CASE REPORT

Ultrasound-Guided Platelet-Rich Plasma Injection for the Treatment of Triangular Fibrocartilage Complex Injury: A Case Report on Efficacy and Outcomes

Md. Mosharaf Hossain[1], Md Mostafa Kamal[2], Ashraful Hoque[3]

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1. Anaesthesiologist, Department of Anaesthesia and Intensive Care Unit, National Institute of Cancer Research and Hospital, Dhaka.

2. Anaesthesiologist, Department of Anaesthesia, Intensive Care and Pain Medicine, Shaheed Suhrawardy Medical College and Hospital, Dhaka.

3. Assistant Professor, Department of Transfusion Medicine, Cumilla Medical College, Cumilla.

Correspondence
Md. Mosharaf Hossain
dr.mhpalash47@gmail.com

Abstract

Triangular fibrocartilage complex (TFCC) injuries are a common yet frequently overlooked cause of chronic wrist pain, particularly post-trauma. Non-surgical treatment options remain limited, but platelet-rich plasma (PRP) therapy has emerged as a promising alternative. This case report describes a 32-year-old male with chronic right wrist pain following a motorcycle accident. MRI confirmed a Type 1C TFCC injury. He received two sessions of ultrasound-guided PRP injections, which resulted in significant improvement in pain and function, as assessed by Patient-Rated Wrist Evaluation (PRWE) score. This case highlights the potential of PRP therapy as a safe, effective, and minimally invasive option for managing TFCC injuries.

Key words: Chronic wrist pain, Triangular fibrocartilage complex, Platelet rich plasma, Patient rated wrist evaluation

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Introduction

The triangular fibrocartilage complex (TFCC), located on the ulnar side of the wrist, plays a vital role in stabilizing the distal radioulnar joint (DRUJ) and distributing axial load across the ulnocarpal joint. It comprises the articular disc, dorsal and volar radioulnar ligaments, ulnolunate and ulnotriquetral ligaments, the extensor carpi ulnaris tendon sheath, and the meniscus homologue[1].

TFCC injuries, particularly from falls, rotational trauma, or repetitive microtrauma, are a common but underdiagnosed source of ulnar-sided wrist pain. The Palmer Classification is usually used to categorize TFCC injuries. Broadly 2 types of TFCC injury are described: class 1 is traumatic, and class 2 is degenerative. Each class is further subclassified into 1A, 1B, 1C, 1D, 2A, 2B 2C, 2D, and 2E according to the extent of injury[1,2].

Initial management is typically conservative, including immobilization, NSAIDs, and corticosteroid injections[1]. When these fail, surgery may be considered, although it can be invasive, costly, and not widely available, especially in resource-limited settings.

PRP, a concentration of autologous platelets in plasma, is rich in growth factors such as PDGF, TGF-β, VEGF, and IGF. These factors promote inflammation modulation, tissue regeneration, and angiogenesis. While PRP has shown efficacy in tendinopathies and ligament injuries, its application in TFCC pathology is still evolving[3-6]. Singh et al. (2020) reported the effectiveness of of PRP in TFCC tear in their preliminary report[7].

This case report explores the successful use of ultrasound-guided PRP injection in a chronic Type 1C TFCC injury, with substantial pain relief and functional recovery.

Case presentation

A 32-year-old male daily laborer from Naogaon, Bangladesh (non-diabetic, normotensive, body weight: 67 kg) presented with persistent right wrist pain for 16 months following a motorcycle accident. Pain was moderate to severe, aggravated by lifting, household chores, and wrist flexion/extension. Previous NSAID treatments offered only temporary relief. Physical examination revealed no swelling over the wrist joint, skin color and bony alignment were normal, TFCC compression and stress tests were positive. The press test and ulnar grind test elicited localized pain. There was no evidence of hypothenar hammer syndrome, ulnar carpal impingement, and extensor or flexor muscle tendonitis. X-ray of the wrist showed no fracture and/or dislocation of the radius, ulna and carpo-metacarpal bones. MRI of the right wrist revealed a Type 1C TFCC injury.

Patient-Rated Wrist Evaluation (PRWE) questionnaire was used to assess wrist pain and disability[8]. Baseline PRWE score was 72 (Pain: 43, Specific Activities: 34, Usual Activities: 24).

Case management

Patient was treated conservatively for several months and due to the patient's reluctance to undergo surgery, PRP therapy was chosen. For preparation of PRP the following protocol was used: 20 mL of blood was collected from the antecubital vein into a sterile tube containing 2 mL ACD. First centrifugation: 2000 rpm for 6 minutes, then supernatant plasma was aspirated, avoiding the buffy coat followed by second centrifugation: 3500 rpm for 3 minutes. Approximately 3–4 mL of PRP was injected into the TFCC region under ultrasound guidance. The patient was advised to rest the wrist and followed up with PRWE assessments at 4 and 8 weeks. Table I demonstrates the PRWE score before and after PRP. PRWE decreased from 72/100 to 48.5/100 and 28.5/100 after 4 weeks and 8 weeks, respectively.

Table I: PRWE score before and after PRP injection

Time Point	Pain (0-50)	(0-Specific Activities -20)	Usual Activities (0-30)	Total PRWE (0-100)
Baseline (Before PRP)	43	34	24	72
4 Weeks After 1st PRP	28	24	17	48.5
8 Weeks After 2nd PRP	18	13	8	28.5

Values were expressed as absolute number.

Discussion

Management of TFCC injuries including medications, physical therapy, and corticosteroid injections before advancing to surgical options varies. Surgical

option is considered if conservative treatment fails. For type 1C injury, debridement is a surgical option that induces bleeding to stimulate healing[1].

In this case, PRP therapy was chosen as an alternative to invasive surgical option. Because the mechanism of PRP therapy is rooted in the regenerative potential of platelet-derived growth factors, which stimulate angiogenesis, tenocyte proliferation, and extracellular matrix formation[3-6], processes essential for healing ligamentous-cartilaginous structures like the TFCC.

This case illustrates a successful outcome following two ultrasound-guided PRP injections in a patient with chronic Type 1C TFCC injury. The patient showed a 60% improvement in PRWE score, correlating with substantial pain relief and functional restoration.

Ultrasound guidance plays a critical role in accurate delivery, improving precision and reducing risks of damage to adjacent structures. Studies like Singh et al. (2020)[7] have highlighted symptomatic relief in TFCC injuries with PRP, although broader literature remains limited.

In low-resource settings, PRP offers a cost-effective and accessible solution compared to arthroscopic repair. However, limitations include a lack of standardized PRP protocols and short-term follow-up data.

Future randomized controlled trials with larger populations and longer follow-up periods are needed to validate these findings and establish treatment guidelines.

Conclusion

Ultrasound-guided PRP injection significantly reduced pain and improved wrist function in a patient with chronic TFCC injury. This case supports the potential utility of PRP as a minimally invasive and accessible alternative in resource-limited settings like Bangladesh. Larger studies are warranted to explore its role further and optimize protocols.

Declaration

Ethics approval

Ethics approval: Not applicable

Author contributions:

Conception and development of the idea: MMH, MMK
Data collection: MMH, AF
Data analysis: MMH, MMK, AH
Writing - Original draft preparation: MMH
Review & editing: MMH, MMK

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