

IMMEDIATE LOAD OF MANDIBULAR OVERDENTURE USING MINI IMPLANTS. A CASE REPORT

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Abstract

Transitioning patient from failing dentition to fixed implant-supported prosthesis requires careful planning and well-sequenced treatment. However, patients are frequently uneasy about using a removable prosthesis, especially the mandibular one. This case report presents the option of placing two mini implants and immediately loading them to retain mandibular overdenture for a period of time. The technique, performed in the surgical stage, allows for the use of immediate complete denture as interim complete overdenture.

Keywords: immediate implants, mini implants, overdenture, interim prosthesis.

1. INTRODUCTION

Full mouth rehabilitations are often associated with significant treatment planning and prolonged treatment time [1]. Patients with hopeless residual dentition are often concerned about the management of the provisional phase until definitive prosthetic restoration [1]. When extraction of all hopeless teeth is considered, possible solutions include a conventional removable complete denture, removable implant-supported overdenture, and fixed implant-supported restoration [1]. Depending on bone quality, different implant placement protocols have been reported in literature [2]. Unique clinical consideration for each of the various implant placement protocol must be followed [3]. Immediate or early dental placement after tooth extractions presents attractive solutions for patients and clinicians [4,5]. Nevertheless, patients using immediate mandibular denture often complains of diet, retention, comfort, and stability [6,7]. Hence, retaining immediate mandibular prosthesis with a provisional mini-implant (MDI) for a transitional phase until final

implant placement would be a practical approach to improve mastication, speech, comfort, and denture retention, as well as the quality of life [6,8]. MDIs have been used as a treatment modality for more than 20 years, as a transitional implant or for orthodontic anchorage, with a plan for subsequent removal [9,10]. MDIs offer a viable economical alternative option since they involve less complex surgical procedure with flapless insertion, and permit for immediate loading protocol [11].

Many terms have been reported in the literature for implants with a diameter less than 3.5 mm [12]. Mini and transitional implants are defined as those with a diameter ranging from 1.8 to 2.9, as suggested by Bidra *et al.* [12]. Various indications of MDI have been reported in addition to their use for an interim prosthesis. It has been suggested that they help in stabilizing surgical guide during implant placement [13]. The transitional implant has been reported to be used in growing patients following failed tooth re-implantation of post avulsion [14]. It is also used for prosthodontic management of young ectodermal dysplasia [15]. The use of MDIs further suggested their utilization for definitive mandibular overdentures, especially with elderly or severely debilitated patients, where the lengthy duration of conventional implants treatment would preclude their use [12,16]. The overall survival rate of MDI retained overdenture prosthesis reported was 95.63%, with a mean follow up 28.24 months [9].

The present article describes a technique for simultaneous placement and immediate loading of two MDIs, enabling the patient to wear mandibular overdenture prosthesis following the surgery.

2. CLINICAL PRESENTATION

A 55 year-old Caucasian male patient with multiple caries and periodontal involvement, presented for full mouth rehabilitation (Fig. 1). Various treatment plans were explored, including extraction of all non-recoverable teeth and replacement with a removable partial denture. The patient requested a fixed prosthesis. However, due to financial concerns and periodontal conditions, two transitional MDI implants were planned to retain mandibular overdenture as an interim prosthesis, based on the cone-beam computed tomography taken for planning completed denture implant-supported prosthesis. A treatment plan and signed consent form were obtained for full mouth extraction, mandibular retain overdenture as temporary prosthesis utilizing two MDIs, and dental implants placement for an implant-supported fixed dental prosthesis as definitive prosthesis.



A



B

Fig.1. Initial presentation. A. Frontal Intraoral photo. B. Panoramic view from the CBCT

Following local anesthesia, after extraction of all remaining mandibular teeth, 2 MDIs (LODI 2.4 mm platform diameter, 10 mm length, and 2.4 cuff height: Zest Dental Solution) were placed in the site of the laterals, according to the manual rules (Fig. 2). An insertion torque above 30N cm was achieved for both implants. Following placement, the implant with its coronal locator design as a retentive element for the denture extended about 1.5 mm above the level of the mucosa. Space was prepared in the denture to allow for locator attachment in the denture, without direct contact with the resin base. The prepared intaglio surface of the denture was filled with soft liner (COE-SOFT™ GC America Inc.) and the denture was placed over the implants. After polymerization, any excess of soft reliner was removed.



A

B

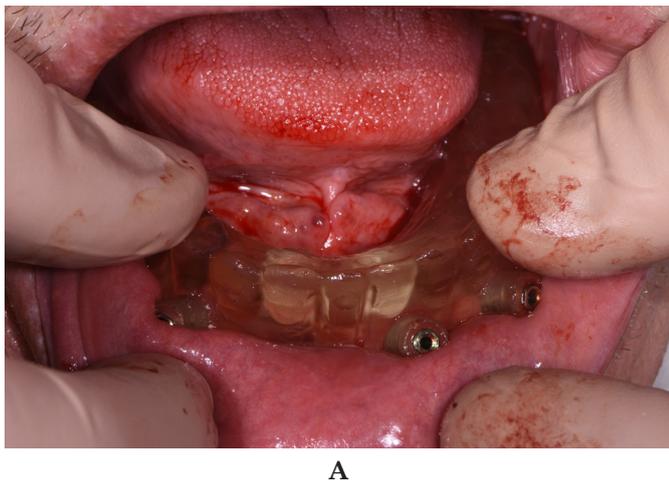
Fig. 2. A. LODI implants with locator attachment. B. Occlusal view of MDI placement after surgery

Additionally, the soft reliner was removed above and around the implants and replaced with autopolymerization resin (EZ Pickup, Sterngold Dental, LLC) to pick the metal housing. Postoperative instructions on daily cleaning of denture and implants were offered to the patient (Fig. 3). The patient was recalled for follow up after 48 hours and 1 week, to control the stability of the denture, and also for oral hygiene reinstructions, if indicated. Then, the patient was recalled after 3 weeks, 2 months, and 4 months, respectively, for follow up and reliner replacement, if indicated. Post-extraction ridge resorption was periodically monitored and the prosthesis relined with hard reliner (COE-RECT™ GC America Inc.) after a healing period of 6 months.



Fig. 3. Frontal intraoral photo after surgery shows relined mandibular overdenture and maxillary complete denture

After one year of healing, five guided implants were placed as a planned definitive implant-supported prosthesis. Two guides were fabricated utilizing mini implants, fixation screws for the first guide (Fig. 4).



A



B

Fig. 4. Surgical guides. A: First guide stabilized by mini implant to secure fixation screws. B. Second guide for placement of 5 implants.

Then, the Mini implants were removed (Fig. 5), and 5 implants were placed (Straumann bone level implant RC; 4.1 mm, length 10 mm, Institut Straumann AG).



Fig. 5. Removed Osseointegrated MDI

By achieving a torque value of 35 Ncm of these implants, the prosthesis was converted into a fixed temporary implant-supported one (Fig. 6). The patient was instructed to follow a soft diet and avoid excessive force.



Fig. 6. Screw-retained fixed temporary implant-supported prosthesis

3. DISCUSSION

Often, transitioning of a patient from hopeless dentition to definitive prosthesis required careful planning and extended treatment time [1]. These patients are concerned about the management of the provisional phase; specifically, the patients using immediate complete denture are often complaining of retention, low comfort and stability.

The procedure here described offers to the patient the advantage of having an immediate mandibular overdenture. This is an effective approach to improve mastication, speech, comfort, and retention of the denture, as well as a help for sequencing the treatment, when the cost is a concern for the patient. These mini-implants offer a viable cost-effective option, since they involve less invasive surgical procedures with flapless insertion, and allow for immediate loading [6,8]. Nevertheless, the locator attachment here used to retain the immediate denture will enable them to be considered as definitive prostheses, if indicated. In addition to their use as interim prosthesis, various indications of MDI have been described in literature [12-16]. In this report, the MDI were utilized to stabilize the surgical guide for final implant placement.

4. CONCLUSION

In conclusion, this report suggests that the immediate loading of two mini implants to retain an overdenture is a viable treatment option for transition patients from hopeless dentition to an implant-supported fixed prosthesis. This approach enhanced prosthesis stability, comfort and function, as well as the quality of life.

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