MAR Dental Sciences

Review Article

Immediate Dental Implants: A brief review

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Received Date: April 16, 2021
Publication Date: May 01, 2021

Abstract

Dental implants are considered a revolutionary advancement in the field of dentistry. Placement and prosthetic rehabilitation which can be both removable as well as fixed are done to maintain the esthetic and function of the oral cavity. In the last two decades, a great deal of activity has occurred with the development of better materials and newer techniques that have shown better clinical performance. The immediate implant is one of them that has caught the eye of almost every practitioner. It is a concept of implant placement in the fresh socket. It is indicated in cases with perfect extraction sockets. It reduces overall surgical steps and treatment time. It provides instant gratification to the patient. This manuscript reviews the immediate dental implant, its advantages, disadvantages, and procedure for its placement.

Keyword*: Dental Implant, Immediate Implants, Osseointegration.*

Introduction

Dental implants are prosthetic devices made up of alloplastic material that is implanted into the oral tissues to support either fixed or removable prosthesis. They are considered an excellent alternative for the rehabilitation of teeth. Branemark in 1965, placed the first endosseous titanium implant successfully. He placed the implant with the original concept that is the placement of the implant where

healing has been taken place with the formation of new bone. In 1989, Lazzara placed implants at the time of tooth extraction and called them the immediate implant. Immediate implant signifies the implant placed in an extraction socket at the time of extraction or explantation. An important factor to be considered for the longevity of dental implants is their passive nature.

Techniques for implants placement (1,2)

1.Delayed Implant placement

It is also known as conventional implant placement. It includes the original protocol.

Traditionally, before implant placement, compromised teeth are removed and a healing period from 6-8 months was considered mandatory. After that implant placement was done and again a healing period from 3-6 months was given for osteointegration followed by prosthetic rehabilitation. This whole procedure takes a year or more. This procedure was given by Branemark in 1977.

By delaying the placement of the implant, tooth site infection may be resolved before implant placement and there is a greater percentage of osseointegration in a healed site. Moreover, soft tissue volume is better for flap adaptation and coverage of the implant.

2.Immediate Implant Placement

The therapeutic concept was introduced in Scheult & Heimke 1976. It is an implant placed as a part of surgical procedures and immediately after tooth extraction. This reduces overall treatment time. Patient education is very important. This procedure maintains optimal soft tissue contour and tissue esthetics. The emergence profile of the tooth root is more easily captured in the immediate provisional contour thereby supporting the soft tissues ideally. It decreases patient's anxiety and discomfort.

Indications (3)

1. The ideal extraction site for immediate implant placement with little or no periodontal bone loss.
2. In case of crown fracture.
3. In patients with endodontic failures.
4. When the patient has an unfavorable crown root ratio.
5. Patient with adequate bone height and width
6. Tooth fracture in the anterior region.
7. non-restorable carious lesions.
8. Root fracture and root resorption cases.
9. The presence of at least 3-5mm of residual bone beyond the apex.

Contraindications (4)

1. The presence of purulent exudate ate the time of extraction.
2. Adjacent soft-tissue cellulitis or granulation tissue.
3. Poor configuration of the remaining bone.
4. Patient with chronic periapical infection.
5. The width of the extraction socket is less than 4-5mm.
6. Patient with thin biotype wherein buccal bone is lost.
7. In patients with high smile lines.
8. Proximity to vital structures.

Advantages (5,6)

1. The height and width of alveolar bone are preserved.
2. Osseointegration is more favorable when implants are immediately placed following extraction.
3. Provides esthetic and functional benefits especially in the anterior region.
4. Provides psychological benefits.
5. Preserve proprioception of the bone hence prevent recession of the gingival tissues and atrophy of the alveolar ridge.
6. The procedure keeps contamination away from the socket.
7. Minimally invasion surgical procedure
8. Soft tissue preservation by maintaining the interdental papilla
9. An ideal three-dimensional implant positioning, eliminate the need for angulated abutments and facilitates the positioning of the final restoration.
10. Eliminates the need for a second surgery and hence, increases case acceptance.
11. Reduces treatment time as it eliminates the wait for primary healing of soft tissues and regeneration of osseous structures significantly.
12. Increases patient's quality of life.
13. The extraction socket acts as a **guide** for the determination of parallelism and alignment to the opposing and adjacent teeth.

Disadvantages (7)

1. Technique sensitive
2. Difficult to maintain primary stability.
3. Need for a bone graft to fill the gap between implant and socket wall which increases the cost of the treatment.
4. Difficult to achieve complete closure of the implant site.

5. Fracture of the buccal bone
6. More extensive soft tissue manipulation
7. In the case of the multirooted teeth, prediction of the final position of the implant can be difficult.
8. A thin biotype may compromise optimal outcomes.
9. Potential lack of keratinized mucosa for flap adaptation
10. Frequently, bone loss occurs that causes a buccal portion of the implant to gradually lose its hard tissue coverage and that the metal portion becomes visible affecting the aesthetics. To overcome this, an implant should be placed deeper in the fresh socket and in the lingual palatal portion of the socket.

An ideal situation for the procedure is where the infection-free, intact socket can be obliterated almost entirely by the implant.

Procedure

When deciding upon immediate versus delayed implant placement, many factors must be considered before proceeding in a given direction. A thorough evaluation of the patient's presentation and implant site conditions must be performed. Treatment sequence and planning protocol proceeds as clinical examination, radiographic examination, fabrication of surgical template, surgical and prosthetic phase, and maintenance.

1. Diagnosis and proper investigation should be conducted. The proper investigation includes intra-oral radiographs, orthopantomogram, cone-beam computer tomography.
2. There should be at least a bone of 10mm height or 3-5mm beyond the tooth apex **(8)**.
3. The important step in treatment planning is determining the prognosis of the tooth.
4. **Preanesthetic Medication** involves the initiation of antibiotics, and analgesics a day before treatment and informed as well as written consent of the patient to be taken.
5. On the day of surgery, evaluation of blood pressure, blood glucose level and written consent of the practitioner, if a patient is on any medication.
6. After evaluation of complete sterilization of instruments, the first and foremost thing is the extraction of a tooth.
7. Extraction should be carried out in a complete or as much as possible an atraumatic condition.
8. This can be carried out using a periotome or mini-surgical blade.
9. After extraction, evaluation of tooth that is extracted so that it does not have any root portion left in the socket.
10. Complete debridement of the extraction socket to induce fresh blood or removal of granulation tissue from the socket, and to remove remnants of periodontal fibers with the help of a curette.
11. Socket to be irrigated using normal saline.

12. Atraumatic implant site preparation with an adequate number of drills or instruments.
13. It is advised to place an implant slightly lingually or palatially as bone loss can occur that may cause a buccal portion of the implant to show its metal portion.
14. To prevent metal portion exposure of implant or to maintain esthetics other techniques such as socket shielding technique is advisable.
15. The immediate implant should be limited in the patient with three or four-walled sockets, sufficient bone to stabilize the implant.
16. There should be close contact between implant and socket wall, if a gap exists one can fill them with bone graft or membrane to promote healing.
17. Irrigation is carried out and sutures are placed. Primary stability should be evaluated after implant placement. It is a key to the success of the immediate implant.
18. The patient is given post-treatment antibiotics and analgesics along with chlorhexidine mouthwash.
19. Primary stability can be evaluated with Periostat or RFA (Resonance Frequency Analyzer)**9**.
20. Follow-up should be advised after 24 hours and whether the implant should be immediately loaded or not depends upon the primary stability and clinician's choice. It is best to have progressive loading with immediate implants.

A recent advancement with the introduction of basal implants involves the placement of implants in basal bone and can be immediately loaded within 3 days. These implants are gaining popularity as they have good primary stability.

Immediate implant in diabetic patients

Diabetes is an endocrine disorder that causes a persistent increase in blood glucose levels.

Type-1 diabetes causes a decrease in bone mineral density as well as reduces bone formation but increases bone resorption **(10)**.

Type -2 diabetes patients have normal bone mineral density **(11**).

Upon reviewing the literature, it can be seen that the success rate of a dental implant in diabetic patients is similar to a non-diabetic patient. But patients should have blood glucose levels close to normal **(12)**. Other factors that play important role in success in diabetic patients are the length of diabetic's disease and implant length. In diabetic patients, there are more chances of infection and has delayed wound healing.

1. Before treating the patient HbA1c test should be conducted. This test reflects the glucose levels in the blood over the past 3 months.

2. On the day of implant placement, fasting as well as regular blood glucose should be evaluated.
3. After implant placement patient is advised to control their diabetes and to maintain good oral hygiene.
4. The patient, if have a habit of smoking, should discard it.

The immediate implant can be given in diabetic patients **(13)** but a patient should fulfill all the above conditions to make the treatment successful.

Conclusion

Immediate implant placement in the fresh socket is considered a predictable and successful treatment modality. The survival rate for Immediate implant range between 94-100%. It solves the problem regarding bone quality, esthetics, and treatment time as compared to the delayed implant placement. However, adequate case selection and primary stability are the key factors for the success of immediate implants.

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Volume 2 Issue 5 May 2021