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Case Report

Pink Ceramic in Esthetic Soft Tissue Reconstruction – A Case Report

Joji Markose[1], Suresh S[2], Shruthi Eshwar[3]*, Rekha K[4] and Vipin Jain[4]

[1]Implantologist/ Specialist Prosthodontist, Cosmo French Medical Center, Sharjah, United Arab Emirates

[2]Professor, Department of Prosthodontics, oxford Dental college, Bangalore, India

[3]Reader, Department of Public Health Dentistry, Karnataka Lingayat Education Society Dental College and Hospital, Bengaluru, Karnataka, India

[4]Senior lecturer, Department of Public Health Dentistry, Karnatak Lingayat Education Society Dental College and Hospital Bengaluru, Karnataka, India

***Corresponding Author:** Shruthi Eshwar, Reader, Department of Public Health Dentistry, Karnataka Lingayat Education Society Dental College and Hospital, Bengaluru, Karnataka, India.

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Abstract

Esthetically replacing missing teeth in areas of significant anterior ridge deformities has been a significant challenge in dentistry. Majority of literature that deals with implants placed in the anterior maxilla, deal with complex Guided bone regeneration or soft tissue grafting, but none have considered simple esthetic parameters. High esthetic expectations and the addition of different GBR techniques have only increased the challenge. Gingival replacement is often a component of comprehensive prosthodontics. Therefore, it's important for a clinician to fully understand all the available options and limitations, as well as where, when, and how to best utilize the pink ceramics. Use of pink ceramic restoration can reduce the necessity for a surgical procedure to restore missing soft and hard tissues. The case discussed here highlights about pink ceramics in achieving optimum esthetics and patient satisfaction, thereby simplifying and reducing the time and cost of treatment.

Keywords: *Pink Ceramics; Gingival Reconstruction; Prosthetic Design; Esthetics*

Introduction

Dental rehabilitation of partially or totally edentulous patients with oral implants has become a routine treatment modality in the last decades, with reliable long-term results. However, unfavorable local conditions of the alveolar ridge, due to atrophy, periodontal disease, and trauma sequel, may provide insufficient bone volume or unfavorable vertical heights [1]. The alveolar ridge alterations that occur following tooth extraction in the anterior maxilla normally leads to a loss of vertical and horizontal bone volume. Several graft techniques for vertical and horizontal bone augmentation at implantation sites have also been used. However, so far there is no agreement on the best grafting approach to be used with implants dentistry that makes the predictability of grafting procedures uncertain [2].

Approximately 80% of the population display part of their gingiva while smiling and this is even more with females. The overall aesthetics of the gingival contour around teeth is critical to the aesthetic outcome of any tooth replacement implant therapy [2]. The greater challenge for aesthetic prosthodontic implant rehabilitation occurs in the multiple tooth loss situations especially missing maxillary central, lateral incisor and possibly canine teeth [3].

Multiple surgical procedures including both bone and soft tissue grafting are required in vertical and horizontal defects. In most cases, prosthetic gingival replacement is not considered in the initial diagnosis and this "solution" is more often seen as "last resort" [4].

Prosthetic pink replacement

Advances in CAD/CAM technologies and materials science developments, along with highly artistic ceramic skills, we have been able to create very natural and lifelike ceramic tooth replacements. The materials currently available for the reproduction of artificial gingiva are ceramics, acrylics and composite. Each one has its own advantages, disadvantages and specific indications. For fixed partial restorations and implants ceramics were usually the material of choice to reproduce not only the white esthetics but also the pink esthetics [5].

Pink ceramic restorations repairs maxillofacial defects and compensate for inadequate maxilla and mandibular relationships, reduces the need for technique-sensitive surgical procedures thus decreasing cost and time. Despite developments in pink ceramics, there are obviously significant limitations in the colour matching, characterization of pink porcelains, difficulties in handling materials especially in thin cross sections [6].

The shade of the gum are multicolor, after an individual analysis, it is important to have at one's perceptions about different masses of colors in different chromaticity and opaticity, which can be used alone or can be mixed together or combined with the stain colors. Only by using such technique it will be possible to reproduce the natural effects of the gum [7].

We must also appreciate that many patients may not wish to undergo multiple surgical procedures. The difficulty, indeed the challenge, is to appreciate and predetermine what cases can be successfully and predictably surgically augmented and which cases are better prosthetically augmented. Obviously, this will be a significant variable based upon clinical surgical skills as well as patient preference. Indeed, it is sadly far too common in aesthetic zone cases for patients to go through multiple surgical procedures over an extended time period, only to end up with a compromised aesthetic result or, alternatively, requiring the use of prosthetic gingival replacement [2].

Pink Material Selection

Case Report 1

A male patient aged 35 years visited French centre for dental implants, private clinic in Dubai with a complaint of past history of accident and had undergone hard & soft-tissue grafts, followed by implant placement with zicornia crown on tooth 11 and 12 (Figure1 and 2). He presented with complaints of discolorations and metal exposure while smiling. Condition may have been caused by excessive buccal implant positioning, poor planned prosthetics restorations, soft tissue and hard tissue collapse (Figure 3). Radiographic and clinical examination showed well Osseo integrated implant with good bone support (Figure 4). The implant body was positioned facially and horizontal bone deficiency and minimal attached gingiva were observed. The possible treatment options included: remove the implant, perform bone and soft-tissue grafts, then place a new implant; or alternative treatment option was not to perform surgery and instead provide an artificial gingival restoration with zirconia custom made abutments. The patient decided to proceed with minimal invasive procedure without any surgery.

Figures 1: *Pre-Operative view – Implant placement with zirconia in relation to 11 and 12.*

Figures 2: *Un-esthetic provisionals with maxillary right central and lateral incisors (Metal exposure).*

Figures 3: *Intra oral view of facially Placed Implants.*

Figures 4: *Three weeks after removal of abutment screw.*

After removing the existing abutment and prosthesis, a healing cap was placed. After 3 weeks the patient returned for assessment, clinical examination suggested that soft tissue healing were within normal limits. A closed-tray polyvinyl siloxane impression was taken and the laboratory prescription requested a custom Procera abutment (Figure 5 and 6) with a cervical collar in pink porcelain. When implants are incorrectly angled or improperly positioned and soft-tissue defects exist, conventional abutments cannot be used; therefore, the use of custom angled abutments is required. When the patient returned for placement of the prosthesis, the provisional crowns was removed and the abutment seated the crown was positioned and assessed for internal fit, marginal integrity, occlusion and esthetics.

Figures 5: *Placement of custom made procera aburment.*

Figures 6: *Intra oral view of completed prosthesis with gingival porcelain.*

The hygiene and maintenance procedures were carefully discussed with the patient as they are paramount for the long-term success of the restoration. Follow-up appointments were scheduled in advance. The first appointment should be scheduled within three months after insertion; Subsequent appointments, depending on their risk assessment.

Discussion

Gingival defects may be treated using a surgical or prosthetic approach. To re-establish natural crown ratios and natural gingival profiles in complex situations, artificial gingival restoration can reduce the necessity for technique-sensitive surgical procedures thereby simplifying and reducing the cost and duration of treatment [3].

The diagnostic waxup is critical when the replacement of missing teeth is esthetically challenging with hard tissue deficiency. The wax up provides also a blueprint for amount of pink ceramics and its marginal extensions. Main concerns are in blending the pink ceramic margins to the soft tissues especially in mesial and distal aspect. To create emergence profile in anterior region is technically challenging. If the clinician and technician are not taking proper care leads to formation of double papillae. The transition between artificial gingiva and alveolar mucosa in an apical direction depends primarily on the amount of tissue exposed during the patient's maximum natural smile. Ideally, the transition between the pink ceramic and the alveolar mucosa should be located outside the zone of smile line [7].

Artificial Papillae

Pink ceramic restorations can have different kinds of papilla design and establishing a soft tissue and ceramic blended papillae is challenging. These variations should be planned and verified initially with the diagnostic wax-up and should be further evaluated with the provisional. The papilla can be totally artificial or can be half natural and half artificial. When the papilla beside a natural tooth is slightly resorbed the restoration should be aimed to fill the papilla with ceramics providing some pressure on the soft tissue, to push it toward the apically, and sharing the interproximal space with the artificial papilla. Space for flossing must be retained but the gap must be obscured to create the illusion of a natural gingival margin [8].

It is advisable to take some pictures for a dynamic evaluation and verification of the of the patient smile, general esthetic guidelines, the transition zone between the natural and artificial gums.

Pink Ceramic buildup and try-in

The first try-in would be after the first white ceramic build up, the midline, overjet, overbite, and the basic tooth shades can be checked and corrected. The second stage would be after the final buildup of the crown portion, it is need to mark the extension of artificial gingival in the final crown itself which help to get a definite margins. The third stage of verification is done after the artificial gingivae are added. The dentist should check the overall esthetic look and the relationship between the natural and artificial gums can be adjusted. With a fine diamond bur, the margin of the artificial gum should be trimmed to blend it with the natural gum. The surface in contact with the gum should be highly glazed, polished, and free of concavities. The esthetics and hygiene are always kept in mind [8].

Maintenance

Maintenance is crucial for the long-term success of such restorations. It is easy and more predictable if we could include artificial gingiva from the beginning of treatment planning, including the surgical approach, ridge shape, and implants, to ensure an ideal esthetic and healthy restoration. It is strongly recommended that the prosthesis should be screw retained, so that it may be unscrewed periodically to verify the health of the tissues involved. Furthermore, this also enables the practitioner to repair, polish, reshape, or add to the artificial gingiva if necessary [6].

Conclusion

Restoring a defective environment inside the esthetic zone will always be challenging. The availability of pink materials has increased significantly and provides the restorative clinician with a new armamentarium for improving esthetics when presented with a difficult and compromised surgical result. Pink materials composite, acrylic or porcelain with a final restoration has the ability to mask a defect and create a symmetric and esthetic result, offering resolution for both the patient and clinician. When comprehensively understood and correctly planned, artificial gingival restorations can reestablish predictably harmonious anatomy to the lost gingival tissue, reproducing the color, contour, and texture of the patient's gum line. Prosthetic gingival restoration requires additional theoretic and technical development of the technician so that he or she can execute these restorations with harmony, balance, and continuity of form between the patient's gum and artificial gum.

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