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CASE REPORT

FLAPLESS IMPLANT SURGERY- A CASE REPORT

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ABSTRACT

Background: As osseointegration is now considered highly predictable. Conventional techniques of reflecting a flap for first and second stage surgeries have been routinely carried out. The current trend is to develop techniques that can provide function, aesthetics, and comfort with a minimally invasive surgical approach. **Objective:** To achieve these goals, flapless implant surgery using a tissue punch technique has been suggested. It maintains the tissue integrity, minimizes time for healing and also provides a clean site without the need for a second stage surgery. This paper presents an outline of the principles of treatment planning and surgical procedure for flapless implant surgery.

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INTRODUCTION

A minor incident that produces a drastic result is called the "butterfly effect". It describes the possibility that "something as small as a flutter of a butterfly's wing can ultimately cause a typhoon halfway around the world." In an implant surgery, the gingival incision can have a subsequent large-scale effect that is similar to the butterfly effect. Dental implants have been used frequently for the rehabilitation of missing dentition. It is replacing conventional treatment options like fixed partial dentures and removable partial dentures in many clinical situations of one or more missing teeth (Adell *et al.,* 1981; Branemark *et al.,* 1977). The surgical procedure for placement of implants to replace any tooth begins with an incision to uncover the osteotomy site. Conventionally, a two-stage surgical approach using submerged implants was advocated with the concept that a healing period of at least 3-4 months should be allowed to provide a load free environment and undisturbed healing for successful osseointegration (Albrektsson *et al.,* 1981). The concept that implants should be covered by tissue to ensure primary stabilization and reduce infection was the standard of care in the original concept of surgical protocol. This is now being challenged as flapless surgery for implant placement has come into play.

Review of literature: When Bränemark developed modern implant dentistry with root form implants, and the concept of osseointegration was introduced, dental implants became a predictable procedure. Implant therapy is considered routine for single tooth replacement and stabilization of mandibular full dentures. However, even after 30 years of modern implant therapy, flapless implant surgery is still being developed. The concept that implants should be covered by tissue to ensure primary stabilization and reduce infection was standard of care in the original Bränemark surgical protocol (Branemark *et al.,* 1977). Implants were considered failed if they had mobility or pain, had to be removed, or if they showed more than 0.5mm of bone loss per year and signs of active periimplantitis. Authors called flapless surgery a "blind" surgical technique but said advantages include less time and minimal bleeding, with no suturing necessary. They also stated that patient selection and proper surgical technique were essential factors for success. In a 2-year study by Becker *et al.* (2005), 79 implants were placed in 57 patients from 24 to 86 years old using a minimally invasive one stage flapless technique. The parameters evaluated were total surgical time, implant survival, bone quality and quantity, implant position by tooth type, depth from mucosal margin to bone crest, implant length, probing depth, inflammation, and crestal bone changes. The results of this study demonstrate that by following specific diagnostic and treatment planning criteria, flapless surgery using a minimally invasive technique is successful and predictable. The benefits of this procedure are reduced surgical time, minimal changes in crestal bone height, probing depth, and inflammation, minimal haemorrhage, and less postoperative discomfort. Tae Ju Oh *et al.,* (2007) demonstrated successful use of flapless implant surgery for both immediate and delayed loading protocols in the aesthetic region. Advantages of the flapless implant surgery shown in the cases included less

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traumatic surgery and decreased operative time, which resulted in accelerated postsurgical healing, fewer postoperative complications, and increased patient comfort and satisfaction. Especially with the immediate loading protocol, the advantages were more pronounced because of the absence of a waiting period before prosthetic restoration. Another advantage of the flapless implant surgery was in preservation of soft tissue profiles, including the gingival margins of the adjacent teeth and the interdental papillae. This is attributed to the avoidance of flap reflection, which might cause postsurgical bone resorption and soft tissue recession. Overall, the incidence of intraoperative complications was 3.8% of reported surgical procedures. It was concluded that flapless surgeryappears to be a plausible treatment modality for implant placement, demonstrating both efficacy and clinical effectiveness. Flanagan recognized the problems associated with implants placed with a flapless surgical approach in parabolic shaped ridges.[7] He noted that site selection, adequate attached gingiva, and available bone volume are important considerations. Use of a surgical stent is necessary. The advantages of flapless surgery include reduced trauma, reduced operative time, fewer complications, and faster soft tissue healing.

Possibilities and advantages of flapless implant surgery

1. The ability to protect soft tissue
2. The ability to protect blood vessels of the peri-implant mucosa.
3. The ability to protect peri-implant mucosa health
4. The ability to protect the periosteum
5. The ability to protect peri-implant bone
6. The ability to maintain the original form of the mucosa
7. The ability to increase resistance to postoperative infection
8. Convenience of treatment

CASE REPORT

A 44-year-old female reported to the department of Prosthodontics, D.Y. Patil University School of dentistry for replacement of tooth in the upper left region. On intra oral examination, 24 is missing and has been extracted 3 months back with minimal trauma to ensure that the residual ridge was preserved and augmentation prior to implant placement would not be needed. The region of 24 had adequate width and zone of keratinized tissue. (Fig 1) Given the options for an implant or FPD, the patient chose restoration with an implant. Using a CBCT it was determined that the ridge was of sufficient dimension to accommodate a 3.5 mm wide implant approximately 12 mm in height from the crest of the ridge was available (Fig 2). A BIODENTA implant of 3.5mm width and 12 mm length was planned in this region. A surgical guide was used to make an initial entry into the bone (Fig 3). The area of tooth 24 was anesthetized with 1:100,000 epinephrine. The site for the implant to replace the tooth was done using the surgical guide. The location of the site was slightly facial to the middle of the ridge and precisely between the adjacent teeth. A 2-mm diameter implant pilot drill was placed into the site and was advanced to a depth of 12 mm (Fig 4) The location of the site was slightly facial to the middle of the ridge and precisely between the adjacent teeth. The drill placed into initial osteotomy confirms proper angulation between adjacent teeth (Fig 5). A 4mm diameter rotary tissue punch was placed in a slow-speed handpiece and was positioned over the initial osteotomy to blanch the tissue and create an outline of the punch (Fig 6).

Figure 1. Adequate keratinized tissue in 24

Figure 2. CBCT showing the amount of bone available

Figure 3. The surgical guide ensuring the correct placement

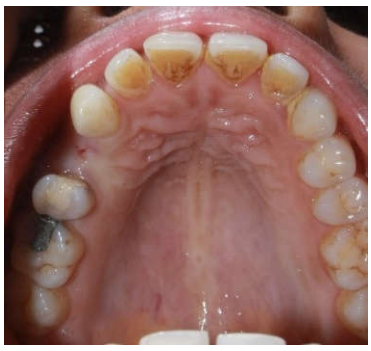

Figure 4. An initial entry is made through the tissue and 2 mm into the bone

Figure 5. Initial osteotomy

The outline was evaluated to ensure that the initial osteotomy was properly cantered. The punch was rotated through the tissue to the residual ridge. A tissue plug was removed (Fig 7), revealing the initial osteotomy made by the pilot drill in the centre of the osseous ridge. Removal of tissue at this stage of the osteotomy allowed the topography of the ridge to be evaluated, and the thickness of soft tissue to bone was measured, making it easier to maintain correct depth with each implant bur (Fig 8).

Figure 6. The 4mm rotary tissue punch

Figure 7. Tissue plug is removed

Figure 8. Site of tissue removal

Figure 9. Radiograph of the osteotomy preparation

The osteotomy preparation done and a radiograph taken to determine and confirm the angulation and depth (Fig 9). Implant placement was done with gingival former placed. A radiograph was taken to confirm the position of the implant and the former in the implant (Fig 10). This ensures the gingiva grows back around the gingival former and not above it, hence no second stage surgery is necessary.

Figure 10. Implant placement done with gingival former placed.

Conclusion

Flapless implant surgery using a tissue punch technique can be successfully employed when replacing posterior teeth. Careful diagnosis and treatment planning are essential. The protocol for this procedure includes proper evaluation of bone type, height and width of the residual ridge, and amount of available keratinized tissue. The surgical technique should include use of a surgical stent, appropriate use of rotary punches and implant burs, and creation of an osteotomy that promotes a stable implant. All the authors state that there are no conflicts of interest

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