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Research Article

IMMEDIATE IMPLANTS AND RIDGE PRESERVATION

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Abstract

Introduction: Loss of teeth leads to resorption of the alveolar bone. Dental implants are usually placed a few months after dental extraction, but recently dentists are opting for immediate implants which show the potential of alveolar ridge preservation

The aim of the work: This literature review is aimed to find the benefits of the immediate implant in alveolar ridge preservation

Methodology: We conducted this literature review using a comprehensive search of MEDLINE, PubMed, and EMBASE from January 1989 to March 2017. The following search terms were used: Immediate implant, alveolar ridge preservation, esthetic implant

Conclusion: Despite most implants are placed several months after dental extraction; recently there has been an increasing trend of using immediate implants. They have proved to preserve the alveolar bone and thus are increasingly used in anterior esthetic zones of the oral cavity.

Keywords: Immediate implant, alveolar bone, alveolar ridge resorption.

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INTRODUCTION:

After tooth extraction, the goal of the prosthetic dental implant is to have a restoration that is in harmony with remaining natural teeth. In order to achieve this, hard and soft tissues must be preserved in adequate quantity and quality. Presently, immediate placement of the implant in the extracted socket has become a common practice to preserve the alveolar. It also leads to lesser appointments and the time for loading implants which leads to higher patient satisfaction. Although a horizontal labial bone width of greater than 2mm width and adequate gingival thickness is considered ideal for dental implants, there is inadequate volume of both hard and soft tissues due to alterations in the structure of the ridge. To solve this issue, immediate implants are often placed. Implants that are placed right after tooth extraction into the socket are called immediate implants [1]. With proper case selection and carefully done surgical procedure, immediate implants are considered a sustainable technique [2].

METHODOLOGY:

Hammerle et al. (2004) ³	Type I	In fresh extraction sockets
	Type I	After soft tissue coverage (4-8 weeks)
	Type I	Radiographic bone fill (12-16 weeks)
	Type I	Healed socket (>16 weeks)
Esposito et al (2016) ⁴	Immediate	In fresh extraction sockets
	Immediate-delayed	> 8 weeks post extraction
	Delayed	< 8 weeks post extraction

Guided Bone Regeneration membranes combined with autograft and other graft materials have shown to regenerate alveolar bone at the time of tooth

Changes in ridge post exodontia

Sufficient bone volume including the adequate thickness of the facial bone wall is an important criterion for an esthetic outcome [6,7]. Thus, understanding the changes in alveolar bone following dental extractions for implant placement in the esthetic zone is of prime importance. A study was

- Data Sources and Search terms**

We conducted this review using a comprehensive search of MEDLINE, PubMed and EMBASE, from January 1989 to March 2017. The following search terms were used: Immediate implant, alveolar ridge preservation, esthetic implant

- Data Extraction**

Two reviewers have independently reviewed the studies, abstracted data and disagreements were resolved by consensus. Studies were evaluated for quality and a review protocol was followed throughout.

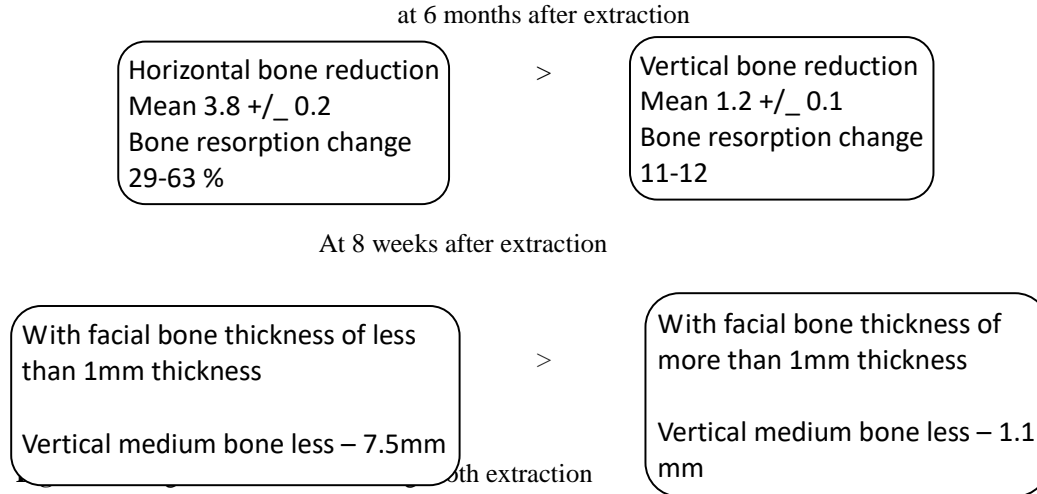
This study was done after approval of ethical board of King Abdulaziz University.

CLASSIFICATION OF IMPLANTS:

Dental implants are classified based on the healing periods of hard and soft tissues and procedure time as shown in the table below [3,4].

extraction. Expected and a good quantity of osseointegration has been seen when concomitant regenerative materials are used. [5].

performed to assess changes in the facial bone of extracted sockets at 8 weeks following extraction of mandibular canines. Results showed a 2.2 mm vertical bone resorption in the mid-facial crest at 8 weeks [8]. Immediate, or early loading with implant along with reconstruction of hard & soft tissues need to be considered to avoid alveolar ridge resorption for implant placement in esthetic regions (Fig. 1).



Ridge preservation after tooth extraction

In the last 20 years, many alveolar ridge preservation techniques were introduced to avoid resorption of bone after tooth extraction from the socket. Several bone filling materials including autografts, allografts [9,10], xenografts [11,12], and alloplasts [13,14] were presented. Use of resorbable or nonabsorbable membranes [15] along with graft materials was also introduced. [16,17]. Dennis Tarnow et al. [18] published 8 studies regarding clinical and histological results following alveolar ridge preservation with a variety of bone graft materials. Although vital bone formation differs with different grafts materials, the amount of dimensional changes in the alveolar ridges are much smaller when compared with control groups. The aim of bone grafting is stabilization of ridge dimensions and osseointegration if dental implants are to be placed. Consequently, a graft capable of replacing vital bone is necessary. In other words, the material must be osteoconductive, but replaceable [18,19].

Immediate or early implant placement

In the conventional decorum, the implant is placed 2-3 months following tooth extraction. The longer the wait, more is the ridge resorption in the edentulous region with longer treatment periods. According to Paolantonio et al. [20], placement of the dental implant in fresh extracted sockets helps maintain the bony crest structure and the alveolar anatomy. Whereas, Araújo et al. [21] performed an animal study and suggested that implant placement in freshly extracted sockets not prevent remodeling 3 months after tooth extraction. Success rate is high in the molar areas with little complications, but often hard and soft tissue augmentation is further needed. As for premolar regions, there is the presence of thick buccal bone with less esthetic requirements. This makes the anterior region most preferred for immediate implant where the esthetic requirement is highest [21].

Time and clinical experience has provided the principles for the success of immediate implants: atraumatic tooth extraction, sterilization and minimal invasive surgical approach, as well as implant primary stability [22].

Difference between immediate and early implants [23,24]

Immediate Implant Placement	Early Implant Placement
<ul style="list-style-type: none"> The median amount of buccal bone resorption at 4-12 months after immediate placement was 1.07mm horizontally and 0.78mm vertically Recession of midfacial mucosa of more than 1mm was observed in 26% on average. The facial bone wall was not detectable on CBCT at 36%-57% of sites. The thickness of facial bone and the position of facial bone crest are important factors affecting long-term esthetic stability after immediate placement. 	<ul style="list-style-type: none"> In early placement with simultaneous GBR, facial bone wall was confirmed on CBCT in more than 90% of cases. Early implant placement is effective for soft and hard tissue preservation compared with delayed implant placement. The proportions of bone height and width reductions were 13.11% and 19.85%, respectively.

PROCEDURE:

Evaluate the bone quantity, quality and associated structures with presurgical radiographs. After giving appropriate local anesthesia, the tooth is extracted as atraumatically as possible. Extraction sockets are then debrided thoroughly and probed for possible

periodontal defects. Osteotomy sites can then be prepared with the sequential order of drills and implants placed with adequate primary stability. Post-operative radiographs are then taken to check the accuracy of implant position. The provisional prosthesis can be placed but should be relieved from occlusion [22].

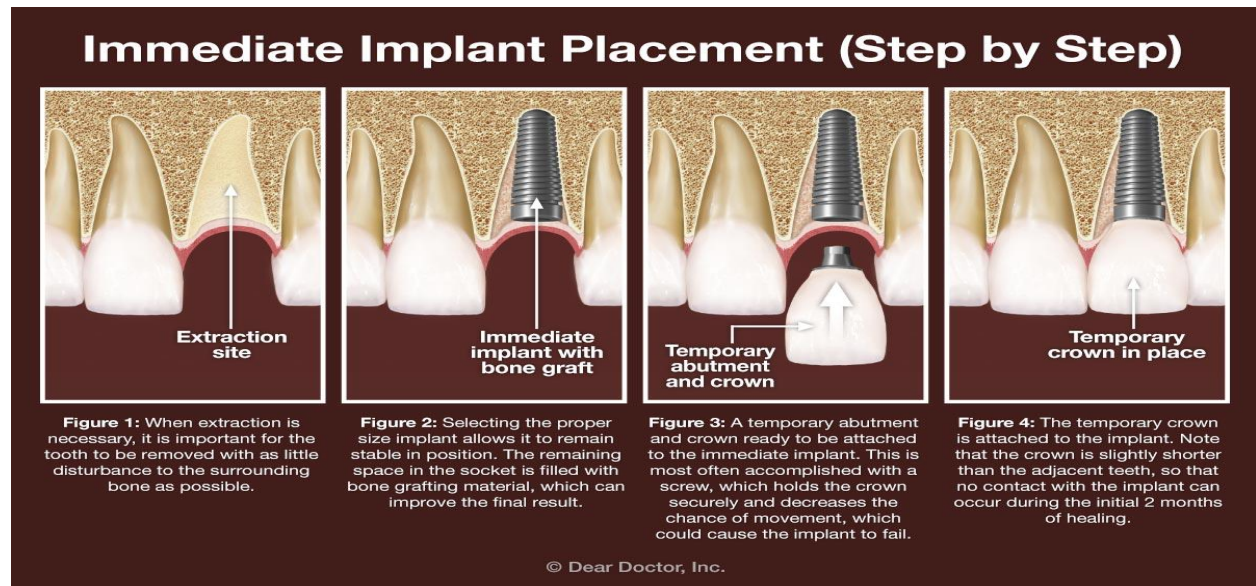


Figure 2: Immediate Implant Replacement [25]

CONCLUSION:

Following dental extraction, an inconstant amount of alveolar ridge resorption takes place. This bone resorption reduces bone available for implant placement; immediate implant placement into these extraction sockets avoids further loss of bone. This

method allows for bone and soft tissue preservation and shortens treatment time by lessening the number of surgical procedures. With proper treatment planning and diagnosis and taking into consideration the patient's anatomical presentation, accidents, and complications, success can be achieved by this

technique.

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