A NOVEL METHOD FOR ASSESSING ELBOW PAIN RESULTING FROM EPICONDYLITIS

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ABSTRACT

Objective: To describe a novel orthopedic test (Polk's test) which can assist the clinician in differentiating between medial and lateral epicondylitis, 2 of the most common causes of elbow pain. This test has not been previously described in the literature.

Clinical Features: The testing procedure described in this paper is easy to learn, simple to perform and may provide the clinician with a quick and effective method of differentiating between lateral and medial epicondylitis. The test also helps to elucidate normal activities of daily living that the patient may unknowingly be performing on a repetitive basis that are hindering recovery. The results of this simple test allow the clinician to make immediate lifestyle recommendations to the patient that should improve and hasten the response to subsequent treatment. It may be used in conjunction with other orthopedic testing procedures, as it correlates well with other clinical tests for assessing epicondylitis.

Conclusion: The use of Polk's Test may help the clinician to diagnostically differentiate between lateral and medial epicondylitis, as well as supply information relative to choosing proper instructions for the patient to follow as part of their treatment program. Further research, performed in an academic setting, should prove helpful in more thoroughly evaluating the merits of this test. In the meantime, clinical experience over the years suggests that the practicing physician should find a great deal of clinical utility in utilizing this simple, yet effective, diagnostic procedure. (J Chiropr Med 2002;1:117–121)

KEY INDEXING TERMS: Orthopedic Tests; Elbow; Lateral Epicondylitis; Medial Epicondylitis

INTRODUCTION

With the current popularity of racket and throwing sports, the number of individuals seeking medical care for elbow pain and dysfunction has increased rapidly in recent years (1,2). Chiropractic physicians frequently encounter this condition in practice and are faced with properly assessing and diagnosing the cause of elbow pain on a regular basis. Accurate diagnosis of elbow pain requires a thorough understanding of the anatomic and pathophysiological processes involved (3). One of the most common causes for elbow pain encountered in a clinical setting is that of epicondylitis (4). Epicondylitis is a condition that is peculiar to the elbow and develops along the medial and lateral epicondyles (5). It presents itself in 2 distinctly different forms, lateral epicondylitis (LE) and medial epicondylitis (ME), depending upon which condyle is involved (6). LE is 3 times as frequent as ME (7) and is often referred to clinically as "tennis elbow," as it is very common among tennis players, affecting up to 50% of all participants at some point in their lives (4). ME, on the other hand, is frequently referred to as "golfer's elbow" or "pitcher's elbow," as it is common among those type of athletes (3). Although both conditions affect athletes because of the strain that certain sports impose upon the elbow joint, 90 to 95% of all cases do not involve sportsmen, but are usually related to repetitive motion injury occurring at work or even from normal activities of daily living (8,9). Epicondylitis of the elbow may stem from repeated microtrauma to the elbow joint with eventual pathologic alteration of the musculotendinous attachments at the lateral or medial epicondyle, the origin of the common wrist extensor or flexor muscles (3). The concomitant inflammatory processes involved can give rise to pain and joint dysfunction.

As epicondylitis is essentially a musculotendinous condition, diagnosis is essentially clinical (10). Radiographs are typically negative unless the chronicity of the condition has allowed periostitis to develop on the affected condyle (11). While diagnosis of the condition is fairly straightforward (12), clinical differentiation between LE and ME is usually corroborated via various orthopedic testing procedures including Cozen's test, golfer's elbow test, Mill's test and Kaplan's test (13). Cozen's test and golfer's elbow test are the 2 most commonly used orthopedic maneuvers to differentiate between LE and ME (2,6). Both involve placing the patient's arm and wrist in specific positions and then performing various resisted flexion maneuvers, with the patient resisting the examiner's efforts to force the wrist and/or wrist and elbow in specific directions (13).

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This paper presents a novel, yet simple, orthopedic test (which I will call Polk's Test) that can be used in conjunction with the above tests, or perhaps as an alternative to them, in assessing the elbow joint for the likelihood of LE or ME. It has the advantage of being easy for both the patient and the examiner to perform. The results of the test not only offer an idea toward establishing a working diagnosis for the examiner, but also aid in the recommendation of certain lifting techniques that will assist in hastening the patients recovery. Another advantage is that the test, itself, actually mimics normal activities of daily living that the patient encounters on a regular basis. As such, the results of the test have an immediate, and often profound, impact on the patients' cognitive awareness of the nature of their condition. A search of appropriate journals and textbooks reveals that this test has not been previously described in the literature.

DISCUSSION

Description of the Test

With the patient seated and the elbow flexed, the patient is instructed to lift an object of approximately 5 lb (2.5 kg) in 2 different ways. For the purposes of the test, most any suitable object will prove adequate. An appropriately weighted sand bag, hand weight, heavy purse or thick book will usually suffice for the purpose at hand. The test itself is performed in performed in 2 separate phases:

In phase 1, the patient grasps the object with the palm facing the floor (pronation of the forearm) and is instructed to attempt to lift it up (Figure 1). Pain produced in the elbow (typically in the region of the lateral epicondyle) upon this maneuver is suggestive of LE. In absence of LE however, the patient usually performs this maneuver quite easily and without pain.

Phase 2 involves the seated patient, with flexed elbow, grasping the object with the palm up (supination of the forearm) and attempting to lift the object (Figure 2). Elbow pain (usually in the region of the medial condyle) produced with this maneuver is suggestive of ME. In absence of ME, the patient performs this maneuver quite comfortably.

To summarize, elbow pain produced by lifting the object with the palm down is suggestive of lateral epicondylitis (LE), while pain produced in the elbow while lifting the object with the palm up suggests medial epicondylitis (ME).

Existing Procedures

Historically, 2 orthopedic tests in particular have been described as being helpful in differentiating between LE

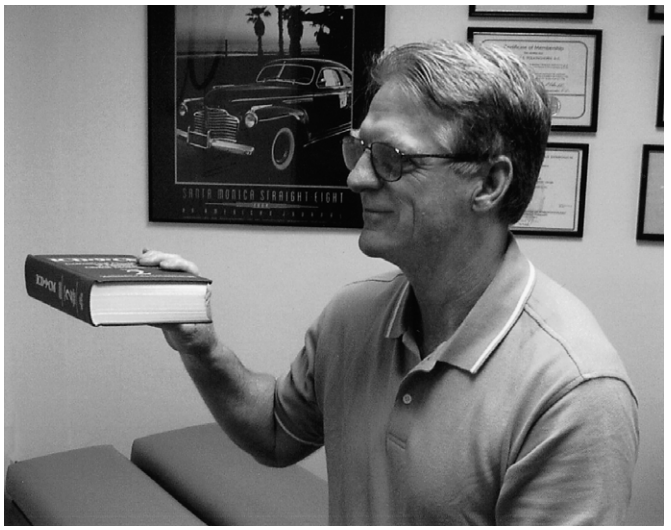

Figure 1: Lateral Epicondylitis: Pain produced at the elbow upon lifting the object with the palm down (forearm pronated) is suggestive of lateral epicondylitis. The pain is due to the strain imposed at the attachment site of the extensor/supinator muscle group. The object being lifted produces resistance to attempted dorsiflexion of the wrist, which is mediated by the extensor/supinators, and is painful to perform for patients with lateral epicondylitis.

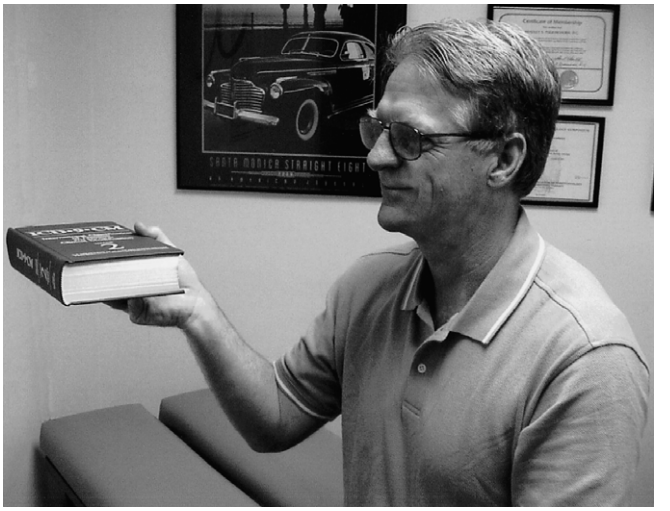

Figure 2: Medial Epicondylitis: Pain produced at the elbow upon lifting the object with the palm up (forearm supinated) is suggestive of medial epicondylitis. The pain results from strain imposed at the attachment site of the flexor/pronator muscle group. The object being lifted produces resistance to elbow-wrist flexion, which is mediated by the flexor/pronators, and is painful to perform for the patient with medial epicondylitis.

and ME: Cozen's test and golfer's elbow test (2,6). The pain associated with lateral epicondylitis is usually aggravated by resisted wrist dorsiflexion (Cozen's test), while the pain associated with medial epicondylitis is accentuated upon resisted elbow-wrist flexion (golfer's elbow test) (13). Cozen's test is accomplished by having the patient flex his or her elbow, turn the palm down (pronation of the forearm) make a fist and then bend the hand backward (dorsiflexion) while the examiner, grasping the patient's wrist and elbow, attempts to straighten the wrist (forced flexion, ie, resisted dorsiflexion) (Figure 3). Pain reproduced at the lateral epicondyle is suggestive of LE (13). The golfer's elbow test involves the seated patient flexing his or her elbow and turning the hand palm up (forearm supination). The examiner then grasps the patient's wrist and elbow and attempts to straighten out the elbow (forced extension) against the patient's resistance (resisted elbow-wrist flexion) (Figure 4). If this maneuver elicits pain at the medial condyle, ME is suspected (13).

Proposed Procedure

Polk's Test is a simple method of inducing the same type of mechanical strain to the affected condyle that the other, more tedious to perform, orthopedic tests do. This simple procedure will cause aggravation of the affected condyle by virtue of the musculotendinous strain that each phase of the test evokes. Its mechanism of action is very straightforward. When the hand grasps an object, tension is placed on both the flexors and extensors of the wrist. The motion of lifting the object, aggravates the tension on the primary affected muscle group with resulting mechanical strain at the inflamed musculotendinous attachment site. The location of epicondylitic pain is most commonly exhibited at the origin of the wrist extensor/supinators from the lateral epicondyle of the humerus and less commonly at the origin of the flexor/pronator group from the medial epicondyle (5,10).

Figure 3: Cozen's test for lateral epicondylitis: resisted dorsiflexion of the wrist causing pain at the elbow is suggestive of lateral epicondylitis. Arrow indicates direction of resistance provided by the examiner. (Adapted and reproduced with permission from Evans, R.C. Illustrated essentials in orthopedic physical assessment. St. Louis: Mosby, 1994. p 147.

Figure 4: Golfer's elbow test for medial epicondylitis: resisted elbow-wrist flexion causing pain at the elbow is suggestive of medial epicondylitis. Arrow indicates direction of resistance provided by the examiner. (Adapted and reproduced with permission from Evans, R.C. Illustrated essentials in orthopedic physical assessment. St. Louis: Mosby, 1994. p 151.

Specific Mechanisms of Action

The patient with LE will exhibit no problem lifting the object with the elbow flexed and the forearm supinated (palm up). Conversely, when lifting the object with the forearm pronated (palm down) pain will be felt in the lateral epicondyle as a result of the strain imposed upon the attachment site of the extensor/supinator muscles which originate in the lateral epicondyle, supracondylar line of the humerus and a portion of the proximal ulna. The wrist extensor/supinators are comprised of the carpi radialis brevis, carpi radialis longus, brachioradialis and the supinator. These muscles are forced into action during the resisted wrist dorsiflexion initiated in Cozen's test or upon lifting the object with the forearm pronated (palm down), as in phase one of Polk's test. Musculotendinous irritation at the lateral epicondylar attachment site will express pain and weakness upon physical

strain to the affected area. Thus, a positive finding in phase one of Polk's test is suggestive of lateral epicondylitis. Clinicians will find that phase one of Polk's test correlates very favorably with Cozen's test (resisted wrist dorsiflexion). It will elicit elbow pain in those same patients who exhibit a positive response to Cozen's test and can therefore be utilized in conjunction with Cozen's to corroborate the clinical diagnosis of LE.

A patient suffering from ME will have no problem lifting the object with the elbow flexed and the forearm pronated (palm down). However, when lifting the object with the forearm supinated (palm up), pain will be felt in the medial epicondyle as a result of the strain imposed upon the attachment site of the flexor/pronator muscles that originate at the medial epicondyles of the humerus and ulna. The flexor/pronator group of the wrist include the flexor carpi radialis, flexor carpi ulnaris, flexor digitorum superficialis, palmaris longus, pronator quadratus and pronator teres. These muscles are the primary movers during the performance of the golfer's elbow test (resisted elbow-wrist flexion) or upon lifting the object with the forearm supinated (palm up), as in phase two of Polk's test. Musculotendinous irritation at the medial epicondylar attachment site will result in pain, often with radiation down the forearm, when the ME patient attempts this maneuver. Thus, a positive finding in this phase of the test is suggestive of ME. The examiner will find that phase two of Polk's test correlates very well with the findings from the golfer's elbow test (resisted elbow-wrist flexion). It will elicit elbow pain in those same patients who exhibit a positive response to the golfer's elbow test and can therefore be used in conjunction with that test to corroborate the clinical diagnosis of LE.

In summary, grasping and lifting the object with the palm down (pronated forearm) mimics the resisted wrist dorsiflexion as is initiated in Cozen's test for LE, with the object acting as the agent resisting the attempted range of motion. Conversely, grasping and lifting the object with the palm up (supinated forearm) mimics the resisted wrist-elbow flexion utilized in the golfer's elbow test for ME, with the object, once again, providing the agent of resistance (Table 1).

Clinical Applications

Any practicing clinician can readily appreciate the utility of an examination procedure that can be easily remembered: "First lift with the palm facing down and then lift with the palm facing up." Likewise, the test can be described to, and subsequently performed by, the patient equally as simply. Regarding interpretation of the results, a simple word association key (palm Up = Ulnar, i.e. medial, involvement) allows the examiner to easily remember how interpret the results of the test, no matter how infrequently he or she may be called upon to perform it. The benefits of Polk's test are that it is easy to learn, quick and uncomplicated to perform and very simple to remember. For today's busy clinician, these benefits can add up to a big advantage.

Perhaps the main benefit of this test however, is that it is often easier for both the doctor and the patient to perform than some of the previously described resisted flexion tests. Additionally, the results and implications of the grasping and lifting maneuvers utilized in Polk's test are readily understood by the patient and can be used to emphasize to the patient the hazards of lifting objects improperly, relative to their specific condition. It is often remarkable to see the look of surprise on the patients face as he or she realizes, usually for the first time, how 1 method of lifting will cause elbow pain, while the other will not. This newfound understanding on the part of the patient can go a long way toward hastening recovery, as they consciously avoid improper methods of lifting.

An important part of managing epicondylitis is teaching the patient lifting techniques that will protect the elbow. Lifting objects with the palm down or up, dependent upon the condition, will help to avoid continual strain to the joint and hasten recovery. The general consensus among authorities in the field is that the avoidance of aggravating activities on the patient's part will help to maximize response to treatment and is often paramount in maintaining stabilization afterwards in this very commonly encountered clinical condition (4,6,9,10,14). Polk's test helps to definitively identify

TABLE 1
EPICONDYLITIS DIFFERENTIATION—PROCEDURAL SUMMARY

PROCEDURE	MECHANICAL ACTION	SUGGESTIVE DIAGNOSIS
LIFTING OBJECT W/PALM DOWN (FOREARM PRONATION)	RESISTED WRIST DORSIFLEXION/EXTENSOR-SUPINATOR MUSCLE GROUP	PAIN = LATERAL EPICONDYLITIS
LIFTING OBJECT W/PALM UP (FOREARM SUPINATION)	RESISTED ELBOW-WRIST FLEXION/FLEXOR-PRONATOR MUSCLE GROUP	PAIN = MEDIAL EPICONDYLITIS

the method of lifting that is best to be avoided by the patient.

When assessing elbow pain of suspected epicondylar origin, no completely reliable or pathognomonic sign exists (1). Epicondylitis can be hard to differentiate clinically from radiohumeral bursitis (13). However, the latter is a relatively rare occurrence because the radiohumeral bursa, itself, is a relatively rare occurrence, found only approximately 5% of the time during dissection studies (15). Nerve entrapment syndromes may mimic the symptoms of epicondylitis as well; however, sensory deficits and motor weakness are usually apparent as differentiating symptoms (16). Epicondylitis represents, perhaps, the most common cause of elbow pain (4). The diagnosis of epicondylitis is essentially clinical in nature and is dependant primarily upon the patients history, clinical presentation and physical examination findings (1,3,6). While there are limitations to the diagnostic efficiency of any given orthopedic test and thorough clinical assessment involving radiographs, MRI and/or blood chemistry might be appropriate in any given case, the use of Polk's Test appears to offer a quick, reliable method of assessing elbow pain of epicondylar origin in a clinical setting.

CONCLUSION

Polk's test is an easy to learn, easy to perform and simple to interpret test that can help the clinician differentiate between LE and ME. It aids the clinician in establishing a working diagnosis and also serves as an educational tool for the patient in helping them to better understand their condition and avoid the specific activities that aggravate it. As such, it helps the clinician in establishing specific recommendations for the patient to follow that should hasten the recovery. Polk's test can be used in conjunction with Cozen's and/or the golfer's elbow tests for confirmatory diagnostic information in assessing patients suffering from epicondylitis, as its findings correlate very well with those 2 common tests.

Further research, performed in an organized academic setting, should prove helpful in more thoroughly evaluating the merits of this test. In the meantime, my clinical experience over the years suggests that the practicing physician should find a great deal of clinical utility in utilizing this simple, yet effective, diagnostic procedure.

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