Treatment of Lateral Epicondylitis

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Lateral epicondylitis associated with cumulative trauma as seen in the clinical setting has usually involved long-term care with fair results. This paper describes the structured treatment program for lateral epicondylitis developed at the Michigan Hand Rehabilitation Center in Warren, Michigan. Results of the program, as reflected in five cases, have been a decrease in treatment time and a high incidence of return to work with no symptoms or reduced symptoms.

Management of lateral epicondylitis can be difficult. The overuse that results from repetitive motion, along with other aspects of upper extremity trauma in the work setting (e.g., vibration), adds to an already trying situation when dealing with this diagnosis. Currently, there is a strong focus on reducing the number of these cases through ergonomics and an increasing emphasis on returning these patients to their jobs. In view of this, a specific treatment plan was devised to meet these needs.

A team consisting of four registered occupational therapists, one certified occupational therapy assistant, and two hand surgeons was organized at Michigan Hand Rehabilitation Center, Inc., to develop a treatment protocol for lateral epicondylitis. The protocol was based on knowledge gained from 17 years of experience and success with this diagnosis. The lateral epicondylitis protocol (and its application with 5 patients) is reported below.

Treatment Regimen

The three major components of the lateral epicondylitis protocol are (a) formal evaluation, (b) instruction in a home program and provision of protective equipment, and (c) clinic exercises and modalities.

A standard upper extremity evaluation is used. The focus is on assessing the patient’s strength, edema, pain, range of motion (active and passive), and function. In addition, a history is taken with attention to the type of work performed (and the hours involved), previous care or therapy for the extremity, and the patient’s hobbies. Following the evaluation, in the first therapy session, the patient is given a detailed explanation of the diagnosis using an anatomical skeletal arm. Protection techniques—a list of do’s and don’ts—are reviewed (see Figure 1). The postures and movements are demonstrated and reviewed with the patient. A handout (Figure 1) is provided for the patient to refer to when away from the clinic.

The patient is also given a home exercise program (see Figure 2) and instructed to perform each exercise slowly three times a day (10 repetitions per task). Exercises are performed with a household item weighing approximately 1 lb. Weight is increased as the therapy program progresses and the patient’s tolerance improves. The items used as a weight can be placed in a bucket if they become too large to grip. The patient exercises with the arm extended, but if an increase in pain is experienced during exercise, he or she is instructed to exercise with the arm in 5° to 15° of elbow flexion.

Equipment is issued depending on the patient’s complaints of pain and the therapist’s professional judgment with respect to prevention of further injury to the elbow. We usually issue a pneumatic cuff (tennis elbow band), an elastic cock-up wrist splint, a bicycle glove, and...
Figure 1. Protection techniques, which are taught in the first therapy session. **Note.** Copyright 1990 by the Michigan Hand Rehabilitation Center, Inc. Reprinted by permission.

Figure 2. Exercises to be done at home. **Note.** Copyright 1990 by the Michigan Hand Rehabilitation Center, Inc. Reprinted by permission.

Figure 3. Exercises performed in the clinic. **Note.** Copyright 1990 by the Michigan Hand Rehabilitation Center, Inc. Reprinted by permission.

An elastic tube stocking. The bicycle glove has a padded palm to protect the median nerve. This nerve is often affected or injured in repetitive jobs and often results in carpal tunnel syndrome. The use of the bicycle glove served as a protective measure for these patients. The equipment choices have been made based on previous reports of comfort and ease of use.

At the completion of this first session, cold packs are placed on the lateral epicondyle or over the radial tunnel for approximately 10 min. In addition, the patient is instructed to use cold packs at home three times a day for 10 min, or as necessary if symptoms or pain increase.

The clinic exercises (see Figure 3) and modalities described below are initiated in the second session. The patient's treatment progresses as he or she is able to perform tasks without pain or edema.

During the clinical treatment session the patient is required to record the exercises and repetitions, pain level or positive results, weight (if used), and specific areas of pain or posture of the arm when pain is experienced. This is recorded on a functional activity log provided by the therapist. Pain is monitored on a scale of 0 to 10, with 0 indicating no pain and 10 indicating excruciating pain requiring hospitalization. (The term hospitalization is used in an attempt to establish a familiar limit for severity of a patient’s pain level.)

Modalities are applied following each treatment session. They are used as a precursor or follow-up to the treatment activities in an occupational therapy session, with the goal of helping the patient manage pain as necessary to enhance performance of purposeful activities. A selection from the following basic menu may be part of the patient's therapy plan, depending on which modality will lessen the patient's symptoms. Patients' complaints are usually of pain around the lateral epicondyle, pain with end-range supination, or cramping or tightness of the extensor carpi radialis.
## Table 1
Case Presentation Summary

<table>
<thead>
<tr>
<th>Patient</th>
<th>Type of Work</th>
<th>Type of Injury</th>
<th>Tools Used</th>
<th>Previous Treatment</th>
<th>Treatment at MHRC</th>
<th>Return to Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Paper Cutter</td>
<td>Arm jerked</td>
<td>Cutting knife</td>
<td>Hot packs, Ice, Ultrasound</td>
<td>Friction massage, Home program, Ice massage, Department exercises, Elastic tube stocking</td>
<td>Yes, without restrictions</td>
</tr>
<tr>
<td>B</td>
<td>Electrical Line Worker</td>
<td>Cumulative</td>
<td>Wire cutters, Wrenches</td>
<td>None</td>
<td>Friction massage, Home program, Ergonomic tool modifications, Ice massage, Tennis elbow band, Department exercises, Bicycle glove, Wrist brace</td>
<td>Yes, without restrictions</td>
</tr>
<tr>
<td>C</td>
<td>Machine Operator</td>
<td>Cumulative</td>
<td>Utility knives, Glue gun</td>
<td>None</td>
<td>Friction massage, Home program, Department exercises, Ultrasound, Ice massage, Tennis elbow band</td>
<td>Yes, without restrictions</td>
</tr>
<tr>
<td>D</td>
<td>Molding Machine Operator</td>
<td>Cumulative</td>
<td>Multiple</td>
<td>Ice</td>
<td>Friction massage, Home program, Ice massage, Department exercises, Tennis elbow band</td>
<td>Yes, without restrictions</td>
</tr>
<tr>
<td>E</td>
<td>Injection Molder</td>
<td>Cumulative</td>
<td>Swivel knife, Air gun</td>
<td>Ice, Cock-up wrist splint, Whirlpool</td>
<td>Friction massage, Home program, Ice massage, Department exercises, Ultrasound, TENS, Tennis elbow band, Bicycle glove, Wrist brace</td>
<td>Yes, without restrictions</td>
</tr>
</tbody>
</table>

Note: MHRC = Michigan Hand Rehabilitation Center. TENS = Transcutaneous electrical nerve stimulation.

1. Ultrasound is applied over the lateral epicondyle or radial tunnel for approximately 6 to 10 min at 1.5 watts, pulsed. Hydrocortisone is the lubricant used when permitted by a physician.
2. Transcutaneous electrical nerve stimulation (TENS) is used to reduce pain. The electrodes are usually placed over the radial tunnel and at the dorsal thenar–index web space. Both of these locations are trigger points for decreasing pain in the upper extremity. We have found that the best symptom control is achieved with Medical Designs' Spectrum MAXSD.¹ The unit is set in the Strength Duration modulation mode with a rate of 110 and a width of 75 for approximately 15 to 30 min while the patient is using the cold packs at the end of the therapy session. A TENS unit is issued for home use to those patients who are having difficulty managing their pain in the home setting.
3. A large-head vibrator set at a high frequency is also used to reduce pain. The patient applies it for approximately 10 min over and parallel to the brachialis radialis muscle belly, using a slow stroking motion.
4. Ice massage can be used to decrease pain and edema. The area of the radial tunnel or lateral epicondyle is massaged for approximately 10 min.
5. Point-friction massage is performed at the lateral epicondyle or radial tunnel in attempts to decrease pain and reduce venous congestion at the extensor carpi radialis muscle (a common problem in this syndrome). Massage is performed for 5 to 10 min.

Each patient's therapy program is different and may or may not include all of the above modalities. In addition, frequency and duration of treatment may vary. However, each individual therapy plan consistently includes protection techniques, exercise, ice massage, vibrator use, and a home exercise program.

### Case Review
Five subjects, all factory employees, were treated with this regimen over a period of approximately 6 months. In 4 patients, lateral epicondylitis had resulted from cumula-
tive trauma; in 1 patient it was due to acute trauma. Our treatment notes indicated that all had received friction massage, ice massage, and home program instructions with an explanation of protection techniques. In addition, all 5 patients had participated in the clinic exercise program at Michigan Hand Rehabilitation Center; 3 patients had received ultrasound with phonophoresis; 1 patient had used TENS in the clinic; and 1 patient had received ergonomic tool modifications (enlarged hand grips).

With regard to protective devices, 1 of the patients wore an elastic tube stocking; 2 wore elastic cock-up wrist splints; 4 wore tennis elbow bands; and 2 wore bicycle gloves as a protective measure against carpal tunnel syndrome, because their jobs were repetitive (see Table 1). The period of time from the initial onset of symptoms to the time of discharge varied from 3 to 20 months (see Figure 4). The longest term of treatment was 3 months and the shortest was 3 weeks. The earlier therapy was initiated, the shorter the treatment period. Despite this relationship, the maximum length of treatment did not exceed 3 months for any of the subjects.

All 5 patients returned to their jobs without restrictions and have remained asymptomatic. They are all still working as of this date, over 2 years since treatment.

Conclusion

The success of this treatment regimen for lateral epicondylitis is based on (a) the patient’s understanding and knowledge of the diagnosis and symptoms and (b) the patient’s ability to implement proper pain management techniques and upper extremity posturing and protection measures. Throughout treatment we reinforce the concept that the patient is ultimately responsible for his or her “wellness.” The Michigan Hand Rehabilitation Center team has found that following this program and its protocols has resulted in consistent success.

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