon was performed 1 cm from its origin using Fiberwire suture 1.3mm from Arthrex. After that, a standard tenotomy is performed. A shaver used to smooth any irregularities at the tendon's origin. **(Fig. 3).** The biceps tendon is pulled out from the anterior portal and sutured. **(Fig. 4).**

To improve the visibility of the bicipital groove, the arm is positioned at a flexion angle of 45 degrees. The upper section of the bicipital groove is then prepared with an acromanizer to ensure an appropriate surface for securing the tendon. The long head of the biceps tendon is subsequently fixed utilizing either a CrossFiT Knotless anchor from Conmed or a SwiveLock knotless anchor from Arthrex, ensuring that the arm remains in a neutral position with respect to supination and pronation, and with the elbow flexed at 90°. After securing the tendon, the remaining stump is refined using electro-cautery to promote a clear view and facilitate the surgical procedure. **(Fig. 5).**

Standard rotator cuff repair of the supraspinatus tear is performed in 52 patients using Fiberwire suture from Arthrex in single raw technique. In 6 cases with subscapularis Tear, the subscapularis was sutured from the lateral portal using fiber wire then fixed to the lesser trochanter. A drain was inserted into the subacromial space, and the skin was sutured closed using simple stitches.

Statistical analysis

were conducted using SPSS Version 22. Suitable statistical tests were used. **A p-value of ≤0.05** was considered statistically significant.

RESULTS

A retrospective study was conducted at Zagazig University Hospital from January 2020 to May 2024, involving 54 shoulders from 52 patients who underwent arthroscopic rotator cuff repair with two years follow-up. This included 27 shoulders that received tenotomy and 27 shoulders treated with tenodesis of the long head of the bicep's tendon

92.6% of studied shoulders in the tenotomy group had good post-operative SST results (≥10), and no (0%) shoulder had poor results (≤6). **(Table: 1)**85.2% of studied shoulders in tenodesis group had good post-operative SST results (≥10), and only 1 (3.7%) shoulder had poor results (≤6). **(Table:2)**

There was no notable difference between the two groups when comparing the SST (Simple Shoulder Test) scores both preoperatively and postoperatively. However, within each group, there was a highly significant improvement in SST scores when comparing preoperative and postoperative measurements. This suggests that while the overall outcomes of the two groups are similar, each group's intervention led to significant improvements for its respective patients. **(Table:3)**

25.93% of studied shoulders in the tenotomy group had excellent 3 months post-operative SSCS results (86 to 100 points), 55.56% of shoulders had good results (71to85points), 14.81% had fair results (56-70), and 3.7% shoulder had poor results (<55) whereas 85.19% of studied shoulders in this groups had excellent 6months post-operative SSCS results (86to 100points) 14.81% of shoulders had good results (71 to 85points). Zero % had fair results (56-70points), and (0%) shoulders had poor results (<55**) (Table;4)**

After 3 months 11.11% of studied shoulders in the tenodesis group had excellent SSCS results (86 to 100 points), 7.41% of shoulders had good results (71 to85 points), 70.37% had fair results (56-70) and only 3 (11.11%) shoulders had poor results (<55). After 6 months 74.07% of studied shoulders had excellent SSCS results (86 to 100 points), 22.22% of shoulders had good results (71 to 85 points), 0% had fair results (56-70) and only 1 (3.7%) shoulder had poor results (<55). **(Table: 5)**

There was no notable difference between the two groups regarding SSCS (Subscapularis Clinical Score) both preoperatively and at 6 months postoperatively. However, it was observed that the SSCS was significantly inferior in the tenodesis group at the 3-month mark compared to the tenotomy group. Despite this difference, both groups demonstrated a highly significant improvement in SSCS scores when comparing preoperative and postoperative measurements individually. This indicates that while the tenodesis group lagged behind at the 3-month evaluation, both approaches ultimately yielded significant improvements for patients within their respective groups. **(Table: 6)**

There was no notable difference between the two groups regarding the range of abduction preoperatively, 3 months, and 6 months postoperatively. Range of abduction was found to be significantly lower 6 months postoperatively compared to preoperative status in both groups. **(Table: 7)**

There was a substantial and highly significant difference in pain scores between the tenodesis and tenotomy groups at the 3-month postoperative mark, with the tenodesis group reporting significantly higher pain levels. However, when comparing preoperative scores and 6-month postoperative scores, There was no notable difference between the two groups. Nonetheless, both groups demonstrated a highly significant reduction in pain scores when comparing preoperative and postoperative measurements individually. This suggests that, while the tenodesis group experienced higher pain at 3 months, both surgical interventions ultimately resulted in substantial pain relief over time**. (Table:8)**

There was no notable difference detected between the two groups concerning cramping, elbow function, and re-rupture complications. In contrast, the incidence of Popeye deformity was significantly higher in the tenotomy group compared to the tenodesis group (Table 9). This indicates that while both surgical methods were comparable in several outcomes, the possibility of developing Popeye deformity was notably greater following tenotomy**. (Table: 9).**

Table (1): Description of pre-and post-operative (SST) for the tenotomy group:

		N (27)	%
Pre SST	≤6	23	85.2%
	>6	4	14.8%
	Mean ±SD	4.7 ± 2.1	
	Range	0 - 9	
Post SST	≤6	0	0%
	>6	27	100%

		N (27)	%
	≥10	25	92.6%
	Mean ±SD	11 ± 1.1	
	Range	8 – 12	

Table (2): Description of pre-and post-operative (SST) for the tenodesis group:

		N (27)	%
Pre SST	≤6	25	92.6%
	>6	2	7.4%
	Mean ±SD	4.1 ± 2.3	
	Range	0 – 10	
Post SST	≤6	1	3.7%
	>6	26	96.3%
	≥10	23	85.2%
	Mean ±SD	11 ± 1.4	
	Range	6 – 12	

Figure (1): Beach chair positioning

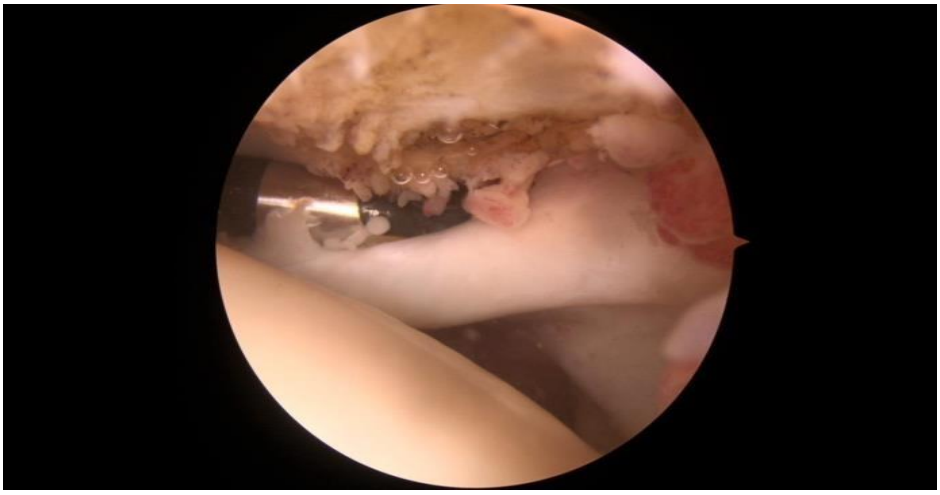

Figure (2): Arthroscopic view showing tenotomy of the biceps tendon (BT) with electro-cautery. Humeral head (HH).

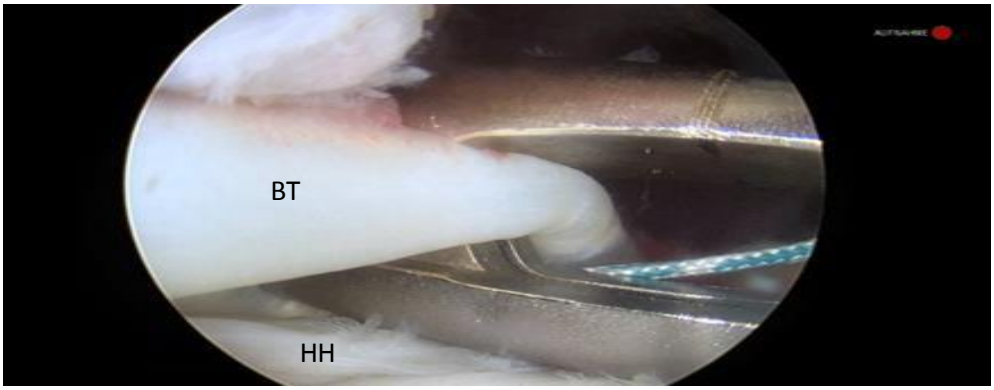

Figure (3): Arthroscopic view showing suturing of the biceps tendon (BT) with electro-cautery. Humeral head (HH).

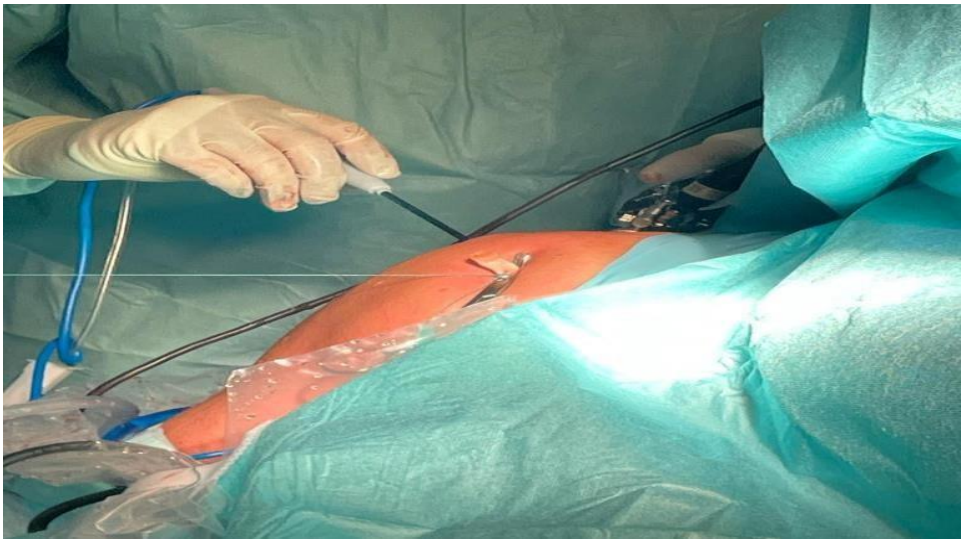

Figure (4): The biceps tendon is pulled out from the anterior portal and sutured

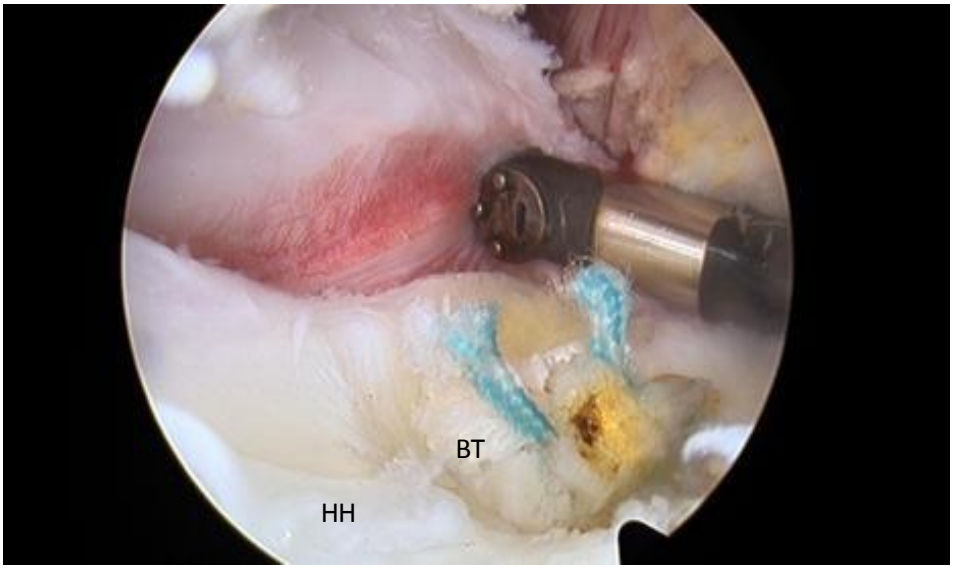

Figure (5): Arthroscopic view showing biceps tendon (BT) after anchoring. Humeral head (HH)

DISCUSSION

The management of long head of the biceps tendon (LHB) lesions in the context of rotator cuff repairs often involves choosing between tenotomy and tenodesis. Both techniques aim to improve shoulder function and alleviate pain, yet they offer different benefits and drawbacks.

According to functional Outcomes, both tenotomy and tenodesis resulted in significant improvements in shoulder function. In our study, the American Shoulder and Elbow Surgeons (ASES) and Western Ontario Rotator Cuff (WORC) scores showed substantial increases after surgery, with no notable differences between the two groups at the 24-month follow-up. This finding aligns with **Zhoe et al[13]** that found both procedures to be equally effective in improving shoulder function over time

The Simple Shoulder Test (SST) outcomes were also similar between groups, with 92.6% of patients in the tenotomy group and 85.2% in the tenodesis group achieving good postoperative results (≥10 points). These results confirm that both techniques effectively restore shoulder function **(Leroux et al**., **[14**].

A significant difference between the two techniques was observed in the incidence of Popeye deformity. This cosmetic issue was more common in the tenotomy group, with a 33.3% occurrence compared to just 7.4% in the tenodesis group. This supports the preference for tenodesis in patients who prioritize cosmetic outcomes, as it better maintains the natural contour of the arm (**Vjada et al., [15**]).

Both procedures were effective in reducing pain and showed no significant differences in terms of cramping, elbow function, or re-rupture rates. These findings are consistent with prior studies that demonstrated similar pain relief and low complication rates for both techniques (**Leroux et al., [14]).**

Tenotomy appeared to facilitate a quicker recovery. At three months, patients in the tenotomy group had higher Constant Shoulder Scores (SSCS) than those in the tenodesis group. However, by six months, both groups showed comparable outcomes, indicating that tenodesis eventually catches up in terms of recovery. This suggests that tenotomy may be advantageous for patients seeking faster initial recovery, while tenodesis provides similar results in the longer term (**Zhoe et al[13]**, **Vjada et al., [15]**).

Checchia et al.[16] issued a study including 15 patients (out of 97 shoulders operated on for rotator cuff tears repair) who endured biceps tenodesis. They found that the technique was highly effective, with 93.4% of these patients reporting satisfactory results.

In a study conducted by **MacDonald, Peter, and colleagues[17]**, 114 participants with an average age of 57.7 years (ages ranging from 34 to 86) were randomly assigned to receive either biceps tenodesis or tenotomy. **Lee, Hyo Jin, et al**[**9**]. conducted a clinical study involving 128 patients who presented with long head biceps tendon (LHBT) lesions and small-to-medium rotator cuff tears. The patients were divided into two groups based on the surgical intervention they received: 56 patients underwent arthroscopic LHBT tenotomy (Group I), while 72 patients underwent LHBT tenodesis combined with rotator cuff repair (Group II).Similar to our findings, their study also showed that both groups experienced improvements in functional scores after treatment, with no significant differences between the two groups at any assessment point. However, the incidence of Popeye deformity was 3 times higher in the tenotomy group (P = .04). They concluded that both tenotomy and tenodesis significantly improve functional outcomes for patients with LHBT lesions and rotator cuff tears. Despite this, the tenotomy group had a notably higher incidence of Popeye deformity. No significant differences were observed in elbow motor power between the two groups.

Koh, Kyoung Hwan[18], and colleagues conducted a study assessing the outcomes for 90 patients over the age of 55 who had rotator cuff tears along with biceps tendon lesions. The study concluded that biceps tenodesis results in a lower incidence of Popeye deformity compared to tenotomy. No other significant clinical differences were found between the two approaches.

The tenodesis technique has good functional outcomes too; however, it is more technically difficult, with prolonged operative time and prolonged post-operative rehabilitation time. Although the tenotomy technique is simpler, and quicker but it had a greater incidence of a cosmetic popeye deformity.

The limitations in this study was small sample sizing, and short follow-up time. Another point of weakness is that the type and severity of the associating rotator cuff lesions may affect the results of both techniques in the treatment of biceps tendon lesions. On the other hand, the advantages of

this research are that it offers valuable insights into the management of LHB lesions during rotator cuff repair by comparing the outcomes of tenotomy and tenodesis. With a two-year follow-up and reliable assessment tools like SST and SSCS, it provides a detailed evaluation of functional recovery, cosmetic outcomes, and complications. The study highlights practical considerations, such as the higher incidence of Popeye deformity with tenotomy and the longer recovery time associated with tenodesis. These findings help surgeons make informed, personalized decisions, address individual patient needs, and improve treatment outcomes in shoulder surgery.

RECOMMENDATIONS

Future research should aim to include larger patient groups and extended follow-up durations to confirm these results and assess the long-term effects of tenotomy and tenodesis. Moreover, investigating factors like age, lifestyle, and cosmetic priorities could enhance the ability to tailor surgical approaches to individual patient needs.

CONCLUSIONS

Shoulder complaints are improved after treating the biceps tendon thru repair of rotator cuff. Tenotomy and tenodesis are reliable methods to treat long biceps tendon lesions. We would recommend tenotomy for patients above 55 years old and inactive patients. Tenodesis is recommended to athletes, patients under 55 years old, and females, who would worry about cosmetic deformity.

Conflict of interest: None
Financial disclosures: None

REFERENCES

1. **Sarmento M**. (**2015**): Long head of biceps: From anatomy to treatment. Acta Reumatol Port 2015(1):26–33.
2. **Wu PT, Jou IM, Yang CC, Lin CJ, Yang CY, Su FC, et al.** (**2014**): The severity of the long head biceps tendinopathy in patients with chronic rotator cuff tears: Macroscopic versus microscopic results. J Shoulder Elb Surg 23(8):1099–106.
3. **Gill TJ, McIrvin E, Mair SD, Hawkins RJ**. (**2001**): Results of biceps tenotomy for treatment of pathology of the long head of the biceps brachii. J Shoulder Elb Surg 10(3):247–9.
4. **Kim J, Nam JH, Kim Y, Kim JS, Kim SH**. (**2020**): Long head of the biceps tendon tenotomy versus subpectoral tenodesis in rotator cuff repair. CiOS Clin Orthop Surg 12(3):371–8.
5. **Ahmad CS, ElAttrache NS**. (**2003**): Arthroscopic biceps tenodesis. Orthop Clin North Am 34(4):499–506.
6. **Aflatooni JO, Meeks BD, Froehle AW, Bonner KF**. (**2020**): Biceps tenotomy versus tenodesis: patient-reported outcomes and satisfaction. J Orthop Surg Res 15(1):56.
7. **BALL C, GALATZ LM, YAMAGUCHI K. (2001):** Tenodesis or Tenotomy of the Biceps Tendon: Why and When to Do It. Tech Shoulder Elb Surg 2(3):140–5**2.**
8. **Lo IKY, Burkhart SS**. (**2004**): Arthroscopic Biceps Tenodesis Using a Bioabsorbable Interference Screw. Arthrosc - J Arthrosc Relat Surg 20(1):85–95.
9. **Lee HJ, Jeong JY, Kim CK, Kim YS**. (**2016**): Surgical treatment of lesions of the long head of the biceps brachii tendon with rotator cuff tear: A prospective randomized clinical trial comparing the clinical results of tenotomy and tenodesis. J Shoulder Elb Surg 25(7):1107–14.
10. **Hsu AR, Ghodadra NS, Provencher CMT, Lewis PB, Bach BR**. (**2011**): Biceps tenotomy versus tenodesis: A review of clinical outcomes and biomechanical results.J Shoulder Elb Surg 20(2):326–32.
11. **Mahmoud HF, Farhan AH, Fahmy FS:** Satisfactory functional results and complication rates after anterior glenoid bone block reconstruction in recurrent shoulder dislocation: a mean 4-year follow-up comparative studyl.Journal of ISAKOS, Volume 7, Issue 4, 47 – 53
12. **Mahmoud HF, Farhan AH, Fahmy FS**. Assessment of Shoulder Function after Internal Fixation of Humeral Diaphyseal Fractures in Young Adults: A Prospective Comparative Study. Adv Orthop. 2021 Nov 1;2021:9471009. doi: 10.1155/2021/9471009
13. **Zhou P, Liu J, Deng X, and Li Z**. Biceps tenotomy versus tenodesis for lesions of the long head of the biceps tendon: A systematic review and meta-analysis of randomized controlled trials. Medicine (Baltimore). 2021 Jan 22;100(3):e23993. doi: 10.1097/MD
14. **Leroux T, Chahal J, Wasserstein D, Verma NN, and Romeo AA**. A Systematic Review and Meta-analysis Comparing Clinical Outcomes After Concurrent Rotator Cuff Repair and Long Head Biceps Tenodesis or Tenotomy. Sports Health. 2015 Jul;7(4):303-7. doi: 10.1177/1941738114539627.

15. **Vajda M, Szakó L, Hegyi P, Erőss B, Görbe A, Molnár Z, and et al**. Tenodesis yields better functional results than tenotomy in long head of the biceps tendon operations-a systematic review and meta-analysis. Int Orthop. 2022 May;46(5):1037-1051. doi: 10.1007/s00264-022-05338-9.
16. **Checchia SL, Doneux PS, Miyazaki AN, Silva LA, Fregoneze M, Ossada A, et al. (2005)**: Biceps tenodesis associated with arthroscopic repair of rotator cuff tears. J Shoulder Elb Surg 14(2):138–44.
17. **MacDonald P, Verhulst F, McRae S, Old J, Stranges G, Dubberley J, et al. (2020)**: Biceps Tenodesis Versus Tenotomy in the Treatment of Lesions of the Long Head of the Biceps Tendon in Patients Undergoing Arthroscopic Shoulder Surgery: A Prospective Double-Blinded Randomized Controlled Trial. Am J Sports Med 48(6):1439–49.
18. **Koh KH, Ahn JH, Kim SM, Yoo JC.(2010):** Treatment of biceps tendon lesions in the setting of rotator cuff tears: Prospective cohort study of tenotomy versus tenodesis. Am J Sports Med 38(8):1584–90.

Table (8): Statistical analysis of pre and post-VAS pain scores between both groups:

	Tenotomy	Tenodesis	Test	p-value*
VAS preoperatively	8.4 ± 1.2 8.5 (6 – 10)	8.6 ± 1.2 9 (6 – 10)	-0.491	0.624 (NS)
VAS postoperatively 3 months	2.6 ± 1.2 2.5 (1 - 6)	4.7 ± 1.8 5 (0 – 8)	-4.721	<0.001 (HS)
VAS postoperatively 6 months	0.6 ± 0.7 0 (0 – 2)	1.1±1.7 1 (0 -9)	-1.318	0.188 (NS)
p-value ^	<0.001 (HS)	<0.001 (HS)		

HS: highly significant difference (p<0.001). NS: non-significant difference (p>0.05).
*: Mann-Whitney test. ^: Friedman test. Data expressed as mean ± SD, median, and IQR.

Table (9): Complications between two Groups:

	Tenotomy	%	Tenodesis	%	P-value
Popeye	9	33.3%	2	7.4%	0.02 (S)
Cramping	6	22.2%	6	22.2%	1.00 (NS)
Elbow function 4/5 **5/5**	2 25	7.4% 92.6%	2 25	7.4% 92.6%	1.00 (NS)
Re-rupture	0	0%	1	3.7%	0.314(NS)

Citation
Mahmoud, H., Abdellatif, M., Imam, A. Tenotomy Versus Tenodesis: Optimal Treatment for Lesions of the Tendon of Long Head of Biceps in Repairable Rotator Cuff Tears:. *Zagazig University Medical Journal*, 2025; (1378-1386): -. doi: 10.21608/zumj.2025.348441.3763