

IMPLANT PLACEMENT PROCEDURE –ONE STAGE VS TWO STAGE

Dr. Amritha Chandran*, Dr.Sunil Dhaded**

ABSTRACT:-Implants have been proven to be viable treatment options for the replacement of missing tooth .The procedure of placing an implant can have a direct role in the overall success of the implant. Implants can be placed penetrating the oral mucosa (1-stage procedure) or can be completely buried under the oral mucosa (2-stage procedure) during the healing phase of the bone at the implant surface.¹ This article is a review comparing one stage and two stage surgical implant placement and to evaluate whether a one stage procedure is as effective as the conventional two stage procedure.

Key words :- one stage procedure ,two stage procedure ,implants

INTRODUCTION :- The goal of modern dentistry is to restore the patient to normal contour ,function,comfort, esthetics ,speech and health,whether by removing caries from a tooth or replacing several teeth.²

What makes implant dentistry unique is the ability to achieve this goal ,regardless of the atrophy ,disease,or injury of the stomatognathic system .However the more teeth the patient is missing , the more challenging this task becomes .As a result of continued research ,diagnostic tools ,treatment planning ,implant designs ,materials and techniques ,predictable success is now a reality for the rehabilitation of many challenging clinical situations .

The increased need and use of implant related treatment results from the combined effect of several factors ,including

- Aging population living longer

- tooth loss related to age
- consequences of fixed prosthesis failure
- anatomic consequences of edentulism
- poor performances of removable partial dentures
- consequences of removable partial dentures
- Psychological aspects of tooth loss and needs and desires of aging baby boomers

8)Predicable long term results of implant supported prosthesis.

9)Advantages of implant supported restorations

10)Increased Public Awareness

Implant Procedure Techniques

Implants may be placed penetrating the oral mucosa (**1-stage procedure**) or can be completely buried under the oral mucosa (**2-stage procedure**) during the healing phase of the bone at the implant surface.

In oral implantology, different endosseous implant systems are currently used. Most implant systems consist of two parts, i.e. the implant which is submerged during a first surgical procedure, and the transmucosal part which is connected to the implant during a second surgical procedure. Therefore, these implant systems are collectively referred to as 'two-stage' systems.

'One-stage' systems consist of one part, which is inserted during a single surgical procedure. The transmucosal part of these implants is integrated to the implant.⁸ Well-documented long-term clinical studies have revealed that both implant types have good and predictable outcomes (Adell et al. 1990, Lindquist et al. 1996, Buser et al. 1999, Haas et al. 1996, Heydenrijk et al. 1998).

With a 2-stage procedure the risk of having unwanted loading onto the implants is minimized, but a second minor surgical intervention is needed to connect the healing abutments and more time is needed prior to start the prosthetic phase because of the wound-healing period required in relation to the second surgical intervention.¹

Among the advances in dental implant therapy, dental implant placement by using a one-stage surgical protocol, i.e., non-submerged implant placement, has been well accepted because of the shorter lag time

between placement and restoration, less surgical manipulation, and better esthetic results. Early soft tissue healing and maturation may be more critical for implants placed using a one-stage surgical protocol because healing complications and the accompanying inflammation may extend readily to the alveolar crest and negatively affect the developing osseointegration.⁴

SURGICAL PROCEDURE :-

There are two approaches for an implant surgery :-

- 1) Two- stage surgery
- 2) One - stage surgery

TWO STAGE SURGERY :-Two-stage surgery requires a two-piece implant system consisting of implant, which is submerged during the first surgical procedure, and the trans - mucosal abutment, which is connected to the implant during the second surgical procedure. The implant is inserted at or slightly below the bone crest in this technique .A low profile cover screw is then inserted into the implant body. The tissues are then approximated into the implant for primary closure .³

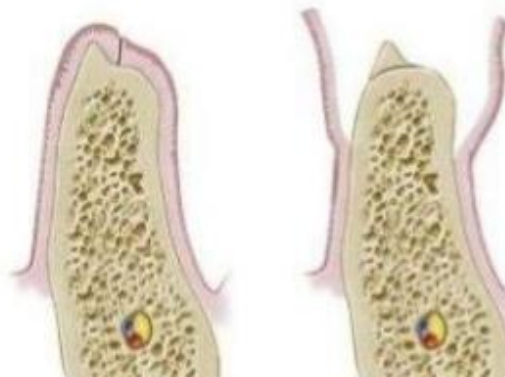
INDICATIONS OF TWO STAGE SURGERY:-

1. Reduced Primary implant stability
2. Compromised bone and mucosa

ADANTAGES OF TWO STAGE SURGERY:-

- 1) Direct observation of crestal bone volume before osteotomy
- 2) Direct observation of crestal bone during osteotomy preparation
- 3) Ability to bone graft the site at the time of implant placement.
- 4) Implant body healing at or below the crest of bone ,which reduces risk of early loading during initial bone healing
- 5) Local hygiene issues or anaerobic bacterial infiltration are not critical factors during initial healing
- 6) Ability to deliver a soft tissue borne transitional appliance in the esthetic zone.

TWO STAGE SUBMERGED IMPLANT PLACEMENT



ONE STAGE SURGERY :- A one stage surgery uses a similar incision and reflection technique to observe directly the crestal bone volume .However at the conclusion of the implant surgery,a permucosal healing

element (PME) is placed into the implant body .The implant body also is usually placed slightly above the crest of the bone .The soft tissue is then placed around the PME.³

INDICATIONS OF ONE STAGE SURGERY :-

1. Sufficient primary implant stability.
2. Minimal risk of infection/no inflammation at the site

CONTRAINDICATIONS OF ONE STAGE SURGERY:-

One-stage implants are preferably not being inserted under the following circumstance⁷:

1. In combination with an augmentation or guided bone regeneration procedure that requires the wound to close tightly to prevent infection.
2. If the abutment interferes with a functional or esthetical design of the suprastructure;
3. To prevent undesirable loading of the implants during the osseointegration period when the temporary suprastructure can not be effectively adjusted.

ADVANTAGES OF ONE STAGE SURGERY

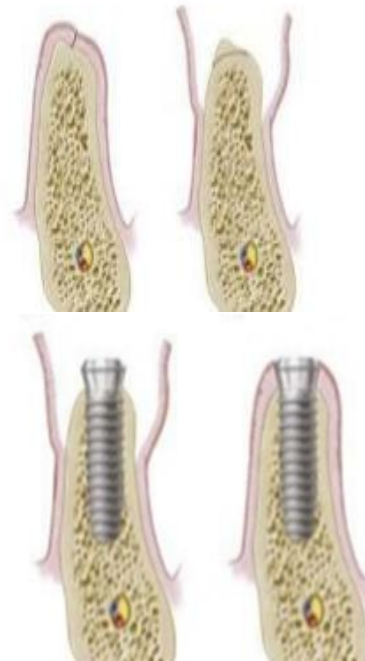
- 1) The soft tissue matures while the bone interface is healing .This permits the restoration to be fabricated with complete

assessment of the soft tissue profile

- 2) Only one surgical procedure required ,making it convenient for patient especially medically compromised patients⁸ .
- 3) Less chair side time per patient and overall reduced treatment cost.⁶
- 4) The prosthetic phase can start earlier because there is no wound-healing period involved related to a second surgical procedure⁸.
- 5) The abutment to implant connection is placed above the crest of bone .This higher location of the implant abutment connection reduces some of the early crestal bone loss in a developing implant interface .
- 6) Due to less crestal bone loss more favourable crown- to -implant length ratio.⁶
- 7) Maintenance of pre operative width of keratinized mucosa as the wound margin can adapt to the implant collar
- 8) The higher profile implant body also allows the restoring dentist to attach the prosthetic abutment with greater ease and tactile ability, which further simplifies the procedure.³

Due to these significant clinical advantages, the non-submerged approach will become more important in implant dentistry in the near future.

ONE STAGE IMPLANT PLACEMENT PROCEDURE



DISCUSSION

The widespread use of osseointegrated implants has resulted in an increasing percentage of an adult population with implant supported prosthesis⁹ .This review articles compares the different procedures of implant placement .In a two stage implant placement procedure an initial insertion of the implant is done and the prosthetic loading procedures are instituted after a period of 4-6 months .Although time tested and predictable two stage implant suffer from limitations of protracted time of

procedures and an inevitable loss of tissues during second stage of the surgery⁹. To overcome these difficulties single stage implants were introduced with the advantage of patient acceptance and shortened procedure time however if unnecessary occlusal forces are applied, there could be severe bone loss and failure of implant in one stage procedures too. As suggested both placement of implants has its own advantage. If the clinical situation favours a good primary stability and minimal or no inflammation at the implant site, one stage implant could be a great alternative to the conventional two stage surgical procedure.

CONCLUSION

In the early curve, the protocol for implant placement was specific in its requirement of a conventional two stage surgical procedure. However over a period of time, with new researches and its applications in clinical scenario, many surgeons have adopted a one stage approach. The type of surgery chosen totally hinges on the clinician depending on various parameters such as the type and quality of bone and the soft tissue characteristics encountered at the time of implant placement for success of the implant in long run.

It is, therefore, necessary for the clinician to be able to clearly distinguish areas where these implants may be successfully restored without any undesirable post-operative sequelae.

REFERENCES :-

1. Esposito M, Grusovin MG, Chew YS, Coulthard P, Worthington HV. Interventions for replacing missing teeth: 1-versus 2-stage implant placement. Cochrane database of systematic reviews. 2009(3). PMID: 19588400 DOI: 10.1002/14651858.CD006698.pub2
2. Tatum OH. The Omni implant system. In Proceedings of the Alabama implant congress, Birmingham, Ala 1988 May.
3. Carl E Misch, Hamzah A Abbas. Contemporary Implant dentistry Third Edition.
4. DeAngelo SJ, Kumar PS, Beck FM, Tatakis DN, Leblebicioglu B. Early soft tissue healing around one-stage dental implants: clinical and microbiologic parameters. Journal of periodontology. 2007 Oct;78(10):1878-86. PMID: 18062110 DOI: 10.1902/jop.2007.070122
5. Yildirm TT, Kaya FA, Yokus B, Colak M, Ozdemir E, Tekin GG, Saribas E, Uysal E. Clinical and radiographic comparison by analyzed cone beam CT between one stage and two stage dental implants. Journal of International Dental and Medical Research. 2017 May 1;10(2):368.
6. Buser D, Mericske-Stern R, Dula K, Lang NP. Clinical experience with one-stage, non-submerged dental implants. Advances in dental research. 1999 Jun;13(1):153-61. PMID: **11276738** DOI: 10.1177/08959374990130010501
7. Røynesdal AK, Ambjørnsen E, Haanæs HR. A comparison of 3 different endosseous nonsubmerged implants in edentulous mandibles: a clinical report.

International Journal of Oral & Maxillofacial Implants. 1999 Jul 1;14(4).

8. Heijdenrijk K. Two-stage dental implants inserted in a one-stage procedure. A prospective comparative clinical study. Groningen: Rijksuniversiteit Groningen. 2002.
9. Mohamed JB, Sabitha Sudarsan KV, Shivakumar B. Rehabilitation using single stage implants. Journal of Indian Society of Periodontology. 2009 Jan;13(1):32. PMID: 20376239 DOI: 10.4103/0972-124X.51893

*-Postgraduate student

** -Professor and HOD

Department of Prosthodontics, Crown,
Bridge and Implantology
AME's Dental college and Hospital,
Raichur