



Periodontally Hopeless Teeth Replaced With Osseointegrated Implants – The High Lip Line

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One of the most difficult prosthetic treatments centers on patients who require replacement of teeth when a high smiling lip line creates a focal frame around the esthetic junction; the connection between mucosa and the dentition. For the past fifteen years we have categorized our patients according to smiling lip line as follows:

1. Class I: shows no maxillary tooth structure. These patients have excessively heavy lip musculature with a long upper lip.
2. Class II: shows 3/4 of the clinical crown and one millimeter of the interdental papilla.
3. Class III: shows the entire interdental papilla and one millimeter of marginal gingiva at the height of cervical contour, or above the CEJ.

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The Relationship of Cigarette Smoking to Impaired Intraoral Wound Healing

J.K. Jones & R.G. Triplett

Experienced surgeons have long implicated smoking as a risk factor for impaired healing. The catastrophic consequences of impaired wound healing in 15 patients, 5 smokers and 10 non-smokers, undergoing simultaneous intraoral bone grafting and implant placement provided the impetus for this review. Impaired wound healing was defined as dehiscence and/or infection resulting in loss of bone and/or implants. All patients received the same local anesthetic regime and wound care. All of the surgical procedures were accomplished by two experienced oral and maxillofacial surgeons over a 5 year period.

Eighty percent of smokers had impaired wound healing versus 10% in

nonsmokers. Additionally, 80% of our problem wounds were in patients who admitted smoking in the perioperative period. Although other factors may have played a role, cigarette smoking is a potentially controllable risk factor strongly associated with problem wounds in this series of patients.

Based on our experiences, simultaneous intraoral bone grafting and implant placement is no longer offered as a treatment option to patients with continuing smoking habits. Smokers are also cautioned that any surgery involving extensive flap undermining carries a significantly increased risk for impaired healing and tissue loss.

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The Acute Effects of Cigarette Smoke Exposure on Experimental Skin Flaps

J Nolan et al

The hypothesis that cigarette smoke exposure leads to increased tissue ischemia and thus flap necrosis is shared by many plastic surgeons. This paper summarizes our initial experimental work on the effects of tobacco smoke exposure on the viability of skin flaps postoperatively. Random vascular patterned caudally based McFarlane-type skin flaps were elevated in groups of Fischer 344 rats. Groups of rats were then acutely exposed on an intermittent basis to smoke generated from well characterized research filter cigarettes.

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Comparative Accuracy of Implant Impression Procedures

D. Assif et al

Dental implants are less mobile than teeth and implant prostheses are screwed precisely into position with metal-to-metal contact. If prostheses do not fit passively on implants, high stress concentrations will be produced when the gold alloy retaining screws are tightened. This can result in immediate patient discomfort, later fracture of the prosthesis or implant components, or eventual loss of integration. For these reasons a dental impression procedure must be accurate.

Four different impression procedures for dental implants were assessed

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4. Class IV: shows the excessively high lip line categorized as the "gummy smile" where two or more millimeters of gingival tissue is evident above the cervix of the teeth. These patients frequently appear to present with maxillary horizontal and vertical excess.

In treating patients with Class II, III and IV smile lines, the esthetic junction between the cervix of the teeth and the mucosa is critically important. Prosthetic restorations must take into account the frame created by the lips when the treatment plan is prepared.

Patients with advanced periodontal disease create an even more complex situation. Although swollen interdental papilla may maintain a reasonable esthetic appearance preoperatively (figure 1), the deep infrabony pockets (figure 2) bleeding on probing and the suppurative sulculi indicate tooth loss in the near future. When treatment planning the implant reconstruction of these patients, a consideration of loss of the interdental papilla as well as general apical loss of the mucosal tissues must be considered. Prosthetic treatment of these teeth is equally complex whether using traditional fixed prosthodontics or an osseointegrated implant supported prosthesis. With osseointegration however, one additional complicating factor lies with the long access angulation of the fixtures. Generally, bone loss and the normal anatomy of the premaxilla create a labial undercut which directs the apical portion of the fixture palatally (figure 11). If a screw retained prosthesis is planned, the long access inclination must be compensated at the abutment connection through use of angulated abutments (figure 4).

Often with advanced periodontitis, maintenance of the remaining alveolar bone is critically important to obtain optimal fixture length. Placement of titanium fixtures immediately into the extraction sites in conjunction with guided tissue regeneration techniques is beneficial. Use of freeze dried bone to fill the void in the extraction site around the fixtures appears to be a reliable technique for bone generation, especially if the area is covered with a barrier material during the healing process.

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Figure 1: Preoperative clinical view.



Figure 2: Preoperative radiographic view.



Figure 3: Preoperative lateral cephalometric film.

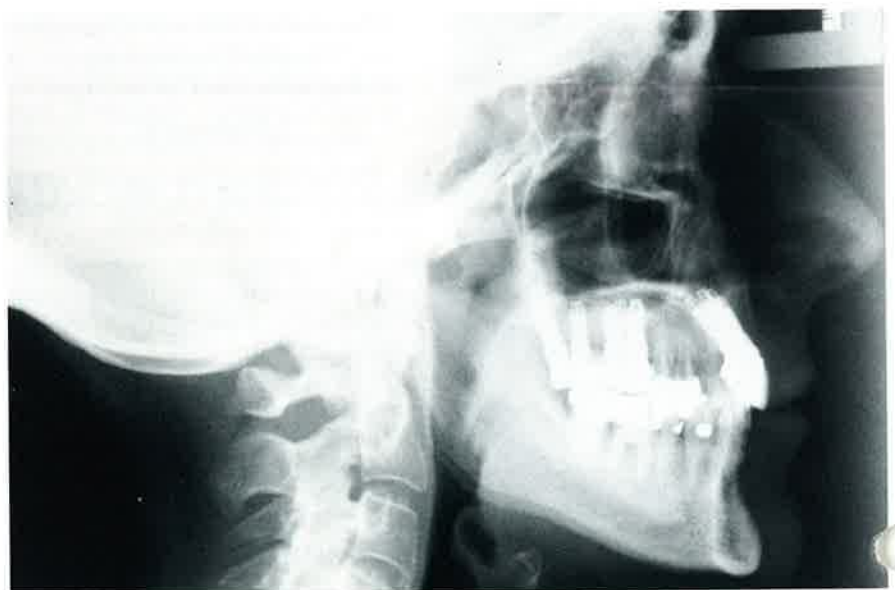


Figure 11: Two year postop lateral cephalometric film.



Figure 4: Angulated abutments



Figure 5: Postoperative clinical view shows angulated abutment.



Figure 6: Gingival replacement unit.



Figure 7: Postoperative clinical view tissue integrated prosthesis with gingival replacement unit in place.



Figure 8: Periapical radiograph immediately following prosthesis delivery.

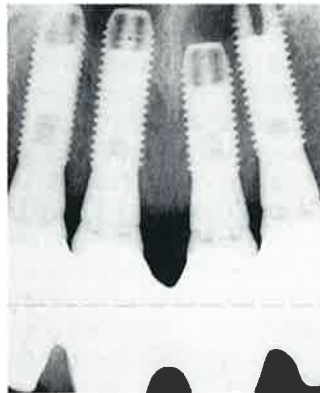


Figure 9: Periapical radiograph two years postop.

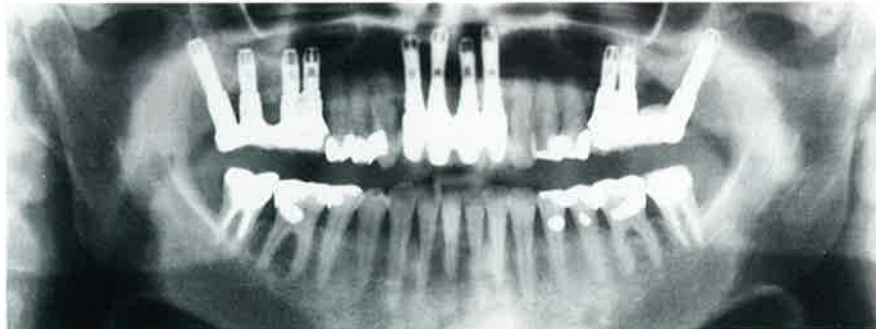


Figure 10: Panradiograph two years postop.

Following first stage surgery prosthodontic maintenance requires careful adaptation of the interim removable provisional restoration to avoid pressure on the bone grafted-sockets or disruption of the barrier material. Complete avoidance of contact with the mucosa during the first three weeks is strongly recommended, as well as the use of a soft lining for the next three months, followed by hard lining of the alveolar ridge area until the end of the treatment healing process.

When angulated abutments are used in the maxillary anterior the "knee" of the abutment is generally prominent and difficult, if not impossible, to hide with the fixed restorative materials. The angulation and undercut created by this abutment will not permit a hygienic covering of the visible titanium (figure 5). For that reason, a removable gingival replacement unit (figure 6) can be fabricated to create a two piece esthetic restoration. (figure 7).

The gingival replacement unit replaces lost gingival tissue and restores ideal esthetics for patients with a high smile line. Having the ability to remove this prosthesis and expose the titanium abutments (figure 5) also permits optimal oral hygiene which in turn helps maintain a healthy mucosa and ideal bone response (figures 8, 9, 10 & 11).

When four individual teeth are replaced by four osseointegrated implants, the recommended prosthetic reconstruction is a splinted mechanism. Although single tooth restorations have worked successfully there are no long term clinical studies which would indicate how long single fixtures supporting crown restorations will last. The splinting effect of the solid multiunit casting helps distribute the loading forces among all of the osseointegrated fixtures rather than just one when occlusal contacts are encountered. Open cervical embrasures are critical to the design of any splinted prosthetic restoration and must permit access for oral hygiene.



Strategies for the Placement of Implants Into the Edentulous Maxilla

M. Reitzik

The availability of bone often dictates the positioning of the implants in the edentulous maxilla. Atrophy of the bone supporting the premolar and molar teeth together with progressive pneumatization of the antra usually precludes these sites for implant placement. This leaves the premaxilla as the usual implant bearing site. This has major biomechanical disadvantages.

Two factors must be considered: 1) Bite forces are greatest in the canine, premolar and first molar areas during mastication; and 2) Implants withstand axial loading far better than lateral loading.

This may explain why short implants confined to the premaxillary area may fail when placed in inadequate bone (i.e. quality or quantity*). This has been observed in patients with a heavy bite and an over-cantilevered prosthesis.

Patients with severe atrophy affecting the whole alveolar ridge provide the practitioner with an uncluttered slate on which to plan the osseous rehabilitation of the maxilla. Implants should be placed in the bony areas supporting the canine to first molar section of the proposed prosthesis. This corresponds to the anterior two thirds of the antra together with the canine eminence just anterior to the antra.

In patients with extreme atrophy, a bilateral sinus lift bone graft will provide sufficient support for three or four implants on each side. Two separate posterior bars will adequately support a full upper prosthesis. Some prosthodontists prefer a single bar connecting all the implants. A fixed prosthesis is also possible as an anterior cantilever supported by posterior implants and is much safer than a posterior cantilever supported by premaxillary implants.

In those patients with sufficient height but insufficient thickness of bone in the canine incisor part of the alveolus, a buccal onlay graft to thicken the alveolus should be combined with an inlay graft into the anterior part of the sinus to support the implants. Eight implants, from the central incisor to the second bicuspid region on each side, will suffice to carry any prosthesis (ending with a single bicuspid sized cantilever*).

An alternative approach in these patients is to graft both antra in the usual way and to add a small buccal onlay graft in the canine region on each side if either eight or ten implants are planned.

**Editor's notes
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Combined Onlay Iliac Augmentation and Sinus Bone Graft Using Simultaneous Implant Fixation and e-PTFE in Highly Resorbed Maxilla

O. T. Jensen

Six patients with extreme atrophy of the maxilla with the majority of the maxilla having 0-3 mm of vertical bone available over the entire alveolar residuum were treated with Iliac bone grafting and osseointegration. One patient had a chin bone graft. A corticocancellous horseshoe-shaped graft was fixated with Brånemark implants in conjunction with sinus and nasal lifts. Particulate graft was used to fill all defects. E-PTFE was used to cover grafted surfaces laterally in four patients. The implants were exposed at 6-7 months postimplantation. A total of 48 implants were placed (eight in each patient). Forty-three implants integrated and were in function 1-3 years after placement. Bone graft incorporation occurred in all cases. At least half of the graft resorbed by the second year in the case where e-PTFE was not used. Graft resorption in the e-PTFE group was much reduced but varied from 0 to 25% at 1-2 years after placement. Three implants were lost

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