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An innovative approach for gingival re-contouring using a provisional restoration and positive pressure – A case report☆

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ABSTRACT

Increase in awareness among patients about the cosmetic options in dentistry make the clinician to be competent enough to meet the needs of the patients. The appearance of the gingival tissues surrounding the teeth plays a critical role in anterior aesthetics and also gingival perspective is concerned with the soft tissue envelope surrounding the teeth. The gingival texture, shape, tooth to tooth progression and its relation to the extra oral tissues are interdependent on many factors. To improve the contour of gingiva we can have either surgical or nonsurgical approaches like application of pressure. In this case positive pressure was applied on soft tissue in an attempt to create the illusion of the restoration emerging from the tissue and the formation of "pseudo" interdental papillae. This article describes a technique of using a uniquely designed provisional restoration for the application of circumferential pressure for contouring gingiva.

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1. Introduction

In today's society, there has been a considerable increase in awareness among patients about the cosmetic options in dentistry. Hence the clinician should be competent enough to meet the needs of the patients.

The dentolabial gingival relationship, which is considered oral aesthetics, has traditionally been where treatment planning is initiated. The appearance of the gingival tissues surrounding the teeth plays a critical role in anterior aesthetics. The gingival perspective is concerned with the soft tissue envelope surrounding the teeth. The gingival texture, shape, tooth to tooth progression and its relation to the extra oral tissues is interdependent on many factors. These include anatomy of the dentogingival complex, tissue hierarchy, osseous crest considerations, periodontal biotype and biform, tooth morphology, contact points, tooth position and extra-oral skeletal and soft tissue landmarks.[1]

Abnormalities in symmetry and contour can significantly affect the harmonious appearance of the natural or prosthetic dentition. Many factors can lead to unhealthy gingival tissue like poor oral hygiene, over contoured margins, violation of biologic width etc. Several authors demonstrated that soft tissue under pontics is associated with clinical signs and

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Fig. 1 – Initial presentation after removal of crown.

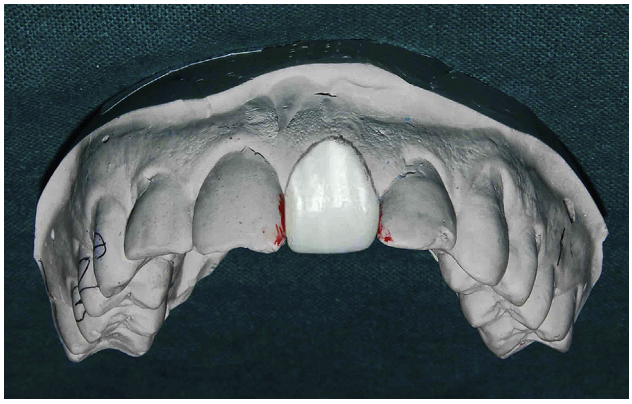


Fig. 2 – Diagnostic mock up to act as a guide to determine the amount of soft tissue management.

symptoms of inflammation such as edema, swelling, and histological changes.[2–4] Contrary to these findings Silness et al[5]and Tolboe et al reported that clinically healthy conditions can be established at pontic sites if appropriate plaque control is performed.[3] Surgical alteration of the shape of a residual ridge or gradual pressure has been valuable management strategies for improving tissue contour.[6] In the past, some believed that pressure over the residual ridge resulted in inflammation hence slight pressure for the development of appropriate ridge anatomy was contraindicated as a clinical procedure.[7] In patients with proper oral hygiene and plaque control, well-controlled pressure applied with a convex and highly polished pontic resulted only in thinning of the epithelium and shortening of rete pegs without inflammation.[8]

This article describes a technique of using a uniquely designed provisional restoration for the application of circumferential pressure for contouring gingiva. This pressure causes soft tissue to be displaced in an attempt to create the illusion of the restoration emerging from the tissue and the formation of "pseudo" interdental papillae.

2. Case report

A 23 year-old male patient reported to the Department of Prosthodontics & Crown & Bridge with the chief complaint of mobility of upper left central incisor with metal ceramic crown after a road traffic accident since one week and with history of crown placement 9 years ago. Clinical examination revealed grade II mobility which could be either due to periodontal breakdown or fracture of the restoration. Patient was advised routine radiographic investigation which showed that good bone support but a fracture line at the cervical region of the restoration.

Metal ceramic restoration was sectioned and removed. After the removal of restoration tooth fracture was observed near the gingival level with unaesthetic gingival contour which was due to the growth of interdental papilla into the secondary carious lesion inter proximally at the tooth restoration margins (Fig. 1).

The patient's diagnostic mock up (Fig. 2) were made, studied and an initial treatment plan was suggested. He was given options of extraction of the fractured tooth followed by replacement with tooth supported or implant supported fixed prosthesis. He declined both the options considering the damage to adjacent tooth and economic restraints respectively. Hence an alternative approach which could address his complaints was formulated which was to restore the crown height by preparing a cast post and core and managing the unaesthetic gingival contour by application of positive pressure technique. In the following appointment, series of photographs of facial profile, close-up views of smile were taken. Combining the findings and clinical examination, study of the diagnostic models, photographic analysis, and a complete esthetic evaluation was done and the following observations were noted.

1. Endodontically treated tooth without any Periapial pathology but compromised crown height.
2. Unaesthetic gingival contour.
3. Receded incisive papilla.

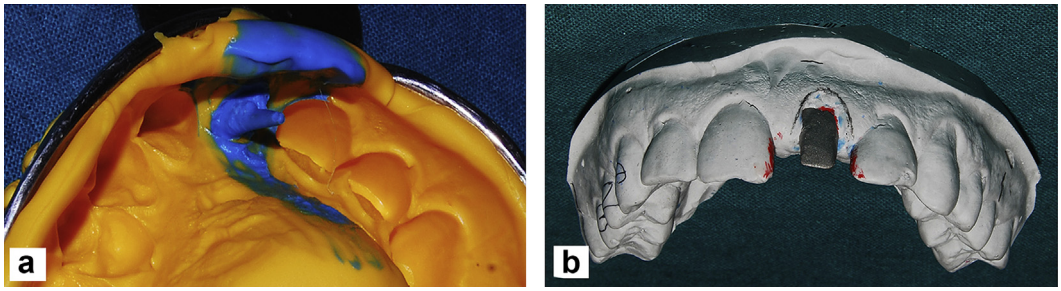


Fig. 3 – (a) Post space impressions; (b) cast post with graphite pencil markings showing the proposed gingival contour.



Fig. 4 – Provisional crowns in place.

After the esthetic evaluation, the following treatment goals were set

1. Correction crown height with cast post and core.
2. Correction of unestheic gingival contour without surgical approach.

3. Materials and methods

Post space were prepared, Poly vinyl siloxane impression was (Express XT Light Body Quick and Express XT Penta Putty; 3M ESPE) made and cast post core fabricated which was luted with glass ionomer cement (Fuji GC) (Fig. 3a and b). The greatest challenge in this case was the correction of unesthetic gingival contour. An alginate impression (Hydrogum; Zermack). Diagnostic wax up helped to find out the esthetic outcome and act as a guide to determine how much soft tissue management is needed to resemble natural gingival contours (Fig. 2).

A graphite pencil (Diameter of 0.4 mm) was used to mark the outline (Fig. 3b) of the desired gingival contour over the cast which represents the region where the patient would have the deepest point of tissue adaptation. Cast was scored along the pencil mark using a No. 8 round carbide bur (SS white). This way the tissue overhanging onto the tooth structure was removed. A scalpel was used to contour the surface. Wax mock-up was invested and a heat polymerized acrylic (Melio-dent. Heraeus Kulzer) and an inter rim provisional restoration with which is slightly over contoured was fabricated.

Provisional restoration (Fig. 4) was disinfected, placed intra orally and advanced with application of slow pressure. Those areas which was occupied by the overhanging tissues were subjected to pressure by the provisional manifested as blanching. Clinically mild blanching of the tissues indicated positive pressure within physiological limit and adequate time was given to the tissue to adjust with the pressure. It was then cemented with quick setting provisional cement (Temp-Bond NE; Kerr).

Patient was instructed to report for review weekly for 12 weeks and periodontal maintenance therapy was done every 2 weeks. Patient was kept on provisional restoration for 12 weeks. During this period the provisional restoration had conditioned and contoured the tissues around (Fig. 5a). Once the desired tissue contour was achieved, definitive impressions were made followed by permanent crowns (Fig. 5b and c).

4. Discussion

The concept of using positive pressure has been extensively used in pontic site modification in the case of fixed partial

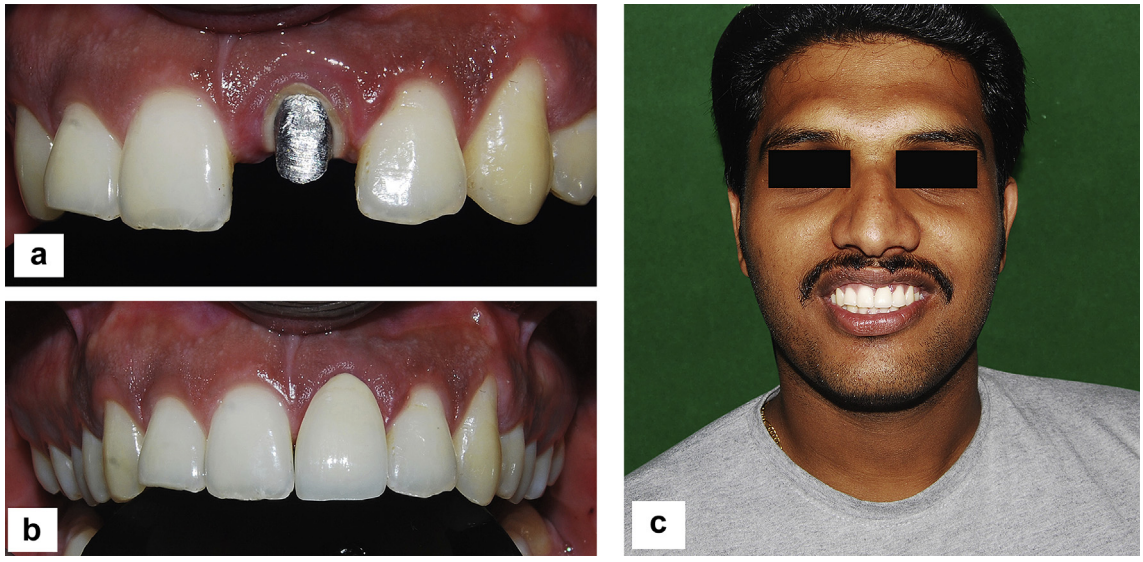


Fig. 5 – (a) well contoured gingiva around the tooth after a period of 3 months, (b) final restorations in place, (c) Post-treatment smile photograph.

dentures as well as implant supported prosthesis. Even though there are other methods of gingival tissue management like surgery, laser etc., they all possess a risk of unpredictable recession which can be difficult to manage. Another advantage of this technique is that no invasive remodeling of tissue done to achieve readaptation. By using positive pressure there is chance for ischemic blanching of tissues in the areas of pressure and also a resistance to placement of provisional, but they are transitory in most cases.[7] Clinically, healthy conditions can be established at the restoration site if appropriate plaque control is performed and in such condition a well-controlled positive pressure produces only thinning of the epithelium and shortening of rete-pegs without causing any inflammation. This way a gradual controlled pressure application with the help of a provisional restoration can transform a compromised tissue contour into a favorable one.

Conflicts of interest

All authors have none to declare.

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Congratulations Dr. S. Jayachandran….



Dr. S. Jayachandran, MDS, Ph.D., MAMS; Professor & Head, Department of Oral Medicine & Radiology, Tamil Nadu Government Dental College & Hospital has been inducted as President of Indian Academy of Oral Medicine & Radiology in National Conference held at Mangalore on 21, 22 and 23rd November 2014.