

Functional Outcome of Open Surgical Release versus Percutaneous Release of Tennis Elbow.

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ABSTRACT

Introduction: Tennis Elbow is a familiar term used to describe myriad of symptoms around the lateral aspect of the elbow. It occurs more frequently in non-athletes than athletes. Tennis elbow has a reported prevalence of 2% in the general population. It is most commonly seen in patients between the ages of 30 and 50 years. Tennis Elbow is considered resistant if it fails to respond to conservative means of treatment for at least six months.

Methods: Patients meeting the criteria were divided randomly into two groups of open surgical release and percutaneous release using random number generator software and respective surgery was done. Functional score, time to return to pre-injury status and patient satisfaction were noted at two months and six months follow up.

Results: Among 62 patients (34 female, 28 male) enrolled, 32 patients (mean age 42.5 years) were allocated to open group and 30 patients (mean age 44.2 years) were allocated to percutaneous group. At two months follow up, 81% of open group had excellent to good score and 19% of cases had fair score as compared to 90% cases of percutaneous group with excellent to good score and 10% with fair score ($p = 0.376$). At six months follow up, both open and percutaneous group had 90% excellent to good results and 10% fair results ($p = 0.596$). The mean time to return to work of open release was 6.03 weeks and percutaneous release was 2.3 weeks ($p = 0.0001$).

Conclusions: Percutaneous release and open surgical release in surgical management of resistant tennis elbow have statistically similar functional outcome. The time to return to work after percutaneous release is significantly earlier.

Keywords: open release; percutaneous release; tennis elbow.

INTRODUCTION

Lateral epicondylitis is usually self-limited or is responsive to non-operative treatment in the majority of patients. Surgical management is indicated in 5% to 10% of cases in which non-operative treatment fails to provide lasting relief of six months to one-year duration¹⁻⁴. There is no merit in delaying the

surgical treatment in the face of persisting symptoms, as post operative pain relief is significantly better in the patients with shorter duration of preoperative symptoms^{5,6}.

This study intends to compare the functional outcome of the open surgical release vs. percutaneous release of resistant tennis elbow in our setup. There are a

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significant number of patients with tennis elbow who visit our outpatient department. Among them, a reasonable number of patients require surgical intervention. This study will be guide for the selection of the better modality of surgical treatment for those patients.

METHODS

The ethical approval was taken from Institutional Review Board NAMS. This was a prospective observational study undertaken at Patan hospital, Bir Hospital and Shree Birendra Hospital, Kathmandu from July 2011 to January 2013, as a part of thesis of master of surgery (MS) in orthopedics and trauma surgery. Patients with tennis elbow with unfavorable response to non-surgical treatment for at least six months duration with the following modalities: rest, cessation of exacerbating activities, NSAIDs, physiotherapy, and local steroid injections, were included in the study. Patients with other musculo-skeletal problems like radial tunnel syndrome, carpal tunnel syndrome, cervical radiculopathy and elbow arthritis, previous operation on lateral side of affected elbow, with known allergy to xylocaine, unwilling to give written consent were excluded from the study. The selected cases were randomized using Random Number Generator, into open group or percutaneous group. Open group underwent open surgical release under local anesthesia using 3 cm long longitudinal incision directly over lateral epicondyle, fascia was incised in line with skin incision, common extensor origin was identified, incised and pathological tissues were removed, no repair of the tissue was done and fascia and skin were closed. Percutaneous group underwent percutaneous release under local anesthesia, wherein a small 1 cm long incision was given over lateral epicondyle, an artery forcep was maneuvered underneath the common extensor origin and it was divided transversely with scalpel, wrist was flexed to complete the procedure so that 1 cm palpable gap was created between the ends of tendons. Both the groups underwent similar post operative protocol: wound inspection on 3rd day, suture removal after two weeks, similar physiotherapy was prescribed for both the groups and functional score was recorded on 3rd and 6th month post operatively.

RESULTS

Out of 65 cases operated, 3 were lost to follow up, hence discarded from study. Remaining 62 patients were enrolled in this study (34 female, 28 male). 32 patients (mean age 42.5 ± 10 years) were allocated to open group and 30 patients (mean age 44.2 ± 8.08 years) were allocated to percutaneous group. The functional score of open and closed techniques are mentioned in following Table 1.

Surgical outcome of open and closed techniques was statistically insignificant ($p = 0.596$). The mean time to return to work was 6.03 weeks for patients operated with open technique and 2.3 weeks for the patients operated percutaneously. The difference was statistically significant ($p = 0.0001$). Two patients in the open surgical release group had superficial infection of the wound which responded to the local wound care and oral antibiotics for one week. There were no other complications like hematoma, limitation of movement after surgery.

Table 1. Functional outcome at 3rd and 6th month.

	Functional score	Open release	Percutaneous release
3 months follow up	excellent	28%	43%
	Good	53%	47%
	fair	19%	10%
	poor	0%	0%
6 months follow up	excellent	59%	70%
	Good	31%	20%
	fair	10%	10%
	poor	0%	0%

DISCUSSION

The functional outcome of both open and percutaneous release in our study at 6 month follow up were similar to most of the series operated with either open release or percutaneous release, with excellent to good results in around 90% of the cases⁷⁻¹⁰. In our study, none of the cases had poor outcome with worsening of the symptoms. Regardless of the technique used for the release of tennis elbow, the outcomes were similar

with most of the patients responding well to treatment. This emphasizes the fact that, it is the surgical trauma, which induces the acute inflammatory reaction and accelerates the healing response of the tendon leading to clinical improvement¹¹.

The open release technique has advantages of better direct visualization of the common extensor origin, better and complete release of the common extensor origin, inspection of the other probable causes of tennis elbow and ability to address them if any found. The percutaneous technique has been very attractive in terms of procedural simplicity, morbidity to the patients, safety and still providing excellent to good results in majority of the cases.

There were total 65 cases operated in our study out of which 3 cases were lost to follow up hence were discarded from the study and the remaining 62 cases were analyzed. Among the 62 cases, female (34) were slightly more than male (28) with male female ratio of 1:1.2. Thirty two cases were allocated to open surgical group and 30 patients were allocated to percutaneous release group. The mean age of the patients in open surgical group was 42.5 ± 10 years, compared to 44.2 ± 8.08 years in percutaneous group ($p > 0.05$).

The functional scoring of the outcome of surgery was done at three and six months follow up period. At three months' follow up 81% of the case in the open group had excellent or good result as compared to 90% of excellent or good results in the percutaneous group. In the early follow up, because of the magnitude of the surgical injury which is more in the open group, the results are comparatively less satisfactory though it was statistically insignificant ($p=0.5$). At six months' follow up, however, there were 90% excellent or good results in both the open and percutaneous group and there were no poor results. In the study by Dunkow PD et al, percutaneous release produced significantly better patient satisfaction, improvement in basic DASH score and improvement in sporting activities, which is unlike our study where the results were similar⁷. The difference might be because the authors have directly compared subjective patient satisfaction between the groups and the surgical technique used for the open release is more radical with bigger incision and exposure unlike the technique used by us with smaller incision.

Grundberg AB et al had operated on 32 patients using the percutaneous technique as we have used and followed up for average period of 26 months and evaluated the outcome using a scoring system similar to ours. They reported 29 out of 32 elbow had excellent or good results (90%) and three cases (10%) had unsatisfactory results⁸. Lakhey S et al used a needle tenotomy technique for the release of tennis elbow on 21 elbows. In his series 76.2% of the cases had excellent or good outcome, 19% had satisfactory outcome and 4% had poor outcome⁹. In another study done by Nazar MA et al on 30 elbows using percutaneous release, 87% of the patients had complete pain relief¹⁰. Baumgard and Schwartz achieved excellent results in 32 of 35 patients they operated using percutaneous technique¹¹. Similarly, Yerger and Turner reported more than 90% excellent or good results in 149 patients they operated¹². However, there is concern about completeness of tendon release by percutaneous technique, which may be attributed to some of the poor results.

The mean time to return to work in our study was six weeks for open group and two weeks for percutaneous group. In the study by Dunkow PD et al the median time off work in the open group was five weeks compared to two weeks in the percutaneous group⁷. Mohamed and Othman reported median time off work after percutaneous release to be three weeks¹³. However, Lakhey S et al using needle tenotomy technique found it to be an average of 60.3 days ranging from one day to three months⁹. In the study of Bankes and Jessop, the average time off work was just over three weeks¹⁴ and after open release done by Dwyer AJ, the time to return to work was three months for the manual laborers² but the authors haven't mentioned the time for non-manual workers.

The time to return to work after percutaneous release in most of the series was 2-3 weeks which is significantly less than the time required after formal surgical release which ranged from five weeks to three months. Our study also confirms that return to work after percutaneous release is significantly earlier compared to formal open technique ($p=0.001$).

CONCLUSIONS

Percutaneous release and open surgical release in surgical management of resistant tennis elbow have similar functional outcome and the time to return to work after percutaneous release is significantly earlier than open surgical release.

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