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Immediate Vs Delayed Dental Implants: A Review

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Abstract:
Dental implants are prosthetic devices made from alloplastic material that's implanted into the oral tissues to support either fixed or removable prosthesis. They are considered a superb alternative for the rehabilitation of teeth. Immediate implant signifies that the implant is placed in an extraction socket at the time of extraction or exodontia.
There are mainly 2 methods for implant placement:
a. Delayed Implant placement: It is also referred to as conventional implant placement. Conventionally, before implant placement, compromised teeth are removed. A healing period of 6-8 months was considered mandatory.
b. Immediate Implant Placement: In this modality, patient education is extremely important. This procedure also maintains optimal soft tissue contour and tissue aesthetics.
Conclusion: Immediate implant placement in the fresh socket is a predictable and successful treatment modality. The survival rate for Immediate implant ranges between 94-100%.
Keywords: Dental Implants, Delayed Implant Placement, Immediate Implant placement, Peri-implantitis, Prostheses

INTRODUCTION

Dental implants are prosthetic rehabilitation devices. They are generally made of alloplastic material that are implanted into the oral tissues. They are engineered to support either fixed or removable prosthesis, based on the need and convenience of the patient. They are considered a wonderful choice for the rehabilitation of teeth. Branemark in 1965, placed the primary 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 latest bone. Immediate implant indicates towards the time of the placement of implant into the socket. The implant is placed into the socket "immediately" following the extraction of the tooth that the implant is being placed to replace. This is a crucial factor to be considered for the longevity of dental implants is their passive nature.

TECHNIQUES FOR IMPLANT PLACEMENT

Delayed Implant placement

It is also known as "conventional implant placement." Conventionally, before implant placement, compromised teeth are removed. A healing period of 6-8 months was believed to be inevitable. The implant placement was done followed by a healing period of 3-6 months. This was given for osteointegration, and was followed by prosthetic rehabilitation. This whole procedure took about an year or more. This was the procedure given by Branemark in 1977. By delaying the placement of the implant, infections at the tooth site could be resolved before the placement of the implant. Therefore, there is a greater percentage of osseointegration during the healing period. Moreover, the soft tissue volume available proves to be better for flap adaptation as well as coverage of the implant.

Immediate Implant Placement

This concept of implant placement was introduced in 1976 by Scheult & Heimke. In this procedure, implant is placed immediately after tooth extraction. This reduces the overall treatment time.

In this modality, patient education is extremely important. This procedure also aims to maintain optimal soft tissue contour, as well as tissue aesthetics. The emergence profile of the root is more easily captured within the immediate provisional contour. Therefore, there is adequate and ideal support for the soft tissues. It also decreases patient's anxiety and discomfort.

Indications for implant placement

The ideal extraction site for immediate implant placement should have little or no periodontal bone loss. Implants may be placed in cases of crown fracture or endodontic failures. They are also useful in cases where a patient has an unfavourable crown-root ratio.
It is ideal for patients with adequate bone height and width. In cases of fractured anterior teeth, or teeth with non-restorable carious lesions, implants may give good results. Teeth with root fracture and resorbed roots, and with atleast 3-5mm of residual bone beyond the apex, implants may be placed with good prognosis.

Contraindications

In case there is a presence of purulent exudate at the time of extraction, chronic periapical infections, adjacent soft-tissue cellulitis, or presence of granulation tissue, implants are contraindicated. Patients who have poor configuration of the remaining bone, with less than 4-5mm width of the extraction socket, or with thin biotype where the buccal bone may be lost, implants may have poor prognosis. In addition, patients with high smile lines and with close proximity of the tooth roots to vital structures may be contraindicated for implants.

Advantages of immediate implants

With immediate implant placement, the height and width of alveolar bone are preserved. It is also observed that osseointegration is more favourable when the implants are immediately placed following an extraction. Aesthetically and functionally, immediate implants are seen to be superior to delayed implants. There is also a factor of psychological benefits for the patient and improves their quality of life.

As the placement of immediate implants preserves the proprioception of the bone, it prevents recession of the gingival tissue and maintains the interdental papilla. It also prevents the atrophy of the ridge in the edentulous region. It also keeps contamination away from the socket, and is a minimally invasive procedure.

Due to the ideal three-dimensional implant positioning, the need for angulated abutments is eliminated. The extraction socket itself acts as a guide for the determination of parallelism and alignment to the adjacent as well as opposing teeth. This facilitates the positioning of the final restoration. Due to the elimination of the need for a second surgerical procedure, there may be increased case acceptance. It also reduces the treatment time as there is no waiting period for the primary healing of the soft tissues as well as regeneration of osseous structures. There is also a factor of psychological benefits for the patient and improves their quality of life.

Disadvantages

Immediate implant placement is extremely technique sensitive. It is difficult to maintain primary stability and the need for a bone graft to fill the gap between implant and socket wall increases the cost of the treatment. It is also difficult to achieve complete closure of the implant site.

There may be fracture of the buccal bone, and more extensive soft tissue manipulation. In case of multirooted teeth, the prediction of the final position of the implant is difficult.

A thin biotype may compromise the optimal outcomes and there is a potential lack of keratinized mucosa for flap adaptation.

Very frequently, bone loss is seen on the buccal portion of the implant. This gradually causes the loss of hard tissue coverage and the metal portion of the implant may be exposed, affecting the aesthetics as well as stability of the implant. This however, can be precented by placing the implant deeper in the fresh socket and in the lingual-palatal portion of the socket. An ideal procedure of immediate implant is where an infection free intact socket can be almost completely obliterated by the implant itself.

DISCUSSION:

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

Diagnosis should be done and proper investigations should be conducted. This includes intra-oral radiographs, orthopantomogram, and cone-beam computer tomography. There should be at least bone height of 10mm or 3-5mm beyond the tooth-root apex.

The most important step in process of treatment planning is determination of the the prognosis of the tooth that is being replaced.

Preanesthetic Medication: This involves the initiation of prophylactic antibiotics, and analgesics on the day before treatment.

Informed, as well as written consent of the patient is to be taken on or before the day of the surgery.

On the day of surgery, evaluation of blood pressure, blood glucose level is to be done. Written consent of the practitioner is to be taken in cases of the patient being on any medications.

After evaluation of complete sterilization of instruments as well as surgical site, the first procedure that is undertaken is the extraction of a tooth. The extraction must be carried out in an atraumatic or minimally traumatic manner. It may be carried out using a periotome or a mini-surgical blade.

After extraction, the evaluation of the tooth must be done so as to make sure no fragment of tooth is left behind in the socket. A complete debridement of the extraction socket is done to induce fresh blood. All granulation tissue, and periodontal fibres must removed using a curette. The socket must be irrigated using normal saline.

An atraumatic implant site is prepared with an adequate number of drills or instruments. It is advised to place the implant slightly lingually/ palatally. This is to prevent implant exposure due to bone loss that may occur in the buccal portion of the implant. Socket shield technique may also be employed to prevent metal exposure of the implant, and to maintain optimal aesthetics.

Immediate implant placement should be limited to patients with three or four walled sockets, as sufficient bone is required to stabilize the implant. There must be close contact between the socket wall and the implant. In cases of gap, bone graft may be placed to promote good healing and osseointegration.

Irrigation should be done, followed by suturing. The primary stability of the implants must be evaluated after implant placement, and is a key to the success of an immediate implant. This can be done using a Periostat, or a Resonance Frequency Analyzer(RFA).

After immediate implant placement, the patient is prescribed post-treatment antibiotics, analgesics and chlorhexidine mouthwash.

A follow up is advised after 24-hours. The choice as to whether the implant must be immediately loaded or not is left to the primary stability and the clinician's evaluation of the pros and cons of doing so. However, with immediate implants, it is advisable to progressively load the implants so as to allow better healing and osseointegration.

One recent advancement in implants was made with the introduction of basal implants. This procedure involves the placement of implants into the basal bone. Due to this, the implant can be immediately loaded within 3 days. These implants have been gaining popularity as they have shown good primary stability, as well as immediate loading.

CONCLUSION

The procedure of immediate implant placement in a fresh socket right after extraction has a predictable outcome and is considered to be a successful treatment modality. The survival rates for Immediate implants range between 94-100%. It solves the problem regarding bone quality, aesthetics, and treatment time compared to the delayed implant placement. However, adequate case selection, treatment planning and primary stability are the key factors for the success of immediate implants.

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