Content available at: https://www.ipinnovative.com/open-access-journals

IP International Journal of Maxillofacial Imaging

Journal homepage: www.ijmi.in

Case Report

Injectable platelet-rich fibrin as a regenerative adjunct in implant-supported prosthetic rehabilitation: A case report

Preetika Bansal[1*], Pardeep Bansal[2], Ishita Vij[1], Tanvi Khanna[1], Parul Sharma[1], Harleen Kaur[1]

[1]Dept. of Periodontology and Oral Implantology, Dasmesh Institute of Research and Dental Sciences, Faridkot, Punjab, India
[2]Dept. of Prosthodontics, Dasmesh Institute of Research and Dental Sciences, Faridkot, Punjab, India

Abstract

Implant-supported prosthetic rehabilitation restores function and aesthetics with high predictability. This case report describes a 52-year-old female rehabilitated with implant-supported prostheses using injectable platelet-rich fibrin (i-PRF) as a regenerative adjunct. Clinical and radiographic evaluation guided implant placement in posterior maxilla and mandible, with i-PRF applied at surgical sites to enhance healing. Follow-up demonstrated uneventful recovery, stable soft tissue contours, and favourable osseointegration. The case highlights the adjunctive benefits of i-PRF in improving peri-implant tissue response and overall treatment outcomes.

Keywords: Implant-supported prosthesis, Injectable platelet-rich fibrin, Ortho-pantogram, Cone beam computed tomography, Bone regeneration.

Received: 12-07-2025; **Accepted:** 30-08-2025; **Available Online**: 30-09-2025

1. Introduction

The loss of teeth and subsequent occlusal disharmony can significantly impair mastication, phonetics, aesthetics, and overall quality of life. Implants in dentistry create opportunities to enhance the success of prosthetic rehabilitation by improving patient comfort and functional performance.[1] Extensive clinical experience spanning over three decades, supported by scientific evidence, has established implant-supported prosthetic rehabilitation as a reliable treatment modality with consistently high success rates.[2] When compared to removable prosthesis, implant-supported rehabilitations provide notable advantages, including enhanced occlusal stability and support, a more streamlined prosthetic design, and overall improvement in oral health.[3] A comprehensive approach requires careful evaluation of the patient's functional needs, aesthetic expectations, bone quality, and assessment of periodontal integrity and edentulous ridges, all of which are vital for the long-term success of implant-supported prosthetic reconstructions.[4] Treatment planning must be individualized, often involving an interdisciplinary strategy to achieve optimal results.

In recent years, platelet concentrates have emerged as a promising tool in periodontal regenerative therapy, largely because they are derived from the patient's own blood (autologous). Their regenerative capacity is attributed to the rich reservoir of growth factors stored within the granules of the platelets, which upon activation are released directly at the local treatment site thereby supporting natural healing and boneregeneration.[6] Recently, advancements such as injectable platelet-rich fibrin (i-PRF) have further supported implant rehabilitation by promoting faster healing and improved tissue regeneration. i-PRF contains a higher concentration of cells, including immune cells like leukocytes, which play an essential role in host defence and wound healing by releasing various growth factors, thus

*Corresponding author: Preetika Bansal
Email: dr_preetika_11@yahoo.co.in

https://doi.org/10.18231/j.ijmi.51250.1759222896

optimizing the regeneration and healing environment around implants.[2]

This case report presents the rehabilitation of a patient using implant-supported prostheses, augmented by regenerative techniques such as i-PRF to enhance hard tissue regeneration and optimise osseointegration, highlighting the clinical considerations, the treatment sequence, and the functional outcomes achieved through planning and execution.

2. Case Report

A 52-year-old female patient reported to the Department of Periodontology and Implantology, Dasmesh Institute of Research and Dental Sciences Faridkot Punjab, with the chief complaint of difficulty in chewing food. Detailed medical history was taken and was non-contributory.

Clinical examination revealed that in the 1st quadrant long span fixed dental prosthesis was present. In the 2nd quadrant short span edentulous area extending from #24-27 with a cantilever extending onto the #24 was noted. Bilaterally, edentulous areas were present in the posterior mandible along with a cantilever extending onto the #36. Preoperative Ortho-pantogram (OPG) & Cone beam computed tomography (CBCT) (**Figure 1**) was performed to evaluate the ridge dimensions prior to surgery, followed by diagnostic impressions and fabricating the study cast. Radiographic evaluation revealed afracture of the root of #13. Adequate residual bone height and width was available for implant placement. Following detailed clinical &radiographic assessment, a treatment plan was formulated. The rehabilitation process was planned in a sequential manner, commencing from the second and the third quadrants. The cantilever components in the respective quadrants were removed before prior to the surgery. Complete blood investigations were evaluated to eliminate any risk to the surgery. In accordance with ethical guidelines, the study's risks and benefits were communicated to the patient and written consent was taken prior to the surgery.

2.1. Procedure

The surgical procedure was performed under strict aseptic conditions and under local anaesthesia. Osteotomy sites were prepared using the standard sequential drilling protocol. Prior to implant placement, i-PRF was prepared by collecting 10 ml of the patient's venous blood in a plainvacutainer, which was immediately centrifuged at 800 rpm for 3 minutes (**Figure 2**). The cleari-PRF layer obtained at the top was aspirated with a syringe (**Figure 3**) and carefully applied into the prepared implant site. The implants were then placed (**Figure 4**A & B) with cover screw and the site was sutured. Postoperatively, the patient was instructed to maintain proper oral hygiene, prescribed necessary medications. A soft diet was recommended for the remainder of the healing phase.

Suture removal was done after 7 days. Postoperative healing was uneventful, with no signs of infection. After 3 months, patient was recalled for 2nd stage implant surgery, where in the implants were uncovered and gingival formers (healing cap) were placed for7-10 days, allowing adequate gingival cuff formation and proper emergence profile. Considering the limited interocclusal space, root canal therapy was done for #34 and #35. Following satisfactory gingival cuff formation, the gingival formers were replaced with abutments, and digital impressions were taken to accurately capture of both implant positions and adjacent dentition. The prosthetic phase was then completed with fabrication of the final restoration (PFM).The patient will be recalled for the second phase of treatment, which will involve the rehabilitation of the first and fourth quadrants. Oral hygiene instructions were given to patient and scheduled recall visits explained.[10]

Follow-up evaluations for crestal bone loss (CBL) were carried out using post op OPG and CBCT at 3 and 6 months (**Figure 5**). Clinical examination revealed stable soft tissue architecture. Radiographs demonstrated reduced marginal bone loss at 6 months in contrast to 3 months.

Figure 1: Pre-operative OPG

Figure 2: Patients blood immediately after centrifugation

Figure 3: Injectable platelet rich fibrin aspirated in the syringe

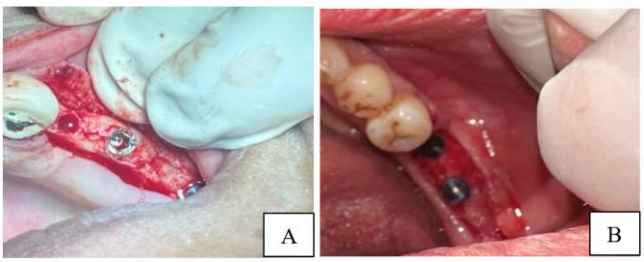

Figure 4: A): Implants placed at the osteotomy site of second quadrant; **B)**: Implants placed at the osteotomy site of second quadrant

Figure 5: Post-operative

3. Discussion

Oral rehabilitation represents a notable clinical challenge, necessitating an exacting and coordinated workflow that typically involves multiple dental specialties. The patient's inability to adequately masticate was attributable to the absence of teeth, resulting in functional deficiency and impaired quality of life.

Since bone formation largely depends on osteoblast activity, agents that stimulate extracellular matrix (ECM) deposition can, in turn, promote and enhance new bone formation.[7] Furthermore recent studies have observed that the reduced centrifugation speeds retain a greater concentration of cells, particularly leukocytes, prior to fibrin clot formation.[5] The biological advantages of i-PRF likely contributed to the favourable soft tissue health, accelerated bone regeneration and absence of complications observed in this case.[2] It was thus postulated that i-PRF may facilitate a sustained and prolonged release of growth factors extending beyond 10 days, in contrast to Platelet rich plasma, which is typically resorbed and rendered ineffective within that timeframe.[8] Evidences from variety of clinical studies have demonstrated that i-PRF supports bone regeneration in a variety of situations, including maxillary sinus lift procedures, healing of extraction-site defects, and repair of fractures.[9]

Post-operative assessment revealed healthy, stable soft tissue adaptation around all implants. Restoration of masticatory ability to the affected side was successfully achieved, with the patient reporting marked improvement in oral function and comfort.

3.1. Interdisciplinary approaches in the case

Periodontology and oral implantology: The posterior teeth were restored with implants along with enhanced bone regeneration with i-PRF. Endodontics: The premolars in the third quadrant were treated endodontically to preserve the natural dentition and maintain functional support for the final prosthesis. Prosthodontics: Instead of conventional impressions, digital impressions were employed to capture the prepared teeth and implant positions with high precision. This technology ensured- accurate registration of both tooth- and implant-supported sites, seamless integration into CAD/CAM workflow for prosthesis design and fabrication, improved patient comfort by eliminating conventional impression materials, reduced chairside time and fewer adjustments during prosthesis delivery. The prosthesis fabricated via CAD/CAM ensured precise fit, functional stability, and enhanced aesthetics. Oral Medicine & Radiology: OPG offering a panoramic overview, while CBCT provides detailed 3D visualization, together enhancing diagnosis and treatment planning.

Overall, this case highlights the importance of a comprehensive, interdisciplinary, and biologically guided approach in oral rehabilitation.

4. Conclusion

The present case demonstrates the successful use of an interdisciplinary approach where i-PRF played a pivotal role. The use of injectable platelet-rich fibrin (i-PRF) as a regenerative adjunct further supported healing by promoting accelerated soft tissue repair and bone regeneration around the implant sites.

5. Source of Funding

Nil.

6. Conflicts of Interest

There are no conflicts of interest.

References

1. Yao CJ, Cao C, Bornstein MM, Mattheos N. Patient-reported outcome measures of edentulous patients restored with implant-supported removable and fixed prostheses: a systematic review. *Clin Oral Implants Res*. 2018;29 Suppl 16:241–54. https://doi.org/10.1111/clr.13286.
2. El Komi A, Abd Elkarim H. Clinical outcome of an injectable platelet-rich fibrin and platelet-rich plasma on immediate dental implant. *Tanta Dent J*. 2021;24(4):417–24.
3. Monteiro DR, Silva EVF, Pellizzer EP, Filho OM, Goiato MC. Posterior partially edentulous jaws, planning a rehabilitation with dental implants. *World J Clin Cases*. 2015;3(1):65–76. https://doi.org/10.12998/wjcc.v3.i1.65.
4. Cociuban CLM, Maghiar TT, Olariu I, Vasca EM, Berari AR, Pasca C, et al. Clinical-statistical study on oral rehabilitation methods using dental implants. *Med Pharm Rep*. 2024;97(3):398–404. https://doi.org/10.15386/mpr-2772.
5. Ghanaati S, Booms P, Orlowska A, Kubesch A, Lorenz J, Rutkowski J, et al. Advanced platelet-rich fibrin: a new concept for cell-based tissue engineering by means of inflammatory cells. *J Oral Implantol*. 2014;40(6):679–89. https://doi.org/10.1563/aaid-joi-D-14-00138.
6. Marrelli M, Tatullo M. Influence of PRF in the healing of bone and gingival tissues. Clinical and histological evaluations. *Eur Rev Med Pharmacol Sci*. 2013;17(14):1958–62.
7. Wu CL, Lee S-S, Tsai CH, Lu KH, Zhao JH, Chang YC. Platelet-rich fibrin increases cell attachment, proliferation and collagen-related protein expression of human osteoblasts. *Aust Dent J*. 2012;57(2):207–12. https://doi.org/10.1111/j.1834-7819.2012.01686.x.
8. Miron RJ, Fujioka-Kobayashi M, Hernandez M, Kandalam U, Zhang Y, Ghanaati S, et al. Injectable platelet rich fibrin (i-PRF): opportunities in regenerative dentistry? *Clin Oral Investig*. 2017;21(8):2619–27. https://doi.org/10.1007/s00784-017-2063-9.
9. Costa FR, de Souza SAL, Martins RA, Costa BR, Pires L, de Macedo AP, et al. The role of injectable platelet-rich fibrin in orthopedics: where do we stand? *Curr Issues Mol Biol*. 2025;47(4):239. https://doi.org/10.3390/cimb47040239.
10. Bansal P, Dhanya M, Bansal P, Singh H, Shanta A. Dental implant maintenance-how to do and what to do. A review. *J Adv Med Dent Sci Res*. 2019;3:24–9. https://doi.org/10.21276/jamdsr.

Cite this article: Bansal P, Bansal P, Vij I, Khanna T, Sharma P, Kaur H. Injectable platelet-rich fibrin as a regenerative adjunct in implant-supported prosthetic rehabilitation: a case report. *IP Int J Maxillofac Imaging*. 2025;11(3):101–104.