

## Functional outcome of Conservative vs Steroid injection in Tennis elbow

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### Abstract

Lateral epicondylitis which is also known as tennis elbow is a very painful condition which can restrict the daily activities of a person. It can be treated in various modalities out of which local corticosteroid and physiotherapy with analgesics are the common modes which has shown good results in the past. However there exists a conflict between the functional outcome and the efficiency of these two modalities with no definitive conclusion on which is the better among the two. In this study we compare the functional outcome between the two modalities at a follow up of six weeks and found that local corticosteroid injection has proved to give faster relief from symptoms with early return to work. However patients who were treated with analgesics and physiotherapy also showed significant improvement during the course of treatment. This study will help to decide which among the two modalities have a better result and what the management protocol to be followed is.

**Keywords:** Lateral epicondylitis, Tennis elbow, Conservative, Local corticosteroid.

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### Introduction

Lateral epicondylitis, better known as tennis elbow was first described by Runge in 1873. Commonly seen in activities which involve repeated forearm movements and was described in lawn tennis players over a century ago<sup>(1)</sup>. It is a dynamic condition, i.e. pain on activity involving the affected elbow, however in the severe stages patient also gives history of rest pain. It is commonly seen in old workmen and rarely seen in sportsmen<sup>(2)</sup>. Only 8% of those diagnosed with tennis elbow actually play tennis<sup>(3)</sup>. Tennis elbow can produce a long lasting economic crisis for a patient due to inability to work and hence treatment with symptomatic relief in the shortest possible time is the need of the hour.<sup>(4)</sup>

There has always been a conflict of interest in the management of this condition with few studies showing good results with physiotherapy while few other studies have shown that local steroid injection provides better results. However, for the Orthopaedician this is a challenging situation as a patient presenting with this condition expects complete recovery within a short period of time to carry out their occupation<sup>(6)</sup>.

### Materials and Methods

23 patients aged between 24-52years of age who presented with complaints over the lateral side of the elbow with tenderness over the lateral epicondyle origin of extensor tendons associated with pain on forced dorsiflexion of the wrist and middle finger within 3 months from the

onset were included in the study. Patients who underwent surgery previously on the lateral aspect of the elbow, arthritis, local skin or any neurological conditions involving painful elbow joint were excluded from the study.

None of the patients presented with bilateral tennis elbow in our study. Pain was evaluated using visual analogue scale and patient related tennis elbow score following which they were offered the option of local corticosteroid injection or analgesic for 2-3weeks<sup>(9)</sup> with physiotherapy. Components of physiotherapy used were ultrasound massage and wax bath to the lateral epicondyle.

13 patients opted for the non-invasive treatment and were subjected to anti-inflammatory and analgesics along with electrotherapy (Ultrasound massage and wax bath) for pain management to the affected elbow<sup>(10)</sup>. Physiotherapy was continued for a span of 1 week and analgesics was administered for a period of 2-3 weeks

10 patients preferred local steroid injection therapy and were injected with 40mg of triamcinolone (Kenacort) diluted with 1% lignocaine at the insertion of extensor digitorum brevis under aseptic precautions. The doctor involved in injecting the patient was not part of the pain assessment to avoid result bias.

Patients in both groups were asked to follow-up in the outpatient department at 3 weeks and 6 weeks from the first consultation. Patient related tennis elbow evaluation questionnaire and visual analogue scale scores were recorded at third and sixth weeks. Results were compared using Freidman test and Mann Whitney test.

### Results

Out of the 23 patients, 3 were lost to follow up. None of the patients developed any anaphylactic reaction to the injection or any skin reactions to the various modalities of heat therapy.

Pain parameter showed highly significant difference in the steroid group with maximum improvement seen in the

first 3 weeks (p=0.007). Significant improvement in the functional disability was seen in the first 3 weeks of the steroid group (p=0.025). Visual analogue scale also showed a statistically significant improvement of the patient's perception of pain in the first 3 weeks in the steroid group (p=0.002).

However there was no significant improvement of pain between the 2 groups between the 3<sup>rd</sup> to 6<sup>th</sup> week follow-up in all 3 parameters (p=0.342; p=0.673; p=0.317).

A comparison of the final outcome of the parameters showed highly significant improvement of pain and functional disability within the groups during the course of six weeks on regular follow-ups. The visual analogue scale also showed a significant improvement in the patient perception of pain (p=0.003; p=0.010) in both the groups using Freidman test.

NAME: \_\_\_\_\_ O.P./I.P. No: \_\_\_\_\_  
 AGE: \_\_\_\_\_ ADDRESS: \_\_\_\_\_  
 PHONE NO.: \_\_\_\_\_  
 DIAGNOSIS: \_\_\_\_\_

MODE OF TREATMENT: \_\_\_\_\_

VAS SCORE: \_\_\_\_\_

RANGE OF MOVEMENTS:

|   | ON PRESENTATION | 3 WEEKS | 6 WEEKS |
|---|-----------------|---------|---------|
| GRIPPING                                  |                 |         |         |
| PALPATION                                 |                 |         |         |
| RESISTED WRIST OR MIDDLE FINGER EXTENSION |                 |         |         |
| STRETCHING OF FOREARM MUSCLES             |                 |         |         |

PATIENT RATED TENNIS ELBOW EVALUATION SCORE

|                             | ON PRESENTATION | 3 WEEKS | 6 WEEKS |
|-----------------------------|-----------------|---------|---------|
| THE LEAST PAIN AT ITS WORST |                 |         |         |

FUNCTIONAL DISABILITY:

|                                    | ON PRESENTATION | 3 WEEKS | 6 WEEKS |
|------------------------------------|-----------------|---------|---------|
| TURN A DOOR KNOB                   |                 |         |         |
| CARRY A BAG OF GROCERIES           |                 |         |         |
| LIFT A CUP FULL OF COFFEE TO MOUTH |                 |         |         |
| OPEN A JAR                         |                 |         |         |
| PULL YOUR PANTS                    |                 |         |         |
| WRING OUT A WET TOWEL              |                 |         |         |

USUAL ACTIVITIES:

|                                 | ON PRESENTATION | 3 WEEKS | 6 WEEKS |
|---------------------------------|-----------------|---------|---------|
| PERSONAL ACTIVITIES             |                 |         |         |
| HOUSEHOLD WORK                  |                 |         |         |
| WORK                            |                 |         |         |
| RECREATIONAL OR SPORTING EVENTS |                 |         |         |



**Conclusion**

From this study we would like to conclude that both the groups have shown significant improvement in their outcome but early improvement of symptoms is seen in the steroid injection group. The maximum improvement is seen in the first 3 weeks following which the improvement is on par with the conservative group. All the patients who participated in the study have resumed their occupation by 6 weeks, the earliest being 1 week by a patient in the steroid group. Few patients in the conservative group have complained about the inconvenience of 12 sessions of physiotherapy.

However patients who did not give adequate rest to the forearm in the conservative group showed a slow improvement of symptoms unlike those in the steroid group wherein the results showed uniformity.

| Parameter             |               | Group                   | Paired Differences |                | Mannwhitney test Z value | p    |
|-----------------------|---------------|-------------------------|--------------------|----------------|--------------------------|------|
|                       |               |                         | Mean               | Std. Deviation |                          |      |
| PAIN                  | 0 week-3 week | Steroid Injection       | 5.727              | 2.054          | 2.72                     | .007 |
|                       |               | Conservative management | 2.667              | 2.179          |                          |      |
|                       | 0 week-6 week | Steroid Injection       | 9.364              | 2.908          | 2.76                     | .006 |
|                       |               | Conservative management | 5.444              | 1.667          |                          |      |
|                       | 3 week-6 week | Steroid Injection       | 3.636              | 1.748          | .95                      | .342 |
|                       |               | Conservative management | 2.778              | 1.394          |                          |      |
| Functional disability | 0 week-3 week | Steroid Injection       | 4.182              | 2.183          | 2.24                     | .025 |
|                       |               | Conservative management | 2.000              | .500           |                          |      |
|                       | 0 week-6 week | Steroid Injection       | 7.818              | 2.639          | 1.98                     | .041 |
|                       |               | Conservative management | 5.333              | 2.500          |                          |      |
|                       | 3 week-6 week | Steroid Injection       | 3.636              | 1.963          | .42                      | .673 |
|                       |               | Conservative            | 3.333              | 2.291          |                          |      |

|                       |               | management              |       |       |      |      |
|-----------------------|---------------|-------------------------|-------|-------|------|------|
| Visual analogue scale | 0 week-3 week | Steroid Injection       | 2.091 | .539  | 3.08 | .002 |
|                       |               | Conservative management | .889  | .782  |      | HS   |
|                       | 0 week-6 week | Steroid Injection       | 2.818 | .982  | 1.67 | .095 |
|                       |               | Conservative management | 2.000 | 1.000 |      | NS   |
|                       | 3 week-6 week | Steroid Injection       | .727  | .786  | 1.00 | .317 |
|                       |               | Conservative management | 1.111 | 1.167 |      | NS   |

Parameter: PAIN

| Group                   |        | N  | Minimum | Maximum | Mean  | Std. Deviation | Median | Freidman test value | P    | 0 <sup>th</sup> – 3 <sup>rd</sup> | 0 <sup>th</sup> – 6 <sup>th</sup> | 3 <sup>rd</sup> – 6 <sup>th</sup> |
|-------------------------|--------|----|---------|---------|-------|----------------|--------|---------------------|------|-----------------------------------|-----------------------------------|-----------------------------------|
| Steroid Injection       | 0 week | 11 | 28      | 42      | 36.27 | 4.819          | 38.00  | 22.000              | .000 | .003                              | .003                              | .003                              |
|                         | 3 week | 11 | 24      | 40      | 30.55 | 5.484          | 29.00  |                     | HS   | HS                                | HS                                | HS                                |
|                         | 6 week | 11 | 20      | 37      | 26.91 | 5.486          | 24.00  |                     |      |                                   |                                   |                                   |
| Conservative Management | 0 week | 9  | 28      | 41      | 35.22 | 4.522          | 35.00  | 18.000              | .000 | .007                              | .007                              | .007                              |
|                         | 3 week | 9  | 24      | 39      | 32.56 | 5.126          | 34.00  |                     | HS   | HS                                | HS                                | HS                                |
|                         | 6 week | 9  | 23      | 35      | 29.78 | 5.286          | 31.00  |                     |      |                                   |                                   |                                   |

Parameter: Functional disability

| Group                   |        | N  | Minimum | Maximum | Mean  | Std. Deviation | Median | Freidman test value | P    | 0 <sup>th</sup> – 3 <sup>rd</sup> | 0 <sup>th</sup> – 6 <sup>th</sup> | 3 <sup>rd</sup> – 6 <sup>th</sup> |
|-------------------------|--------|----|---------|---------|-------|----------------|--------|---------------------|------|-----------------------------------|-----------------------------------|-----------------------------------|
| Steroid Injection       | 0 week | 11 | 20      | 40      | 33.55 | 5.681          | 34.00  | 21.535              | .000 | .003                              | .003                              | .005                              |
|                         | 3 week | 11 | 18      | 36      | 29.36 | 5.353          | 30.00  |                     | HS   | HS                                | HS                                | HS                                |
|                         | 6 week | 11 | 15      | 34      | 25.73 | 5.274          | 26.00  |                     |      |                                   |                                   |                                   |
| Conservative Management | 0 week | 9  | 25      | 41      | 34.00 | 5.196          | 36.00  | 18.000              | .000 | .005                              | .008                              | .007                              |
|                         | 3 week | 9  | 23      | 39      | 32.00 | 5.050          | 34.00  |                     | HS   | HS                                | HS                                | HS                                |
|                         | 6 week | 9  | 20      | 34      | 28.67 | 4.359          | 29.00  |                     |      |                                   |                                   |                                   |

Parameter: Visual analogue scale

| Group                   |        | N  | Minimum | Maximum | Mean | Std. Deviation | Median | Freidman test value | P    | 0 <sup>th</sup> – 3 <sup>rd</sup> | 0 <sup>th</sup> – 6 <sup>th</sup> | 3 <sup>rd</sup> – 6 <sup>th</sup> |
|-------------------------|--------|----|---------|---------|------|----------------|--------|---------------------|------|-----------------------------------|-----------------------------------|-----------------------------------|
| Steroid Injection       | 0 week | 11 | 4       | 8       | 6.36 | 1.286          | 6.00   | 20.462              | .000 | .002                              | .003                              | .023                              |
|                         | 3 week | 11 | 2       | 6       | 4.27 | 1.272          | 4.00   |                     | HS   | HS                                | HS                                | HS                                |
|                         | 6 week | 11 | 2       | 6       | 3.55 | 1.368          | 3.00   |                     |      |                                   |                                   |                                   |
| Conservative Management | 0 week | 9  | 4       | 8       | 5.78 | 1.394          | 6.00   | 12.200              | .002 | .023                              | .010                              | .028                              |
|                         | 3 week | 9  | 2       | 7       | 4.89 | 1.537          | 5.00   |                     | HS   | Sig                               | Sig                               | Sig                               |
|                         | 6 week | 9  | 1       | 5       | 3.78 | 1.302          | 4.00   |                     |      |                                   |                                   |                                   |

## Discussion

Results in our study showed that after three and six weeks of treatment with conservative therapy and local corticosteroid injection therapy, patients had significant improvement in the range of movements and activity related pain. As per previous literature a study conducted in 1969 by Hughes and Currey showed 95% improvement of symptoms<sup>(5)</sup>. In our study the functional disability improved significantly in the corticosteroid group between presentation to 3 weeks follow up. However no significant improvement was seen in between the first and the second follow ups which concludes that functional disability improves early in the corticosteroid group.

After a successful treatment with corticosteroid or analgesic therapy all patients followed up with recurrence of pain. However significant improvement was seen with respect to the initial consultation. Most of the short term studies have shown good to excellent results<sup>(1)</sup>. Corticosteroid injections and analgesics reduce the intensity of pain but do not address the cause. Multiple studies have shown that tennis elbow is a self-limiting condition which subsides within 8-12 months<sup>(8)</sup>. However in our study, the patients were able to carry out their daily activities with difficulty except one patient whose activities of daily living was grossly restricted. However the severity of symptoms after 6 weeks was reduced and patients returned to their occupation. Hence the economic consequences can be evaded with early treatment of corticosteroid administration. It takes 2 visits for corticosteroid injection administration but around 12 visits to the physiotherapist for electrotherapy along with regular medications for a period of 3 weeks. Since our study was a short term study, the long term effects and side effects were not followed up. Previous literature has proved that at 6 weeks follow up, corticosteroid performed better than wait and watch or analgesics with physiotherapy group. But on follow up of patients for 1 year, corticosteroid had a very poor outcome and subjects had greater chance of recurrence compared to analgesics with physiotherapy. The number of physiotherapy session is also an open discussion as previous studies have advised eight to 12 sessions<sup>(7)</sup>. We followed the higher limit for our patients and compliance to physiotherapy was 100%.

From our study we have noticed that prompt treatment of tennis elbow has better prognosis and delay has a bad prognosis. Corticosteroid injection in the early phases of inflammation i.e. within 1 month of onset gave good results. It was noticed that pain was inversely proportional to the prognosis and greater the pain signifies acute phase which shows good results with corticosteroid injection.

Cryotherapy and rest to the elbow gave significant relief of pain and helped to reduce swelling and thereby activity level of the affected hand improved.

The goal of treatment for tennis elbow involves relief of pain, cessation of bleeding, control of inflammation, promotion of healing, rehabilitation and prevention of recurrence. Recurrent cases can be managed in the same way as the primary case but most of them end up with

surgery. Recurrences are commonly seen in patients who have not undergone a full course of rehabilitation<sup>(7)</sup>.

After six weeks, the satisfactory pain relief in the corticosteroid group was higher than the physiotherapy group and if the patient manages to follow the preventive protocol, he or she can carry out regular sporting activities.

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