



Case Report

Successful Healing of a Chronic Non-Healing Post-Total Knee Replacement Wound Using Merisis Platelet-Rich Plasma/Platelet-Rich Fibrin Matrix (PRP/PRFM) Therapy: A Case Report

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Citation: Bose S, et al. Successful Healing of a Chronic Non-Healing Post-Total Knee Replacement Wound Using Merisis Platelet-Rich Plasma/Platelet-Rich Fibrin Matrix (PRP/PRFM) Therapy: A Case Report. *J Surg Res Prac.* 2025;6(3):1-5.

<https://doi.org/10.46889/JSRP.2025.6312>

Received Date: 09-12-2025

Accepted Date: 24-12-2025

Published Date: 31-12-2025



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Abstract

Background: A non-healing wound following Total Knee Replacement (TKR), complicated by hospital-acquired infection with Methicillin-Resistant Staphylococcus Aureus (MRSA), is a major debilitating condition. In this study we discuss the use of Merisis Platelet-Rich Plasma (PRP) injections combined with Platelet-Rich Fibrin Matrix (PRFM) topical applications (Merisis PRP/PRFM, DiponEd Bio Pvt. Ltd.) to treat chronic non-healing post-TKR wounds.

Methods: A case study was conducted involving a 67-year-old female with type 2 diabetes mellitus and hypertension who developed a chronic, non-healing wound following right and left Total Knee Replacement (TKR), complicated by hospital-acquired infection with Methicillin-Resistant Staphylococcus aureus (MRSA).

Findings: Progressive healing was observed, with wound contraction, reduction of exudate and granulation tissue formation within two weeks. The treatment resulted in near-complete wound closure within six weeks of therapy, with normalization of inflammatory markers, significant pain reduction (VAS 2/10) and improved functional recovery.

Conclusion: The combined PRP/PRFM therapy promotes wound healing in patients suffering from chronic non-healing post-TKR wounds complicated by hospital-acquired infection. Merisis PRP/PRFM was demonstrated to be a safe and effective regenerative approach for the treatment of a chronic, non-healing post-TKR wound.

Keywords: Total Knee Replacement; Methicillin-Resistant Staphylococcus Aureus; Merisis Platelet-Rich Plasma (PRP); Platelet-Rich Fibrin Matrix (PRFM)

Abbreviations

CRP: C-Reactive Protein; EGF: Epidermal Growth Factor; ESR: Erythrocyte Sedimentation Rate; HbA1c: Glycated Hemoglobin; MRSA-Methicillin-Resistant Staphylococcus Aureus; PDGF: Platelet-Derived Growth Factor; PRFM-Platelet-Rich Fibrin Matrix; PRP: Platelet-Rich Plasma;

TGF- β : Transforming Growth Factor-Beta; TKR-Total Knee Replacement; VEGF: Vascular Endothelial Growth Factor; WBC: White Blood Cell Count

Introduction

Total Knee Arthroplasty (TKA), commonly referred to as Total Knee Replacement (TKR), is one of the most successful orthopedic surgical procedures to replace damaged or worn-out knee joint surfaces with the prosthetic metallic and plastic components [1]. Nevertheless, the advancement in surgical techniques, wound complication associated with post-operation remain as one of the most challenging factors among patients [2]. Extensive research on conservative method suggests that the chronic, non-healing post-TKR wound result in prolonged hospitalization and reduce the patient's quality of life [3,4] Additionally, non-healing post-TKR wound gets complicated on hospital-acquired infection with Methicillin-Resistant Staphylococcus Aureus (MRSA) [5]. The

infection associated with MRSA results in delayed healing and wound breakdown [6].

Post-TKR wounds can also be difficult to heal, as the knee joint is close to the surface, making the overlying skin and its blood supply more vulnerable [7]. As a result, non-healing post-TKR wound needs immediate medical attention, as it's a serious complication, potentially caused by infection or poor blood supply, which can lead to severe outcomes like the need for further surgery or even prosthesis removal [8]. The risk factors like diabetes, obesity and smoking are major factors that contribute to non-healing wound [9].

Accumulative evidence suggests that the combined therapy with Platelet-Rich Plasma (PRP) and Platelet-Rich Fibrin Matrix (PRFM) plays a promising role in the management of a chronic, non-healing surgical wound [10,11]. PRP and PRFM are autologous blood-derived therapies that promote wound healing by stimulating fibroblast proliferation [12,13]. The objective of our study is to investigate the effect of Merisis PRP/PRFM (DiponEd Bio Pvt. Ltd.) in a patient with chronic, non-healing wound following TKR, complicated by hospital-acquired infection with Methicillin-Resistant Staphylococcus Aureus (MRSA).

Methodology

Patient Profile

This is a single-patient case study describing the application of Platelet-Rich Plasma (PRP) and Platelet-Rich Fibrin Matrix (PRFM) therapy in the management of a chronic, non-healing surgical wound following total knee replacement (TKR). A 67-year-old female with a history of type 2 diabetes mellitus (15 years) and hypertension (20 years) underwent right and left TKR. The postoperative course was complicated by surgical site infection due to Methicillin-Resistant Staphylococcus Aureus (MRSA), leading to a non-healing wound. Conventional wound management, including debridement, antibiotics (culture-directed) and standard dressings, failed to achieve satisfactory healing over 10 weeks [14].

Baseline Laboratory and Clinical Findings

The wound of the patient was 8.5 x 4.0 cm, with a depth of 1.8 cm, 60% slough, 10% necrosis and 30% granulation. CRP, ESR, WBC and HbA1c were 85 mg/L, 72 mm/hr, 15,200/ μ L and 8.4%, respectively. The VAS pain score was 8/10.

Preparation of PRP/PRFM

According to the protocol of the Merisis PRP Kit, we collected 8 ml of peripheral blood from the patient and added it into the 10 ml PRP tube. After that, centrifuge this tube at 3500 rpm for 5 minutes and collect 2 ml of PRP (which will be above the gel barrier). On the other hand, according to the protocol of the PRFM Kit, we collected 18 ml of peripheral blood from patients by using a 20 ml syringe. 9 ml of blood were added into the Supercell tube and the remaining 9 ml of blood were added into the PRFM tube. Then centrifuged both the tubes at 3500 rpm for 5 min to collect the supercell (2-3 ml part above the gel) from the supercell tube into a 1 ml insulin syringe and for the PRFM tube, waited 5-10 min after centrifugation for the formation of a fibrin gel clot.

Clinical Course before PRP/PRFM

The postoperative course was complicated by non-healing wound with irregular margins, slough and persistent discharge despite debridement, antibiotics and dressings.

Timeline: 10 weeks of a non-healing, hospital readmission prolonged by 28 days.

Treatment Procedure

The wound was assessed weekly for three weeks. Wound measurements, pain scoring (VAS) and photographs were used to monitor healing. Blood collection and PRFM preparation were carried out immediately before application. PRP injected at wound margins. Before application of PRFM and supercells, we removed senescent or abnormal cells from the wound. The freshly prepared approximately 1-2 cm long PRFM was fenestrated using sterile forceps and scissors to be uniformly applied on a healthy wound, followed by application of a non-absorbable dressing [15]. Adequate rest was ensured during the treatment course to allow drainage of wound exudate, increase moisture and air exchange and improve intimate application to the wound bed. Supercell and a given activator were mixed and injected around the ulcer [16]. The secondary dressing of the patient and the dried PRFM were removed from the wound bed after a minimum of 5 days. The procedure was repeated every week for three weeks. After 1 week, there was depletion in the area and the volume of the ulcer. After three sittings of PRP and supercell

plus PRFM, the wound healed completely in six weeks. After sitting, photographs of the wound are taken and healing is assessed by measurements of the ulcer and volume of the wound. As a concurrent procedure, standard wound care has been taken, antibiotics tapered after two weeks and strict glycemc control maintained [17].

Results

The results suggest that at baseline (Week 0), the postoperative wound measured 8.5×4.0 cm (area: 34 cm^2) with a depth of 1.8 cm, irregular margins and heavy purulent exudate. Moreover, the laboratory investigations revealed markedly elevated inflammatory markers (CRP: 85 mg/L, ESR: 72 mm/hr, WBC: $15,200/\mu\text{L}$), consistent with ongoing infection and inflammation. Additionally, the patient reported severe pain (VAS 8/10) and discomfort during mobilization. The Fig. 1 illustrates the graphical representation of different parameters (wound size reduction, CRP level and pain score) upon post-PRP/PRFM therapy. Following two sessions of Merisis PRP/PRFM therapy (Day 14), a noticeable reduction in wound discharge and slough was observed. Healthy granulation tissue formation increased to approximately 55% and pain levels decreased (VAS 6/10). Correspondingly, inflammatory parameters improved (CRP reduced to 45 mg/L), indicating an early therapeutic response. The Fig. 2 represents image of patient with post TKR-Merisis PRP/PRFM therapy. By Day 28, there is 80% granulation tissue coverage, little serous leakage and a significant reduction in wound size to 6.0 cm^2 . The wound bed appeared healthier, the margins were distinct and there was no evidence of reinfection. Ongoing systemic improvement was indicated by the significant decrease in pain levels (VAS 4/10) and the drop in CRP to 25 mg/L. By Day 42 (6 weeks), nearly full epithelialization (approximately 95%) was achieved. The wound size had reduced to 0.5×0.3 cm (0.15 cm^2) with a depth of 0.1 cm, leaving only a fine scar line. CRP normalized to 12 mg/L and the patient reported minimal discomfort (VAS 2/10). Functional recovery was evident, as the patient resumed full weight-bearing ambulation and physiotherapy with significant improvement in quality of life. Table 1 describe the detailed overview of different wound parameters upon post-PRP/PRFM therapy. No adverse reactions or complications related to PRP/PRFM therapy were observed throughout the treatment course. The overall healing trajectory demonstrated progressive wound contraction, pain reduction and normalization of inflammatory markers, correlating with the clinical restoration of tissue integrity.

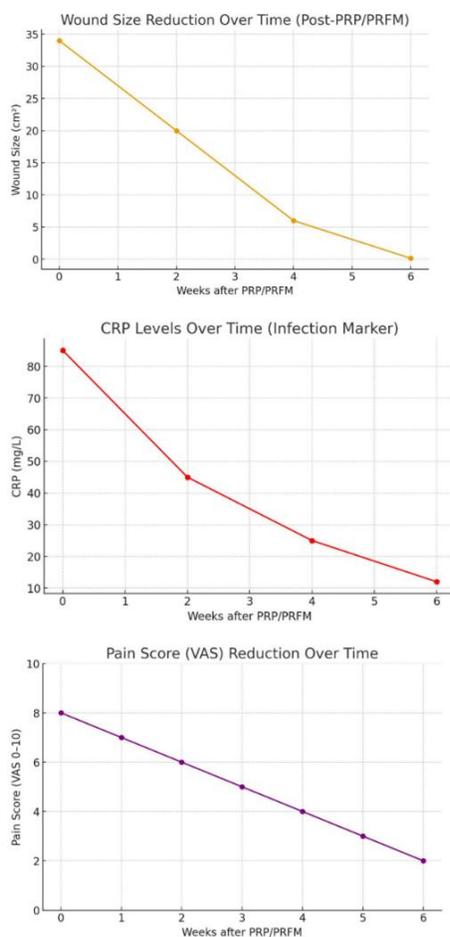


Figure 1: The graphical representation of wound size reduction, CRP level and pain score upon post-PRP/PRFM therapy.

Parameter	Pre-PRP/PRFM (Day 0)	Post-PRP/PRFM (Week 6)
Wound size	8.5 × 4.0 cm	0.5 × 0.3 cm
Wound depth	1.8 cm (muscle exposed)	0.1 cm
Wound bed	60% slough, 10% necrosis, 30% granulation	95% granulation, 5% epithelialization
Exudate	Heavy, purulent	Minimal serous
CRP	85 mg/L	12 mg/L
ESR	72 mm/hr	20 mm/hr
WBC	15,200/ μ L	7,800/ μ L
Pain (VAS)	08-Oct	02-Oct
HbA1c	8.40%	7.10%
Mobility	Unable to bear weight	Walking with support, resumed physiotherapy
Quality of life	Anxiety, poor sleep	Improved mood, resumed activities

Table 1: Improvement of different parameters in a chart format.



Figure 2: The image of patient with post TKR-Merisis PRP/PRFM therapy.

Discussion

PRP and PRFM provide a high concentration of autologous growth factors (PDGF, TGF- β , VEGF, EGF) and bioactive fibrin scaffolds that promote angiogenesis, collagen deposition and epithelialization [18]. In this case, Merisis PRP/PRFM therapy demonstrated remarkable healing in a complex surgical wound resistant to conventional management, with additional systemic benefits of reduced inflammation and improved glycemic control. The gradual reduction in the size of the wound, normalization of inflammatory markers and complete epithelialization within six weeks demonstrate the regenerative potential of autologous platelet-derived preparations in promoting soft-tissue repair [17]. The observed reduction in inflammatory markers such as CRP, ESR and WBC correlates findings from previous clinical trials [19]. The studies suggests that the PRP application reduced local inflammation through modulation of macrophage activity and cytokine balance [20]. Overall, our study suggest that Merisis PRP/PRFM contribute to be an autologous, safe and effective treatment option in a patient with chronic, non-healing wound following TKR, complicated by hospital-acquired infection with MRSA infection.

Conclusion

This case highlights the importance of Merisis PRP/PRFM therapy as a regenerative approach in managing complex post-surgical and non-healing wounds in high-risk patients. As the single-patient outcomes cannot be generalized, the larger clinical studies are warranted to validate these findings.

Conflict of Interest

The authors declare that there is no conflict of interest.

Funding

None

Informed Consent Statement

Informed consent was obtained from the participant involved in this study.

References

1. Kurtz S, Ong K, Lau E, Mowat F, Halpern M. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. *J Bone Joint Surg Am.* 2007;89(4):780-5.
2. Patel VP, Walsh M, Sehgal B, Preston C, DeWal H, Di Cesare PE. Factors associated with prolonged wound drainage after primary total hip and knee arthroplasty. *J Bone Joint Surg Am.* 2007;89(1):33-8.
3. Galat DD, McGovern SC, Larson DR, Harrington JR, Hanssen AD, Clarke HD. Surgical treatment of early wound complications following primary total knee arthroplasty. *J Bone Joint Surg Am.* 2009;91(1):48-54.
4. Saleh KJ, Hoeffel DP, Kassim RA, Burstein G. Complications after revision total knee arthroplasty. *J Bone Joint Surg Am.* 2003;85-A(Suppl 1):71-4.
5. Peel TN, Cheng AC, Buising KL, Choong PFM. Microbiological aetiology, epidemiology and clinical profile of prosthetic joint infections: Are current antibiotic prophylaxis guidelines effective? *Antimicrob Agents Chemother.* 2012;56(5):2386-91.
6. Trampuz A, Zimmerli W. Prosthetic joint infections: Update in diagnosis and treatment. *Swiss Med Wkly.* 2005;135(17-18):243-51.
7. Springer BD, Hanssen AD, Sim FH, Lewallen DG. The kinematic rotating hinge prosthesis for complex knee arthroplasty. *Clin Orthop Relat Res.* 2001;392:283-91.
8. Saleh KJ, Hoeffel DP, Kassim RA, Burstein G. Complications after revision total knee arthroplasty. *J Bone Joint Surg Am.* 2003;85-A(Suppl 1):71-4.
9. Singh Bedi J, Singh Chowdhary P. Assessment of risk factors for delayed wound healing after elective surgeries. *Int J Curr Pharm Rev Res.* 2025;17(5):791-6.
10. Marx RE. Platelet-rich plasma: evidence to support its use. *J Oral Maxillofac Surg.* 2004;62(4):489-96.
11. Dohan Ehrenfest DM, Rasmusson L, Albrektsson T. Classification of platelet concentrates: From pure platelet-rich plasma to leucocyte- and platelet-rich fibrin. *Trends Biotechnol.* 2009;27(3):158-67.
12. Ashour SH, Mudalal M, Al-Aroomi OA, Al-Attab R, Li W, Yin L. Effects of injectable platelet-rich fibrin and advanced platelet-rich fibrin on gingival fibroblast cell vitality, proliferation and differentiation. *Tissue Eng Regen Med.* 2023;20(7):1161-1172.
13. Miron RJ, Fujioka-Kobayashi M, Hernandez M. Injectable platelet-rich fibrin: Opportunities in regenerative dentistry? *Clin Oral Investig.* 2017;21(8):2619-27.
14. Koressel J, Perez BA, Minutillo GT, Granruth CB, Mastrangelo S, Lee GC. Wound complications following revision total knee arthroplasty: Prevalence and outcomes. *Knee.* 2023;42:44-50.
15. Filardo G, Di Matteo B, Di Martino A. Platelet-rich plasma intra-articular knee injections show no superiority versus viscosupplementation: A randomized controlled trial. *Am J Sports Med.* 2015;43(7):1575-82.
16. Sclafani AP. Platelet-rich fibrin matrix for improvement of deep nasolabial folds. *J Cosmet Dermatol.* 2010;9(1):66-71.
17. Meznerics FA, Fehérvári P, Dembrowszky F. Platelet-rich plasma in chronic wound management: A systematic review and meta-analysis of randomized clinical trials. *J Clin Med.* 2022;11(24):7532.
18. Dohan Ehrenfest DM, Bielecki T, Mishra A. In search of a consensus terminology in the field of platelet concentrates for surgical use. *Curr Pharm Biotechnol.* 2012;13(7):1131-7.
19. El-Sharkawy H, Kantarci A, Deady J. Platelet-rich plasma: growth factors and pro- and anti-inflammatory properties. *J Periodontol.* 2007;78(4):661-9.
20. Mariani E, Filardo G, Canella V. Platelet-rich plasma affects bacterial growth in vitro. *Cytotherapy.* 2014;16(9):1294-304.

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