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Managing Immediate Implant Placement and Final Restoration Using Mucolock Concept of TTPHIL ALL TILT® Technique in Anterior Extraction Socket

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Abstract

The placement of dental implants in the anterior region of the maxilla is challenging for clinicians because of the patient's high esthetic demands and difficult pre-existing anatomy. There are anatomic factors such as horizontal or vertical bone deficiencies and iatrogenic factors such as improper implant selection or dental implant malpositioning for an esthetic implant restoration. The immediate loading of implants is highly recommended especially in the anterior region where esthetic requirements are high.

In the literature, alternatives prove the effectiveness of immediate implant placement after tooth extraction that decreases the number of surgical procedures, reduces treatment time, and improved esthetics due to adequate osseointegration and much integration. This article presents a case with immediate implant placement and immediate loading using Tall Tilted Pin Hole Immediate Loading ® (TTPHIL ®) protocol in the anterior region with a fixed screw-retained prosthesis, satisfying the patient's functional and esthetic needs. TTPHIL® technique is considered as evidence-based dentistry, using tall and tilted implants with bicortical anchorage in a flapless, subcrestal manner delivering permanent prosthesis in 2-5 days. TTPHIL ® concept is more advantageous in the esthetic zone as it provides soft tissue stability by creating a biologic seal.

***Keywords**: TTPHIL ®, Tilted implant, Bicortical engagement, flapless, subcrestal, one time one abutment, mucolock.*

Introduction

It is considered that placing implants after extraction in a single visit will reduce morbidity, treatment time, and treatment costs. This approach is called the "immediate implant and was first reported by Schulte et al in 1978.**[**1,2**]** Thereafter literature depicts several clinical reports with clinical and radiographic success.**[**3-11**]** The abundant experimental studies were performed on a light microscopic level in animals to confirm that osseointegration can be achieved following immediate implantation in immediate extraction sites.**[**12-14**]** In recent years, implant placement post-extraction in the esthetic zone for a single tooth is a frequent indication in implant therapy. **[**15**]**

The objective of implant treatment is an esthetic outcome, least number of surgical procedures, less pain and morbidity, low risk of complication, least treatment period, cost-effective to the patient.**[**16**]** TTPHIL® (Tall Tilted Pin Hole Immediate Loading®) is an advanced concept that has evolved from various philosophies in implantology (Basal, Pterygoid and Tilted) under immediate loading.**[**17-22**]** This technique utilizes the use of long tilted implants with bicortical engagement in the maxillary, nasal and pterygoid bone to maximize the success of rehabilitation. Tall implants (length: 16mm-25mm) and Tilted implants (30°-45°) with bicortical anchorage offer primary stability which supports osseointegration.**[**23**]** These implants bypass vital anatomical structures, reduce the cantilever effect, help in stress distribution and anterior-posterior spread.**[**24**]** The Pinhole (PH) placement of implant i.e flapless procedure reduces tissue trauma arising from flap reflection, maintaining soft tissue profile and reducing postoperative discomfort.**[**25,26**]** The implants are immediately loaded (IL) within 48 hours due to the good stability of implants attained from the bicortical anchorage.

Case Report

Figure 1: Preoperative frontal view

Figure 2: Drill passing through the surgical guide

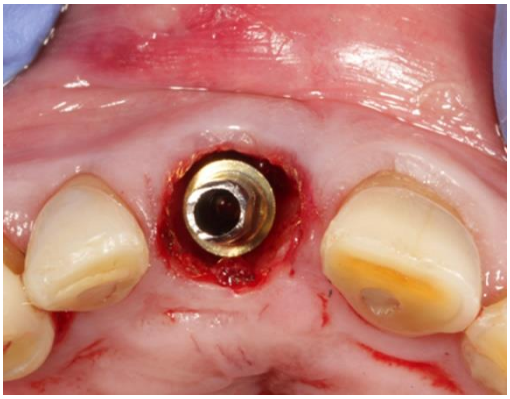

Figure 3: Implant placed subcrestally

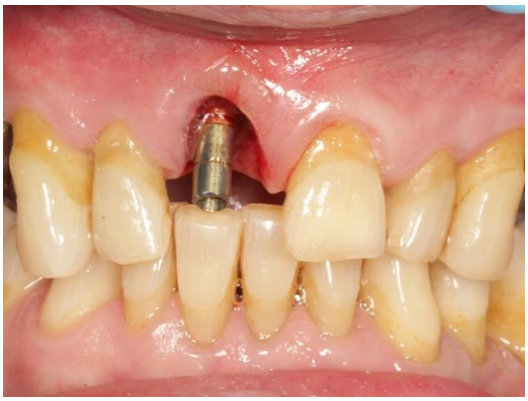

Figure 4: Abutment attached in the same appointment

Figure 5: Postoperative view of Zirconia crown restoration

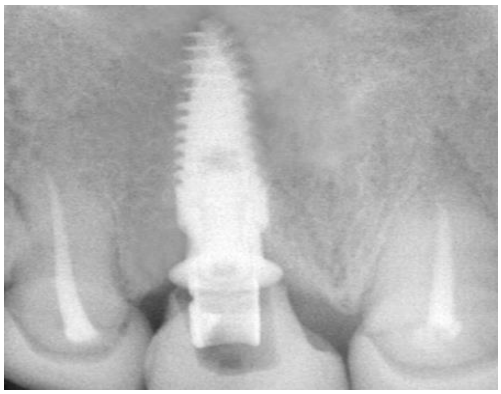

Figure 6: Post operative follow up RVG at 2 years

A 35-year-old male patient presented with complained of pain in the front region for few days and also wanted replacement of missing back teeth of the upper jaw. The past medical history revealed no contraindication to dental treatment. Oral examination revealed acceptable oral hygiene, few missing teeth, pain on percussion in relation to 11(Figure 1). The periodontal evaluation revealed a thick periodontal biotype with generalized recession and probing depth of 3-4 mm. A thorough radiographic examination using orthopantomogram(OPG) and Cone Beam Computed Tomography (CBCT) was advised. The radiographic evaluation suggested a fractured # 11 with an unfavorable prognosis. The treatment plan was formulated and discussed with the patient, it was decided to extract tooth #11 followed by immediate implant placement and immediate loading using TTPHIL® technique.

Informed consent was obtained from the patient. Tooth extraction with immediate implant placement was planned. Under local anesthesia (2% lignocaine with 1:200000 adrenaline), atraumatic tooth extraction was performed. The extraction socket was thoroughly debrided and degranulated mechanically to remove all infected tissue followed by saline irrigation. Using a surgical guide, a single drill concept osteotomy was initiated through the extraction site with a pilot drill of diameter 1.2mm followed by a final single drill of 2.0 mm diameter (Figure 2). To obtain primary stability, osteotomies were performed at least 3 mm apical to the extraction socket. Bioline Surface Implant (3.75 mm diameter, 18 mm length) with an insertion torque of 45 N/cm² was placed subcrestally(Figure 3). The abutment was placed in the same appointment to avoid repeated detachments/attachments affecting the mucosal integration around it(Figure 4). Abutment level open impression was made. Shade selection was done and sent to a lab for zirconia crown fabrication. The bisque trial was done followed by shade confirmation and was sent to the lab for finishing the prosthesis. Using the CAD-CAM technique, the implant was loaded within 48 hours using a zirconia crown(Figure 5). The postoperative OPG was exposed showing implant and prosthesis. After 3 months, 1 year, and 2 years; the patient was recalled and it was noted to have exhibited good esthetic and stable bone levels(Figure 6). The tissues were healthy with no signs of inflammation.

Discussion

Whenever the dentists face a situation of tooth extraction in the esthetic zone, the decision is challenging in terms of esthetic success. Here, immediate extraction along with immediate implant placement is a highly predictable treatment plan. **[**27**]** The long treatment time and the use of a removable prosthesis during the treatment time may pose difficulty to many patients. Several authors considered 1-stage surgery, immediate implant placement, and immediate loading as the best option in case of replacement of anterior teeth.**[**28**]** When the atraumatic extraction is achieved with a flapless approach, the gingival architecture and blood supply to the boccal plate is preserved. In the literature, many techniques have been proposed to decrease the amount of hard and soft tissue collapse after extraction with different

ranges of successes. [29-31] Immediate implant placement and immediate loading using TTPHIL® technique has shown to maintain crestal bone levels through its concept of mucolock. This concept encompasses the advantages of flapless, subcrestal and one-time surgery to produce and maintain excellent esthetic results.[17] This provides a biologic seal around the abutment and maintains the hard and soft tissues. Nevertheless, its use in a larger number of cases and higher levels of evidence studies will provide further information and validity.

Conclusion

In this case report, the harmony of soft and hard tissue was achieved in the esthetically challenging situation by immediate implant placement and immediate loading using TTPHIL® technique. Minimally invasive surgical procedures, lesser treatment time with minimum post-extraction complications and preservation of gingival aesthetics are a boon to the patient. However proper case selection, diagnosis and treatment planning, meticulous post-operating care are very essential long term success. Thus, the result of this case report has the potential to be recommended for similar cases.

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