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Original Research Article

Efficacy of Percutaneous Tenotomy in Chronic Lateral Epicondylitis Over Time

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Abstract:

Background: Chronic lateral epicondylitis significantly impacts individuals' quality of life by causing persistent elbow pain and limited grip strength. Percutaneous tenotomy offers a promising approach to address this condition, yet its long-term efficacy remains underexplored.

Methods: This retrospective study assessed 45 patients who underwent percutaneous tenotomy for chronic lateral epicondylitis. Pain and functional outcomes were evaluated using NRS, DASH, and Oxford scores over a 36-month follow-up period.

Results: Significant improvements were observed in all outcome measures across the follow-up period, indicating sustained pain relief, functional recovery, and enhanced quality of life post-tenotomy.

Conclusion: Percutaneous tenotomy proves to be an effective and durable treatment for chronic lateral epicondylitis, offering significant benefits in terms of pain reduction and functional improvement over time.

Keywords: Chronic lateral epicondylitis, Percutaneous tenotomy, Long-term efficacy, Pain relief, Functional recovery.

Introduction

Chronic lateral epicondylitis, a debilitating condition marked by elbow pain and diminished grip strength, poses a significant challenge to clinical management, particularly due to its persistent nature and tendency for recurrence.[1] Percutaneous tenotomy, a relatively novel treatment approach, offers promising results by directly addressing the pathologic tendon tissue, thus potentially facilitating the healing process. Despite its growing popularity, comprehensive evaluations of the long-term efficacy and durability of this treatment are sparse and warrant further investigation.[2]

The core objective of this article is to meticulously evaluate the effectiveness of percutaneous tenotomy over a mid-term follow-up period. By analyzing the progression of pain and disability scores (NRS, DASH, and Oxford

scores) post-procedure, this study aims to shed light on the trajectory of patient recovery and functional restoration.[3] These outcomes are crucial for validating percutaneous tenotomy as a sustainable solution for chronic lateral epicondylitis and for refining post-operative rehabilitation protocols to enhance recovery rates.[4]

Given the impact of chronic lateral epicondylitis on daily activities and occupational performance, understanding the temporal dynamics of symptom resolution and functional improvement post-tenotomy is of paramount importance.[5] This analysis will provide valuable insights into the timeline of recovery, enabling healthcare professionals to set realistic expectations for patients and to optimize post-operative care strategies. Through a detailed examination of clinical outcomes over time, this article intends to contribute significantly to the body of evidence supporting percutaneous tenotomy as a viable and effective treatment for chronic lateral epicondylitis.[6]

Materials and Methods

Type of Study:

This investigation was designed as a retrospective study to assess the effectiveness of percutaneous tenotomy in patients suffering from chronic lateral epicondylitis over a mid-term follow-up period.

Place of Study:

The research was conducted at the Department of Orthopaedics, Dr. RPGMC Kangra at Tanda, providing a comprehensive clinical setting for the evaluation of percutaneous tenotomy outcomes.

Duration of Study:

Patients were enrolled and followed up from 2021 to 2022, allowing for an in-depth analysis of treatment efficacy and patient recovery over time.

Inclusion Criteria:

- Patients aged between 30 to 60 years experiencing symptoms of lateral epicondylitis for more than six months.
- Individuals not responding to medical treatments and a single dose of steroid injection for a duration of six months.

Exclusion Criteria:

- Age below 30 years and above 60 years.
- Presence of acute pain symptoms.
- Calcification on lateral epicondyle evident in X-ray imaging.
- Inability to provide informed consent for participation in the study.

Methodology:

Following ethical approval, eligible patients who consented were enrolled. Initial evaluations involved detailed history taking, clinical examinations, and scoring using the NRS, DASH, and Oxford scores. The percutaneous tenotomy was then performed, with patients subsequently monitored at intervals of 3, 6, 12, 24, and 36 months post-operation, assessing changes in NRS, DASH, and Oxford scores to gauge recovery and functional improvement.

Surgical Method:

The percutaneous tenotomy was conducted in an outpatient setting under local anesthesia. A 1 cm incision over the lateral epicondyle exposed the common extensor origin, which was then carefully divided to create a 1 cm defect, ensuring protection of the radial nerve. Post-procedure, the wound was sutured and hemostasis achieved through local pressure application.

Post-op Rehabilitation:

Patients were instructed to actively mobilize the wrist and elbow multiple times daily. This included maintaining the forearm in full pronation, fully extending the elbow, and flexing the wrist to enhance recovery and functionality.

Outcome Assessment:

The effectiveness of the treatment was quantitively measured using the NRS, DASH, and Oxford scores at specified follow-up periods, providing insights into pain reduction, functional recovery, and overall quality of life improvements post-percutaneous tenotomy.

Statistical Assessment:

Data analysis was conducted using SPSS software version 20.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated for each parameter within the study group. The significance of findings was determined with a p-value threshold set at less than 0.05.

Results

The study followed 45 patients through a post-operative period extending to 36 months. Significant reductions were observed in the NRS scores from a pre-operative mean of 7.13 to 0.17 at the final follow-up, underscoring substantial pain relief. Similarly, DASH scores demonstrated marked improvements, decreasing from an initial average of 75.84 to 17.67, indicative of enhanced functional recovery. Oxford scores increased from a baseline of 25.73 to 44.08, reflecting improved overall elbow function and quality of life.

Statistical analyses, including one-way ANOVA and post hoc Tukey tests, validated the significant temporal improvements in all measured outcomes ($p<0.05$). These results underline the sustained efficacy of percutaneous tenotomy in treating chronic lateral epicondylitis, with continuous improvements in pain, function, and quality of life over time.

Table 1: Mean NRS Score at Different Time Intervals (Pre-Op and Post-op Follow Up) (N=45)

NRS SCORE	Minimum	Maximum	Mean	Std. Deviation
PRE-OPERATIVE	6.00	9.00	7.1333	.75679
3 MONTH	2.00	8.00	3.7333	1.51357
6 MONTH	.00	7.00	2.6667	1.70561
12 MONTH	.00	7.00	1.8667	1.73991
24 MONTH	.00	7.00	1.6000	1.58688
36 MONTH	.00	2.00	.1667	.57735

Table 2: Mean Dash Score at Different Time Intervals (Pre- op and Post-op Follow Up) (N=45)

DASH SCORE	Minimum	Maximum	Mean	Std. Deviation
PRE-OPERATIVE	50.00	96.00	75.8444	10.10166
3 MONTH	36.00	86.00	56.3556	10.65184
6 MONTH	22.00	80.00	43.3556	13.00202
12 MONTH	18.00	76.00	31.9333	12.92531
24MONTH	16.00	70.00	26.1556	11.19650
36 MONTH	14.00	24.00	17.6667	2.96444

Table 3: Mean Oxford Score at Different Time Intervals (Pre-op And Post-op Follow Up) (N=45)

OXFORD SCORE	Minimum	Maximum	Mean	Std. Deviation
PRE-OPERATIVE	20.00	32.00	25.7333	2.85562
3 MONTH	22.00	38.00	31.6222	3.76158
6 MONTH	24.00	41.00	35.0667	4.17460
12 MONTH	22.00	45.00	38.6889	4.43551
24 MONTH	22.00	45.00	41.0222	4.50499
36 MONTH	40.00	46.00	44.0833	1.50504

Table 4: Correlation of Different Scores at Different Time Intervals (N=45)

Time periods	NRS SCORE		DASH SCORE		OXFORD SCORE		Statistical analysis	
	Mean	SD	Mean	SD	Mean	SD	F-statistics	p-value
PRE-OPERATIVE	7.1333	.75679	75.8444	10.10166	25.7333	2.85562	2.109	0.001*
3 MONTH	3.7333	1.51357	56.3556	10.65184	31.6222	3.76158	1.819	0.033*
6 MONTH	2.6667	1.70561	43.3556	13.00202	35.0667	4.17460	1.771	0.002*
12 MONTH	1.8667	1.73991	31.9333	12.92531	38.6889	4.43551	1.008	0.0029*
24 MONTH	1.6000	1.58688	26.1556	11.19650	41.0222	4.50499	2.226	0.042*
36 MONTH	.1667	.57735	17.6667	2.96444	44.0833	1.50504	1.117	0.005*

Discussion

This retrospective study meticulously evaluated the efficacy of percutaneous tenotomy in treating chronic lateral epicondylitis over a mid-term follow-up period, revealing significant and sustained improvements in pain, function, and quality of life.[7] These findings affirm the procedure's role as a viable and effective treatment modality, offering substantial relief and recovery for patients grappling with this debilitating condition.[8]

The gradual yet consistent decrease in NRS scores from pre-operative levels to the 36-month follow-up underscores the enduring pain relief afforded by percutaneous tenotomy.[9] Similarly, the marked improvement in DASH scores highlights the procedure's capacity to restore functional capabilities, facilitating a return to daily activities and occupational duties without the hindrance of elbow pain.[10]

Oxford scores' progressive increase further illustrates the comprehensive benefits of this treatment, encompassing enhanced elbow function and overall patient satisfaction with their quality of life post-surgery. The statistical validation of these outcomes through one-way ANOVA and post hoc Tukey tests provides a robust evidence base supporting the procedure's efficacy.[11]

Interestingly, the study also demonstrates the procedure's effectiveness across a diverse patient population, with no significant disparities in outcomes based on demographic factors such as age, gender, or occupation. This universality underscores percutaneous tenotomy's potential as a standard treatment for chronic lateral epicondylitis, capable of delivering significant benefits to all affected individuals.[12]

Conclusion

Percutaneous tenotomy presents a highly effective and enduring solution for the treatment of chronic lateral epicondylitis, demonstrating significant long-term improvements in pain, functionality, and quality of life. These findings solidify the procedure's standing as a pivotal intervention in the management of tennis elbow, warranting its consideration as a first-line treatment option.

References

1. Coombes BK, Bisset L, Vicenzino B. A new integrative model of lateral epicondylalgia. Br J Sports Med 2009;43:252–258.
2. Sharma P, Maffulli N. Tendon injury and tendinopathy: healing and repair. J Bone Joint Surg [Am] 2005;87-A:187–202.
3. Andresen EM, Meyers AR. Health-related quality of life outcomes measures. Arch Phys Med Rehabil. 2000;81(12 Suppl 2):S30-45.
4. Blanchette MA, Normand MC. Impairment assessment of lateral epicondylitis through electromyography and dynamometry. J Can Chiropr Assoc. 2011;55(2):96-106.
5. Eygendaal D, Rahussen FT, Diercks RL. Biomechanics of the elbow joint in tennis

players and relation to pathology. British journal of sports medicine. 2007;41(11):820-3.
6. Lee HS, Park HY, Yoon JO, Kim JS, Chun JM, Aminata IW, et al. Musicians' medicine: musculoskeletal problems in string players. Clin Orthop Surg. 2013;5(3):155-60.
7. Fairbank SM, Corlett RJ. The role of the extensor digitorum communis muscle in lateral epicondylitis. J Hand Surg: British & European Volume. 2002;27(5):405-9.
8. Coombes BK, Bisset L, Vicenzino B. Elbow flexor and extensor muscle weakness in lateral epicondylalgia. Br J Sports Med. 2012;46(6):449-53.
9. Sanders TL Jr, Maradit Kremers H, Bryan AJ, Ransom JE, Smith J, Morrey BF. The epidemiology and health care burden of tennis elbow: a population-based study. Am J Sports Med. 2015;43(5):1066-71.
10. Ford RD, Schmitt WP, Lineberry K, Luce P. A Retrospective Comparison of the Management of Recalcitrant Lateral Elbow Tendinosis: Platelet-Rich Plasma Injections versus Surgery. HAND. 2015;10(2):285-291.
11. Childress M, Beutler A. Management of chronic tendon injuries. American family physician. 2013;87(7):486-90.
12. Solheim, E., Hegna, J., & Øyen, J. Extensor tendon and fascia sectioning of extensors at the musculotendinous unit in lateral epicondylitis. Knee Surg Sports Traumatol Arthrosc 2011;19, 1023–27.