www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v6i4.55

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

A Case of Common Extensor Tendon Tear of Elbow Treated with Platelet Rich Plasma Infiltration

Authors
Dr Shikha Dhaundiyal[1], Dr Deepak Chaudhary[2], Dr Deepak Joshi[3]
Dr Colonel Bibhu Kalyan Nayak[4]
[1]Postgraduate Resident, Department of Sports Medicine, VMMC and SJH
[2]Director and Professor, Sport's Injury Centre, VMMC and SJH
[3]Senior Specialist and Professor, Sport's Injury Centre, VMMC and SJH
[4]Specialist On Deputation (Sports Medicine), Sport's Injury Centre, VMMC and SJH

Abstract
Common Extensor tendinopathy is one of the most common overuse injury of elbow. With the repetitive overload and microtrauma of elbow it may eventually leads to tear of the common extensor tendon that is rare.
In this case report we describe a case of a middle aged man pilot by profession presented with chief complaints of pain in elbow and a clinical history corresponding with tendinopathy caused by repetitive overload of common extensor tendon due to repeated use of his hand and elbow as per according to his job demand. On examination tenderness was present around lateral aspect of elbow with painful range of movements and weak and painful grip. Initial diagnosis was made clinically for lateral epicondylitis and ultrasound imaging was done to correlate with the clinical findings which showed a frank 4mm tear of i.e. hypoechoic swelling of tendon with focal interruption of internal fibrillar pattern and soft tissue indentation unlike microtear of tennis elbow. Clinical diagnosis of common extensor tendon rupture was confirmed in this patient who had clinical history corresponding to lateral epicondylitis.
Patient was treated with injection PRP(Platelet Rich Plasma) given in weekly intervals under ultrasound guidance and in follow up it showed decrease in size of tear and healing of tear of common extensor tendon.
This case report is to highlight upon a fact that PRP can be a promising treatment for tendon tears which have shown good result in this case report.

Introduction

From the lateral epicondyle of humerus arises the muscle forming common extensor tendon which is composed of extensor carpi radialis brevis, extensor digitorum, extensor digiti minimi, and extensor carpi ulnaris and their main action is to extend the wrist and supinate the forearm.[1]

Rupture of common extensor tendon is generally rare and occur as result of repetitive microtrauma of elbow i.e. large valgus force with medial distraction and lateral compression of elbow[2] and it may also get ruptured following a steroid injection.[3]

Tendon rupture can be classified as partial or complete, acute or chronic and traumatic or nontraumatic. Most of the cases of common extensor tendon tear are partial, acute and spontaneous.[4]

Platelet rich plasma (PRP)(also referred to as platelet rich in growth factors, platelet rich fibrin matrix, platelet rich fibrin, fibrin sealant, platelet concentrate) is an orthobiologic and is a safe and non surgical way to treat musculoskeletal injuries by enhancing body innate ability to repair and regenerate.[5]

[IOC Consensus paper on use of Platelet rich plasma classified into four categories depending on their leucocyte and fibrin content: pure platelet-rich plasma(P-PRP), leucocyte and platelet rich plasma(L-PRP), pure platelet rich fibrin(L-PRF) and leucocyte and platelet rich fibrin(L-PRF).[6]

PRP is basically a plasma fraction derived from patient's whole autologous blood that is obtained by centrifugation which contain platelet concentration exceeding above the baseline. Centrifugation helps in separating the RBC's so that it can be removed. PRP can be activated with calcium chloride and thrombin.[7]

Apart from high platelet concentration, PRP also contains range of growth factors, chemokines, cytokines. The presence and absence of leucocytes and its activation may determine the type of PRP. Platelets contain alpha granules that is rich in various growth factors like vascular endothelial growth factors(VEGF), epidermal growth factors (EGF), platelet derived growth factors(PDGF), insulin like growth factor(IGF),transforming growth factor(TGF) and interleukin(IL) which helps in healing of injured tissue.[8]

Platelet number more is not necessarily better 1.5million/ul may be optimal above this has a catabolic effect.

A concentration of 1,000,000 platelets/μL has been suggested to be the working definition of PRP; this represents a platelet concentration five times higher than that of whole blood.[9]

Autologous platelet rich clots when administered in-vitro promote tendon healing by inducing cell proliferation and by angiogenesis promoting growth factors.[10]

Platelet rich plasma induce formation of matrix forming collagen type 1[COL3A1], cartilage oligomeric matrix protein (COMP), with no increase in MMP-3 and MMP-13.

There is paucity of well published literature on use of platelet rich plasma in common extensor tendon tear.

Based on clinical features, laboratory findings and ultrasound findings report a case of common extensor tendon tear treated with injection PRP which have shown complete healing of tear with only residual mild tendinosis.

Case Report

A 32 year old man pilot by profession presented to us in OPD with chief complaint of pain on left elbowsince1 year gradual in onset and progressive in nature and became aggravated for the last 2 months. Pain was radiating to upper left shoulder and downward to the forearm. Pain was present throughout the day but become worse with activity and maximum at the end of the day. The pain is of pin pricky and achy type around the elbow. Pain aggravated by gripping, elbow flexion and wrist extension and relieved on taking rest and pain killers. Not associated with any sensory symptoms. No radiation to the neck.

On physical examination: Pain on resisted wrist extension.

On palpation tenderness present as a painful lump in tendon few mm distal to lateral epicondyle

Active movements	Passive movements
Elbow flexion – ROM : 0-130 terminally painful	Full ROM
Elbow extension: terminal hyperextension painful	Full ROM
Pronation 0-80 Supination 0-90 Grip: weak and painful	Full ROM

Investigation

Routine baseline investigation was done which includes hemogram, KFT and LFT and they were within the normal limits.

X-ray of elbow was normal.

Ultrasound findings

Figure 1: Pre-Procedure Tear in Common Extensor Tendon: frank 4mm tear of i.e. showed a hypoechoic swelling of tendon with focal interruption of internal fibrillar pattern and soft tissue indentation.

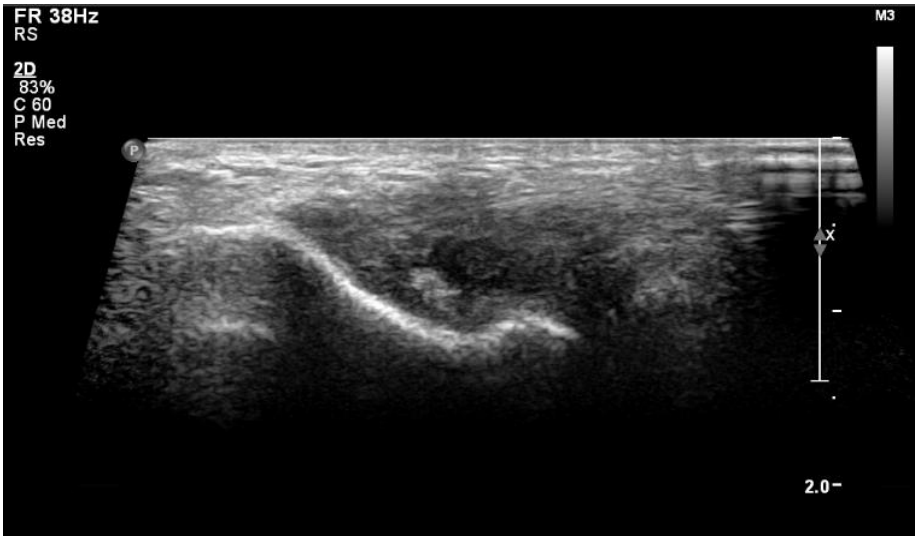


Figure 2: PRP being injected into the tear

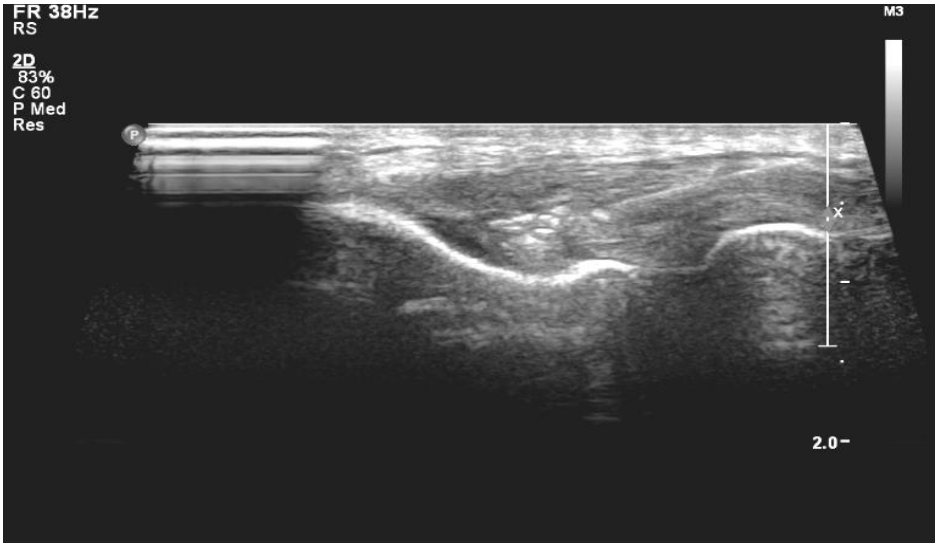


Figure 3: 2nd Image of PRP being injected into the tear

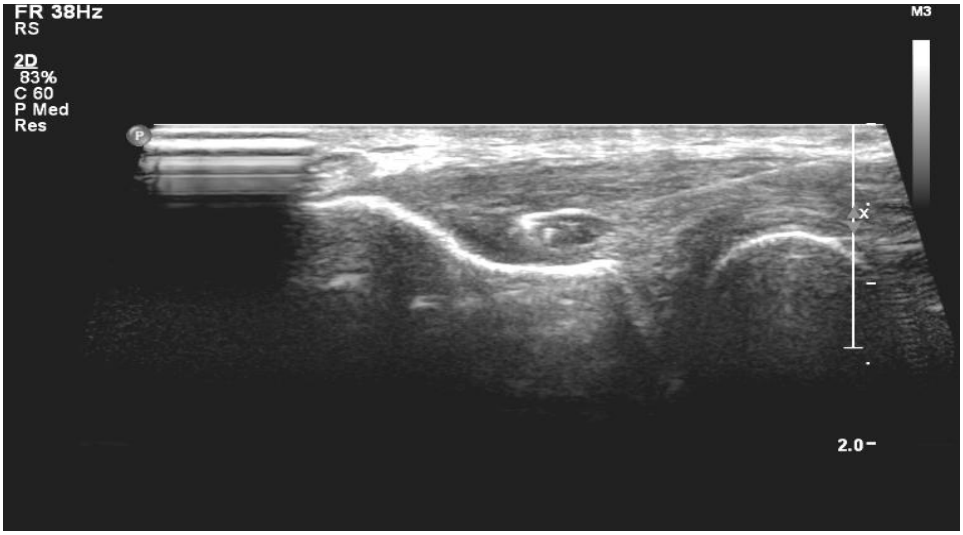
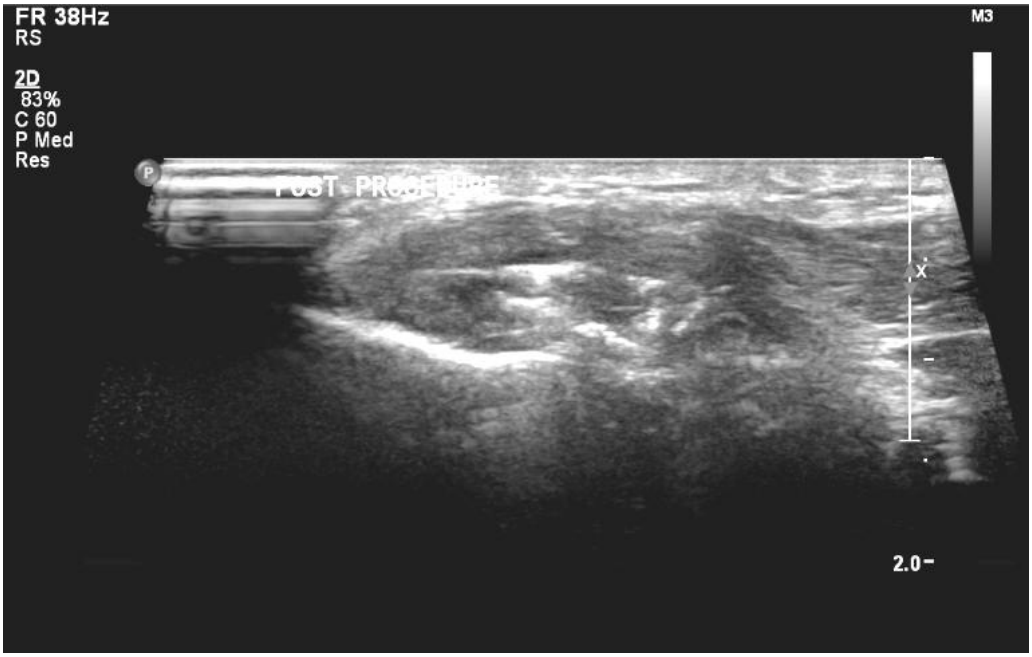


Figure 4: Post Procedure USG :PRP in tear



Patient was treated with 3 Injection of PRP in 4 weekly intervals. Patient was followed up in 3-4 weekly intervals and his VAS score was noted in each visit and after 4 months of follow up patient had shown significant recovery with decrease in VAS and improvement in grip i.e. up to full strength.

Ultrasound was repeated after 4 and 6 months of post procedure to see for healing and showed decrease in size of tear with healing and only mild residual tendinosis of common extensor tendon

Figure 5: Post injection follow up:
Common Extensor tendon width -5.5mm
Tear Size : 1x 1.5mm

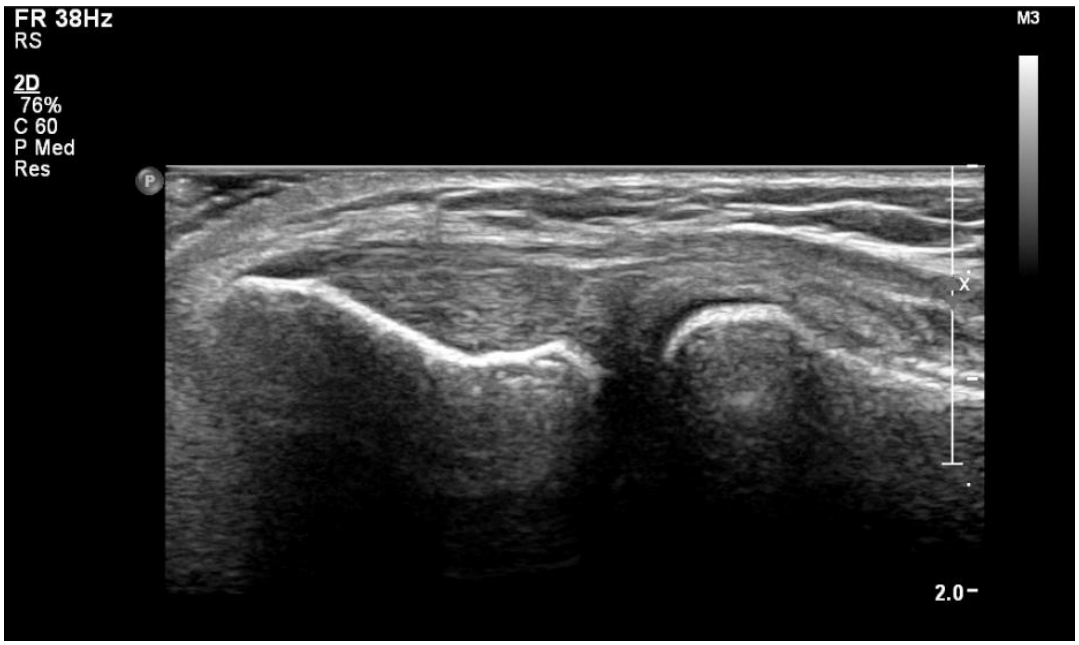
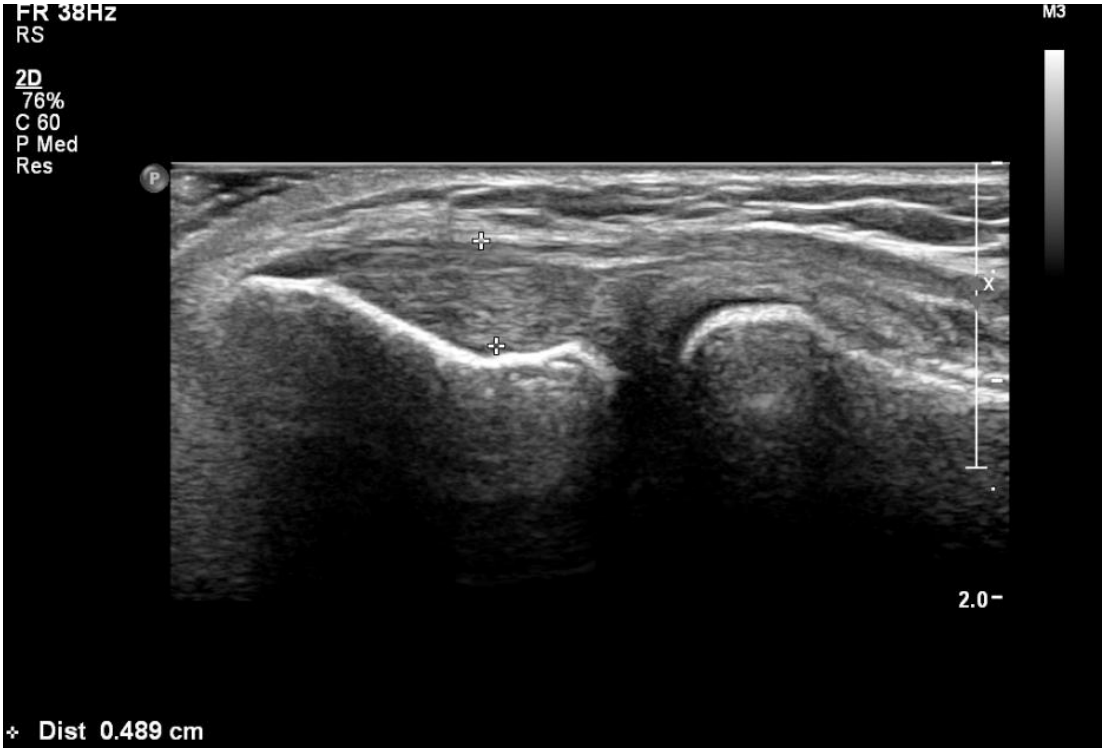


Figure 6: 4 months follow up: No tear, only mild tendinosis



Discussion

Rupture of elbow tendons very rare. If happened they mainly affect extensor as compared to flexor and biceps and triceps.[12]

The most common pathology associated with common extensor tendon is lateral epicondylitis.[13,14]

It is characterized by loss of the normal tendon structure showing myxoid and hyaline degeneration, angiofibroblastic proliferation, fibrosis and calcifications. These changes cause the tendon to lose its elasticity and become easily damaged.[15,16]

Ultrasound imaging of elbow is a low cost non invasive approach to evaluate dynamic overview of pathology in tendon, ligaments and nerve. The elbow ultrasound is indicated for revealed a 4mm tear of common extensor tendon with hypoechoic foci with loss of internal fibrillar pattern.(Fig 1).[15]

Platelet rich plasma stimulate the healing by clot formation. Thrombin at the site of bleeding causes platelet aggregation and activation, resulting in the release of α-granules, which contain growth factors that stimulate the inflammatory cascade and healing.[17]

The interactions of these growth factors are responsible for the healing response, promoting chemotaxis, cell proliferation, angiogenesis, and collagen synthesis.[18]

This case report is to highlight upon the fact that platelet rich plasma can be used in tendon tears as it has shown good improvement in terms of healing.

Clinicians should become aware of this therapy and more studies can be done in this.

References

1. Morrey B. Anatomy of the elbow joint. In: Morrey B, ed. The elbow and its disorders. Philadelphia, PA: Saunders, 1993:16–52].
2. Hume P.A., Reid D., Edwards T. Epicondylar injury in sport: epidemiology, type, assessment, management and prevention. Sport Med. 2006;36(2):151-170. [PubMed]
3. AG Smith, K K Kosygan, H Williams, R Newman. British Journal Of Sports Medicine.1999;33:423-425
4. Martinoli C., Bianchi S., Giovagnorio F., Pugliese F. Ultrasound of the elbow. Skelet Radiol.2001;30:605-614

5. Schwarz A. A Promising Treatment for Athletes, in Blood. The New York Times;2009.
6. David M. Dohan Ehrenfest, Lars Rasmusson, Tomas Albrektsson Department of Biomaterials, Institute of Clinical Sciences, The Sahlgrenska Academy at University of Gothenburg, Sweden volume 27, Issue 3, March 2009, Pages 158-67]
7. Mehta V. Platelet-Rich Plasma: A Review of Science and Possible Clinical Applications. ORTHOPEDICS. 2010; 33(2)
8. Andia I, Abate M: Platelet rich plasma: underlying biology and clinical corelates. Regen Med 2013;8;645-658].
9. Weibrich G, Kleis WK, Hafner G, Hitzler WE. Growth factor levels in platelet-rich plasma and correlations with donor age, sex, and platelet count. J Craniomaxillofacial Surg 2002; 30:97–102]
10. Anitua E, Andia I, Sanchez M, Azofra J, del Mar Zalduendo M, de la Fuente M, Nurden P, Nurden A. Autologous preparation rich in growth factors promote proliferation and induce VEGF and HGF production by human tendon cells in culture. J Orthop Res.2005;23:281-286.
11. Schnabel LV, Mohammed HO, Miller BJ, McDermott WG, Jacobson MS, Santangelo KS, Fortier LA. Platelet rich plasma(PRP) enhances anabolic gene expression pattern in flexor digitorum superficialis tendon.J Orthop Res.2007; 25:230-240.
12. G.Kachrimanis, O Papadopoulos J ultrasound. 2010 Jun; 13(2): 74-75.
13. Levin D., Nazarian L.N., Miller T.T. Lateral epicondylitis of the elbow: US findings. Radiology. 2005;237(1):230-234]
14. Hume P.A., Reid D., Edwards T. Epicondylar injury in sport: epidemiology, type, assessment, management and prevention. Sport Med. 2006;36(2):151-170.
15. Martinoli C., Bianchi S., Giovagnorio F., Pugliese F. Ultrasound of the elbow. Skelet Radiol. 2001;30:605–614.
16. Draghi F., Danesino G.M., De Gautard R., Bianchi S. Ultrasound of the elbow. J Ultrasound. 2007;10:85–92.]
17. Everts PA, Knape JT, Weibrich G, et al. Platelet rich plasma and platelet gel: a review. J Extra Corpor Technol 2006; 38:174–187]
18. Thanasas C, Papadimitriou G, Charalambidis C, Paraskevopoulos I, Papanikolaou A. Platelet-rich plasma versus autologous whole blood for the treatment of chronic lateral elbow epicondylitis: a randomized controlled clinical trial. Am J Sports Med 2011; 39:2130–2134]
19. Everts PA, Knape JT, Weibrich G, et al. Plateletrich plasma and platelet gel: a review. J Extra Corpor Technol 2006; 38:174–187]
20. Thanasas C, Papadimitriou G, Charalambidis C, Paraskevopoulos I, Papanikolaou A. Platelet-rich plasma versus autologous whole blood for the treatment of chronic lateral elbow epicondylitis: a randomized controlled clinical trial. Am J Sports Med 2011; 39:2130–2134]