

Predictable aesthetic outcome with immediate placement and early loading of one piece mini implant - A 5 year follow-up case report

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Abstract:

One piece mini implants are viable and predictable options to conventional implants in areas of deficit bone width. These can be placed without complex surgical augmentation procedures and are cost effective. Four mini implants were placed in a 40 year old female patient replacing her mobile mandibular anterior teeth. Provisional restoration was given after 2 weeks followed by individual ceramic crowns after 6 months. 5 year follow-up showed aesthetic soft tissue contours and successful osseointegration. One piece mini implants are viable treatment option in the aesthetic management of partial edentulism especially in the mandibular anterior region.

Key Words: Early loading, immediate placement, one piece mini implants, osseointegration

Introduction

Dental implants are presently considered a standard modality of treatment in replacing missing teeth. Lower anterior region normally presents with resorbed ridges, compromising placement of conventional implants. Augmentation of such resorbed ridge involves complex surgical procedures resulting in extended treatment period and additional treatment cost.

One piece mini implant is designated as implant with diameter of 1.8 mm and 2.4 mm dimensions.¹ Mini implants have numerous advantages one such as that it can be placed in narrow ridge without augmentation.² They are used for retention of provisional dentures.³ They are cost-

effective, need minimal drilling sequences and yield good primary stability.⁴ Mini implants are an advantageous option especially in the mandibular anterior region to replace the incisors as they have very narrow mesiodistal space.

Azfar et al stated that the use of mini implants in areas of lesser occlusal load and narrow mesio-distal width situations may lead to favourable treatment outcomes.⁵

Dennis Flanagan reported about 3 mini implants for replacement of mandibular anteriors and 2 year follow-up revealed successful function with no apparent bone loss, gingival inflammation or mobility.⁶

Extraction and immediate conventional diameter implant placement preserves residual hard and soft tissues dimensions by minimizing post extraction resorption of the socket.⁷ But less data is available on crestal bone preservation following immediate one piece mini implant placement in fresh extraction sockets.⁶

Literature review revealed limited information on the predictable success of mini implants and their potential in preserving crestal bone height when placed in fresh extraction sockets.

This case report details about the aesthetic outcome and preservation of crestal bone when 4 mini implants placed immediately following extraction of mandibular anterior teeth with early loading during a 5 year follow up period.



Figure 1A: Pre-operative view.

Case Report

A systemically healthy 40 year old female patient reported to the Department of periodontics and oral implantology, SRM Dental College and Hospital, Chennai, Tamil Nadu, India, with the complaint of mobility in the lower anterior region. Clinical intraoral examination revealed generalized probing depth of 6-8 mm, recession in the lower anterior region, generalized moderate bone loss with extensive bone loss in relation to 31, 32, 41, 42 associated with Grade III mobility (Figure 1A). Treatment plan included full mouth scaling and root surface debridement with splinting in the lower anterior region. This is followed by full mouth open flap debridement, extraction of 31, 32, 41, 42 with immediate Implant placement.

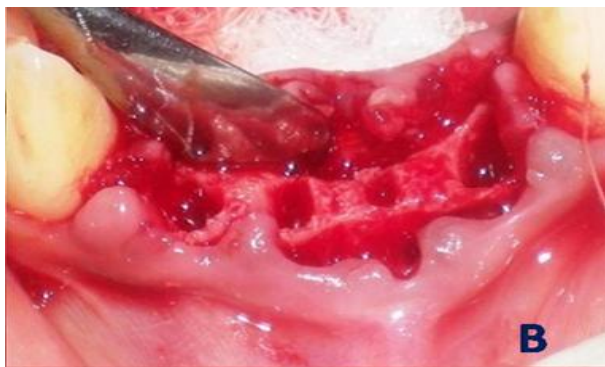


Figure 1B: Extracted sockets.



Figure 1C: Placement of One-piece Mini implants.

Surgical Procedure

8 weeks following full mouth open flap debridement, the Lower anterior region was anesthetized with 2% Lignocaine HCl(1:200000 adrenaline) and splinting was removed, a full thickness muco-periosteal flap was elevated and extraction of 31, 32, 41, 42 was performed (Figure 1B) during which a bony fenestration defect was noted in relation to the labial aspect of 42. The extracted sockets were curetted and implant osteotomy was performed to place mini implants of 2.4 mm diameter (Figure 1C). 4 Mini Implants (TRI-N Life-Care Devices Pvt Ltd) of 2.4



Figure 1D: 4 mini implants in place.

mm diameter and 13 mm length was threaded into place in 31, 32, 41, 42 region with the primary stability of >35 Ncm (Figure 1D). The fenestration Defect in 42 (Figure 2A)



Figure 2A: Fenestration defect in 42.



Figure 2B: Graft placed and sutured.

was treated with a Bovine Bone-graft (Bio-Oss[®]) and a GBR membrane (Bio-Guide[®]). Flap was approximated and sutured with 3-0 Black silk (Ethicon[®]) (Figure 2B). Patient was given routine post surgical instructions and medication. Patient was examined after 10 days during which suture removal was done and post surgical event was uneventful. Patient was examined 1 week later for provisional restoration during which impression was taken and acrylic splinted provisional crowns were fabricated and cemented (Figure 2C). 4 Months following implant placements, IOPA radiograph revealed successful

osseointegration and stable crestal bone height. Impressions for permanent prosthesis were taken and individual PFM crowns were fabricated and cemented on to the implants in 31, 32, 41, 42 region (Figure 2D). 5 years follow up revealed stable bone dimensions around the Implant with excellent soft tissue contours and optimal patient oral hygiene maintenance.



Figure 2C: Splinted provisional crowns in place.



Figure 2D: Individual PFM crowns.

Discussion

Until recently, dental implant treatment was limited to patients with a minimum of 7 mm to 8 mm of available mesiodistal bone width to enable the placement of a 3.0 mm diameter implant without impinging on the roots of the adjacent teeth. The availability of mini implants with 1.8 mm to 2.4 mm diameter has opened a new horizon in oral-implant restoration. Mini-implants are a new treatment paradigm, when compared with the traditional procedures as they offer many distinct advantages over conventional implants like placement without special preparation, minimal drilling, stable support,⁸ easy placement, and immediate loading.⁹ Apart from providing function and aesthetics similar to natural dentition, they also provide the most conservative treatment option, especially for single-tooth restoration without the need for bone grafting or bone expansion procedures. Being a relatively new method of treatment limited scientific data

is available regarding the use of mini implants. Mini implants require less buccolingual and mesiodistal bone volume hence they could be an excellent treatment option especially in lower anterior and maxillary lateral incisor replacement. Immediate loading is a distinct advantage with most mini implant systems due to the implant surface

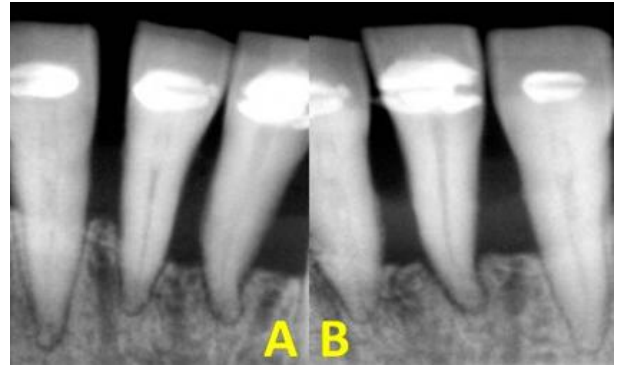


Figure 3A & 3B: Pre-operative IOPA.

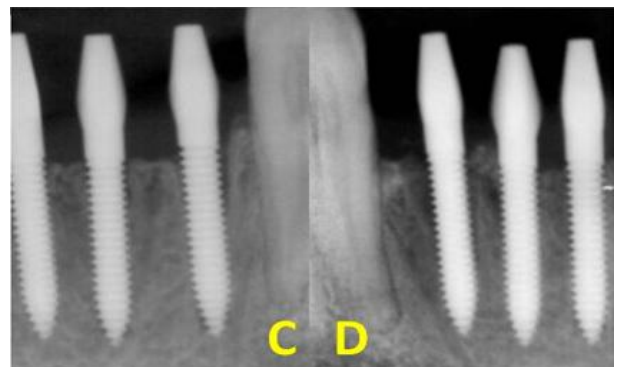


Figure 3C & 3D: Post-operative IOPA.

design pattern offering immediate provisional teeth replacement. Mini implants obviously have less surface area available for osseointegration compared to narrow-diameter implants, and this may be a handicap in some clinical situations, however the length of these mini implants compensate for their narrow diameter.⁶ In the present case report extraction and replacement of 41, 42, 31, 32 was decided considering grade III mobility and advance bone loss (Figure 3A, 3B). Conventional fixed partial dentures was not planned as the natural abutments 43 and 33 were also periodontally compromised. Conventional implants require a minimum of 2 mm safe distance between the implants and natural teeth and 3mm between implants. The available Mesiodistal width between 33 and 43 necessitate placement of 4 implants with a maximum diameter of 2.5mm. Hence one piece mini implant of 2.4 mm diameter was decided in the present case report. Extraction was performed very

carefully without causing any damage to the residual bone, the extraction sockets were debrided and 4 mini implants with minimal osteotomy was placed (Figure 3C, 3D). Primary stability of 35 Ncm torque was achieved for the 4 mini implants which were subsequently restored with individual metal ceramic crowns. Patients were examined every three months in the first year followed by an examination once in every six months till the fifth year, during which radiographic evaluation of crestal bone height and soft tissue health were evaluated and oral hygiene maintenance reinforced. 5 year follow-up showed stable bone height (Figure 4A, 4B), excellent soft tissue health and optimal oral hygiene maintenance.

Conclusion

Mini implants are indicated for areas where the use of narrow platform implants needs additional bone augmentation/expansion procedures. The use of mini implants are restricted to replacement of teeth in areas with minimal occlusal load until longitudinal studies support its use in conventional situations.

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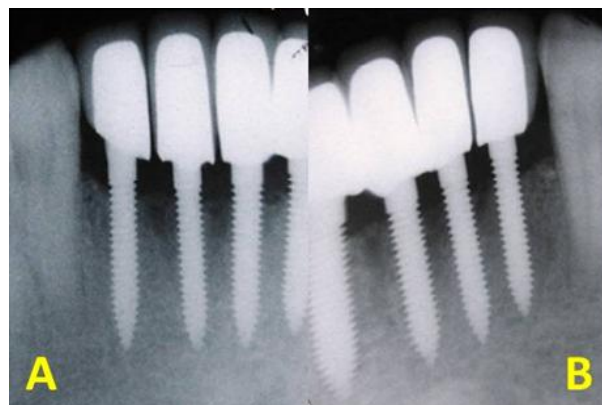


Figure 4A & 4B: 5 year follow up IOPA.

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