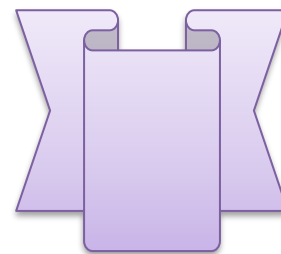
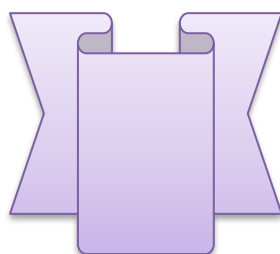
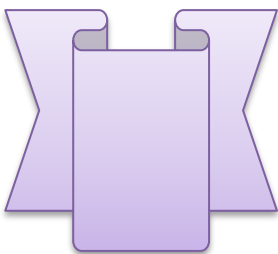
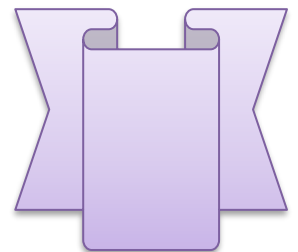
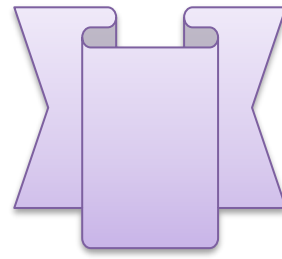
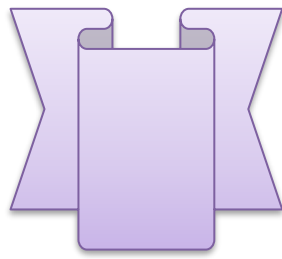
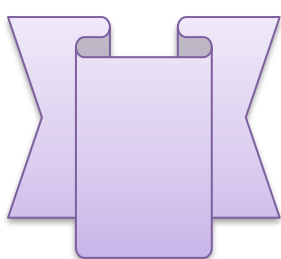
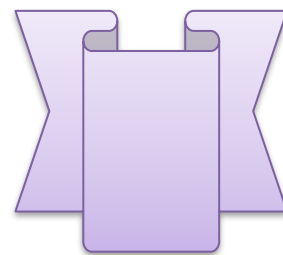
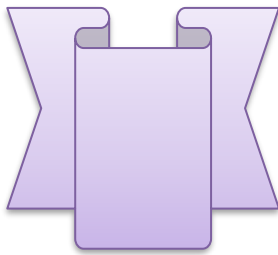
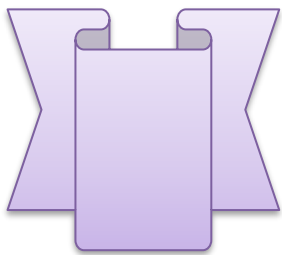


INTERNATIONAL JOURNAL OF MEDICAL ARTS



Volume 5, Issue 10, October 2023

<https://ijma.journals.ekb.eg/>

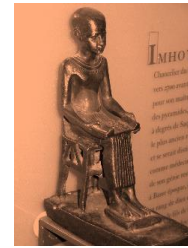


Print ISSN: 2636-4174

Online ISSN: 2682-3780



Available online at Journal Website
<https://ijma.journals.ekb.eg/>
Main Subject [Dentistry]



Original Article

Immediate Implant Placement with Flap or Flapless Surgery

Esam Eshaweirf *, Abdesalam Sougei

Department of Fixed Prosthodontics, Faculty of Dentistry, ALasmarya University, Zliten, Libya

ABSTRACT

Article information

Received: 21-08-2023

Accepted: 04-11-2023

DOI: 10.21608/IJMA.2023.230752.1786.

*Corresponding author

Email: esamprosthodontist@gmail.com

Citation: Eshaweirf E, Sougei A. Immediate Implant Placement with Flap or Flapless Surgery. IJMA 2023 October; 5 [10]: 3785-3789. doi: 10.21608/IJMA.2023.230752.1786.

Background: The practice of immediately placing dental implants has grown widespread in the field of oral implantology, and there is ongoing discussion on the optimal surgical technique, namely whether to use a flap or flapless approach. The objective of this study was to evaluate and compare the results of these two procedures in relation to gum health, bleeding during probing, soft tissue thickness, implant durability, bone loss, and bone density.

The Aim of the work: We aim to examine and contrast the results of instantaneous implant implantation operations using two distinct surgical methods: flap surgery and flapless surgery.

Patients and Methods: A total of forty patients who were scheduled for implant surgery at the Maxillofacial Department Surgery were assigned to two distinct groups: Group I, which underwent flapless surgery, and Group II, which underwent flap surgery. The study evaluated various parameters including the gum health index, bleeding during probing, soft tissue thickness around and on top of the implants, implant stability, bone loss, and bone density. These assessments were conducted at the start of the trial and again after a 6-month follow-up.

Results: There were no notable disparities in the average gum health index and bleeding during probing between the two groups at the start and after 6 months. There were no notable variations in the thickness of the soft tissue surrounding the teeth on the sides. Nevertheless, the thickness of the soft tissue covering the teeth was notably reduced in the group that underwent flap surgery. The implant stability was similar in both groups.

Conclusion: Flapless surgery exhibited similar results to flap surgery in terms of gum health, bleeding during probing, soft tissue thickness, and implant stability. Nevertheless, it shown benefits in preserving the thickness of the soft tissue above the teeth and preventing excessive bone loss and decreased bone density during a 6-month timeframe.

Keywords: Implant placement; Flap surgery; Flapless surgery; Gum health; Bone loss.



This is an open-access article registered under the Creative Commons, ShareAlike 4.0 International license [CC BY-SA 4.0] [<https://creativecommons.org/licenses/by-sa/4.0/legalcode>].

INTRODUCTION

Osseointegrated dental implants are typically implanted via a surgical technique known as a flap approach, wherein the skin and tissue surrounding the implant are repositioned and sutured following its placement. The traditional approach presents several drawbacks: it restricts blood circulation to the bone's outer layer due to the lifting of the skin, potentially leading to bone deterioration; patients may experience discomfort, including pain, bleeding, and swelling, while the surgical procedure may also be prolonged [1].

Flapless surgery has gained popularity as a routine practice in clinics. It has been determined to exhibit a foreseeable result and a high level of effectiveness. Modern radiography technologies and dental implant treatment planning software are utilized to assess the quantity of bone present in the specific regions where dental implants are intended to be positioned. Flapless surgery offers several possible advantages [2].

From the patient's standpoint, it facilitates expedited surgical procedures, mitigates pain and inflammation, and expedites postoperative recovery. Moreover, the blood arteries in the adjacent hard and soft tissues are safeguarded in close proximity to the site of implantation. According to certain research, performing a less invasive operation to puncture the outer layer of the mouth or tongue may help minimize bone loss. Nevertheless, performing surgery without creating an incision in the skin poses some hazards due to the difficulty in visualizing and operating on the surgical site [3].

Therefore, this method necessitates the expertise of highly experienced clinicians with discerning discretion in selecting suitable patients, specifically those with sufficient jawbone density and healthy gum tissue [4].

The study is questioning what is the effect of immediately placing dental implants with a surgical flap compared to flapless surgery on the total success rate of the implants? Hypothesizing that Flapless surgery results in higher stability and better osseointegration of immediate dental implants compared to flap surgery.

The main objective of this study is to thoroughly examine and contrast the results of instantaneous implant implantation operations using two distinct surgical methods: flap surgery and flapless surgery. The objective of

the study is to evaluate and examine crucial aspects such as overall success rates, post-operative complications, and implant stability. The research aims to provide significant insights to the area of implant dentistry by clarifying potential distinctions among different surgical approaches. This will assist clinicians in making well-informed decisions to get the best possible outcomes for their patients.

PATIENTS AND METHODS

Study Settings: In this study, a total of 40 patients participated in a prospective, randomized controlled clinical trial, where they had implant insertion at the Maxillofacial Department Surgery.

Inclusion Criteria: Treatment is available for individuals aged 18 to 65 who have lost their molars in both the upper and lower jaws, provided that they possess sufficient bone and gum tissue to support a dental implant. Furthermore, it is imperative to have a minimum of 2 mm of intact gum tissue surrounding the implant.

Exclusion Criteria: The individual underwent a dental extraction within a time frame of less than 4 months. They engage in excessive smoking, alcohol consumption, and drug abuse. They have a past medical record of poorly managed diabetes. They underwent radiation or chemotherapy previously. They engage in bruxism. In addition, they consume medications that have the potential to impact their gum health, such as analgesics, cyclosporine, and corticosteroids. Women who are lactating or pregnant.

Every patient was given the chance to make a decision about the most appropriate surgical procedure after being provided with all the essential information. The selection was recorded by acquiring written consent, explicitly articulating the patient's preferred alternative.

The study was conducted in accordance with the principles specified in the Helsinki Declaration.

Study Design: The physicians categorized the patients into two distinct groups. There were 20 patients in each group. In the flapless group, the implants were inserted without the need to elevate any tissue or utilize a specialized surgical guide. In the second group [flap group], implants were inserted by elevating a flap of tissue and bone. Following the insertion of the implant, the surgeons assessed its stability and secure positioning during

the surgical procedure. The physicians conducted assessments of the patients on the second and seventh post-operative days to evaluate the severity of their pain, edoema, infection, and tissue damage. The dentist assessed the gingival depth around the tooth during the placement of the support structure, and subsequently reevaluated it three months later upon attachment of the crown. The stability of the implant was assessed six months post-surgery. The bone's height was assessed using cone beam computed tomography [CBCT] immediately post-surgery and then again after a 6-month period as well as the bone density was assessed six months post-surgery with CBCT. A specialized instrument known as a tissue thickness meter is utilized to quantify the thickness of the soft tissues. Bone resorption is the quantification of the extent to which bone undergoes degradation or erosion. The measurement is established by assessing the distance between the initial screw of an implant and the most elevated point of the bone. The pre-operative and postoperative measures were collected and subsequently analyses using statistical methods.

RESULTS

The mean age in the group that did not undergo surgery was 62.4 years, in contrast to 58.3 years in the group that underwent surgery. Nevertheless, the disparity in ages was not substantial. In terms of gender, the surgical group had a higher number of females [14 females] compared to the group without surgery [4 females]. The observed difference was statistically significant, as indicated by a p-value of 0.001.

The position in the body mostly pertained to the anatomical placement. In the cohort where the procedure was performed non-invasively, 16 instances occurred in the mandible and 4 instances occurred in the maxilla. Within the cohort where the gums were incised, there were 18 instances in the mandible and 2 instances in the maxilla. The disparities between the

two groups were not substantial, as seen by the data presented in Table [1].

Table [2] indicates that there were no discernible disparities in gum health between the two groups at the start and after 6 months.

The extent of hemorrhaging observed during probing was comparable in both groups at the onset and after a duration of 6 months. The disparities were inconsequential, as evidenced by Table [3].

There was no notable disparity in the thickness of soft tissue on the cheeks and tongue between the two groups, both prior to and following a 6-month period. However, in terms of oral tissue thickness, the flap group exhibited a thinner tissue compared to the other group, and this disparity was statistically significant, as indicated in Table [4].

The changes in average probing depth between the two groups after 6 months and 3 months following the placement of the crown were minimal, as indicated in Table [5].

The evaluation of implant stabilization was conducted in two distinct groups. The assessments occurred 6 months post-procedure and subsequently 3 months post-crown cementation. The results can be observed in Table [6].

The initial significance of bone loss surrounding the tooth was minimal, but, after a span of 6 months, it exhibited a substantial increase in the group that underwent a surgical flap procedure, as indicated by the data presented in Table [7].

There was no significant difference in the average bone density between the two groups prior to and immediately following the treatment. After a period of 6 months, the group who underwent the flap procedure exhibited a notable decrease in bone density as compared to the other group, as evidenced by the data presented in Table [8].

Table [1]: Demographic data between the studied groups

		Flapless [n= 20]	Flap [n= 20]	P value
Age [years]		62.4 ± 12.1	58.3 ± 13.2	0.3123
Gender [No., %]	Males	16 [80%]	6 [30%]	0.0014*
	Females	4 [20%]	14 [70%]	
Anatomic location of treatment	Maxilla	4 [20%]	2 [10%]	0.3758
	Mandible	16 [80%]	18 [90%]	

Table [2]: Mean gingival index between the studied groups

	Flapless [n= 20]	Flap [n= 20]	P value
Baseline [index units]	0.1±0.2	0.1±0.1	1
6 months [index units]	0.0±0.1	0.0±0.0	1
Change [index units]	0.1±0.2	0.1±0.1	1

Table [3]: Mean bleeding on probing between the studied groups

	Flapless [n= 20]	Flap [n= 20]	P value
Baseline [index units]	0.2±0.2	0.2±0.3	1
6 months [index units]	0.1±0.2	0.1±0.2	1
Change [index units]	0.1±0.3	0.1±0.2	1

Table [4]: Soft tissue thickness changes between the studied groups

		Flapless [n= 20]	Flap [n= 20]	P value
Buccal	Baseline [mm]	0.9±0.4	1.1±0.5	0.1706
	6 months [mm]	1.0±0.4	1.3±0.6	0.2225
	Change [mm]	0.1±0.3	0.2±0.7	0.8853
	Range [mm]	-0.4±0.6	-1.2±1.4	0.0241*
Lingual	Baseline [mm]	2.3±0.5	2.0±1.0	0.2376
	6 months [mm]	2.7±0.5	2.3±1.3	0.2068
	Change [mm]	0.4±0.5	0.3±0.7	0.6062
	Range [mm]	-0.6±1.3	-1.4±1.6	0.0908
Occlusal	Baseline [mm]	-	-	
	6 months [mm]	2.3±0.8	1.7±0.5	0.0071
	Change [mm]	-	-	
	Range [mm]	0.8±3.1	1.2±2.9	0.6758

Table [5]: Probing depth between the studied groups

	Flapless [n= 20]	Flap [n= 20]	P value
After 6 months	2.25±0.63	2.5±0.76	0.1938
Three months after crown cementation	1.98±0.35	1.99±0.51	0.9427

Table [6]: Implant stability between the studied groups

	Flapless [n= 20]	Flap [n= 20]	P value
After 6 months	77.67±3.14	77.±4.60	0.5937
Three months after crown cementation	83.2±2.3	82.8±4.1	0.7831

Table [7]: Crestal bone loss between the studied groups

	Flapless [n= 20]	Flap [n= 20]	P value
Immediate	0.36±0.03	0.37±0.03	0.2985
6 months	0.5±0.05	0.77±0.05	0.0001*

Table [8]: Bone density between the studied groups

	Flapless [n= 20]	Flap [n= 20]	P value
Pre	428.00 ±92.82	416.33±87.96	0.6855
Immediate	500.17±98.46	473.67±100.35	0.4045
6 months	913.50±72.12	834.67±102.10	0.0076*

DISCUSSION

At the beginning of the trial and after a follow-up period of six months, there were no statistically significant differences detected between the two groups in terms of the mean gingival index. Similarly, there were no significant differences between the groups in terms of the average bleeding that occurred during probing at the beginning of the study and after six months had passed. The outcomes of this study are in agreement with those of the research carried out by **Siu et al.** [4] which discovered that there were no significant differences in healing indexes among groups that were comparable. In addition, our research discovered that there were no

significant differences between the groups in terms of the average depth of probing at six months and three months after crown cementation. These findings are consistent with the findings of the research carried out by **Deabs et al.** [5] and **Wang et al.** [6], which came to the conclusion that there were no significant differences in pocket depth between the flap and flapless groups during the various appointments. On the other hand, **Jiao and Gao** [7] and **Anumala et al.** [8] obtained contradictory results, which indicated that the flapless technique resulted in a significant reduction in pocket depth and more beneficial modifications in soft tissue in comparison to the flap technique.

In accordance with the findings of Deabs *et al.* [5] our research discovered that both groups exhibited comparable levels of implant stability at six months and three months after crown cementation. With regard to the Implant Stability Quotient [ISQ] values, we noticed a consistent increase in both groups from the initial measurement to the assessment that was performed six months later. It was determined that the ISQ was only slightly higher in patients who did not undergo a flap operation; however, this differential was not regarded to be of clinical relevance. Over the course of time, the stability of implants has shifted from being driven by mechanical variables to being influenced by biological factors. This demonstrates the trend that has been seen [9].

When it came to the loss of crestal bone, our research found that there were no significant differences at the beginning stage. The group that got flap treatment, on the other hand, exhibited significantly higher levels of crestal bone loss over the course of a period of six months. Further, there was no discernible change in the mean bone density between the groups that had undergone surgery and those that had undergone surgery immediately after the procedure. After a period of six months, the flap group, on the other hand, exhibited a considerably lower bone density. The findings of this study are in agreement with the findings of a study that was conducted by Pisoni *et al.* [10]. The study underlines the fact that flapless surgery does not completely reduce bone loss that occurs around dental implants. According to the findings of the study, bone loss occurs in a manner that is almost identical regardless of the surgical technique that is utilized. Taking into consideration the necessity of long-term monitoring in assessing bone preservation is highlighted by this.

Our work gives valuable insights into the comparative outcomes of flap and flapless surgery in implant procedures, thereby supporting and expanding upon the findings of previous research. The importance of having a comprehensive grasp of the ways in which surgical techniques and other clinical parameters interact with one another is brought into focus by these modest findings. When it comes to implant dentistry, having this knowledge is really necessary in order to make judgements that are founded on evidence and are educated.

Conclusion: Even though flapless surgery causes only slight discomfort for most patients during recovery, it does not prevent bone loss, and the surgeon must know the risks associated with the technique.

Financial and non-financial relations and activities of interest: None

REFERENCES

1. Archana A, Sn R, Dahiya S, Babaji P, Anand Bajoria A, Gangadhar K. Comparative Assessment of Crestal Bone Loss by Flapless and Flap Technique for Implant Placement: A Prospective Study. *Cureus*. 2023 May 5;15[5]:e38598. doi: 10.7759/cureus.38598.
2. Luo R. A Review of Flapless Implant Surgery. *Int J Ortho Res*. 2021;5[3]:105-113.
3. Osunde OD, Adebola RA, Omeje UK. Management of inflammatory complications in third molar surgery: a review of the literature. *Afr Health Sci*. 2011 Sep;11[3]:530-7. PMID: 22275950.
4. Siu TL, Dukka H, Saleh MHA, Tattan M, Dib Z, Ravidà A, *et al*. Flap versus flapless alveolar ridge preservation: A clinical and histological single-blinded, randomized controlled trial. *J Periodontol*. 2023 Feb;94[2]:184-192. doi: 10.1002/JPER.22-0213.
5. Deabs M, Abdallah M, Shuman M. Effect of flap and flapless procedures in dental implant installation on initial crestal bone loss. *Al-Azhar J Dent Sci*. 2020;23[2]:181-186. doi: 10.21608/ajdsm.2020.26262.1042.
6. Wang F, Huang W, Zhang Z, Wang H, Monje A, Wu Y. Minimally invasive flapless vs. flapped approach for single implant placement: a 2-year randomized controlled clinical trial. *Clin Oral Implants Res*. 2017 Jun;28[6]:757-764. doi: 10.1111/clr.12875.
7. Jiao G, Gao M. Clinical observation on the effect of minimally invasive flapless technique and implant prognosis in oral implants, *Int J Clin Exp Med* 2018;11:165-172.
8. Anumala D, Haritha M, Sailaja S, Prasuna E, Sravanthi G, Reddy NR. Effect of Flap and Flapless Implant Surgical Techniques on Soft and Hard Tissue Profile in Single-Stage Dental Implants. *J Orofac Sci* 2019;11:11-5. doi: 10.4103/jofs.jofs_127_18.
9. Cannizzaro G, Leone M, Consolo U, Ferri V, Esposito M. Immediate functional loading of implants placed with flapless surgery versus conventional implants in partially edentulous patients: a 3-year randomized controlled clinical trial. *Int J Oral Maxillofac Implants*. 2008 Sep-Oct;23[5]:867-75. PMID: 19014156.
10. Pisoni L, Ordesi P, Siervo P, Bianchi AE, Persia M, Siervo S. Flapless Versus Traditional Dental Implant Surgery: Long-Term Evaluation of Crestal Bone Resorption. *J Oral Maxillofac Surg*. 2016 Jul;74[7]:1354-9. doi: 10.1016/j.joms.2016.01.053.



International Journal

<https://ijma.journals.ekb.eg/>

Print ISSN: 2636-4174

Online ISSN: 2682-3780

of Medical Arts