Two prosthetic crowns supported by a single **implant in the esthetic zone**

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Abstract: *The objective of this case report was to present a therapeutic option for cases with loss of neighboring teeth, carried out by means of two prosthetic crowns supported by a single implant in the anterior maxilla. Techniques such as soft tissue augmentation and immediate provisional implant crown are required to preserve soft tissue contour and have proved predictable to achieve aesthetic harmony.* **Keywords.** *Dental implants. Dental aesthetics. Dental prosthesis.*

INTRODUCTION

Loss of anterior neighboring teeth is a challenge for aesthetic implant-supported prosthetic replacement, since the gap between teeth tends to hamper the formation or maintenance of aesthetic interdental papilla. In some cases, it is recommendable that a single implant be placed, while the other missing tooth is replaced by a bridge with cantilever springs. In the anterior region, this alternative is subject to less stress and, for this reason, does not involve a major biomechanical problem, provided that accurate adjustments be performed for anterior guidance.[1]

The presence or absence of papillary tissue between two neighboring teeth,[2] as well as one tooth and one or more implants,[3] has received major attention from clinicians in the last 15 years, since filling most of the interproximal gap with gingival papilla is key to achieving dento-gingival harmony.[4]

Recovering the natural aspect of peri-implant anatomical traits is an ongoing

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» Patients displayed in this article previously approved the use of their facial and intraoral photographs.

challenge posed to the multidisciplinary team dealing with osseointegration. From an aesthetic perspective, prosthetic replacement is unpredictable in these clinical cases, particularly regarding peri-implant soft tissue contour.[5]

Tarnow et al[3] measured gingival papilla height between implants and found a mean value of 3.4 mm ranging from 1 to 7 mm. When this result is compared to the mean papillary height between teeth (5 mm), it represents a deficiency of 1 to 2 mm, which leads to major aesthetic implications when applied to the anterior maxilla.

With a view to minimizing this issue, a number of procedures, whether surgical[6-9] or prosthetic,[10,11] have been proposed to preserve or recover soft tissue integrity in the aesthetic zone.

Ten patients, five men and five women, with missing maxillary central and lateral incisors, were treated with a single implant-supported prosthesis with cantilever springs, which might provide patients with aesthetics when being subjected to treatment of unilateral loss of maxillary central and lateral incisors.[12]

The objective of this clinical case report was to present a therapeutic option for cases with loss of neighboring teeth in the aesthetic zone.

MATERIAL AND METHODS

A 25-year-old female ASA I melanoderma patient with low smile line sought Exímia (Funorte - Ubá) graduate course. She reported having suffered a car accident, which caused upper lip keloid on the left side, followed by loss of neighboring central and lateral left incisors. The patient was concerned with the use of a removable prosthesis, showing interest in dental implants (Fig 1).

Intraoral clinical examination revealed missing teeth and a completely healed flat ridge signaling difficulty involving papillae formation (Fig 2). Panoramic radiograph revealed available bone height; however, with the bone ridge presenting a concave aspect (Fig 3).

Treatment option included implant-supported prosthesis placement to support two crowns. The patient was informed of the limitations involved in papillae formation, particularly because of technical difficulty in restoring bone peak lost to trauma, as reported by the patient, or to bone remodeling after extraction. After being cleared up and approved, reverse prosthetic replacement planning was carried out with the potential for immediate implant placement at any available site, so that it had its emergence profile in a more palatal position, thereby allowing a screw-retained restoration to be used.

After the gingival tissue had been cut open, the condition of the ridge, as previously revealed by panoramic radiograph, was evinced (Fig 4). In occlusal view, the remodeled bone was thick enough, so as to allow implant anchorage (Fig 5).

Figure 1. Melanoderma patient with low smile line and post-trauma lip keloid.

Figure 2. Missing central and lateral incisors. Note the flat, concave aspect.

With the surgical guide in place, drilling was carried out with the aid of a pointed drill, while analyzing which of the two sites would allow the implant to be more palatally placed without causing fenestration of the buccal wall. The surgical guide can be removed as many times as needed before losing any walls (Figs 6 and 7).

The central incisor implant site allowed a Morse taper 3.50 x 15 implant (Dentoflex®, São Paulo/SP, Brazil) to be placed. The four implant walls were surrounded by bone (Figs 8 and 9).

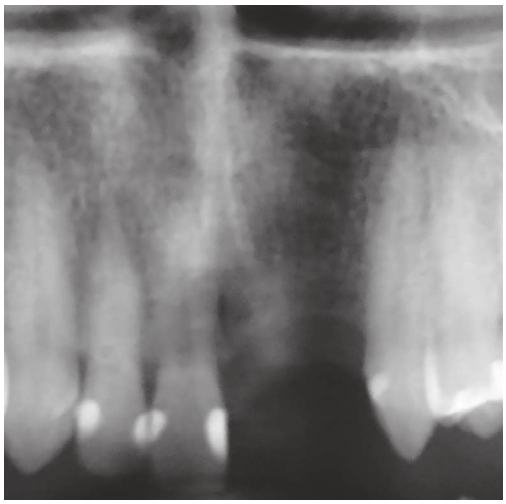

Figure 3. Panoramic radiograph revealing available bone height; however, with the bone ridge presenting a concave aspect.

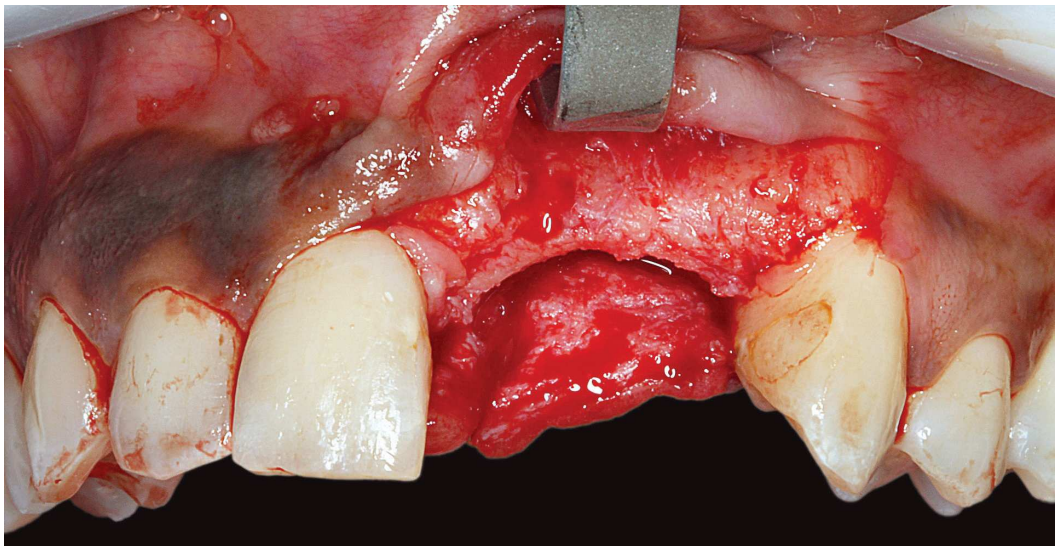

Figure 4. After the gingival tissue had been cut open, the condition of the ridge, as previously revealed by panoramic radiograph, was evinced.

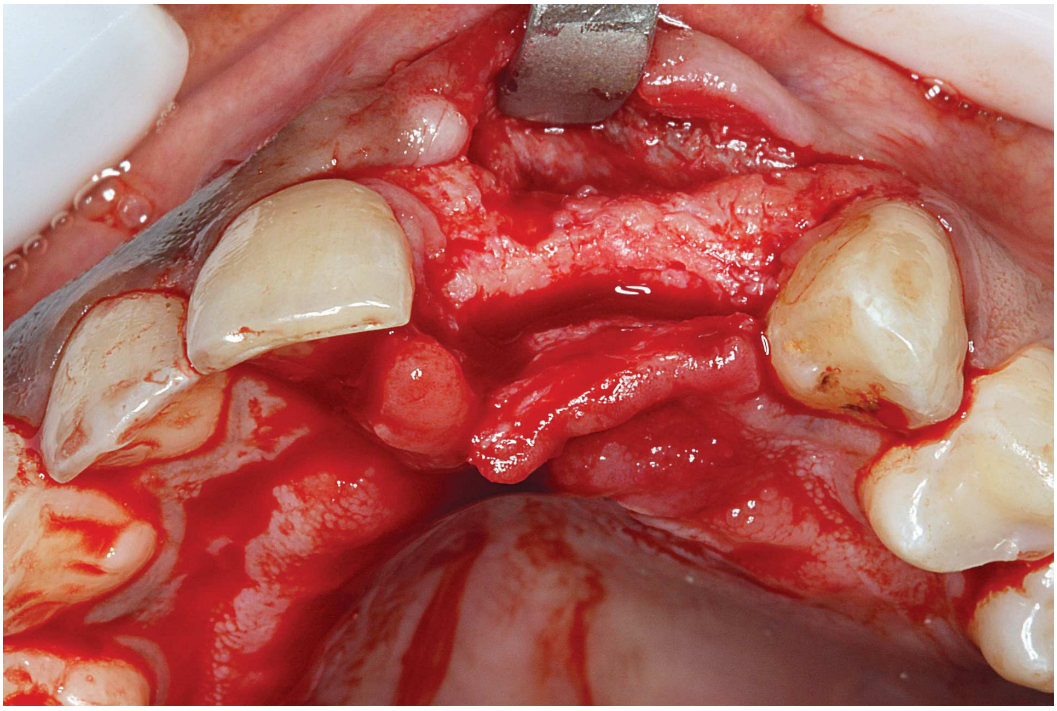

Figure 5. Healed socket, remodeled bone.

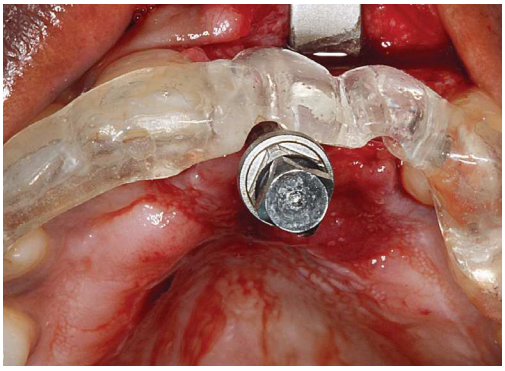

Figure 6. Surgical guide in place.

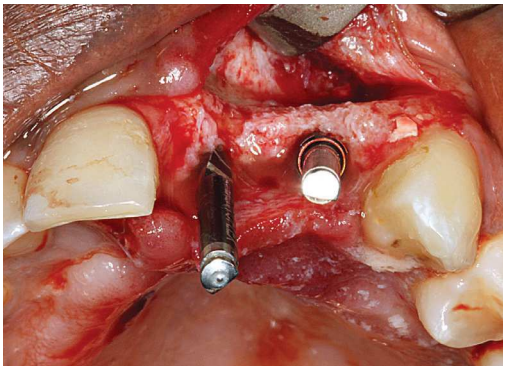

Figure 7. During drilling, the central incisor was more palatally placed in comparison to the lateral incisor.

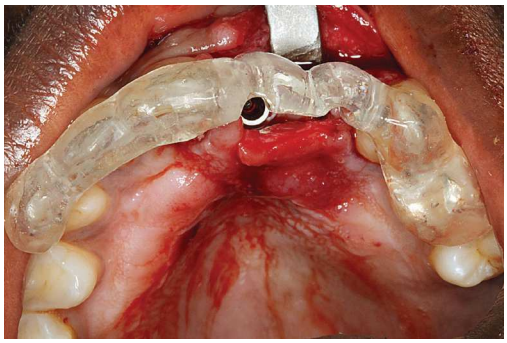

Figure 8. Central incisor implant site allowed implant placement following surgical guide strictness.

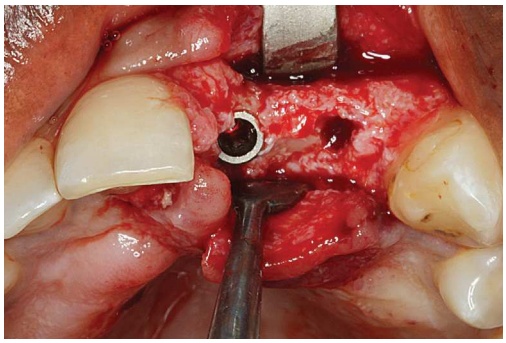

Figure 9. Four implant walls surrounded by bone.

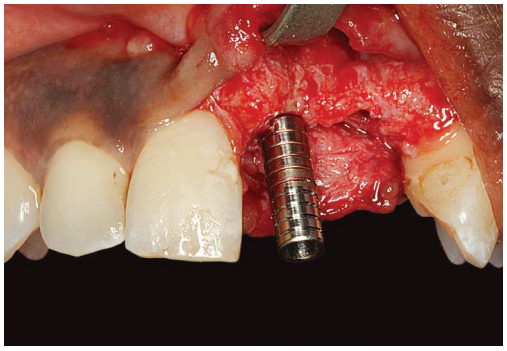

Figure 10. Device directly linked to the implant being placed.

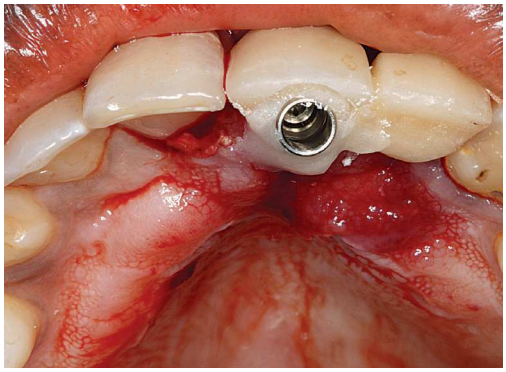

Figure 11. The provisional prosthesis was made. In occlusal view, it illustrated that screwed prosthesis indeed requires a more palatal implant positioning.

A component that binds directly to the implant was installed (UCLA Pross®, Dabi Atlante, São Paulo / SP, Brazil) and the draft was made with facet and tooth stock and acrylic resin (Dencor, Classic, Sao Paulo Brazil) by brush technique (Fig 10).

Figure 11, in occlusal view, proves that the screw-retained restoration requires the implant to be more palatally positioned. The provisional prosthesis should have a profile that enables a passive gingival fit, in addition to being extremely polished. Once the provisional prosthesis had been installed, free gingival graft (FGG) was removed with the aid of an 8-mm round scalpel under 1200-rpm rotation or mode "one" in the implant engine. Graft removal was complete with the aid of a 15 C blade (Swann Morton®, England), allowing at least the periosteum to contact the bone at the harvesting site13 (Figs 12 and 13).

FGG was well secured to the receptor site by a mattress suture, with the epithelium facing the bone. Important details of this technique involve its reproducibility not only for beginners in Implantodontics, but also for experienced professionals. The graft did not require preparation; i.e., the epithelium was not removed (Fig 14). The donor site was compressed with gauze until hemostasis was achieved and a collagen membrane (Hystoacryl, BBraun, Melsungen, Germany), a suture and a layer of surgical sealer (Hystoacryl, BBraun, Melsungen, Germany) could be placed without providing the patient with post-surgical discomfort.[14]

The gingiva was repositioned and sutured over the provisional prosthesis, which resulted in a pleasant emergence profile (Fig 15). Figures 16 and 17 illustrate 10 and 30-day postoperative conditions, respectively. Healing was attained within its natural course.

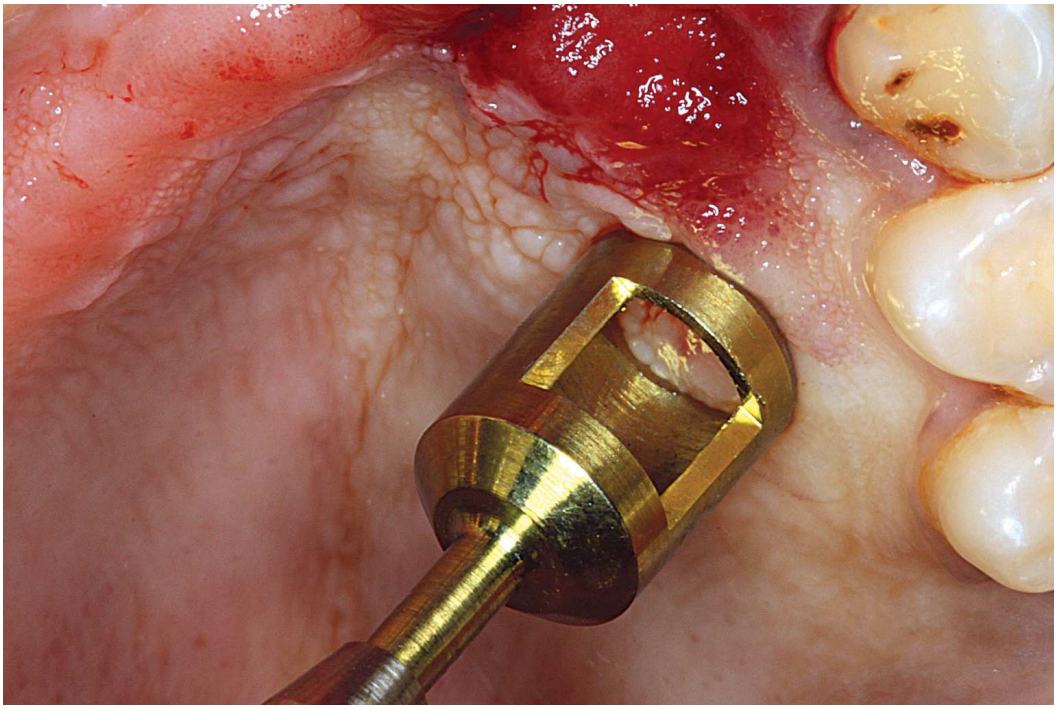

Figure 12. Free gingival graft (FGG) being removed with the aid of an 8-mm round scalpel under 1200-rpm rotation or mode "one" in the implant engine.

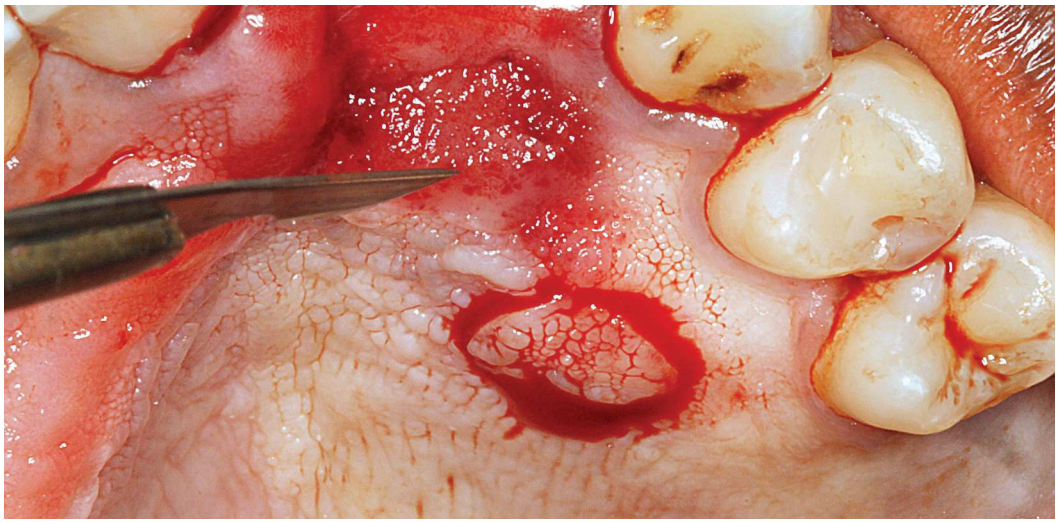

Figure 13. Graft removal was complete with the aid of a 15 C blade, allowing at least the periosteum to contact the bone at the harvesting site.

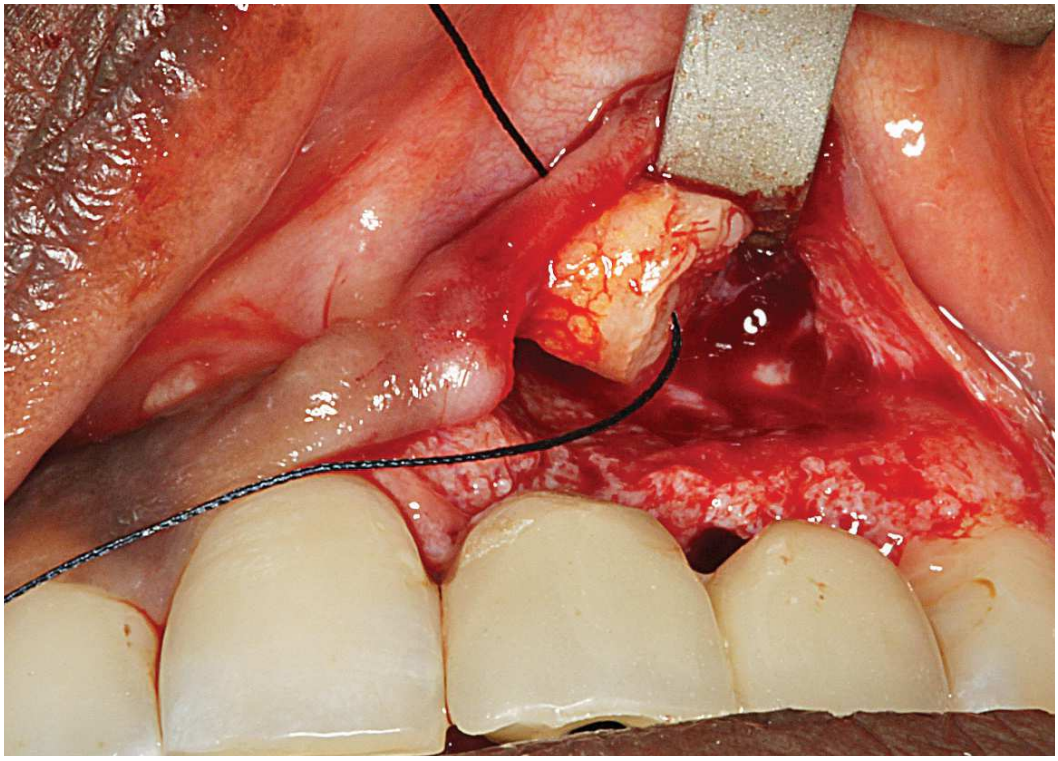

Figure 14. FGG was well secured to the receptor site by a mattress suture, with the epithelium facing the bone. The graft did not require repair; i.e., the epithelium was not removed.

Figure 15. The gingiva was repositioned and sutured to the provisional prosthesis.

Figure 16. Post-operative phase after 10 days. Removal of stitches.

Figure 17. Post-operative phase after 30 days.

As from the fourth month onwards, the provisional prosthesis was removed. From an occlusal view, a small papilla could be seen; however, it was suggestive of being formed by the provisional prosthesis and compensated by graft (Figs 18 and 19).

Custom impression was carried out by copying the provisional prosthesis base (Fig 20). From that point onwards, laboratory procedures were performed and a metal-ceramic restoration was manufactured. Figures 21, 22 and 23 illustrate the metal-ceramic restoration in place, patient's low smile line limited by post-trauma keloid, and facial smile harmony despite the limitations of the case. Patient has been followed up for two years and has proved satisfied with the outcomes (Fig 24).

Figure 18. Post-operative phase after four months.

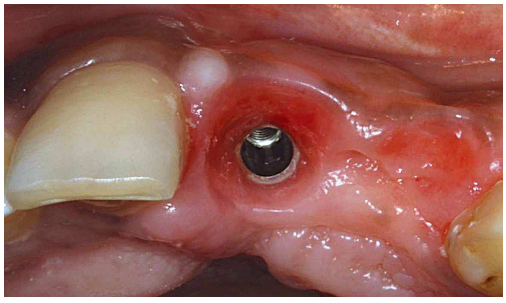

Figure 19. Ridge in occlusal view after four months.

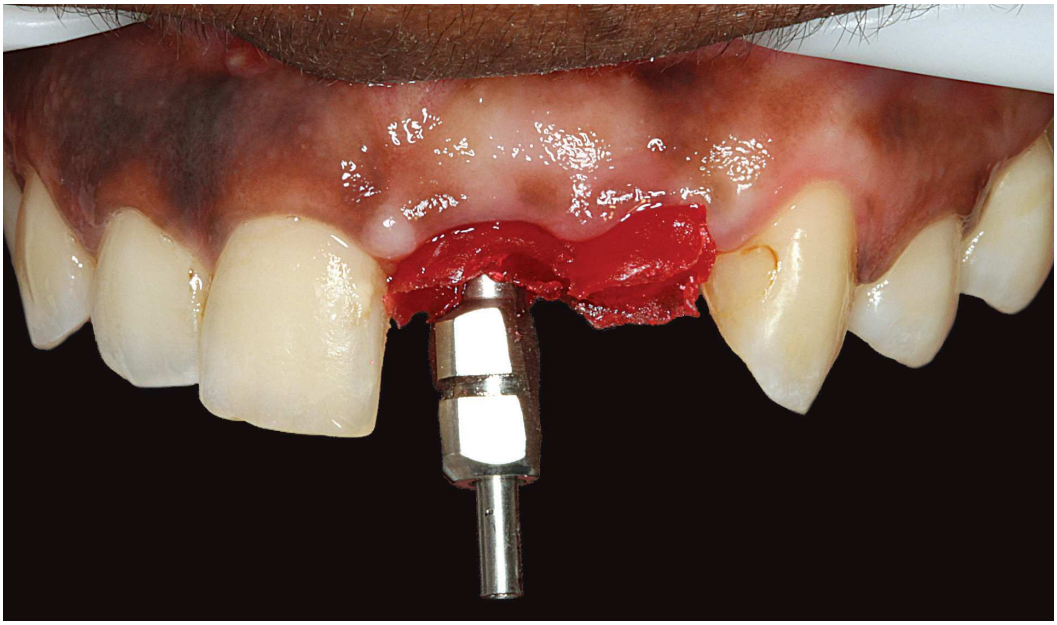

Figure 20. Custom impression was carried out by copying the provisional prosthesis base.

Figure 21. Metal-ceramic restoration in place.

Figure 22. Patient's low smile line limited by post-trauma keloid.

Figure 23. Facial smile harmony despite the limitations of the case.

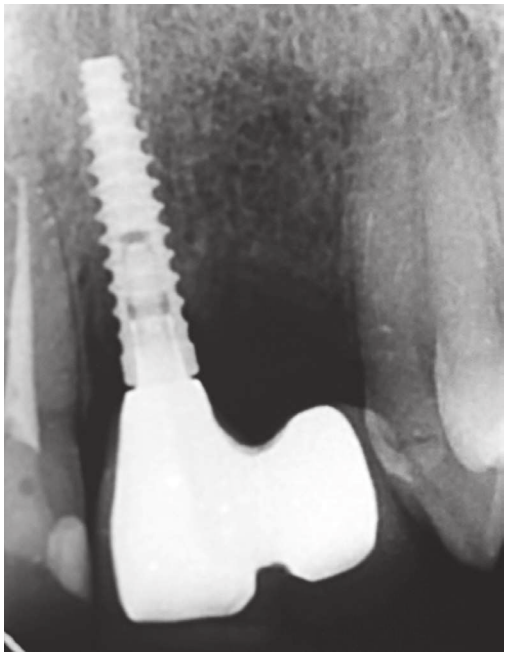

Figure 24. Radiographic control after 24 months.

DISCUSSION

Two neighboring implants hamper maintenance of gingival contour. First and foremost, edentulous bone ridge is flat and lacks the bone crest usually underlying natural teeth gingival papillae. Secondly, the reason behind it might involve understanding the formation of biological space around implants.[15] It is a known fact that bone loss near implant platforms is triggered and the process of bone remodeling progresses apically and laterally.[16] Importantly, the degree of loss relies on a number of factors, namely: individual genetic predisposition,[17] the magnitude of prosthetic load,[18] the type of implant used as well as its initial position.[19]

Should a single implant be used, that is, based on an implant-bridge relationship, the potential for maintenance of bone ridge height increases. A number of advances have been described with a view to maintaining the bone crest around implants by means of changing its macro and micro anatomical traits.[20,21,22]

Various implant systems have a better clinical performance in terms of maintaining the bone crest.[23] From a technological development perspective, expectations are that implants be capable of maintaining the bone structure around the implant platform. Therefore, it is not until implants safely behaving as tooth roots are available, that is, implants capable of maintaining the bone crest unchanged around the crown, that clinicians should consider using a single implant to replace two lost neighboring teeth, since this procedure is likely to result in better performance.

In spite of scarce scientific evidence, a number of factors give support to the biomechanical integrity of the single implant-supported prosthesis with cantilever springs: in the anterior maxilla, masticatory load is less than half of that found in the posterior maxilla;[24] implants currently available present a higher percentage of bone-to-implant contact, which is likely to increase anchorage;[25] careful occlusal adjustment[26] providing mild torque in intercuspal contact position, adequate protrusion and lateral guidance movements, especially at the implant abutment; and patient selection excluding those with parafunction.

In light of a demanding analysis, melanin spots needed to be minimized, and other interventions had to be performed in the soft tissue. As from a prosthetic perspective, many would argue in favor of artificial papilla; however, for patients, the fact of simply not using a removable denture is enough to satisfy their needs. Should we be responsible for highlighting such defects even under the interested party unawareness? Let us reflect upon that.

CONCLUSION

Resources such as soft tissue compensation, immediate provisional prosthesis that provides gingival restoration and the use of a single implant to support two clinical crowns proved predictable to achieve aesthetic harmony in cases with loss of neighboring teeth in the aesthetic zone.

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