

Delayed Implant Placement – A Case Report

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Abstract

Case Report

The aim of this paper is to describe a case of implant-prosthetic rehabilitation in a patient with missing second premolar in first quadrant, lost due to caries. Oral implant was placed in a prosthetic-guided position. After osseointegration period the implant was loaded.

Keywords: implant-prosthetic rehabilitation, premolar, quadrant.

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INTRODUCTION

Restorative therapy performed on implant(s) placed in a fully healed and non-compromized alveolar ridge has high clinical success and survival rates [1]. In the literature numbers of factors (smoking, poor oral hygiene etc.) that can influence the outcome of implant treatment have been analyzed. Therefore, the control of these risk factors and periodontal therapy are key elements to achieve stable results over time [2,3]. Among these, the timing of load result is not able to influence the therapeutic outcomes (implant failure: RR 1.65; 95% CI 0.68 to 3.98; 10 trials) [4]. Even for the timing of implant placement there is insufficient evidence to determine the possible advantages or disadvantages of immediate, immediate-delayed, or delayed implants; therefore the preliminary conclusions of the literature are based on few underpowered trials often judged to be at high risk of bias. In the Third International Team for Implantology (ITI) Consensus Conference, three basic protocols for implant placement were defined according to the time between tooth extraction and implant installation [5]. In the type-1 protocol (immediate implant installation), implants are placed in fresh extraction sockets, with the aim to engage the remaining socket walls with the implant. In the type-2 protocol (early implant placement), implants are placed approximately 4–8 weeks after tooth extraction. The main objective of this protocol is to ensure the lack of pathology when placing the implant and, at the same time, to optimize the availability of soft tissue for primary healing and probable lateral bone augmentation. In the type-3 protocol (early-delayed/conventional implant placement) the implants are placed once most of the dimensional changes in the alveolar ridge have occurred (12–16 weeks). Hämmerle

and coworkers considered it necessary, however, to develop a new concept (classification) that incorporated the growing knowledge in this field of implant dentistry. This new classification took into consideration data describing structural alterations that occur following tooth extraction as well as knowledge derived from clinical observations. The fixture placement in relation to the dental extraction should be based on an adequate understanding of the structural changes that occur in the alveolar process after tooth loss [6]. During the healing, alveolar bone walls are partly absorbed, the center of the socket is filled with porous bone, and the overall volume of the site is greatly reduced [7]. The buccolingual resorption, however, prevails and occurs in the first 3 months from the extraction [8].

Therefore, the clinician must know and predict the changes of post extraction ridge to plan the timing of implant placement and the management of the site in the best way possible in order to get predictable results. In light of these premises, we describe a clinical case that came to our attention to be rehabilitated by dental implant due to the loss of tooth in the first quadrant as a result of caries.

CASE REPORT

A 35-year-old patient with missing 2nd premolar in first quadrant came under our observation to resolve his dental problems with a specific request to be rehabilitated with fixed prostheses. The patient was in good state of health. Intraoral examination showed extrinsic stains. In addition 1st premolar in same quadrant was having deep carious lesion. After taking alginate impressions, models were developed with

diagnostic wax-up of the case. A CBCT to evaluate the available bone volume for the prosthetic rehabilitation was carried out (fig 1). After careful oral examination nonsurgical periodontal therapy was carried out and reevaluation at 4 weeks was done. Root canal therapy was carried out with respect 1st premolar. Patient was motivated to oral hygiene at each visit. After nonsurgical periodontal therapy the implant treatment was undertaken (Figure 4). Surgery was performed under local anesthesia using 2% lignocaine solution combined with a vasoconstrictor. The incision was extended from the edentulous distal crest (fig 2). A full thickness flap was carefully elevated. It was decided to proceed with the placement of implant at 15 sites with a type 4 implant placement. Before surgery, the patient has performed for 2 minutes rinse with chlorhexidine 0.20%. Site 15 prepared to accommodate implant, 3.5 × 11 mm. The wound was closed with horizontal

mattress and simple sutures. After surgery patient was prescribed amoxicillin 500mg tid for 3 days and .2% chlorhexidine gluconate rinse tid for 4weeks. The patient was shown how to perform a roll-stroke brushing technique and was motivated to control oral hygiene. The patient did not report specific symptoms and showed no adverse clinical signs. During implant osseointegration, the patient did not apply on the edentulous ridges any provisional prosthetic rehabilitation in order to avoid trauma and wound dehiscence in the early stages of healing. After 6 months of healing, we proceeded to expose the implant with a small incision using a miniblade. The cover screw was replaced with a healing abutment. After 7 days we proceeded to take the polyether impression. Clinical examination at the delivery of the prosthesis revealed clinically healthy peri-implant soft tissue and no signs of complication.

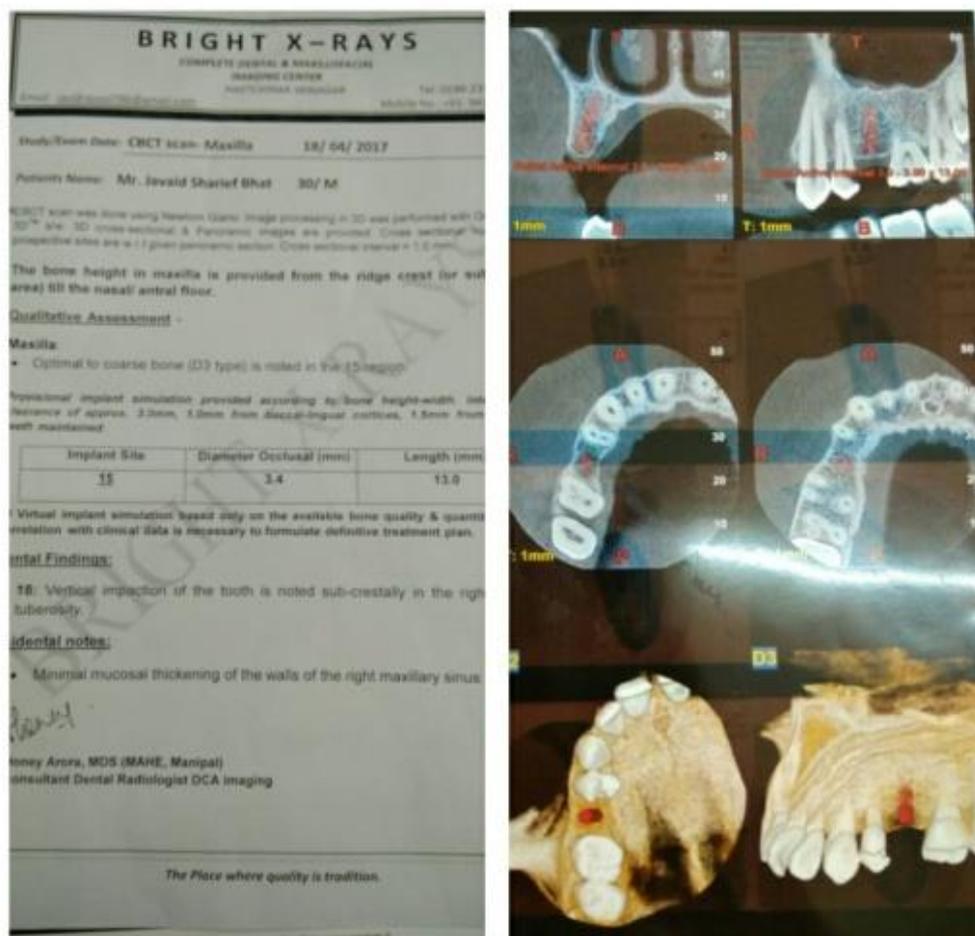


Fig-1: CBCT of patient



Fig-2: flap design, elevation and insertion



Fig-3: Implant site preparation; round bur used to mark site and create starting point for twist drills



Fig-4: Subsequent twist drills were used to prepare the site of proper depth and alignment



Fig-5 Periapical radiograph with guide pin to have visual guide for path of insertion



Fig-6: Final osteotomy site



Fig-7: Implant placement by hand with wrench



Fig-8: Final implant placement



Fig-9 cover screw placed



Fig-10: Flap closure and suturing, horizontal mattress sutures and interrupted sutures



Fig-11: Final implant position: IOPAR

DISCUSSION

The use of implants in patients with teeth lost is now established practice [9]. The decision to place an implant following tooth extraction is usually determined by some soft and hard tissue characteristics of the healing socket. Healing does not necessarily follow rigid time frames, and may vary according to site and patient factors. Classification by Hammerle *et al.* 2004 took into consideration data describing structural alterations that occur following tooth extraction as well as knowledge derived from clinical observations using numerical descriptors – types 1, 2, 3, and 4 – that reflect the conditions of the hard and soft tissues:

- Type 1 placement: the implant is placed immediately following the extraction of a tooth
- Type 2 placement: the implant is placed in a site where the soft tissues have healed and a mucosa is covering the socket entrance
- Type 3 placement: the implant is placed in an extraction site at which substantial amounts of new bone have formed in the socket
- Type 4 placement: the implant is placed in a fully healed ridge
- It was further recognized that there is a clear separation between hard tissue healing and soft tissue healing within and around the extraction socket. Type 4 placement which we followed consists of Healed site (typically >16 weeks) with

advantages of clinically healed ridge and mature soft tissues that facilitate flap management. But this placement type has some disadvantages - Increased treatment time, Adjunctive surgical procedures may be required, and large variation in available bone volume.

The correct three-dimensional implant placement and the management of the peri-implant tissue have allowed us to obtain good results. We were able to obtain a good primary stability. There were no complications and fixture was loaded after a conventional healing period of 5-6 months.

CONCLUSION

When teeth have to be replaced by oral implants, there are various factors conditioning the timing of implant placement after dental extraction, among these, the three-dimensional position of the tooth in the oral cavity, the hard and soft tissue contour of the site, and the adaptive changes of the alveolar ridge after tooth extraction that may affect the outcome of the therapy. The decision on the planning for implant placement should be based on a full understanding of the structural changes that occur in the alveolar process after tooth extraction.

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