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## **Attached gingiva augmentation before implant placement using injectable-platelet rich fibrin and collagen membrane: A case report**

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### **Abstract**

The aim was to observe the gain in keratinized tissue width using apically positioned flap (APF) along with injectable- platelet rich fibrin (i-PRF) and collagen membrane. Keratinized gingiva around dental implants may enhance aesthetics, facilitate restorative procedures and plaque control. Tissue engineering materials have recently gained popularity in periodontal plastic surgeries because autogenous grafts are associated with significant patient morbidity. In the patient-centered era, minimally invasive patient friendly technique to augment keratinized gingiva should be developed. Fifty-four years old systemically healthy female patient was referred from department of prosthodontics for keratinized gingiva reconstruction. APF along with collagen membrane soaked in i-PRF was performed and followed-up for 3 months. Keratinized tissue width increased from 1mm preoperatively to 3mm after 4 weeks of surgery. This augmented width remains stable up to 3 months of follow-up i-PRF along with collagen membrane could be a promising technique to augment keratinized gingiva.

**Keywords:** Aesthetics, connective tissue, injectable-platelet rich fibrin

### **Introduction**

Long-term success of dental implants rely on healthy periodontal tissue. Studies have revealed that patients might experience discomfort and pain during daily oral hygiene procedures at implant sites having inadequate keratinized gingiva (<2 mm) <sup>[1, 2]</sup>. A study found negative correlation between less keratinized gingiva (<2mm) and gingival recession. Furthermore, inadequate keratinized gingiva was also associated with higher plaque index, bleeding on probing, and more marginal bone loss <sup>[3]</sup>.

According to Meffert *et al.*, keratinized gingiva reconstruction should be performed prior to implant placement <sup>[4]</sup>.

Various surgical techniques to augment keratinized tissue width includes: apically positioned flap (APF), free gingival graft (FGG), pedicle grafts and connective tissue graft (CTG). However, these techniques are associated with significant patient morbidity i.e. wound at palatal donor site. To overcome patient morbidity, tissue engineering materials platelet rich plasma (PRP), and platelet-rich fibrin (PRF) are recently being used. Injectable- platelet rich fibrin (i-PRF) is a platelet concentrate in a liquid formulation. As compared to PRF, it has higher expression of PDGF, transforming growth factor (TGF- $\beta$ ), regenerative cells, and type-1 collagen <sup>[5]</sup>. Al-Maawi, *et al.* analyzed histologically the combination of an autologous i-PRF with xenogeneic collagen-based biomaterials and found that i-PRF could be used as a drug delivery system to support GTR <sup>[6]</sup>.

Therefore, to reduce patient morbidity and accelerate soft tissue wound healing, in this case report APF along with i-PRF and collagen membrane has been attempted to augment keratinized gingiva.

### **Case Description**

A 54-years old systemically healthy, non-smoker female patient was referred to the department. She has been evaluated for the placement of implant supported dental prosthesis in the department of Prosthodontics but they found insufficient attached gingiva in relation to edentulous site. Clinical examination revealed missing left mandibular premolars and molars.

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Keratinized tissue width was 1mm at edentulous site (Figure-1). Thorough scaling and root planning was performed and APF along with i-PRF and collagen membrane was planned to augment keratinized tissue width before implant placement after obtaining written and informed consent.

After achieving local anaesthesia, horizontal incision was made with #15blade slanted in an apical direction at approximately a 25 degree to create internal bevel. Vertical incisions were made at the distal aspect of 33 and distal to 36 to join the first incision (Figure 2). The flap was raised.

For thei-PRF preparation, a tourniquet was tied around the arm of the patient. 10 mL whole blood was collected by venepuncture of the antecubital vein. The collected blood was centrifuged at 700 rpm for 3 minutes (Miron RJ) at room temperature in restriction enzyme-mediated integration laboratory centrifuge machine. At the top layer, i-PRF formed was instantly collected into a 2 mL syringe with a 25-gauge needle. Then, commercially available collagen membrane (HEALIGUIDE, Advanced Biotech Products, India) was trimmed according to the recipient surgical site and soaked into i-PRF for 10 minutes in a steel bowl and placed at recipient site with the help of tissue forceps. Collagen membrane was secured using 4-0 vicryl sutures (Figure-3).

Post-operative instructions were given and Amoxicillin (Almox, Alkem laboratories, India) 500mg 3/dayx5days, Ibuprofen (Brufen, Abbott, India), 400mg 3/dayx3days and 0.2% chlorhexidine (0.2% Hexidine, ICPA Health Product Ltd, India) mouthwash twice dailyx14days were prescribed. Patients were advised not to use mechanical means of plaque control until suture removal. The sutures were removed after 14 days. Postoperative healing was uneventful and no complications were observed.

Patient was recalled for examination at 1 month (Figure-4) and subsequent at 3 months following surgery (Figure-5). Keratinized tissue width was recorded using UNC-15 periodontal probe, from gingival margin to the mucogingival junction (MGJ) at buccal aspect.

## Result

Four weeks following surgery, adequate keratinized tissue width of 3mm was gained. Gain in keratinized tissue width remained stable upto 3 months of follow-up.

## Discussion

Dental implant success not only depends on the Osseo integration between implant and bone, but also depends on the soft tissue condition around the dental implant. Earlier, the criteria for implant success was based on immobility, absence of peri-implant radiolucency, alveolar bone loss less than 0.2mm annually after first year of implant and absence of pain, discomfort and infection. Recently, implant success is assessed by a lot of others factors also. These include: width of the attached gingiva, width of dental implant, smoking, medical condition, genetic and immunological factors [7].

The keratinized gingiva augmentation around dental implants has been done to enhance aesthetics, to facilitate restorative procedures and plaque control [8]. In the present case, APF along with collagen membrane and i-PRF was used. According to Basegmez *et al.*, APF increases keratinized tissue by 1.15 mm at 1 year after surgery [9]. However, the result was unstable because of severe postoperative tissue contraction. To prevent tissue contraction, clinicians attempted to combine APF with FGG or CTG. Shortcomings associated with autogenous grafts are limited auto graft tissue, second surgical area, risks of pain and infection, texture and

color difference at recipient site. Currently, xenogenic collagen membranes are used extensively as soft tissue substitutes. Collagen membrane is semipermeable membrane. It promotes wound healing through clot stabilization and enhance primary wound coverage via its chemotactic ability to attract fibroblasts. Collagen membrane guides the growth of keratinized tissue cells and fibroblasts from the edge to center by using its unique 3D scaffold. A case report by YuHan, *et al.* demonstrated peri-implant keratinized tissue width reconstruction from 0.5mm to 4mm, utilising collagen membrane alongwith PRF [10]. i-PRF is the most recent and successful advancement in PRF. The advantage of i-PRF includes constant release of growth factors, promotes cell migration, the expression of type I collagen and transforming growth factor.

## Figure Legends



**Fig 1:** Image showing pre-operative keratinized tissue width of 1mm at edentulous site.



**Fig 2:** Image showing apically positioned flap raised.



**Fig 3:** Image showing collagen membrane soaked in i-PRF secured with sutures.



**Fig 4:** One month of follow-up, keratinized tissue width of 3mm gained



**Fig 5:** Image showing stability in gained keratinized tissue width at 3months of surgery

### Conclusion

APF combined with collagen membrane and i-PRF, was attempted to augment keratinized tissue width in the posterior mandible, and the outcomes were satisfactory. The width of keratinized gingiva increased from 1 mm to 3mm. This case report suggests, apically positioned flap along with collagen membrane soaked in i-PRF could be a promising technique to augment keratinized tissue width.

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Author deny any conflict of interest.

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Not available

### References

1. Souza AB, Tormena M, Matarazzo F, Araujo MG. The influence of peri-implant keratinized mucosa on brushing discomfort and peri-implant tissue health. *Clin Oral Implants Res.* 2016;27:650-655.
2. Perussolo J, Souza AB, Matarazzo F, Oliveira RP, Araujo MG. Influence of the keratinized mucosa on the stability of peri-implant tissues and brushing discomfort: a 4-year follow-up study. *Clin Oral Implants Res.* 2018;29:1177-1185.
3. Adibrad M, Shahabuei M, Sahabi M. Significance of the width of keratinized mucosa on the health status of the supporting tissue around implants supporting overdentures. *Journal of Oral Implantology.* 2009

Oct;35(5):232-7.

4. Meffert RM, Langer B, Fritz ME. Dental implants: a review. *Journal of periodontology.* 1992 Nov;63(11):859-70.
5. Miron RJ, Fujioka-Kobayashi M, Hernandez M, Kandalam U, Zhang Y, Ghanaati S, Choukroun J. Injectable platelet rich fibrin (i-PRF): opportunities in regenerative dentistry?. *Clinical oral investigations.* 2017 Nov;21(8):2619-27.
6. Al-Maawi S, Herrera-Vizcaíno C, Orłowska A, Willershausen I, Sader R, Miron RJ, *et al.* Biologization of collagen-based biomaterials using liquid-platelet-rich fibrin: new insights into clinically applicable tissue engineering. *Materials.* 2019 Dec 2;12(23):3993.
7. Pappaspyridakos P, Chen CJ, Singh M, Weber HP, Gallucci GO. Success criteria in implant dentistry: a systematic review. *Journal of dental research.* 2012 Mar;91(3):242-8.
8. Barone R, Clauser C, Grassi R, Merli M, Prato GP. A protocol for maintaining or increasing the width of masticatory mucosa around submerged implants: a 1-year prospective study on 53 patients. *Int J Periodontics Restorative Dent* 1998;18:377-387.
9. Basegmez C, Ersanli S, Demirel K, Bölükbaşı N, Yalcin S. The comparison of two techniques to increase the amount of peri-implant attached mucosa: free gingival grafts versus vestibuloplasty. One-year results from a randomised controlled trial. *Eur J Oral Implantol.* 2012;5:139-145.
10. Han CY, Wang DZ, Bai JF, Zhao LL, Song WZ. Peri-implant keratinized gingiva augmentation using xenogeneic collagen matrix and platelet-rich fibrin: A case report. *World Journal of Clinical Cases.* 2021 Dec 12;9(34):10738.

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