

## Percutaneous extensor tenotomy for chronic tennis elbow using an 18G needle

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### Abstract

**Introduction:** Tennis elbow is a common orthopaedic problem presenting in office orthopaedics, but its exact patho-aetiology has not been identified to date. It is treated operatively when conservative measures including multiple local steroid injections are not helpful to the patients.

**Material and method:** This was a retrospective study to assess the outcome of tennis elbow patients on whom percutaneous release of the common extensor origin was performed using an 18 gauge hypodermic needle. 17 patients with 21 elbows were included in the study. Data was collected by going through the patients' medical records, and follow-up by questionnaire mailed to the patient's home, to assess the outcome and patient satisfaction with the procedure.

**Results:** 14 of the 21 (66.7%) elbows became completely pain free. The time taken to achieve a completely pain free elbow ranged from 1 day to 3 months (average 60.3 days). Those that did not achieve a pain free elbow had a residual pain of 1.5 to 8.5 on the VAS (average 2.64). 9 elbows (42.9%) had an excellent outcome, 7(33.3%) had good, 4(19%) had satisfactory and 1(4.8%) had poor outcomes.

**Conclusion:** Tennis elbow probably results from degenerative tear of common extensor origin and a percutaneous tenotomy using an 18 gauge hypodermic needle is a simple, safe, patient friendly, effective and easily reproducible method of treating it in those who require surgery and can be done as an office procedure.

**Key words:** Tennis elbow, percutaneous tenotomy, 18g hypodermic needle

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Tennis elbow is a common orthopaedic problem presenting in office orthopaedic OPD, but its exact, patho-aetiology has not been identified to date. Many theories have been suggested to explain the aetiology of this condition: bursitis, periostitis, infection, aseptic necrosis, neuritis of branches of the radial nerve, radiohumeral synovitis, irritation of the collateral ligament, etc. The most widely held theory is that there are macroscopic or microscopic tears in the common extensor origin, as described by Cyriax and others<sup>1</sup>. Greater than 90% of these patients can be successfully treated non-operatively.<sup>1,2</sup> Those that do not respond to conservative treatment are offered surgery. A variety of surgical procedures for treating tennis elbow have been described in the literature<sup>3,4</sup>. One of them is tenotomy of the common extensor origin at the elbow. Many authors<sup>2,5,6,7</sup> have now published their results of releasing the common extensor origin percutaneously. It is a simple operation with minimal morbidity, and good-to-excellent results in most of their patients. We present our own results of percutaneous tenotomy of the common extensor origin using the bevel of an 18 gauge hypodermic needle for the tenotomy instead of a surgical blade.

### Aim and objective

The aim and objective of this study was to determine the efficacy of percutaneous tenotomy using the bevel of an 18g hypodermic needle in those cases of tennis elbow requiring surgery.

### Materials and methods

This was a retrospective study to assess the outcome of tennis elbow patients on whom percutaneous release of the common extensor origin was performed using an 18 gauge hypodermic needle. Data was collected by going through the patients' medical records, and follow-up by questionnaire mailed to the patient's home, to assess the outcome and patient satisfaction with the procedure.

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The diagnosis of tennis elbow was made on the consistent signs of tenderness directly over the lateral epicondyle and pain over the lateral epicondyle on extension of the wrist against resistance. Only patients who did not respond to conservative treatment including local injection of steroids (injection Celestone) were taken up for surgery. 17 patients with 21 elbows were included in the study. The age of the patients ranged from 36 to 64 years (average 48.3 years). The pain duration before the surgery ranged from 2 months to 7 years (average 14.9 months).

0–6 steroid (average 2.9) injections were given locally in the elbow at the painful site before the patient was operated. The patients were followed up for a period ranging from 4 months to 6 years (2.5 years). All the procedures were performed by the senior author (MM) in his office or in the operation theatre when another surgery was being carried out in the same patient under general anaesthesia.

The technique for the procedure, when done in the office, is described below:

1. With the patient seated comfortably on a chair and the forearm resting passively on an examination couch by the side, the elbow was flexed to 90° and the wrist passively flexed to around 60°.
2. After preparing the entire aspect of the lateral elbow with 70% ethanol solution, 10ml of 0.2% Ropivacaine (local anaesthetic) was infiltrated by a 30G needle around the entire common extensor origin.
3. After the local anaesthetic had taken effect, an 18G needle was introduced through the skin, and the bevel of the needle used to divide the extensor origin at the site of maximum tenderness. The radial nerve was protected by staying within the extensor origin.
4. The needle puncture site was sealed by band-aid and a wrist brace was applied.

Post-operatively, 1 gram of Panadol (Paracetamol) tablets was given four times a day for several days, and for a longer period of time, if so required. The wrist brace was discarded after pain resolved, and normal activity of the limb was resumed as quickly as tolerated.

Patient outcome and satisfaction was graded in the following manner:

Excellent: Full return to all activity with no pain.

Good: Full return to all activity with occasional mild pain.

Fair: No pain with normal activities; significant pain with heavy activities

Poor: Little or no relief of pre-operative symptoms.

### Results

9 elbows (42.9%) had an excellent outcome, 7(33.3%) had good, 4(19%) had satisfactory and 1(4.8%) had poor outcomes. 76.2 % of the patients had excellent or good outcome. 14 of the 21 (66.7%) elbows become completely pain free. The time taken to achieve a completely pain free elbow ranged from 1 day to 3 months (average 60.3 days). Those that did not achieve a pain free elbow had a residual pain of 1.5 to 8.5 on the VAS (average 2.64). The pain intensity in the Visual Analogue Scale (VAS) after the effect of the local anaesthesia wore off ranged from 0 to 9 (average 3.2). Post-operative “bothersome” pain ranged from 6 hours to 6 months (average 17.4 days). 1 patient was not sure when the “bothersome” pain left him and another still has “bothersome” pain

### Discussion

Greater than 90% of tennis elbow patients can be successfully treated non-operatively<sup>1,2</sup> which comprise chiefly of rest, activity modification, analgesics, and local steroid injection. Since different aetiologies have been proposed for this condition, a variety of surgical options have been tried<sup>3,4</sup> depending on the aetiology thought to be causing it. These include open/percutaneous division of the common extensor origin, excision of pathological tissue at the ECRB, and repair of the longitudinal defects, denervation of the lateral epicondyle both by isolation of the individual nerve branches (all of the radial nerve), decompression of the radial nerve as it dives deep to the proximal border of the superficial head of the supinator muscle and Arcade of Frohse, and various intra-articular procedures including division of the annular ligament or excision of intra-articular synovial folds.<sup>3</sup> Surgical lengthening of the ECRB tendon has been yet another of the treatment options that has been tried.<sup>4</sup> The results of percutaneous release of the common extensor origin have been very attractive in terms of simplicity, safety, minimal morbidity to the patients, and good-to-excellent outcome in the majority of patients.<sup>2,5,6,7</sup>

Grundberg and Dobson<sup>2</sup> reported 29 of 32 operated cases having excellent or good results, but they have not mentioned any criteria for the same in their

publication. Similarly, Yerger and Turner<sup>6</sup> operated on 149 patients with more than 90% achieving excellent or good results. Once again, they have not mentioned any criteria for the same in their publication. Baumgard and Schwartz<sup>7</sup> achieved excellent results in 32 of 35 patients they operated. Their results were termed Excellent (no pre-operative symptoms), Good (improvement of pre-operative symptoms) or Poor (no improvement of pre-operative symptoms) depending on the outcome symptoms. Since our outcome criteria is different from the one mentioned in literature<sup>7</sup> and in fact, two of the other publications<sup>2, 6</sup> do not have any outcome criteria for excellent or good results at all, the outcome of our study with 76.2% good or excellent results cannot be compared with that of others.

All of these chronic tennis elbow patients had undergone various modalities of non operative treatments including multiple steroid injections for the condition before being undertaken for surgery. It is difficult to believe that they do not affect microscopic changes in some way at the local site. No published studies have examined specimens from patients with acute diagnosis of lateral tennis elbow syndrome<sup>4</sup>. After going through the literature<sup>2,5,6,7</sup>, we tend to agree with those who believe that it results from gradual degenerative tear of the common extensor origin.<sup>1,5,8,9,10,11</sup> We believe that tenotomy of the common extensor tendons and scraping of the epicondylar region using the bevelled end of an 18G needle expedites the healing process of degenerative tendon by converting a chronic inflammatory condition to an acute inflammatory condition which heals rapidly, thereby relieving the pain of tennis elbow which is not amenable to conservative treatment.

### Conclusion

Tennis elbow probably results from degenerative tear of common extensor origin and a percutaneous tenotomy using an 18 gauge hypodermic needle is a simple, safe, patient friendly, effective and easily reproducible method of treating it in those who require surgery and can be done as an office procedure.

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