

Tennis Elbow: A Review

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Abstract: Lateral epicondylitis is one of the most common causes of lateral elbow pain in general population. There are various treatment options available so far despite the lack of an ideal treatment. This article provides knowledge of the various treatment options available with the goal of improving patient functional outcome.

Keywords: autologous blood injection, lateral epicondylitis, platelet rich plasma injection, steroid injection, tennis elbow

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I. Introduction

Tennis elbow is amyotendinosis commonly encountered in orthopaedic practice. Many research and studies have been done to studying and treating of this disabling condition. There is still lack of consensus with regards to an optimal treatment of tennis elbow.

Tennis elbow is due to the overuse injury of extensor carpi radialis brevis insertion at the lateral epicondyle of humerus affecting dominant arm. ⁽¹⁾ It was first described by Runge in 1873. ⁽²⁾ Patient shows pain at the lateral aspect of elbow, decreased grip strength, tenderness at the lateral epicondyle. ⁽³⁾ Repeated injury of tendon causes micro trauma and failed normal healing response due to hypovascularity and hypoxia causing tendinosis or tendinopathy. ⁽⁴⁾ It is a degenerative process and not an inflammatory process that involves angiofibroblastic hyperplasia and noninflammatory degeneration of extensor carpi radialis brevis. Extensor carpi radialis brevis is more frequently involved than extensor carpi radialis longus and extensor digitorum communis. ⁽⁵⁾

1.1 Incidence

It's more commonly seen in general population with an incidence of 1% to 3%. Males and females are affected equally and tennis elbow is usually seen in fourth and fifth decade of life. ⁽⁶⁾

1.2 Diagnosis

It can be diagnosed with ease just based on clinical history & examination. ⁽⁷⁾ It is a clinical diagnosis verified via ultrasonography and magnetic resonance imaging. ⁽⁸⁾⁽⁹⁾ Histologically tendons show neovascularisation and fibroblastic degeneration. ⁽¹⁰⁾ Microscopically excess of fibroblastic degeneration and neovascularization is seen within the substance of extensor tendons, particularly affecting the extensor carpi radialis brevis describing as angiofibroblastic hyperplasia.

1.3 Management Of Tennis Elbow

Multiple treatment proposals have been developed for the treatment of tennis elbow. Non-operative treatment is successful in 80% of patients with tennis elbow. ⁽¹¹⁾ Treatment involves activity modification, rest, stretching exercises, NSAIDs, steroid injection, extracorporeal shock wave therapy, laser treatment, botulinum injection, arthroscopic debridement, acupuncture therapy. ⁽¹²⁾ However, there is greater chance that lateral epicondylitis can recur and last for a long time after treatment. ⁽¹³⁾

1.3.1 Role of splints and orthotics:

A Cochrane review looking at orthotic devices that have been advocated in the treatment of tennis elbow could not draw any conclusions about the efficacy of these modalities of treatment. The devices described include elbow bandage, elbow band, elbow clasp and cast immobilization. ⁽¹⁴⁾

1.3.2 Extracorporeal shock wave:

Extracorporeal shock waves are transient pressure oscillations that propagated in three dimensions and directly stimulate the healing, neovascularization and suppression of the activity of nociceptors on the target tissue. ESW treatment can increase the neovessels at the normal tendon-bone junction through the release of growth factors, transforming growth factor (TGF- β -1) and Insulin-like growth factor (IGF-I). ⁽¹⁵⁾ For newly diagnosed patients with tennis elbow, extracorporeal shock wave therapy can reduce the severity of pain and improve daily activity. ⁽¹⁶⁾

1.3.3 Autologous blood injection:

Autologous blood injection is considered as a first line injection treatment. ⁽¹⁷⁾ Blood contains humeral and cellular mediators that initiate an inflammatory process in the injured tissue and results in repair and healing. A local injection of autologous blood in a case of lateral epicondylitis provides cellular and humoral

factors to the site of lesion and triggers a healing cascade.⁽¹⁸⁾ Thus in this manner it initiates the inflammatory cascade and helps in healing in an otherwise degenerative process. It is minimal invasive, simple, cheap and can be done as outpatient procedure; it has no potential complications like skin atrophy and tendon tears associated with corticosteroid injection. It is easy for preparation and application which does not use any specialized expensive equipment and can be done on OPD basis. It is with less side-effect and minimum recurrence rate.

1.3.4 Corticosteroid injection:

It provides short term pain relief after local injection of steroid. Corticosteroids act by reducing the levels of calcitonin gene-related peptide, substance P, and Neurokinin 1-receptors in tendon thereby reducing the pain in patients with lateral epicondylitis.⁽¹⁹⁾ It has superior short-term results but intermediate or long-term results were inferior to autologous blood injection. It may produce some side-effects such as post-injection pain, sepsis, tendon rupture, local skin atrophy, post-injection flare, facial flushing, hyperglycaemia and hypersensitivity reactions. In long term follow up corticosteroid injection yielded poor results than physiotherapy.⁽²⁰⁾

1.3.5 Platelet-rich plasma (PRP):

It delivers higher levels of growth factors for stimulation of regeneration but yields similar results to autologous blood in terms of pain reduction and functional improvement at 6 months. However the need for surgical intervention was higher after platelet-rich plasma injection than autologous blood injection (HO Arik)⁽¹⁷⁾. Preparation of PRP requires specialized equipment which is both expensive and time consuming. PRP injection, for intractable lateral epicondylitis of the elbow is safe in reducing symptoms and have shown it has reduced the need for surgical intervention in this difficult cohort of patients (21)

Mishra and colleagues conducted a study using platelet rich plasma and reported significant improvement in pain in patients with complaints less than 6 weeks.⁽²²⁾

1.3.6 Nonsteroidal anti-inflammatory drugs:

There remains insufficient evidence to recommend or discourage the use of oral NSAID, although it appears injection may be more effective than oral NSAID in the short term. A direct comparison between topical and oral NSAID has not been made and so no conclusions can be drawn regarding the best method of administration.⁽²³⁾

1.3.7 Botulinum toxin injection :

It offered significant pain relief, but few patients had weakness in fingers as a complication.⁽²⁴⁾

1.3.8 Operative intervention:

The commonly performed operations for tennis elbow are open, percutaneous or arthroscopic releases. Open technique involves release of the extensor aponeurosis to expose the ECRB, debridement of the diseased tendon and decortication of the bone. Percutaneous release consists of a blind release of the ECRB tendon through a small incision without debridement of the affected tendon. This has been done as a viable treatment option after the failed conservative management of tennis elbow.⁽²⁵⁾ Arthroscopic release for tennis elbow is becoming popular and involves routine diagnostic arthroscopy of the elbow followed by debridement of the affected ECRB tendon. Some authors perform plication of the tendon arthroscopically if the area of debridement exceeds 2cm.⁽²⁶⁾ The procedure is completed by decortication of the lateral epicondyle. The advantages of arthroscopic release include the complete intra-articular visualization of the elbow.

1.3.9 Physiotherapy practice

There was no consistency in the choice of modality used, the type of exercise or the dose of exercise prescribed. There is a clear need for evidence-based guidance for physiotherapists treating patients with tennis elbow.⁽²⁷⁾ Wrist extensor eccentric strengthening exercises and scapula stabilization exercises can be useful as intervention methods for relief from pain due to lateral epicondylitis and for the improvement of functions impaired by lateral epicondylitis.⁽²⁸⁾

1.4 Pulsed low intensity ultrasound therapy:

Pulsed low intensity ultrasound therapy trial done by D'Vaz concluded that no significant benefit comparing to placebo.⁽²⁹⁾

II. Discussion:

Tennis elbow is usually regarded as a minor ailment and is known to be a self-limiting condition. It commonly occurs with activities that need repetitive and forceful elbow flexion and extension or wrist extensions. Symptoms are usually mild, but occasionally there is significant disability.⁽³⁰⁾ The diagnosis is simple and clinically diagnosed by tests such as palpation on the facet of the lateral condyle, the tomsentest, handgrip dynamometer testing, mill's test, chair test and the coffee cup test.⁽³¹⁾ Radiographs may show calcification on the lateral epicondyle. Differential diagnosis includes posterior interosseous nerve entrapment syndrome, an osteochondral lesion of the radiocapitellar joint, varus instability, osteoarthritis and referred pain from the shoulder or cervical spine.⁽³²⁾

Pain of a tennis elbow results from a periosteal tear at the origin of ECRB, and that stress could be readily relieved by a relatively simple operation designed to lengthen the tendon of ECRB.⁽³³⁾ Autologous blood is

effective than corticosteroid in terms of pain reduction & functional recovery at 6 months after injection, with 90% relieved of pain in autologous blood group compared to only 45% in corticosteroid group.⁽³⁴⁾ Ultrasonographic evidence of tendon reparation such as decreased interstitial clefts and anechoic foci within the tendon and decreased pathological vascularity after autologous blood injection for lateral epicondylitis have been reported.⁽³⁵⁾

There is 79% recovery after injecting autologous blood, in their prospective case series study.⁽¹⁸⁾ Similar type of study found about 85% results⁽³⁶⁾ and 94.2% success rate in pain relief.⁽³⁵⁾ Corticosteroid injection relieved pain faster than autologous blood injection but for short term whereas autologous blood injected patients had slower and sustained relief in pain and recurrence rate is negligible when compared to steroid injected patients.⁽³⁷⁾ Peerbooms et al compared a single PRP injection and corticosteroid injection in patients who failed nonoperative measures and demonstrated significant pain reduction and increased function with PRP injection therapy.⁽³⁸⁾ Corticosteroid is effective only in short term, in long term follow up this treatment yielded poorer results than physiotherapy.⁽²²⁾ In case of failure of conservative measures in 5–15% of patients surgery is required and the reported success rate of surgery is 85%.⁽³⁹⁾

III. Conclusion:

There are various modalities of treatment method however no treatment has shown to be superior to others. There is no optimal treatment protocol for lateral epicondylitis. Hence this article was taken up to review the treatment of lateral epicondylitis.

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