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Epicondylitis: An Ergonomics Issue that Begins With Pain – A Commentary

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Commentary

Epicondylitis is a common cause of pain in the elbow and arm [1]. Generally, epicondylitis is observed in middle-aged patients with no predication for either gender. This disease state was first described in 1873 by Runge as a chronic degeneration condition associated with the wrist/arm. There are two basic forms of Epicondylitis, lateral and medial, when evaluated from an anatomical prospective. Medial epicondylitis (ME) (Golfer's elbow) is the least common form observed and is a result of movement occurring in the wrist through "twisting" toward the palm. This can occur due to golf swings along with activities like chopping wood, repetitive hand movements that employ a tool or use of a chain saw [1]. ME is associated with the superficialis flexor digitorum and medial epicondyle. The more common form of injury involves the lateral epicondylitis (LE) which has an incidence rate of around 1 to 3 percent in the general population [1]. Higher incidence rates have been observed in occupational populations. LE is seen more frequently in workers that undertake forceful and repetitive activities that usually include awkward postures associated with movement of the elbow [2]. Recently, Descatha et al. [3] reported an association of LE with tasks that are strenuous in nature and support previous findings of activities that are repetitive more than 2 hours a day for hand tools greater than one kilogram. LE is associated with the extensor carpi radialis and lateral epicondyle. Both of these forms have been suggested to result in irritation and inflammation of the associated tendons (e.g. LE - Extensor Carpi Radialis Brevis) and muscles/structures [1,2]. However, actual pathophysiological mechanisms have not been fully elucidated.

It appears the risk factors for epicondylitis are chronic repetitive motion involving the wrist/arm/forearm especially when using "heavier" items while performing twisting and rotating movements. [4]. Thus, forceful exertion has been suggested to be a common risk factor identified in a large number of studies and may exhibit a dose-response relationship [2,4]. It has been suggested that other risk factors such as age, poor social support, smoking and obesity exist for epicondylitis [5,6]. Effects of degeneration as a result of age appears to be an important factor for epicondylitis [7]. The presence of type II diabetes has also been indicated as a risk factor for both ME and LE [5], which may suggest a role of metabolic diseases as a predisposing or contributor factor. Regardless of the type of treatment undertaken, about 80 to 90% of those inflected will spontaneously recover within a one to two year period [1].

This disease is categorized as a degenerative process arising from overuse of muscle/tendon structures [8]. It appears from histological analysis that force on the tendon results in cross-linkages and deposition of collagen resulting in reduced movement and pain. This is usually a result of excess stress on the tendon creating micro-tears. Tendon damage can result in structural damage ultimately causing fiber regeneration with the inclusion of necrosis. Although this disease is traditionally identified as an inflammatory process, microscopically there appears to be limited inflammatory components with most considering this to be actually a tendinosis [8-10]. This has led to the concept of epicondylitis being a glutamate-related neurological process, which ultimately results in secondary factors resulting in chronic issues [10]. There does appear to be histological and neurological changes associated with this disease and its pathophysiology is likely directly related to the severity, pain, and micro-tears with these dictating potential patient outcome which ultimately result in the formation of treatment modalities [11]. Fundamentally, this disease is closely related to a degenerative condition likely involving neurochemical components associated with damage to collagen [12].

The most common presentation by patients is pain in the upper half of the epicondyle (LE) or medal elbow (ME) after repeated use involving wrist extension. This is normally associated with overuse of the arm along with no history of trauma [1,8]. Continued use can result in creation of a chronic condition exhibiting severe pain when undertaking simple tasks such as grasping a coffee cup [13,14]. For LE, diagnosis is associated with decreasing strength and a poor ability to grip items. Pain will be associated with the lateral elbow. ME is be more associated with resistance in twisting the wrist [1]. Thus, a history of physical use of the elbow/arm, particularly involving stress/force, are important in diagnosis.

In occupational populations, different work regimes can result in activities that predispose workers to either ME or LE. If there is a prolonged exposure time involving forceful activities that are repetitive in nature investigations suggest a greater incidence of LE occurrence [3]. However, if there are either a forceful or repetitive action alone there is a selection toward ME. Both LE and ME may be potentially magnified by activities that reduce vascular functions such as diabetes and smoking [5]. This is supported in the finding of an association of cardiovascular disease and the risk of LE [15]. These studies indicate other disease states may be important in the occurrence and epidemiology of both ME and LE [6].

Epicondylitis, especially LE, occurs in both the work environment as well as athletes. This disease, as noted, is due to heavy contraction loads that are chronic in nature. The resultant strain "overloads" the bone-tendon junction resulting in pathological changes. In most cases there are no reports of trauma or injury associated with the arm and clinical diagnosis is based on the patient's activity and physical examination. Occupationally, these injuries are most commonly seen for specific job titles which require forceful and repetitive actions involving the arm, most notability the elbow [3].

From a number of studies [3,8] there appears to be a dose-response relationship with elbow-stress and epicondylitis. However, these

relationships are generally based on job classification and not on actual measurement criteria or physical force parameters [16].

Diagnosis of ME and LE is based on a patient's history and physical evaluation [8]. Various imaging techniques (e.g. radiographs, magnetic resonance) can be employed in diagnosis and evaluation. Treatment usually involves rest, physical therapy and bracing for purposes of reducing stress on the tendon. However, for recalcitrant cases surgery may be an option [1]. Drug therapies involving NSAID's may also have some use and applicability. Patient education is critical in limiting further injury and for prevention. Alternative therapies are beginning to emerge, such as acupuncture which appear to have benefits [17].

ME and especially LE are important and common musculoskeletal disorders causing pain, disability and discomfort in the general population and certain occupations [18,19]. Further information on prevention and etiology are needed for prevention, treatment and reduction of incidence/prevalence.

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