Operative treatment of Tennis elbow: Garden procedure
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Abstract
The study groups consist of 12 patients (12 elbows) which are clinically diagnosed tennis elbow operation done by Garden procedure. Out of 12 patients 7 were men and 5 were women. Follow up duration 12 months to 36 months (with a mean of 24 months). Patients pain, activity level and hand grip strength were evaluated post operatively. 8 elbow (66.67) had excellent or good result, 3 elbows (25%) had a fair result and 1 (8.33%) had a poor result require revision surgery. Most of patients had immediate relief of pain and did not notice any problem and weakness of hand grip and radial wrist extension. There was a good result for tennis elbow with morbidity by the Garden procedure.

Key note
Tennis elbow-operative treatment -Garden procedure.

Introduction
Patho physiology of the lateral epicondylitis is common orthopaedic condition. Lateral epicondylitis or tennis elbow is diagnosed by the clinical symptoms of epicondylar tenderness, Pain on resisted wrist extension and absence of other pathology.1,2 Runge3 described tennis elbow in the literature in 1873. Tennis elbow-is a misnomer because the condition is commonly seen in non tennis player. It is an affection of middle aged and occurs in productive working years. Symptoms are usually mild but occasionally there is a significant disability.4,5 Conservative treatment is usually successful and frequency of operative intervention is relatively low4,5. Many differing operative techniques has been described. Mainly the lesion is the origin of extensor carpi radialis brevis (ECRB)2,4. Garden2 asserted that the pain of the tennis elbow result from periosteal tear at the origin of the extensor carpi radialis brevis (ECRB). So, his degined simple operation to lengthen the tendon of the ECRB. He reported his experience of 50 patients all had immediate pain relief after this operation with no extensor weakness and a rapid return of full function.

Materials and methods
All patients treated for tennis elbow with the Garden procedure at our hospital and private clinic from July 2001 to August 2004. Total of 12 patients (12 elbows) were selected by the following criteria: Pain on the lateral side of the elbow, tenderness over the ECRB origin and pain in the lateral epicondyle during resisted dorsiflexion of the wrist with the elbow in full extension.

Total of 7 men and 5 women aged from 30 to 55 years (mean 45 years). Out of 12 elbows right elbows (8 dominant sides) and 4 left elbows. All Patients had elbows severe, enough to interfere with the daily activities and worked for more than 10 months. Despite non operative treatment which include analgesia, physiotherapy, elbow support, local steroid injection. Duration of symptoms varied from 10

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months to 30 months (mean 17.5 months)

Occupation of patients (12 Patients) 5 are strenuous manual labour, 4 are moderate labour, 3 are light labour.

Procedure
A small incision was made over the dorsolateral aspect of the forearm just proximal to the muscle bellies of extensor pollicis brevis and abductor pollicis longus. Incision was made to show the flatended tendon of extensor carpi radialis longus, which was retracted to show the ECRB tendon lined adjacent to it. The tendon of the ECRB was divided by a step-cut, and lengthened by approximately 1 cm. The ends were sutured with absorbable stutures. Postoperatively, patients were allowed to use the hand within pain limits, and to return to work and sporting activities as and when they felt able. Patients were reviewed at 2 and 6 weeks postoperatively and discharged when satisfied with the surgical out come. No physiotherapy, exercise regimen or splint was given postoperatively.

Review consisted of pain assessment grip, strength and activity evaluation. The over all out come of treatment was rated using the grading system developed by verhaar et al. the result was considered excellent if the pain at the lateral epicondyle had been relieved completely. The patient was satisfied with the result, there was no subjective loss of grip strength and resisted dorsiflexion of the wrist caused no pain. A good result meant that there was occasional sligth pain at the lateral epicondyle after strenuous activities the patient was satisfied with the result. There was no loss or a slight subjective loss of grip strength and resisted dorsiflexion of the wrist caused on pain. The result was considered fair if there was discomfort at the lateral epicondyle after strenuous activites but it was more tolerable than it had been before the operation, the patient was satisfied or moderately satisfied with the result, there was slight or moderate subjective loss of grip strength and resisted dorsiflexion of the wrist caused slight or moderate pain. A poor rating was given if the pain at the lateral epicondyle had not decreased. The patient was dissatisfied with the result, there was severe subjective loss of grip strength and resisted dorsiflexion of the wrist caused severe pain.

Table -1: Occurrence of pain in elbows undergoing the Garden procedure for lateral epicondylitis (n=12).

<table>
<thead>
<tr>
<th>No. of elbows</th>
<th>Before surgery</th>
<th>After surgery</th>
</tr>
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<tbody>
<tr>
<td>Pain on use</td>
<td>12</td>
<td>3 (on heavy manual work)</td>
</tr>
<tr>
<td></td>
<td>1 (on light work)</td>
<td></td>
</tr>
<tr>
<td>Pain at rest</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Pain at night</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>

Results
The follow up period 12 months to 36 months (mean 24 months). In terms of treatment out come 6 (50%) patients had an excellent, 2 (16.67%) patients had good results, 3 (25%) patients had a fair result who had pain on grip and felt the hand weak,1 (8.33%) patient had a poor result and needed revision surgery.

Complications
One patient had a superficial wound infection, which was treated successfully with a short course of antibiotics.

Discussion
Operative treatment is seldom neccessary for tennis elbow and accordingly we have operated on only 12 patients using the Garden procedure over a period of 3 years. The advantages of this procedure itself the short postoperative period and minimal subsequent disability. These advantages are particularly important for the working person who has to continue to work despite a painful elbow. This study found encouraging results and allow rate of complications after the Garden procedure.
Verhaar et al\textsuperscript{7} also reported that 23\% of their patient group had pain on resisted dorsiflexion of the wrist and 40\% had tenderness over the lateral epicondyle at 5-year follow-up. Most of the patients required 6 to 12 weeks for adequate not necessarily complete recovery. Only 18\% of patients had returned to their original work at 6 weeks postoperatively.

Nirschl and Pettrone\textsuperscript{4} in their series of 82 patients found that the mean period for complete pain relief was 2.6 months (range 8 days-12 months) after surgical treatment of tennis elbow. In our study the patients who had good or excellent results had immediate pain relief (within 2 weeks postoperatively) and could return to work early without any need for immobilisation or physiotherapy.

Treatment outcome in our study appears superior to results reported after complete release of the common extensor tendon\textsuperscript{5,8} after resection of the orbicular ligament\textsuperscript{9} and by Nirschl and Pettrone\textsuperscript{4} following excision and repair of the pathologic lesion in the origin of ECRB. So far the literature has not indicated which operative technique for tennis elbow is superior to others, with most studies demonstrating a success rate of more than 80 percent\textsuperscript{3,5}. Given that all operations appear equally effective, a technique that is associated with low morbidity and a short recovery period should be selected.

**Conclusion**

The garden procedure is a simple procedure, giving good results for patients with chronic tennis elbow with low morbidity and early recovery. Further, this study add support to the view that the underlying lesion in tennis elbow is in the origin of ECRB.

**References**