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# SURGICAL RECONSTRUCTION OF LOST INTERDENTAL PAPILLA: TWO CASE REPORTS

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## Abstract

Black triangles or absence of interdental papillae (IDP) is one of the most important steps of decision-making process of clinicians. The IDP may be lost or reduced in height due to various reasons, which gives an unaesthetic appearance when the patient smiles. The shape of the IDP between the teeth is determined by three important aspects - contact relationship, the width of the proximal tooth surfaces, and the course of the cemento-enamel junction (CEJ). The loss of IDP creates esthetic and phonetic problem and may also lead to food impaction. Orthodontic, prosthetic and restorative procedures are the non-surgical approaches that can modify interproximal spaces. The surgical technique aims to re-contour, preserve and reconstruct the soft tissue between the teeth. There are three surgical techniques used for papilla reconstruction, namely Beagle 1992, Han and Takei 1996 and Azzi et al. 1998. In one case, pouch technique (Han and Takei) using Collagen membrane was performed for papilla reconstruction and in the other case T-PRF was placed.

## INTRODUCTION

Aesthetic dentistry is fueled by enchantment, generating compliments, obsession and popularity. A victorious aesthetic procedure regains the patient's self-confidence, resuscitate social skills and knowledge. Restoration of lost teeth in association with aesthetic dentistry involves the management and reconstruction of the encasing gingiva.[1] The interdental papilla is a component of the gingiva which is present between the proximal surfaces of the teeth occupying the cervical embrasure space which extends to fill the lingual, buccal, and occlusal pyramidal space of the interdental space.[2]

The loss or absence of interdental papilla could also be a result of gingival inflammation, attachment loss, and interproximal bone resorption. The foremost common cause being loss due to plaque accumulation also as abnormal tooth shape or traumatic oral hygiene.[3,4]

The Presence or absence of the IDP primarily depends upon the space between the interdental contact point and therefore the interproximal crest of bone that's alleged to be 5mm.[5] Periodontal surgical procedures like soft tissue grafting, connective tissue graft/ free gingival grafts, use of enhanced conservative new mucoperiosteal flap designs, and methods to enhance soft tissue topography with/without GTR/GBR, enhanced regeneration of lost interdental hard and soft tissue.[6] Additive materials like Platelet Rich Fibrin (PRF) as a membrane, etc. have also proven their efficacy.[7]

To gain aesthetics reconstruction and regeneration of lost interdental papilla is the aim of the periodontal surgeons. Such deformities in the interproximal areas can be treated by various non-surgical and surgical techniques such as prosthetic covering, periodontal surgeries, orthodontic teeth alignment or combination of all.[8] The non-surgical procedures modify the interproximal space whereas the surgical approaches recontour, preserve and regenerate the soft tissue between the interproximal spaces.[9]

Limited success has been achieved with surgical procedures like free gingival grafts, interproximal curettage, or displacement of the interproximal palatal tissue due to the shortage of blood supply to the graft tissue.[10]

Reconstruction of the lost interdental papilla shares an equivalent principle of healing on which the subepithelial connective tissue graft for root coverage and ridge augmentation are based, henceforth increasing both the success rate and predictability of the procedure.[11]

## Case Reports

### Case 1

A 35-year-old female patient came to the Outpatient Department of Periodontology & Implantology, Subharti Dental College & Hospital, Swami Vivekanand Subharti University, Meerut, Uttar Pradesh, with the chief complaint of black space between the upper front tooth and the gum region since 6 months.

On clinical examination, class I papillary loss between both the maxillary central incisors was found (Fig-1). Clinical evaluation was done using UNC-15 periodontal probe and the distance from the contact point to the bone crest came out to be 5 mm.

No bone loss was revealed on radiographic examination hence, only soft tissue deficiency was observed. Therefore, complete papilla reconstruction was anticipated.

Informed consent was taken after explaining the procedure followed by phase I therapy and oral hygiene instructions. Immediately prior to the surgical procedure, the patient was instructed to rinse with 0.2% chlorhexidine digluconate solution for 30 seconds.After administration of local anaesthesia (2% lignocaine with 1:80000 adrenaline), a split thickness semilunar incision was performed 3 mm apically from the mucogingival junction facial to the interdental area, and a pouch-like preparation was performed into the interdental area. Intrasulcular incisions were made round the neck of the adjacent teeth extending from the buccal to the palatal surface, to release the connective tissue attachment from the root surface and to permit coronal displacement of the gingival-papillary unit (Fig-2).

A membrane was placed on the recipient site and was then pushed coronally to support and provide bulk to the coronally positionedinterdental tissue (Fig.4). Flap was stabilised using 5-0 black silk sutures and composite stops were placed. (Fig.5).

The patient was prescribed antibiotics and analgesics and 0.2% chlorhexidine digluconate mouthwash twice daily for two weeks with no mechanical cleaning of the surgically treated area.
2 weeks after the procedure suture removal was done and satisfactory healing was found.The patient was reviewed weekly for 1 month, then monthly for 6 months post-operatively. Normal anatomy and shape of the IDP was maintained till 6 months with complete reconstruction of the papilla (Fig.6).

### Case 2

A 37-year-old male patient came to the Outpatient Department of Periodontology & Implantology, Subharti Dental College & Hospital, Swami Vivekanand Subharti University, Meerut, Uttar Pradesh,

with the chief complaint of black space between the upper front tooth and the gum region since 6 months.

On clinical examination, class I papillary loss between both the maxillary central incisors was found (Fig-1). Clinical evaluation was done using UNC-15 periodontal probe and the distance from the contact point to the bone crest came out to be 5 mm.

A recipient site was created with similar surgical procedure as described in Case 1 and it was decided to place T-PRF in that surgical site and finally 5-0 silk sutures were placed with composite stops. The patient was prescribed with antibiotics and analgesics and 0.2% chlorhexidine digluconate mouthwash twice daily fortwo weeks with no mechanical cleaning of the surgically treated area.

2 weeks after the procedure suture removal was done and satisfactory healing was found. The patient was reviewed weekly for 1 month, then monthly for 6 months post-operatively. Normal anatomy and shape of the IDP was maintained till 6 months with well healed papilla showing Triangular shape.

## DISCUSSION

Black triangles within the anterior region of teeth are some extent of aesthetic concern. Several nonsurgical and surgical techniques are proposed to supply acceptable interdental papilla reconstruction.[12]

The distance from the bottom of the contact area to the crest of bone depends on the presence or absence of the interproximal papilla and if it's 5 mm or less, the papilla could also be reconstructed surgically.[13] If the space between the interproximal papilla is quite 5mm, restorative therapy play a crucial role within the reconstruction of the papilla by adding restorative material therein space. Soft tissue grafting of minimal size to a little recipient site is unpredictable due to minimal blood supply from the recipient site to the donor site, both of which have minimal contact because of their size.[14] The lost papilla is often re-created by surgical means that involves the principle of ample blood supply to the newly created tissue. Therefore, semilunar incision along with coronal displacement of entire gingivopapillary unit, with autologous graft may be a most predictable method in reconstructing a lost gingival papilla. Thus, the technique utilized in this study to reconstruct the interdental papilla offers successful results.[12]

Arunachalam *et al.*[13] and Tomar *et al.*[11] reported complete papilla fill in the interproximal embrasure after reconstruction of IDP with PRF. They further quoted that the use of PRF in IDP reconstruction promotes wound healing and hemostasis.

Semilunar incision allows coronal displacement without creating tension and prevents gingiva from rebounding back to its original position of the gingivopapillary unit keeping the prevailing papilla completely preserved. To eliminate the dead space and to maintain the gingival tissue coronally, the dead space was filled with platelet rich fibrin.

Reconstruction of the lost interdental papilla is the most challenging and least predictable problem because of narrow interproximal space which results in obliteration, ischemia and ultimately to necrosis of graft.

## CONCLUSION

The major aesthetic challenge in periodontal plastic surgery is the reconstruction of the lost IDP. The success and the predictability of any surgical procedure for treating papilla loss depends on the amount of papilla fill. In the present case report for the augmentation of interproximal papilla, autologous graft proved to be a reliable solution. The tunnel or a pouch technique in this case avoided a horizontal or vertical releasing incision, which helped in maximizing the papillary and the lateral blood supply

to the graft. The atraumatic management of the tissues, respect for the blood supply and avoidance of tension and pressure are critical for the viability of the tissues and the success for the procedure.

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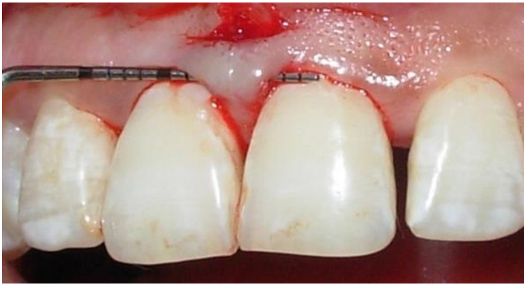
## FIGURE LEGENDS

Fig.1- Preoperative view showing loss of interdental papillae in 11 and 21 region in Case 1
Fig.2- View of the line of incision
Fig.3- Collagen Membrane being tucked into the pouch created
Fig.4- Incisions closed with 5-0 silk sutures
Fig.5- Postoperative view after 14 days
Fig.6- Preoperative view showing loss of interdental papillae in 11 and 21 region in Case 2
Fig.7 - View of the line of incision
Fig. 8- T-PRF being tucked into the pouch created
Fig. 9- Incisions closed with 5-0 silk sutures
Fig. 10- Postoperative view after 1 month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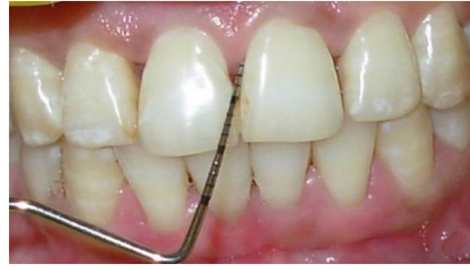
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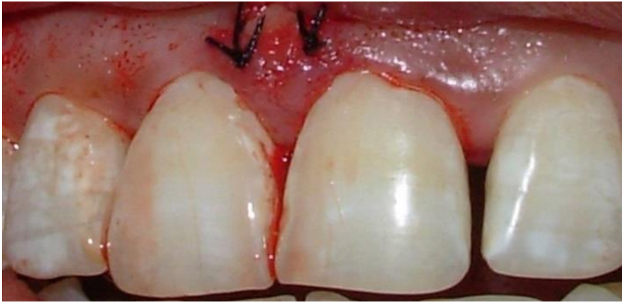
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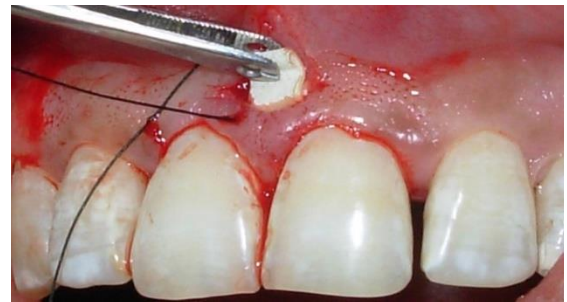
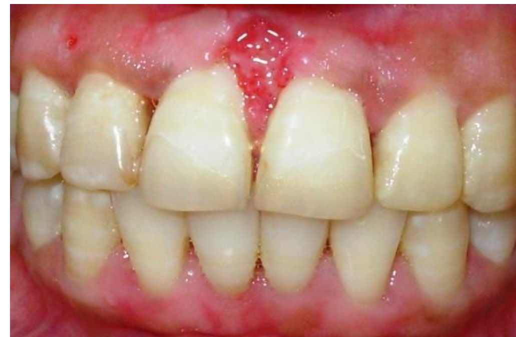


**Fig. 4**

**Fig. 5**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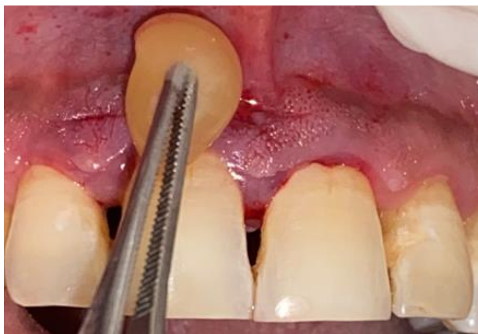
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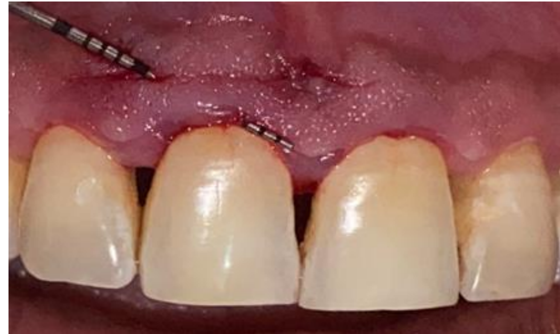
**Fig. 8**

**Fig. 9**

**Fig. 10**