

**Advantages and disadvantages of flapless surgical technique
(Blind technique) in comparison with flap surgical technique (traditional
technique) in dental implant placement.**

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SUMMARY

Flapless surgery for implant placement has been gaining popularity and represent challenge among implant surgeons. The purpose of study is to compare the advantage and disadvantage of flapless surgical procedure for dental implant with traditional flap technique. The study included placement of 176 fixtures in 98 patients 55 fixtures Placed with flapless technique, 121 fixtures with flap technique The study show the success rate in males more than in females and success rate in flap technique more than in flapless technique. The crestal bone height lost in flapless technique less than in flap technique due to the periosteum intact to surround bone. The study concluded that flapless technique simple , less traumatic to bone, less bleeding, time and pain post operatively, and less bone destruction a round implant surface , but to be precise applied in correct site. Surgical procedure must be done under radiographic **navigator**.



الملخص

الدراسة مقارنة في وضع غرس الأسنان داخل عظم الفك باستخدام الطريقة العمياء بدون فتح اللثة والطريقة التقليدية بفتح اللثة ثم وضع غرسة الأسنان داخل العظم . شملت الدراسة وضع 176 غرسة ، 55 غرسة باستخدام الطريقة العمياء و121 غرسه باستخدام الطريقة التقليدية . الدراسة أوضحت ان نسبة النجاح في الذكور اكثر من الاناث ونسبة النجاح باستخدام الطريقة العمياء اقل من الطريقة التقليدية . وجد في الدراسة تآكل العظم حول الغرس باستخدام الطريقة العمياء اقل مما في الطريقة التقليدية . الحصيلة النهائية للدراسة بينت ان الطريقة العمياء طريقة سهلة غير مؤلمة للمريض ، سريعة ، اقل نزوحاً للدم ، التصاق العظم بالغرسة عالي جداً ولكن طريقة العمل فيها تحتاج الى وضع الغرسة تحت قيادة الاشعة ثلاثية الابعاد في كافة مراحل العمل بدءاً من التشخيص الى تهيئة مكان الغرسة الى وضع الغرسة النهائي .

Introduction

The implant procedure for replacing a tooth is a three-step process. The first step is the placement and subsequent healing (integration) of the implant to the jaw bone. Next an abutment is attached to the implant finally, a prosthesis is attached to the abutment. The same procedure is followed when multiple implants are used for a partial or full denture. The most common implants used today are endosseous implants. These implants are surgically inserted into the jaw bone and fuse with the bone.

The classic parameters to evaluate the success rates of endosseous implants are the lack of mobility, discomfort and persistent infection, in addition to absence of pain, and continuous periapical radiolucence (Albrektsson T, Zarb GA 1986 and Smith DE, Zarb GA 1989). These criteria evaluate the integration of the mineralized bone to the implant.

Flapless surgery for implant placement has been gaining popularity among implant surgeons, facilitated by modern radiographic technologies and dental



implant treatment planning software that allow clinicians to perform three-dimensional evaluation of potential implant sites.

One of the major challenges in the surgical insertion of dental implants is the safe placement of the implants into the limited compartment of the dental bony ridge. Traditionally, the implant site is prepared by cutting and pulling back the gum to expose the bony ridge (i.e. flap procedure). This allows the implant surgeon to have a direct view of the shape of the ridge and to avoid perforating the bony walls while drilling for the implants. However, the separation of gums from the underlying bone is a traumatic procedure and is associated with postoperative swelling and considerable pain to the patient.

Flapless implant surgery (placement of implant through the gums without raising a gingival flap) is considered as an advanced procedure. A recent study shows that even experienced implant specialists have great difficulties in placing implants correctly without exposing the underlying bone. Still, the benefits of flapless surgery are that much significant that implant practitioners are often attempted to practice flapless approach while risking considerable complications.

Aims of study

- 1- Compare the success rate, advantages, disadvantages of flapless technique in comparison with flap technique.
- 2- To evaluate the change in crestal bone level and over all safety between the two types of surgical procedure.

Patients & methods

The study was conducted during February 2008 to February 2010 in Al-sadder general hospital of Maysan health directorate.



The study sample consist of 176 implants placed in 98 patients (27 males and 71 females) to restore both partial and complete edentulous arch's with fixed or removal prosthesis.

Duravit implant system from B & B company (Italian company) was used in study, the length of fixtures range from 8 mm to 14 mm, the width range from 2.6 mm to 5 mm.

Post surgical change in crestal bone level was assess by digital x-ray were taken immediately (base line for comparison), three months, six months, one year post operatively. Data collection depend on clinical observation and radiological examination.

Statistical analysis used percentage, probability, stander deviation, Chi square, t- test.

Results

1-Clinical findings

A total 176 implants were placed . 163 implants were loaded and 9 implants failed in flapless technique and 4 implants failed in traditional flap technique .

All the OPG radiograph of the inserted implants were evaluated for marginal bone Change.

Table- 1 shows placement of 55 fixtures in flapless technique , the total success rate was 86%, while in flap technique shows placement of 121Fixtures , the total success rate was 94%.

Table -1 comparison success rate in both flapless and flap technique in both sex.

| Type of sex | Flapless | | | | Flap | | | | Chi square | P- Value | Sig. |
|-------------|----------|----|---|--------------|------|----|---|--------------|------------|----------|------|
| | TP | TI | F | SUCCESS RATE | TP | TI | F | SUCCESS RATE | | | |
| Male | 10 | 28 | 3 | 90.3% | 32 | 68 | 1 | 95.5% | 2.15 | 0.048 | S |

| | | | | | | | | | | | |
|--------|----|----|---|-------|----|-----|---|-------|-------|-------|---|
| Female | 17 | 27 | 6 | 81.8% | 39 | 53 | 3 | 94.6% | 2.29 | 0.043 | S |
| Total | 27 | 55 | 9 | 86% | 71 | 121 | 4 | 95.0% | 2.187 | 0.048 | S |

TP-total number of patients

TI- total number of implants

F- failure implant

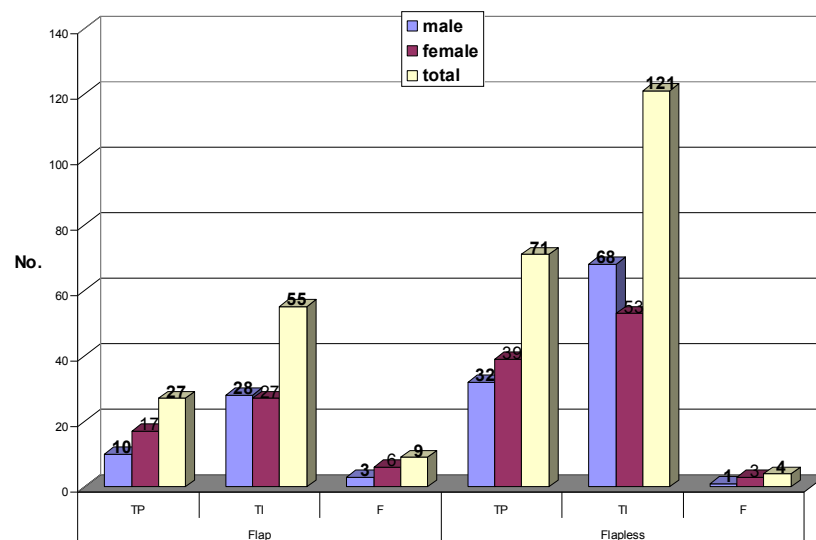


Figure- 1 Shows comparison between flapless and flap techniques in relation to total number of patients and total number of implants.

2-Radiographic findings

Marginal bone loss was assessed in mm from digital OPG that was taken for each patient at the three intervals periods, the bone loss 3 months after implant Placement, 6 months and 12 months after loading in comparison to the base line radiography which was taken immediately after implant placement.

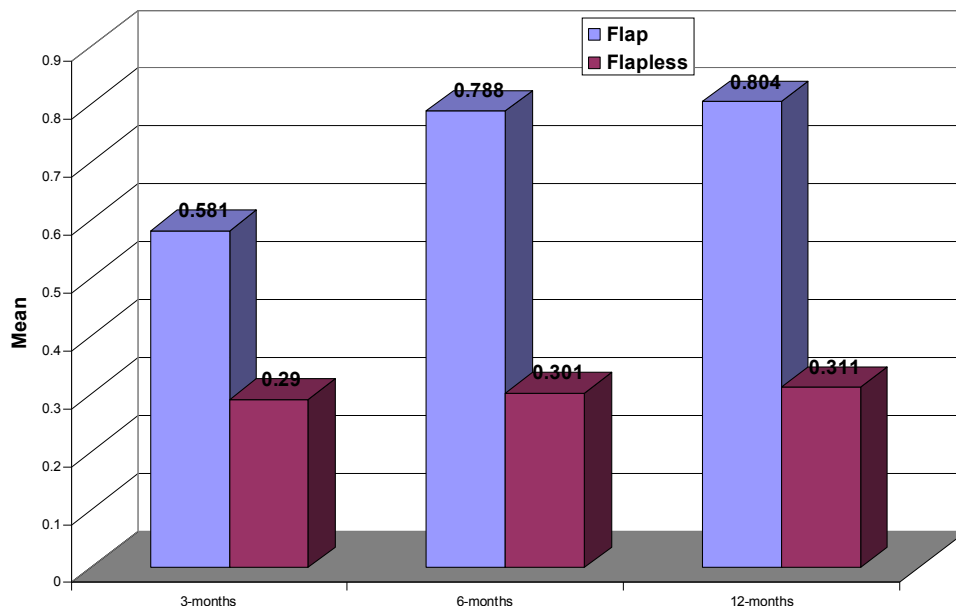
Table -2 shows the amount of bone loss around the fixtures in both types of surgical technique. The mean bone loss in flap technique was 0.581mm, 0.788mm, 0.804mm after 3 months, 6 months, 12 months respectively, while mean bone loss was less in flapless technique 0.290mm, 0.301mm 0.311mm in the same respective

periods. the table shows significant relation in both surgical technique in each interval period.

Table 2- amount of bone loss in both types of surgical procedures (flapless, flap technique).

| Time | Flap | | FLAPLESS | | t-test | p-value | Sig. |
|-----------|-------|-------|----------|-------|--------|---------|------|
| | Mean | SD | mean | DS | | | |
| 3-months | 0.581 | 0.019 | 0.290 | 0.012 | 2.335 | 0.047 | S |
| 6-months | 0.788 | 0.014 | 0.301 | 0.010 | 2.14 | 0.046 | S |
| 12-months | 0.804 | 0.028 | 0.311 | 0.009 | 2.99 | 0.041 | S |

Figure-2 shows the amount of bone loss after three interval period. The figure shows the mean of bone loss less in flapless technique than in flap technique through the three interval periods.



DISCUSSION

The Flapless implant surgery has been suggested as one possible treatment option for enhancement of implant aesthetics and easy to perform (Oh et al., 2006).

Pre-surgical diagnostics with appropriate radiographic software programs provides all the information necessary regarding the implant site and anatomical landmarks. If adequate support of the guide is provided, precise and efficient surgeries can be performed (Holst et al., 2007). The use of radiographic images is necessary to evaluate the surgical site underneath the soft tissue and CT images provide an accurate 3D picture of the surgical field [(Todd et al., 1993; Casap et al., 2004) .

The techniques of the flapless procedure rely on the experience of the surgeon in predicting the shape of the alveolar bone at the implantation site. These generally blind procedures increase the risk of cortical bone perforation and are therefore limited to straightforward cases with favorable bone width.

The ideal goal of implant dentistry is to restore a patient to normal Contour , comfort, esthetic, speech, and health. The present study shows the success rate in males more than females these results agree with study done by moy et al., (2006) and kusagai (2006) who found hormonal disturbance decreases bone density and increase the rate of implant failure .

The study shows the success rate in the flapless technique less than in flap technique , in spite of flapless technique has many surgical advantages over flap technique. Malteo and Francesco 2010, stated flapless implant surgery is blind procedure, one should be aware of risking deviation implant for the difficult evaluation alveolar bone contour and angulation .

Kramer et al., 2005, showed in vitro study the precision of navigated surgery was better than conventional surgery for repeated implant placement to restore a maxillary single tooth. The variation in inclination, depth and angle deviation was less when a tactile navigation system was used compared with conventional surgery. since computer planned implantology offer the possibility to obtained the best possibility of fixtures in bone.

Rousseau 2010, found the success rate less in flapless technique (98.3%) in comparison with traditional technique (98.5%) but the difference not significant.



Berdougo et al. 2010, found in retrospective multicenter comparative Clinical study , the cumulative survival rate was 98.57% in flap technique and 96.30% in the flapless technique .

Campelo and Camara (2002), showed flapless implant placement is generally blind surgical technique, care must be taken when placing implants. angulation of the implants affected by drilling is critical to avoid perforation of the cortical plates, both lingual or buccal, especially on the lingual in the mandibular molar area and buccal cortical in the anterior maxilla.

The study shows less bone loss in flapless or blind technique with those fixture that placed in flap or traditional technique these result agree with many studies, Becker et al ., 2005 shows insignificant crestal bone changes after using flapless implant surgery with cumulative Success rate 98.7% .

Nickeni et al., 2010 shows insignificant bone loss with both types of surgical technique with mean bone loss 0.5 mm.

Shibu et al., 2008 shows in original research that reduction in crestal bone around the surface of fixture in flapless technique mean Change from (0.01-0.06mm) and for flap technique mean change From (0.09-0.40mm), the result of study confirms the hypothesis explained less surgical procedures result in lesser crestal bone reduction to surgeries where mucoperiosteal flap reflection .The explaining of these results are when teeth are present, blood supply to the bone comes from three different paths: the periodontal ligament, the connective tissue above the periosteum, and from within the bone (Campelo and Camara, 2002). When a tooth is lost, periodontal supply disappears; blood comes only from soft tissue and bone. When soft tissue flaps are reflected, supply from the soft tissue is removed, leaving poorly vascularized cortical bone without a part of its vascular supply, resulting in bone resorption. This may lead to long-term esthetic compromise by the effect of the distance from the contact point to the crest of the bone in the absence of interdental papillae(Roman, 2001). Following loss of the



interdental papillae, the interproximal root surface of the tooth adjacent to implants may become exposed causing sensitivity and the implant itself may get exposed. This indicates the significance of maintenance of the soft tissue configuration around the implants.

Jeong et al., 2007, examined the effect of flapless implant surgery on crestal bone loss and osseointegration in a canine model. The teeth were extracted on 6 mongrel dogs and bilateral, flat alveolar ridges were created in the mandible. Two implants (length 10 mm, diameter 4.1 mm; (Osstem) were placed side-by-side in each area. One implant was placed with flap reflection and the other implant placed using a flapless procedure. Care was taken to place both implants at the same height. Prefabricated abutments were attached to all implants, simulating a single-stage procedure. At 8 weeks, the dogs were sacrificed and bone blocks containing the implants were removed. A morphometric study using microcomputerized tomography (micro-CT Skyscan 1076) was used to quantify bone around the implants. Osseointegration was calculated as the percent of implant surface in contact with bone. Additionally, bone height in the peri-implant bone was measured as the distance between the alveolar crest and the bottom surface of the implant. The flapless group had significantly better vertical alveolar ridge height and more bone/implant contact than the flap group. Average bone height in the flapless group was 10.1 ± 0.5 mm versus 9.0 mm in the flap group ($P < 0.05$). The authors speculated that flapless implant surgery may be more effective than traditional surgery with flap reflection in improving implant anchorage.

CONCLUSION

With limitations it can be concluded

- 1- Flapless implant surgery for replacing teeth successfully employed when follow protocol for this procedure includes proper evaluation of bone type, height and width of residual ridge.



- 2- The surgical procedure must be done under radiological navigator to ensure proper angulation and to avoid perforation of bone plates.
- 3- Flapless technique has many advantages over flap technique includes, less invasive procedure, minimum bleeding , no suturing, less post operative pain , bone loss and excellent soft tissue-implant seal is achieved.
- 4- Flapless technique has disadvantages like, inability to visualize anatomic landmark, possibility bone damage secondary to inadequate irrigation during osteotomy, malposed angulation or depth and no access to contour the osseous ridge to facilitate restorative procedures.

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