Lateral epicondylitis. What is it really?

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INTRODUCTION

Lateral epicondylitis (LE) is the most common lesion of the elbow. Its prevalence is said to be from 1% to 3% and seems more common in women.

Less than 50% of the patients with lateral elbow pain are taken care of medically, this means that a large number of patients resolve spontaneously.

The peak prevalence of LE is in the fourth decade of life, when it is four times commoner than in any other decade and the lateral epicondyle is involved seven times more often than is the medial epicondyle. This pathology is reported more frequently in assembly line workers having to repeat pro-supination movements, the repeated motion is apparently more important than the strength used to do the movement.

LE is usually defined as a tendinitis of the extensor carpi radialis brevis (ECRB) and occurs in connection with acute or chronic strain. Extensor digitorum communis (EDC) and extensor carpi radialis longus (ECRL) may also be involved.

Two other theories exist: entrapment of the radial nerve and intra-articular or osseous disorders. LE has also been described in people being treated by Fluoroquinolone.2,3

Despite being first described in 1873, the etiology and treatment are still uncertain.4 The term ‘Tennis elbow’ is a too restricted title, LE can occur very commonly in patients who have never played tennis. Golf players can suffer LE, but medial epicondylitis is more common in that group.

DIAGNOSIS

The diagnosis is essentially a clinical one. The range of movement (ROM) of both elbows and wrists should be compared as well as the strength of the ECRB and EDC. Tenderness on the lateral epicondyle and on the radial head may be elicited for. ECRB and ECRL should be tested by forced extension of the wrist with the shoulder flexed at 60°, elbow extended, forearm in pronation and wrist at 30° flexion when pressure is exerted on the second and third metacarpal bones, in a flexed and a ulnar direction, (Tomsen test). The EDC is tested in the same position but opposing active extension of the middle finger. For the chair test,5 the patient is asked to lift a chair with the shoulder flexed at 60°, elbow extended, forearm pronated. A positive coffee-cup test may be found, in which grasping or pinching with the wrist in extension reproduces the pain at the point of maximum tenderness.6 The lidocaine injection test at the origin of the ECRB should give pain relief. If done 4 finger breadths distal to the lateral epicondyle this will cause a temporary posterior interosseous nerve (PIN) palsy and if the pain is also relieved the PIN syndrome is suspected.

Other entities that can produce pain in this general vicinity are osteochondritis dissecans of the capitellum, lateral compartment arthrosis, varus instability, postero-lateral plica of the elbow, radial head arthritis, bone tumour, carpal tunnel syndrome and perhaps most commonly, radial tunnel syndrome. Radial tunnel syndrome (PIN syndrome) is a compressive neuropathy of the posterior interosseous nerve caused by any of four different anatomical structures in the radial tunnel, including a fibrous band near the anterior aspect of the radial head, a vascular leash of the recurrent radial artery, the extensor carpi radialis brevis tendon margin, or the supinator margin at the arcade of Frohse.

Characteristically, the pain of radial tunnel syndrome is located 3–4 cm distal to the lateral epicondyle and may be reproduced with long finger extension against resistance. The latter finding is inconsistent, as are abnormalities on EMG. True lateral epicondylitis and radial tunnel syndrome may coexist in up to 5% of patients.

Other entities with elbow pain can be C6–C7 cervical root compression and shoulder periarthritis.

IMAGING

X-rays should be taken routinely in order to rule out other conditions such as intra or extraarticular calcifications or elbow osteoarthritis.
Electromyography studies are usually normal, even for patients who have radial tunnel syndrome.

Sonography of the common extensor origin can be used to confirm lateral epicondylitis and provide information about the severity of the disease, but that examination is examiner-dependent. Scintigraphy may confirm the diagnosis. MR findings in epicondylitis are questionable. The specificity and the sensitivity of these techniques are still not well defined.

ANATOMY

Gross anatomy and microscopic anatomy both confirm the difficulty in isolating the origin of ECRB. It appears that ECRB brevis and EDC are indistinguishable at the bone tendon origin. For most authors the aetiology of what is known as TE is a degeneration of the origin of the ECRB.

Biopsies obtained on the ECRB show moth-eaten fibres, fibrous necrosis and signs of muscle fibre regeneration over the whole of the muscle. Mechanical and metabolic overload associated with pain could explain the muscular performance diminution in cases of LE.

In chronic refractory lateral epicondylitis vascular proliferation, fibroblastic invasion and focal hyaline degeneration is observed, which is characteristic of a degenerative process and not that of an inflammatory process (few inflammatory cells such as macrophages or polymorphonuclear leukocytes). This suggests that in chronic lateral epicondylitis requiring surgery, a degenerative process is present, rather than an inflammatory process. It could explain the lack of positive response to rest and anti-inflammatory medication in chronic epicondylitis. Biopsies have only been done in operations for chronic lesions, none have been done in patients who did well with a non-surgical treatment. These patients could well have had a true tendinitis and patients who need a surgical treatment a tendinosis.

Could we put this in parallel with Neer's classification of rotator cuff tendinopathy, with an initial reversible inflammatory grade, then micro tears and finally tendon rupture? Is it really in opposition with what Regan and Al demonstrated: i.e. The initial lesion is not inflammatory but a hypoxic degenerative process? This is in response to the stress of overload and overuse. A poorly vascularised area presents an incomplete healing response to the stress of overload and overuse. A poorly vascularised area presents an incomplete healing response. This then initiates a classic inflammatory response with its healing events. Nirschl described this as the 'angiofibroblastic hyperplasia' in the symptomatic area of the insertion of the ECRB.

TREATMENT

More than 40 different treatments are known.

Conservative

Conservative treatments are still the gold standard, especially when the disease is recent, but do not seem very effective when it has been there for many months or even years.

There is no reason to treat a degenerative disease as if it were an inflammatory disease. The problem is: when has it become degenerative?

In the conservative treatments we find cryotherapy, NSAID's, Cyriax manipulations, physiotherapy (including ionophores and laser) plaster cast, acupuncture, mesotherapy, local corticosteroid injections, orthoses, and shock waves.

Local corticosteroid injection which is one of the most popular treatments, seems to be superior to Cyriax treatment, with a maximum of three injections during a period of 1 year.

No definitive conclusions can be drawn concerning the effectiveness of orthotic devices since there is a lack of well-designed and well-conducted randomised clinical trials. However, biomechanical and electromyographical analysis has shown an inhibition of the maximum contraction of the wrist and fingers extensors by use of counterforce braces on tennis players. Laser therapy does not seem to be more efficient than a placebo. Shock wave therapy still needs scientific proof of its efficiency and cannot be proposed as the only alternative to surgery.

Muscle stretching can reduce the incidence of new painful occurrences, as well as promoting the proper use of the arm in sports or work. Sometimes a change of work may be required. The tennis player may use a more suitable racket with less tension in the strings or even use lower pressure balls, will equip himself with shock absorbers and will play on slower surfaces such as red pile.

Surgical

Surgical treatment is needed in the 5–10% of patients who do not respond after many months to conservative treatment. Many techniques are known with good results for most procedures.
An historical survey of operative treatments of tennis elbow is shown in Table I.

The different operations can be grouped as follows:

1. simple percutaneous or open technique release of the extensor tendons;
2. suture of the linear and circular tears found in the common tendon and capsule;
3. excision of granulated and degenerative tissues with repair;
4. excision, suture and fixation of the common extensors aponeurosis;
5. excision, decortication, drilling, arthrotomy, suture and fixation to the common extensor aponeurosis;
6. PIN neurolysis possibly associated with one of the procedures described above;
7. arthroscopy with degenerative tissue excision and partial release of extensor tendons;
8. denervation of the radiohumeral joint associated possibly associated with one of the procedures described above.

Many of these treatments are appropriate for two if not the three aetiologies (tendinitis of the ECRB, entrapment of the radial nerve, intra-articular or osseous disorders).

Two controversial studies exist about the PIN decompression surgery. Van Rossum found no clinical or EMG evidence for radial nerve entrapment in his patients. Beenisch and Wilhelm found evidence of a supinator syndrome in 53% of their patients.

In the procedure described by Nirschl and Pettrone, opening of the articular capsule is done routinely and allows the exploration of the lateral elbow compartment. They have noted intra-articular pathologies in 11% associated with lateral condyle pain.

Usually the elbow is splinted for 1–3 weeks after surgery but some put the arm in a sling for 1 week and recommend gentle rehabilitation for 6 weeks. Patients can return to sports activities 4–6 months after the operation. Physical therapy is sometimes prescribed if the patient has a lack of extension.

Most studies show a success rate of over 80% and therefore, techniques with low morbidity should be selected. Therefore the simple extensor lateral release seems to be the chosen procedure. It can be done under local anesthesia, knowing that radial tunnel syndrome may exist and that intra-articular problems must be excluded.

### Table I

<table>
<thead>
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**FAILURE**

The first cause of failure is incorrect diagnosis.

Elbow instability can occur when the collateral ligament has been damaged. The muscles on the lateral...
condyle must be released anteriorly, not going beyond the thick aponeurotic band.

Workers who have a compensation claim, have a lower success rate.

Wound healing problems, haematoma, infection, synovial fistula, restriction of function of the elbow joint are all quite low.

CONCLUSION

It is rather odd that:

- this disease known as a tendinitis may not be one,
- the common name of ‘tennis elbow’ is more than often not correct,
- the anatomy cannot make the distinction between the different tendons attached to the lateral condyle, but surgical techniques do !,
- there is no consensus on the treatment, although the initial description of this application goes back to 1873,
- there are more than 40 ways of treating it, all or nearly all of them really effective according to their authors.

REFERENCES