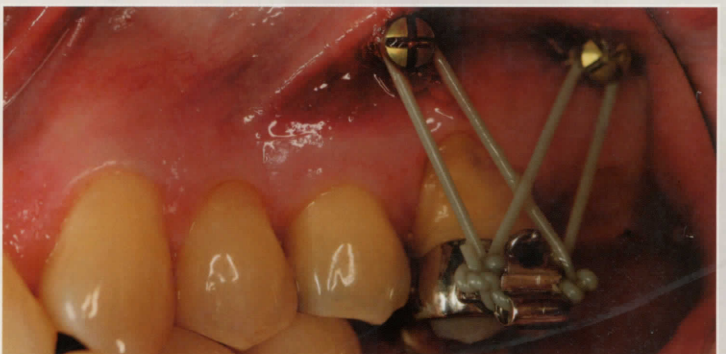
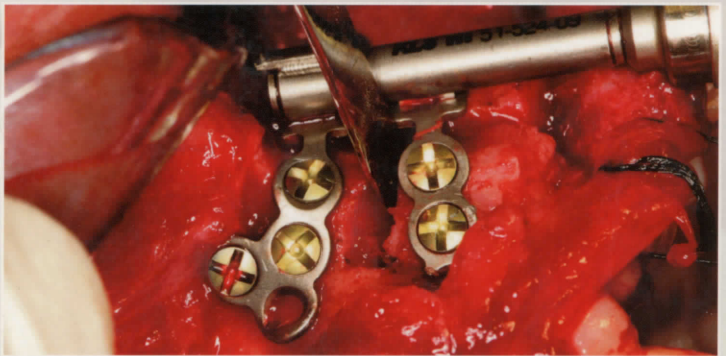
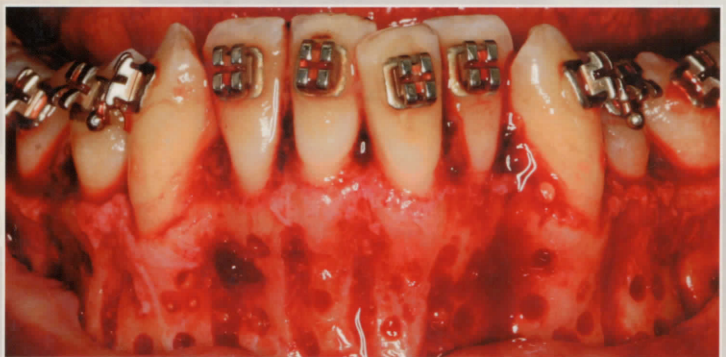


Practical Advanced Periodontal Surgery

Serge Dibart



Blackwell
Munksgaard

Chapter 8 Papillary Construction After Dental Implant Therapy

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HISTORY

The presence of a “black triangle” due to the absence of interproximal papilla between two adjacent implants has become a steady concern among implant surgeons and restorative dentists. Three main surgical methods have been proposed in the past at second-stage surgery (uncovering) to correct the problem. Palacci in 1995 suggested that a full-thickness flap be raised from the palatal side of the implant and a portion of it be rotated 90 degrees to accommodate the interproximal space of the implant. Possible compromise of the blood supply of the rotated small flap, limited amount of pedunculated soft tissue for some larger interproximal areas, and lack of keratinized tissue in cases with a narrow band of attached gingiva on the facial seem to be some of the limitations of this technique. In 1999, Adriaenssens et al. introduced a novel flap design, the “palatal sliding strip flap,” to help form papillae between implants and between natural teeth on the anterior area of the maxilla. The flap was designed and managed in a way that allowed the palatal mucosa to slide in a labial direction after dissection of two mesial and distal strips (to create papillae and at the same time augment the labial ridge).

Nemcovsky et al. in 2000 introduced a U-shaped flap raised toward the buccal; the nature of this design was essentially the same as the one introduced earlier by Adriaenssens, with some minor differences. In 2004, Misch et al. modified Nemcovsky et al.'s technique further by raising the U-shaped flap toward the palatal rather than the buccal side. In 2004, Shahidi developed a surgical procedure with the goal of guiding the soft tissue that formerly covered the implant over to the sides of the implant

and to gently squeeze this piece of tissue after insertion of the healing abutment. This was done to provide enough soft tissue in the interproximal spaces to allow for papilla generation.

In brief, there is not one single technique that is universally accepted to be the one that works 100% of the time. Tissue engineering, with the implantation of fibroblasts in the papillary area, may, in the future, help solve this problem by providing more predictability.

INDICATIONS

- At second-stage dental implant uncovering, between an implant and a tooth or between two or more implants, to minimize the formation of a “black triangle”
- Thick periodontal biotype

CONTRAINDICATIONS

- Thin periodontal biotype
- Lack of keratinized gingiva around the implant(s)
- Need to correct underlying bone

ARMAMENTARIUM

- A basic surgical set as described in *Practical Periodontal Plastic Surgery*
- Implant kit
- Healing abutments

TECHNIQUE

In the single implant model, a small U-shaped flap is created to allow mobilization of the tissue in the mesial direction. Another U-shaped flap, mirror image of the first one and sharing the same buccolingual incision, allows mobilization of the tissues to the distal direction. Occlusally, these full- or partial-thickness U-shaped flaps form an H-shape design (Fig. 8.1). The exact

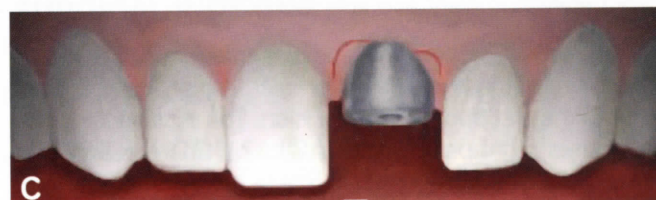
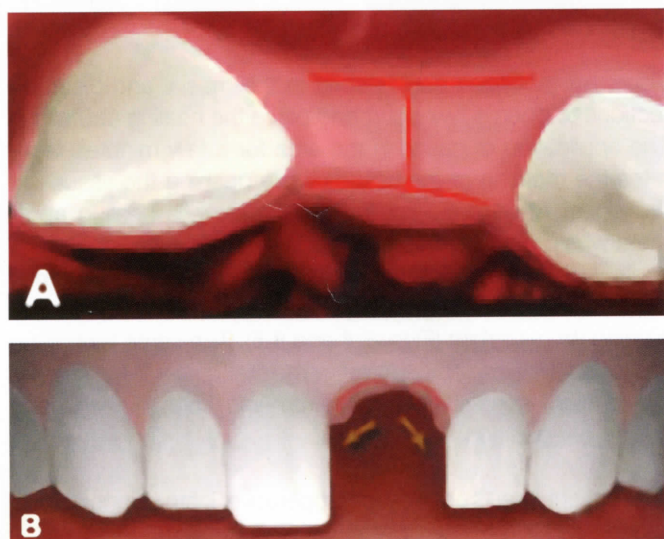


Fig. 8.1. Diagram showing the uncovering incision and procedures for a single implant occlusally (a) and buccally (b) and with the healing abutment in place (c).

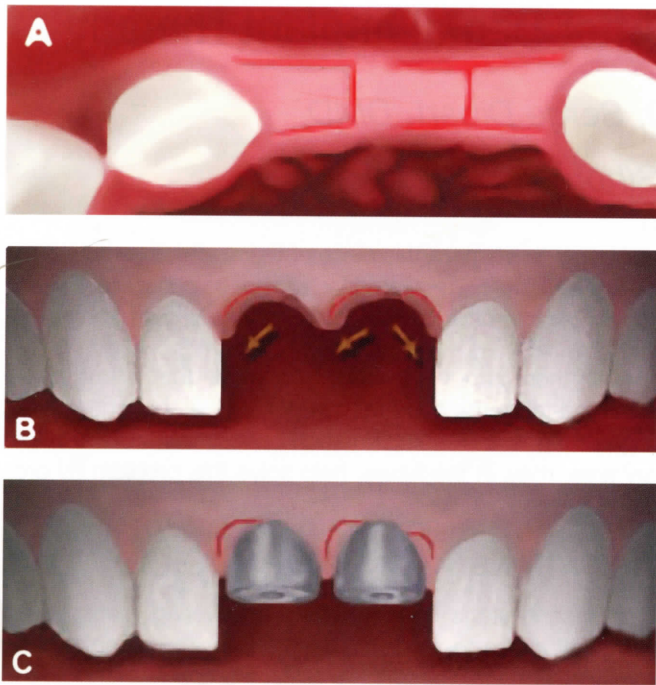


Fig. 8.2. Diagram showing the uncovering incision and procedures for two implants side by side, occlusally (**a**) and buccally (**b**) with the healing abutments in place (**c**).

location of the implant is obtained using periapical/bitewing radiographs in combination with alveolar ridge mapping with an explorer following local anesthesia.

In a multiple implant model (Fig. 8.2), the covering tissue of the most mesial implant provides the proximal papilla (i.e., mesial) of that implant using the U-shape design; the second implant provides the contralateral papilla (i.e., distal) of the first implant.

After proper local anesthesia (Fig. 8.3), the initial incisions, made using a No. 15 blade, are done as follows:

1. The first incision is done in a buccopalatal-lingual direction. The location ranges from the distal edge of the platform of the implant to the middle of the platform, depending upon the amount of tissue needed between implants or between implant and adjacent tooth.
2. The second step involves the placement of a mesiodistal incision on the buccal side for each implant, perpendicular to the first buccolingual incision. The incision is continued in a slight parabola buccally when there is adequate keratinized gingiva on the buccal to create a gingival margin around the implant. The incision is continued in a slight parabola palatally if there is insufficient keratinized gingiva on the buccal. Precautions must be taken to preserve buccal keratinized tissue. The incision passes the mesial



Fig. 8.3. Before uncovering of implant Nos. 4 and 5.

or distal platform of the implant and ends halfway between the platform and the adjacent implant or tooth.

3. The third step involves the placement of a mesiodistal incision on the lingual/palatal parallel to the incision on the buccal. The incision for the anterior implants curves slightly off buccally in the middle, as the top of the papilla should be smaller than its base in the buccolingual direction. In posterior implants, the incision is also placed slightly palatally because the width of the platform of a posterior implant is usually smaller than the width of its crown. This is essential in gaining an adequate buccolingual/palatal papilla or col width to cover the interproximal space.
4. Flaps are elevated by using the tip of the blade and the tip of an Orban knife. First, the soft tissues are reflected from the underlying implant; then each mini-flap is undermined by the No. 15 blade and the Orban knife, and the full- or partial-thickness mini-flap is extended to about 1 mm from the adjacent implant or tooth.

Flaps are mobilized and pushed in the mesial and distal directions to open a "window" and place the healing abutment. The application of gauze in the area for a few minutes facilitates the molding of the tissues while pushing the tissues to the sides. After removing the cover screw, a healing abutment with proper height, width, and shape is inserted into the implant with or without a provisional restoration. This shapes the future papilla by pushing the tissues to the sides and holding them upright (Figs. 8.4 and 8.5). The same technique is repeated for implant(s) distal to the first implant. No sutures are applied, because healing abutments hold the tissues in the proper position.

The patient then receives postoperative instructions and is scheduled for a follow-up visit within 7 to 10 days.



Fig. 8.4. The abutment and provisional restorations for Nos. 4 and 5 in place. Notice how the gingiva has been folded and maintained via the temporary restorations.



Fig. 8.5. The palatal view. The U- and H-shaped flaps have been folded, creating papillae.

POSTOPERATIVE INSTRUCTIONS

The patient is advised to rinse with chlorhexidine gluconate (PerioGard oral rinse; Colgate Palmolive) twice daily for 1 week and take ibuprofen (Advil) 200 mg in case of discomfort. Postsurgical care after the first week of healing involves regular brushing with a soft bristle toothbrush (Colgate 360-degree toothbrush) and rinsing for another week with chlorhexidine gluconate.

SURGICAL INDEXING

This should be considered to increase predictability and aesthetic outcome.

POSSIBLE COMPLICATIONS

- Complications are very unusual due to the minimally invasive nature of the procedure.
- Infection is always a possibility and should be treated with local antibiotherapy and antiseptic mouth rinses.

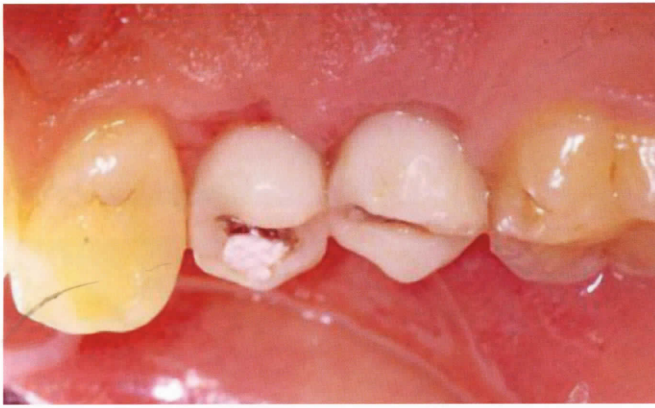


Fig. 8.6. Two weeks postoperatively. The area has healed uneventfully.

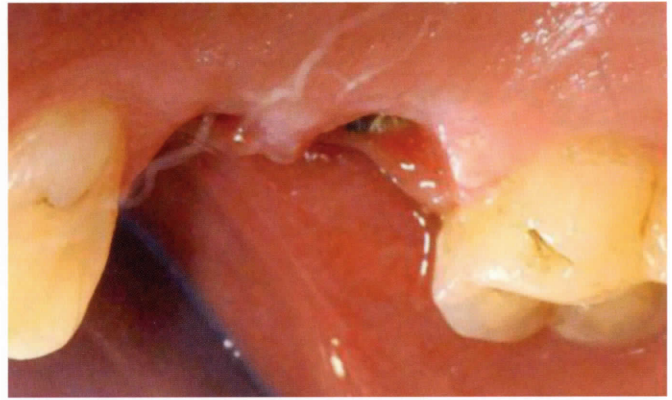


Fig. 8.8. Five months postoperatively (palatal view). Notice the presence of a papilla between implant Nos. 4 and 5.

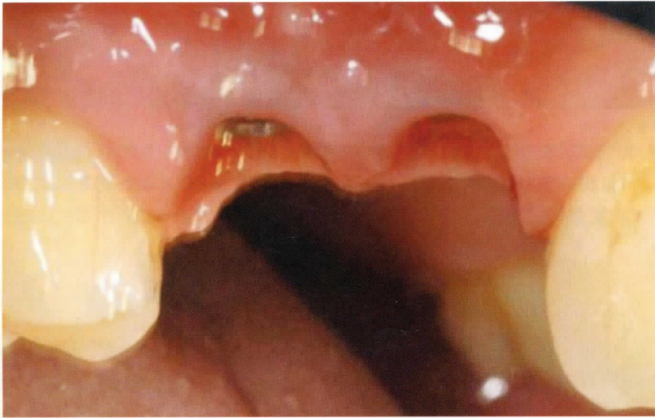


Fig. 8.7. Five months postoperatively. Notice the formation of the papilla between implant Nos. 4 and 5.

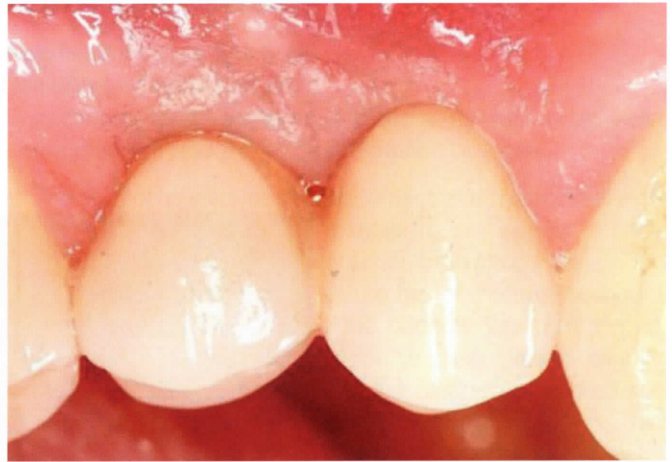


Fig. 8.9. Area with the final restorations at 20 months postoperatively.

HEALING

The results are very stable 1.5 years postsurgery (Figs. 8.6 through 8.9).

The efficacy of this new uncovering technique compared with the conventional one for papilla generation has been tested on 33 patients with 67 implants that were adjacent to either teeth or implants (Shahidi 2004). The mean difference between the two surgical methods revealed that this new technique provided 1.5 mm greater papilla height ($P < .001$) than the conventional one (mean difference for height of a papilla between an implant and a tooth was 1.71 mm [$P < .001$], mean difference papilla height between implants was 0.78 mm [$P < .138$] at 6 months). The papilla generation between an implant and a tooth was more stable and predictable than papilla generation between two implants.

REFERENCES

- Adriaenssens, P., M. Hermans, A. Ingber, V. Prestipino, P. Daelemans, and C. Malevez. 1999. Palatal sliding strip flap: soft tissue management to restore maxillary anterior esthetics at stage 2 surgery: a clinical report. *Int. J. Oral Maxillofac. Implants* 14:30–36.
- Dibart, S., and M. Karima. 2006. *Practical Periodontal Plastic Surgery*. Blackwell Publishing, Ames, IA.
- Misch, C.E., K.E. Al Shammori, and H.L. Wang. 2004. Creation of inter-implant papillae through split finger technique. *Implant Dent.* 13:20–27.
- Nemcovsky, C.E., O. Moses, and Z. Artzi. 2000. Interproximal papillae reconstruction in maxillary implants. *J. Periodontol.* 71:308–314.
- Palacci, P. 1995. *Optimal Implant Positioning and Soft Tissue Management for the Branemark System*. Quintessence, Chicago, pp. 35–39.
- Shahidi, P. Efficacy of a new papilla generation technique in implantology. MS thesis. Boston University. Boston 2004.