

Flapless Implant Placement: A Case Report

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Full-thickness periosteal flap elevation for implant placement is often accompanied by potential marginal bone loss and/or soft tissue recession around the implant due to compromised blood supply to underlying bone. To preserve the blood supply to underlying bone, implants can be placed with a flapless surgical procedure. This procedure also provides numerous other benefits, such as decreased trauma, short recovery time, less pain, reduced rate of infection, and improved patient compliance. This report presents a case of flapless implant placement in the mandibular posterior region that achieved optimum results and caused minimal discomfort to the patient. The advantages and limitations of this procedure are also discussed.

Key Words: dental implants, flapless surgery, crestal bone loss

INTRODUCTION

Over the past 30 years, flap designs for implant surgery have been modified, and more recently, the concept of implant placement without flap elevation and exposure of the bony tissues was introduced. Flapless procedures have already been used for some time with tooth extractions and site preservation, and such procedures have shown less morbidity.¹ The flapless approach is considered for immediate implants in order to preserve the vascular supply and existing soft tissue contours.² Surgeons use rotary instruments or a tissue punch to perforate the gingival tissues to gain access to bone. The method of flapless implant placement has multiple advantages for the patient and the surgeon. For instance, leaving the periosteum intact on the buccal and lingual aspects of the ridge maintains a better blood supply to the site, reducing the likelihood of bone resorption.³ In addition it results in fewer complications at the patient level, such as swelling and pain, and it reduces intraoperative bleeding, surgical time, and the need for suturing.⁴

However, despite these advantages, the flapless

technique also has some shortcomings: the surgeon cannot visualize anatomic landmarks and vital structures or manipulate the circumferential soft tissues to ensure the ideal dimensions of keratinized mucosa around the implant; there is also decreased access to the bony contours for alveoloplasty.⁴ Despite being a seemingly simple operation, it nevertheless requires a highly experienced dental surgeon as the implant has to be inserted into the bone without direct visual checking of its position in the bone.

As this is a blind procedure the success is very much depends on preoperative planning and proper case selection. This case report presents an implant placement with a flapless surgical technique that caused minimal discomfort to the patient.

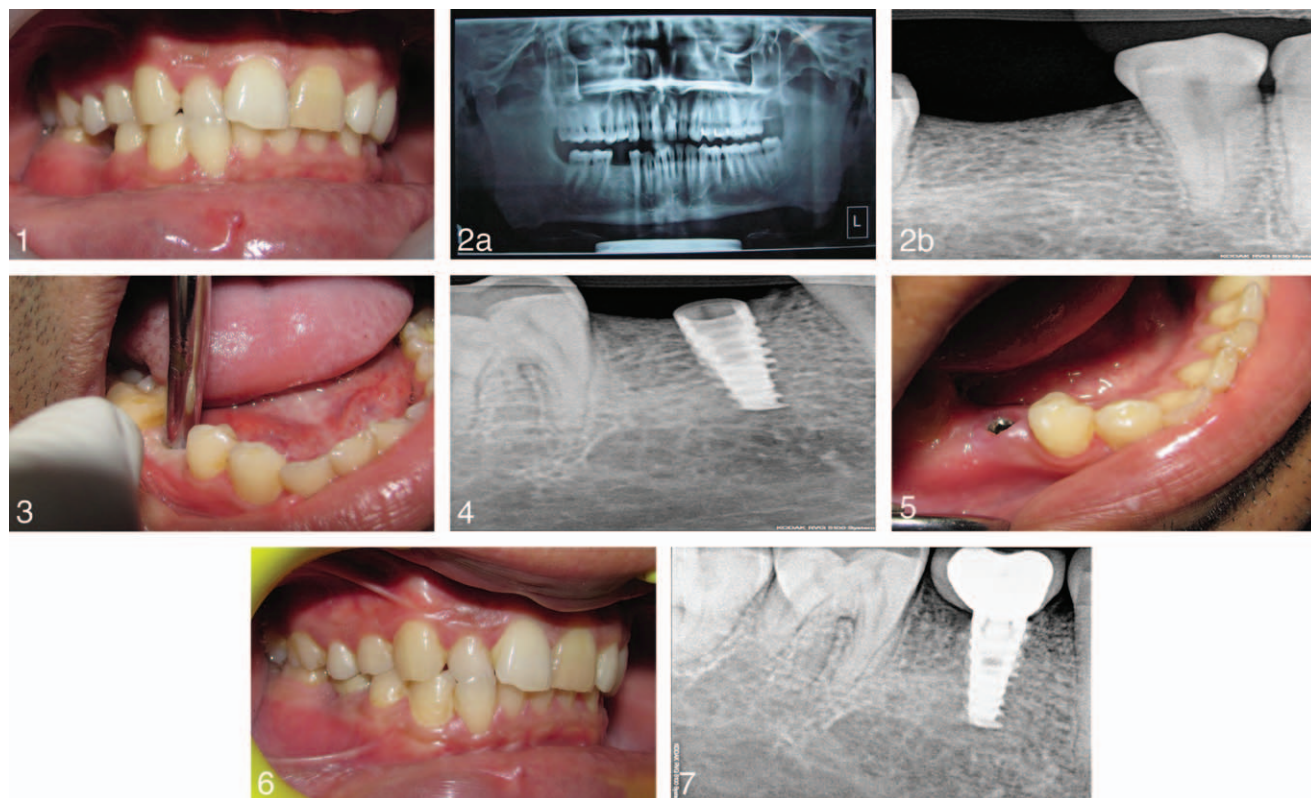
CASE REPORT

A 28-year-old man reported to our department with the complaint of missing tooth 29 (right lower second premolar). The tooth had been extracted 3 years earlier due to caries, and since then he had been wearing an acrylic removable partial denture; however, he had difficulty chewing with this removable partial denture, so he wanted to replace it with a fixed prosthesis. After an initial intraoral examination, treatment options of a fixed partial denture and an implant-supported prosthesis were discussed with patient; he agreed to the implant-

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DOI: 10.1563/AAID-JOI-D-12-00026



FIGURES 1–7. **FIGURE 1.** Preoperative intraoral photograph. **FIGURE 2.** (a) Preoperative orthopantomogram showing available bone above mental foramen; (b) Preoperative intraoral periapical (IOPA) radiograph. **FIGURE 3.** Photograph showing punch incision for implant placement. **FIGURE 4.** IOPA radiograph taken immediately after implant placement. **FIGURE 5.** Gingival cuff formed after 1 week of implant placement. **FIGURE 6.** Photograph showing final prosthesis. **FIGURE 7.** IOPA radiograph taken 6 months after the procedure and showing no changes in crestal bone level.

supported prosthesis as this was more predictable and conservative to teeth.

The patient was a nonsmoker in good general health, and he had no significant medical history. The intraoral examination (Figure 1) showed that he had good gingival and periodontal health. The residual ridge had sufficient width mesiodistally and buccolingually and was covered by healthy keratinized mucosa. On radiographic examination, sufficient bone height was available above the mental foramen (Figure 2). After measuring the bone clinically and radiographically, it was decided to place a standard-sized diameter root form implant (3.75 × 10 mm, Adin Dental Implant System Ltd, Afula, Israel) by flapless surgical procedure.

Surgery was performed under local anesthesia, and a tissue punch was used to perforate the gingival tissue to gain access to bone without elevating the flap (Figure 3). The osteotomy was initiated with a pilot drill at the punch site under copious irrigation, and the final osteotomy was prepared by using sequential drilling. The proper

angulations and depth of osteotomy were evaluated with a depth gauge and intraoral radiographs. After final osteotomy preparation, the implant was placed with a final torque of 45 N/cm² by a torque measuring wrench with good primary stability parallel with the roots of the adjacent teeth (Figure 4). A healing abutment was placed on the implant to facilitate the development of a proper gingival emergence profile for the anticipated restoration.

Postsurgical instructions were explained to control postoperative pain, and an infection antibiotic (amoxicillin 500 mg 3 times a day) and analgesics (ibuprofen 400 mg 3 times a day) were prescribed to the patient for 3 days. The patient was recalled after 2 days for a routine check-up; there was no extraoral swelling, and he only had a little local discomfort. After 1 week, on removing the gingival abutment, a smooth healthy gingival cuff was found to have formed around the gingival abutment (Figure 5). The implant did not seem to cause the patient any pain, and there were no signs of tenderness, so it was decided to make a definitive

impression. The impression post was placed and a definitive impression was taken with polyvinyl siloxane impression material (Aquasil putty and light body, Dentsply, Mannheim, Germany) using a closed-tray technique. The final prosthesis was provided 3 weeks after implant placement with good esthetic and functional results (Figure 6).

The patient was recalled every 2 months for follow-up to assess the implant and the changes in the crestal bone level. A radiograph taken after 6 months did not show any significant changes in crestal bone level (Figure 7), and the patient was quite satisfied with the prosthesis functionally and esthetically.

DISCUSSION

In recent years, there have been reports that flapless implant surgery is a predictable procedure that achieves high success rates if patients are appropriately selected and an appropriate width of bone is available for implant placement.^{5,6} A study on animals has also shown that when implants were placed without flap elevation, both the amount of osseointegration and bone height around the implants were significantly greater than that of implants placed with flap elevation.⁷ Flapless implant surgery has been suggested as one possible treatment option for enhancing implant esthetics, and it is easy to perform.⁸ Evaluating the hard and soft tissue during treatment planning is very important for flapless implant placement. An appropriate site requires 5 mm of faciolingual width and 7 mm of mesiodistal bone length. These dimensions allow a standard-sized diameter (3.5–4.2 mm) root form screw type or press fit implant to be placed with adequate bone housing and implant dental spacing.⁹ The vertical platform position should be 2 to 4 mm apical to the adjacent proximal cemento-enamel junction.¹⁰

Soft tissue evaluation is also important; one should assess the thickness and height of fibrous keratinized tissue, the quality of the fibromucosal attachment, and the position of the mucogingival line. The relation of the soft tissues to the underlying bone, implant positions, and planned emergence profile must also be considered. The attached gingiva should be at least 4 mm from the proposed free gingival margin to the mucogingival junction.⁸

While performing this blind procedure, one should be aware of risk of deviation of implants because of the difficulty in evaluating alveolar bone contours and angulations. Placement of implants without raising a flap requires a certain level of experience, fine motor skills, and sensitivity of the surgeon's hand. This sensitivity, developed through practice and analysis, relates to the density of the palatal bone compared with the buccal bone. Just as with the open flap protocol, the surgeon needs to understand implant angulations from a restorative point of view. It is harder to apply this principle, and it is easier to make a mistake, when you do not actually see the bone you are working with. The possibility of bone perforation and late complications may outweigh the benefit of reduced bone loss with flapless implants, so this procedure should be performed with extreme care and proper preoperative planning.

CONCLUSION

Flapless implant placement provides numerous benefits, such as decreased trauma, short recovery time, less pain, reduced rate of infection, improved patient compliance, and decreased bone loss and inflammation due to improved vascularity. The limitations of these surgical procedures depend on the quantity and quality of the soft and hard tissues. The lack of visualization requires greater surgical skill and preoperative planning than conventional procedures. When used carefully and in the proper situations, this surgical protocol allows patients to benefit from improved implant treatment.

ABBREVIATION

IOPA: intraoral periapical

REFERENCES

1. Sclar AG. Preserving alveolar ridge anatomy following tooth removal in conjunction with immediate implant placement. The Bio-Col technique. *Atlas Oral Maxillofac Surg Clin North Am.* 1999;7:39–59.
2. Sclar AG. Guidelines for flapless surgery. *J Oral Maxillofac Surg.* 2007;65:20–32.
3. Hahn J. Single-stage, immediate loading, and flapless surgery. *J Oral Implantol.* 2000; 26:193–198.
4. Brodala N. Flapless surgery and its effect on dental implant outcomes. *Int J Oral Maxillofac Implants.* 2009;24(suppl):118–125.
5. Campelo LD, Camara JR. Flapless implant surgery: a 10-year

clinical retrospective analysis. *Int J Oral Maxillofac Implants*. 2002;17:271–276.

6. Becker W, Goldstein M, Becker BE, Sennerby L. Minimally invasive flapless implant surgery: a prospective multicenter study. *Clin Implant Dent Relat Res*. 2005;7(suppl 1):S21–S27.

7. Jeong SM, Choi BH, Li J, et al. Flapless implant surgery: an experimental study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2007;104:24–28.

8. Oh TJ, Shotwell JL, Billy EJ, Wang HL. Effect of flapless implant surgery on soft tissue profile: a randomized controlled clinical trial. *J Periodontol*. 2006;77:874–882.

9. Flanagan D. Flapless dental implant placement. *J Oral Implantol*. 2007;33:75–83.

10. Stanford CM. Application of oral implants to the general dental practice. *J Am Dent Assoc*. 2005;136:1092–1100.