A CASE OF RECALCITRANT MULTI COMPARTMENTAL TENOSYNOVITIS TREATED WITH AUTOLOGOUS PLATELET RICH PLASMA – 1 YEAR FOLLOW UP

Abstract:
Tenosynovitis is defined as inflammation of tendon sheath around the tendons which leads to joint pain, stiffness and swelling. Recently the idea of “Orthobiologics” leads to development of less invasive procedures and accelerated treatments which enhances functional recovery of musculoskeletal disorders. Autologous platelet rich plasma has become a novel biological agent of choice for chronic tenosynovitis. Here we report a case of 47 years old male patient with recalcitrant multi compartmental tenosynovitis in extensor aspect of hand who was treated with 2 doses of autologous platelet rich plasma injection under ultrasound guidance, which was followed up for 1 year. The post procedural care, functional outcome and prognosis of chronic multi compartmental tenosynovitis have been elaborated in this article.

Keywords: Orthobiologics, platelet rich plasma, tenosynovitis.
Introduction

Tenosynovitis is defined as inflammation of tendon sheath around the tendons which leads to joint pain, stiffness and swelling. The cause of tenosynovitis is due to overuse from chronic repetitive activities of hand and wrist. Recently the idea of “Orthobiologics” leads to development of less invasive procedures and accelerated treatments which enhances functional recovery of musculoskeletal disorders. The rationale behind the usage of platelet rich plasma in tenosynovitis is the release of bioactive molecules from alpha granules of platelets which enhance the cellular migration, neovascularisation and matrix deposition which in turn leads to tendon healing.1 Here in this article, we have explained about the role of novel and biological autologous platelet rich plasma injection for a recalcitrant multi-compartmental tenosynovitis without recurrence.

Case report

A 47 year old male, a non-diabetic and non-hypertensive, came to orthopaedic OPD in Bapuji Hospital, JJM Medical College, Davangere with the chief complaints of diffuse swelling around wrist joint and restriction of wrist movements from past 2 years. On examination, the diffuse swelling was seen around right wrist with crepitus. The patient had restricted wrist movements of 15° palmar flexion, 20° dorsi flexion, 10° radial deviation and 15° ulnar deviation. The radiograph of right wrist joint shows no radiological abnormality. Septic screen showed a mild elevation of ESR and CRP. FNAC of the wrist swelling yielded scattered lymphocytes admixed with synovial cells. MRI scan of right wrist joint showed chronic tenosynovitis of tendons of extensor compartment 2 (extensor carpi radialis brevis and extensor carpi radialis longus) and 3 (extensor pollicis longus). Serological screen showed negative reports for HIV 1 and 2, HBsAg and HCV.

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Figure 1 – X ray of right wrist in AP, lateral and oblique shows no radiological abnormality

Figure 2 – MRI of right wrist in transverse section showing inflammation of ECRB and ECRL tendons with fluid collection in the tendon sheath

Figure 3 – MRI of right wrist in coronal section showing inflammation of ECRB and ECRL tendons

Before presenting to our hospital, the patient has taken treatment in the form of rest, splinting of the affected part, oral medications (analgesics), physical therapy and two doses of steroid infiltration. Now the patient presented with recalcitrant multi compartmental tenosynovitis. The patient is instructed not to take any analgesics 48 hours prior to platelet rich plasma therapy. 20 cc of venous blood is drawn in vials containing acid citrate dextrose and subjected for centrifugation for 3000 rpm for 10 minutes. The resultant plasma and buffy coat is transferred to plain tube and subjected for re-centrifugation for 5000 rpm for 10 mins. The upper 2/3rd portion contains platelet poor plasma which is discarded. The lower 1/3rd portion contains platelet rich plasma which is injected after mixing calcium chloride to PRP in the ratio of 1:10. The patient underwent active management with 2 doses of autologous platelet rich plasma injection under ultrasound guidance with an interval of 4 weeks between 2 injections. To the post PRP injection, the pain was combated with oral tramadol tablets and ice pack application. The activity around right wrist joint was restricted for 48 hours and crepe bandage was applied. The patient is followed up for 12 months who showed clinical improvements in the wrist movements and functional improvements in VAS and Mayo wrist scoring with improved quality of life without any recurrence.

Figure 4 – PRP injection technique

Figure 5 – PRP injected under ultrasound guidance into the diseased tendon sheaths.
Discussion

Tenosynovitis is defined as inflammation of tendon sheath around the tendons which leads to joint pain, stiffness and swelling. The cause of tenosynovitis is due to overuse from chronic repetitive activities of hand and wrist. Primary tenosynovitis may be idiopathic and secondary tenosynovitis may be due to disorders such as rheumatoid arthritis, gout, diabetes mellitus, SLE or amyloidosis.

The patients may present with following clinical presentation such as:

a) Swelling of joints of hand, fingers and wrist
b) Tenderness over wrist joint and MCP joints of hand
c) Increased intensity of pain with wrist movements
d) Crepitus while performing wrist motion
e) Stiffness of the affected joints

Diagnosis of tenosynovitis is made by physical and radiological examination. Ultrasound of the wrist joint shows increased thickness of the affected tendons with fluid lining the tendon sheath. MRI of the wrist shows inflammation of affected tendons and fluid along the affected tendon sheath along with surrounding soft tissue edema.

Management of tenosynovitis comprises of the following:

a) PRICE regimen (Protection, Rest, Ice pack application, Compression and Elevation)
b) POLICE model (Protection, Optimal Loading, Ice, Compression, Elevation)
c) NSAIDs to reduce pain and inflammation
d) Physical therapy in the form of low wave pulsed LASER & ultrasound therapy
e) Local steroid infiltration
f) Sodium hyaluronate injections
g) Extra corporeal shock wave therapy – 2000 shock waves of 0.04 – 0.12 nj/mm², 3 times at monthly intervals for 6 months
h) Autologous platelet rich plasma injections
i) Autologous tenocyte implantation
j) Surgical release of affected tendon sheath

In our study, the patient has taken treatments in the form of PRICE regimen, NSAIDs, physical therapy and two doses of local steroid infiltration. There is no improvement in pain and swelling around right wrist joint. The patient had significant restriction of wrist movements. The patient underwent 2 doses of autologous platelet rich plasma injection under ultrasound guidance with an interval of 4 weeks between 2 injections.

Once the autologous platelet rich plasma is injected to the affected site, bio-active molecules and growth factors such as VEGF, TGF-β & PDGF are released from degradation of alpha granules of platelets. These bio-active molecules perform a supra-physiological role in cellular migration, proliferation, neovascularisation and extracellular matrix deposition at the affected site which helps in rejuvenating the affected tendons.

Autologous platelet rich plasma offered a great advantage such as elimination of immunological concerns, disease transmission, increases the level of growth factors at the affected site, provides a provisional scaffold for healing, improves hemostasis and provides anti-inflammatory and anti-microbial properties. The processing and application of platelet rich plasma is simple and rapid than other procedures. After a follow up for 1 year, the patient had improved clinically in the form of full range of right wrist movements and functional improvement in the form of VAS score of 2 and Mayo wrist score of 90.

Conclusion

Due to increased demand for treatment of overuse syndromes, the importance of orthobiologics has gained popularity among the community. Orthobiologics has formed the novel and biological treatment option for overuse syndromes. Autologous platelet rich plasma injection is the best treatment platform for recalcitrant multi compartmental tenosynovitis which showed no recurrence of symptoms and improved quality of life.

References