Autologous Blood Injection In The Treatment Of Refractory Tennis Elbow

N ul Gani, M Butt, S Dhar, M Farooq, M Mir, K Kangu, M Halwai

Citation

N ul Gani, M Butt, S Dhar, M Farooq, M Mir, K Kangu, M Halwai. *Autologous Blood Injection In The Treatment Of Refractory Tennis Elbow*. The Internet Journal of Orthopedic Surgery. 2006 Volume 5 Number 1.

Abstract

Tennis elbow is a common cause of pain and disability. It is more frequently seen in non-athletes, with a peak incidence in the early fifth decade on a nearly equal gender basis. Degeneration of the tendon of extensor carpi radialis brevis is believed to be the most common cause. Non-operative treatment is successful in effecting a resolution of symptoms in 90% of the patients. The remaining 10%, who do not respond to conservative treatment are labeled as resistant or refractory cases. Different modalities of treatment are used to treat these chronic cases. This includes multiple steroid injections, percutaneous tendon release, botulinum toxin injection, extracorporeal shock wave therapy, arthroscopic debridement, laser therapy, local injection of autologous blood and even platelet rich plasma and various surgical procedures. The fact that none of these procedures has been able to achieve a desirable outcome in a vast majority of subjects, research is on to reach a consensus in the non –operative treatment of this condition. The present study was undertaken to evaluate the clinical outcome in patients who failed to respond to other forms of non-operative modalities. The result of this study reveals that there was a significant improvement in pain and Nirschl stage in 58% of patients. There was no significant difference in the pain and Nirschl stage between the males and the females. There were, however, eleven patients (42%) who did not show a satisfactory response. There was no complication associated with the procedure. We conclude that autologous blood injection for refractory tennis elbow may be a viable option in these patients before being considered for surgery.

INTRODUCTION

Tendinosis of the common extensor tendon of the elbow, what we refer today as tennis elbow was originally described in relationship to lawn tennis by Major in 1883 [1,2]. It occurs more frequently in non-athletes, with a peak incidence in the early fifth decades on a nearly equal gender incidence [3]. The term epicondylitis is a misnomer as there is little evidence to suggest that there is an inflammably process. Different conditions have been proposed as etiology of this condition, but degeneration of the origin of the extensor carpi radialis brevis (ECRB) is believed by most investigators to be the most common cause. Differential diagnosis of this condition include other conditions that can produce pain in this general vicinity like, osteochondritis dessicans of the capitellum, lateral compartment arthrosis, varus instability and more commonly radial tunnel syndrome. Different non-surgical and surgical options are described for the treatment of this condition [4]. Non-operative treatment is successful in 90% of patients with tennis elbow [3]. Non-surgical treatment consists of activity modification, use of brace, strengthening exercise and occasionally steroid injections. Although symptoms resolve, in most patients with these treatment modalities, some patients will have prolonged pain and dysfunction. Different techniques are described in literature to threat these refractory cases viz. surgical debridement of ECRB [5], percutaneous release [6], arthroscopic debridement [7,8], extracorporeal shock wave [9,10,11,12], laser treatment [13], and Botulinum toxin injection [14]. The fact that there are so many different approaches to the management of this problem suggests that no single treatment has gained universal acceptance.

The introduction of autologous blood injection was a later addition to the treatment modality of this condition and has been claimed to effect resolution of symptoms.

The current study was aimed at evaluating the efficacy of autologous blood injection in patient who had either no relief with non-surgical procedure or the recurrence of symptom resulted in reluctance for repeating the previous procedure and agreed for this treatment modality before being considered for surgery.

MATERIAL AND METHOD

PATIENTS

We treated twenty six patients with refractory tennis elbow between Jan 2005 to Sept. 2006 with autologous blood injection. There were 10 male and 16 female patients. The mean age of patients was 34 years (range, 21 to 54 years). The symptomtology ranged for 6 months to 3 years. (Mean, 2.1 years). In 22 patients lateral epicondylitis involved the dominant extremity and in four non dominant extremity was involved.

Patient Inclusive Criteria:

1. Patient of all ages and gender.
2. Patient who received conservative treatment in the form of rest, actively modification, brace / splint, non-steroidal analgesia and local steroid injection.
3. If one of the these clinical tests is positive:
    a. Tenderness elicited just distal and anterior to the lateral epicondyle.
    b. Pain with resistant wrist extension with elbow in full extension.
    c. Coffee cup test – picking up a full cup of coffee / water associated with localized pain at lateral epicondylar region.

Patient Exclusive Criteria:

1. Coexisting pathology i.e. rheumatoid arthritis of elbow, cervical radiculitis.
2. Previous trauma around elbow.
3. Patients previously treated surgically for lateral epicondyle.
4. Patient who had received steroid injection within 3 months.

These treatment options was discussed with the patients and attendants and were forewarned that like may non-surgical option, there was no guarantee this procedure bringing absolute success. Written consent was taken from the patient or the attendant.

METHOD

Patients were asked to rate their pain on a four point pain scale (none-1, mild-2, moderate-3, severe-4), before the treatment was commenced. Pre-injection Nirschl stage was also recorded.

Two milliliters of autologous blood were drawn from the dorsal vein of ipisilateral hand. We did not mix 2% lidocain or bupivacain with the blood. A needle was introduced proximal to the lateral epicondyle along the supracondylar ridge and gently advanced into the undersurface of ECR, and blood was injected. A triangular sling was prescribed for one week and patient advised against heavy manual work for three weeks. After that time patient was taught exercises to stretch extensor musculature of the arm and elbow. By two months all restrictions were removed.

After the procedure pain rating and Nirschl stages were recorded weekly usually by a telephonic conversation. At six week patient were reassessed and incase of unsatisfactory improvement repeat injection was offered. We did not repeat injection after two procedures. Only those patients who had completed a minimum follow up of six months were included in this study.

Statistical analysis was done and a p-value of <0.05 was considered significant.

RESULTS

The follow up averaged 8 months (range, 6 to 24 months). Mean pain score before autologous blood injection was 3.3 (range, 3-7). The mean Nirschl stage was 5.5 (range, 3 – 7). At the final follow up pain score improved from 3.3 to 1.2 ($p<0.05$). Nirschl score at the final follow up ranged from 2 to 4 (mean 2.1), a significant improvement ($p<0.05$).

Only nine patients received more than one injection. No patient agreed for more than two injections.

There was no difference in gender response to autologous blood injection. Mean pre – injection pain score in males was 3.5 (range, 2 – 4) against a mean score of 3 (range, 2 to 4) in the females. The Nirschl stage in females improved from a pre-injection mean of 5.7 (range, 3 to 7) to 2.5 (range, 2 to 4) at the final follow up. This was statistically insignificant ($p >0.05$) when compared with the improvement in the males (prep. 5.3 vs. 2.3 post injection).

Overall ten of the twenty six patients were comfortable with the activities of daily living. Of the remaining eleven, seven had modified their activities, other four patients avoided strenuous activities altogether.

The pain scores and Nirschl staging also did not differ

significantly between patient receiving single injection and those who received second injection after failure to achieve desired response from the first injection.

Out of eleven patients who did no show a satisfactory outcome, seven had previously received local steroid injections more than three times and had recorded no relief .In one patient ten steroid injections had been given over three years.

DISCUSSION

Chronic elbow pain is a frequent disability in patients and most commonly it is diagnosed as lateral epicondylitis or tennis elbow. Though majority of patients respond to non-surgical treatment, a small minority continues to persist with these symptoms and are labeled as resistant or refractory tennis elbow. In fact a small number of patients (1% to 2%) cannot be treated successfully by non-operative or even operative methods [3].

The fact that there is more than one type of treatment options available in treating resistant cases suggests that no single procedure is effective in all patients. Extra corporeal shock wave, laser treatment, botolinium toxin injection, local steroid injection [15] and manipulation under anesthesia[3] have been used by different authors with variable success.

Autologous blood injection for recalcitrant or refractory tennis elbow is based on the histopathological observation that, tennis elbow is not an inflammatory condition, but a fibroblastic and vascular response called angiofibroblastic degeneration more commonly known as tendinosis. This is characterized by invasion of blood vessels, fibroblasts and lymphatics into the symptomatic area of the extensor carpi radialis brevis [16]. The injection of autologous blood is thought to provide the necessary cellular and humoral mediators to induce a healing cascade [17].

In the current study fifteen of the twenty six patients (58 %) were relieved completely of pain during stress activity after autologous blood injection, five (20%) had mild pain during strenuous activity. There were, however, six patients who rated their pain same as the pre-injection scale. No patient rated pain score more than the pre-injection scale though. Most patients related their relief to first injection, though repeat injection improved outcome in four of the six cases.

Nearly half of the patients that did not experience complete relief of their symptom from a single autologous blood injection in Edwards's series [17]and required repeat injection had been treated previously with at least two steroid injections. Seven (out of eleven) patients who failed to show desired response to this treatment modality in our series had received steroid injection as a part of the non-operative treatment without any benefit. In fact the patients who responded to single injection compared their improvement similar to the one they experienced in a single steroid injection during the treatment history.

Autologous blood injection technique has been refined recently to improve the probability of hitting the area of pathology. Sonographic guided blood injection has been reported to improve clinical outcome [18]. It can also be used to monitor the changes to the common extensor origin. The same technique has been used successfully in the treatment of medial epicondylitis [19].

Instead of autologous blood Mishra and Pavelko [20] injected platelet rich plasma for chronic elbow tendinosis and at a final follow-up of 12-38 months, patients reported 93% reduction in pain compared with the pre injection status. The idea is fascinating though, may not find much audience in our setup considering the difficulty in procuring fresh frozen plasma on an out patient basis. Moreover the mechanism of action and the final outcome may not differ much.

Edwards and Calandruccio summarized the advantages of autologous blood injection for the treatment of refractory lateral epicondylitis in their excellent work on the subject. Its application being minimally traumatic, reduced risk of immune mediated rejection, simple to acquire and prepare and inexpensive are the main advantages.

Although our clinical results are inferior to the results of others and the success rate in literature [17], [18], we relate this to our relative inexperience with the technique and small case series. We feel with a larger case series, a longer follow up and refinement of the procedure a fair conclusion can be drawn with regard to the efficacy and otherwise of this treatment modality.

References

1. Cyriax JH: The pathology and treatment of tennis elbow. J Bone Joint Surg 1936:18A; 921-40.
2. Nirschl RP: The etiology and treatment of tennis elbow. J sports Med Phys Fitness .1974:2:308-323.
3. Christian CA, In Campbell's Operative Orthopaedics. S. Terry Canale (Ed). 9th ed. Mosby. St.Louis, Missouri 1998, vol II, p1321-24.
4. Coonrad RW, Hooper WR. Tennis elbow: its course, natural history, conservative and surgical management. J. Bone Joint Surg. Am. 1973; 55:1177 - 1182.
5. Nirschl RP, Pettrone FA. Tennis elbow: the surgical

treatment of lateral epicondylitis. J. Bone Joint Surg. Am 1979; 61:832-839.
6. Baumgard SH, Schwartz DR. Percutaneous release of the epicondylar muscles for humeral epicondylitis. Am J. Sport Med. 1982; 10:233-236.
7. Baker CL. Jr. Murphy KP, Gottlob CA, Curd DT. Arthroscopic classification and treatment of lateral epicondylitis: two year clinical results. J. Shoulder Elbow Surg. 2000; 9:475-482.
8. Owens BD, Murphy KP, Kuklo TR. Arthroscopic release for lateral epicondylitis. Arthroscopy 2001; 17:582-587.
9. Jih-yang KO, han-shiang Chen, liang-mei Chen. Treatment of lateral epicondylitis of the elbow with shock waves. Clin Orthop 2001; 387:60-7.
10. Wang CJ, Chen HS. Shock wave therapy for patients with lateral epicondylitis of the elbow. Am J Sports Med 2002; 30:422-425.
11. Hakke M Konig IR, Decker T, et al. Extracorporeal shock wave therapy in the treatment of lateral epicondylitis: a randomized multi-center trial. J Bone Joint Surg 2002; 84A; 1982-1991.
12. Crowther MA, Bannister GC, Huma H, Rooker GD. A prospective, randomized study to compare extracorporeal shock-wave therapy and injection of steroid for the treatment of tennis elbow. J. Bone Joint Surg. 84B. 2002:678-679.
13. Grifka J, Boenke S, Kramer J. Endoscopic therapy in epicondylitis radialis humeri. Arthroscopy 1995; 11:743-748.
14. Keizer SB, Rutten HP, Pilot P, Morre HH, van Os JJ, Verburg. AD. Botulinum toxin injection versus surgical treatment for tennis elbow: a randomized pilot study. Clin Orthop 2002; 401:125-131.
15. Altay T, Gunal I, Ozturk H. Local injection treatment for lateral epicondylitis. Clin Orthop. 2002; 398:127-130.
16. Kraushaar BS, Nirschl RP. Tendinosis of the elbow (tennis elbow): clinical and findings of histological, immunohistochemical, and electron microscopy studies. J. Bone Joint Surg, 1999; 81A: 259-279.
17. Edwards SG, Calandruccio JH. Autologous blood injection for refractory lateral epicondylitis. J Hand Surg2003; 28A:272-278.
18. Connell DA, Ali KE, Ahmad M, Lambert S, Corbett S, Curtis M. Ultrasound-guided autologous blood injection for tennis elbow. Skeletal Radiol.2006; 35:371-7.
19. Suresh SP, Ali KE, Jones H, Connell DA. Medial epicondylitis: is ultrasound guided autologous blood injection an effective treatment? Br J Sports Med. 2006 40: 935-9.
20. Mishra A, Pavelko T. Treatment of chronic elbow tendinosis with buffered platelet -rich plasma. Am J Sports Med. 2006; 34: 1774-78.

Author Information

Naseem ul Gani, MS
The Hospital For Bone & Joint Surgery

Mohammad Farooq Butt, MS
The Hospital For Bone & Joint Surgery

Shabir Ahmed Dhar, MS
The Hospital For Bone & Joint Surgery

Munir Farooq, MS
The Hospital For Bone & Joint Surgery

Mohammad Ramzan Mir, MS
The Hospital For Bone & Joint Surgery

Khurshid A. Kangu, MS
The Hospital For Bone & Joint Surgery

Manzoor A. Halwai, MS
The Hospital For Bone & Joint Surgery