

Smile Rehabilitation Using IMPLANT SUPPORTED PROSTHESIS

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Endosseous dental implant therapy is rapidly becoming the prosthetic standard of care for a vast array of clinical applications; however, despite the high success rate of endosseous implant therapy, it has yet to achieve wide public acceptance and utilization [1]. Endosseous implant therapy in the mandible (parasymphiseal mandible) has repeatedly been reported at a success rate of 95% or better, yet public utilization of endosseous implant therapy has not exceeded 5%. An obvious area of focus has been to decrease the amount of time necessary to complete implant therapy. Approaches to achieve this goal have dominated clinical research and practice, immediate implant loading, improving implant surface technology (promotion of quicker healing and better osseointegration), and immediate placement of an endosseous implant after extraction of a natural tooth are some of them.

Immediate implants have become widely accepted despite controversial beginnings but the available literature consistently cites high levels of success (ranging from 94 to 100% on average), immediate implants provide clinically recognizable benefits. Broadly speaking, these benefits include reduction of morbidity, reduction of alveolar bone resorption (controlled clinical studies have demonstrated an average of 4.4mm of horizontal and 1.2mm of vertical bone resorption 6 months after tooth extraction), preservation of gingival tissues, preservation of the papilla in the esthetic zone, and reduction of treatment cost and time (the healing phase is shorter in general and there is a reduction in the number of



FIG. 1: RETRACTED FRONTAL VIEW WITH MAXIMUM INTERCUSPATION SHOWING ADVANCED PERIODONTITIS ON LOWER CENTRAL INCISORS ALONG WITH OPEN BITE DUE TO TONGUE THRUST

FIG. 2: RETRACTED FRONTAL VIEW OF MANDIBULAR ANTERIOR SHOWING ADVANCED PERIODONTITIS ON LOWER CENTRAL INCISORS ALONG WITH ACRYLIC BRIDGE

FIG. 3: REFLECTIVE MANDIBULAR ANTERIOR VIEW SHOWING ADVANCED PERIODONTITIS ON LOWER CENTRAL INCISORS ALONG WITH ACRYLIC BRIDGE

FIG. 4-6: BEAUTIFUL WAX MOCK UP (MARYLAND BRIDGE PATTERN) WITH EXTRA ADDED TOOTH

FIG. 7-9: COMPOSITE-BASED TEMPORIZATION BASED ON WAX MOCK UP MADE FROM PUTTY INDEX TEFLON TAPE PLACED ON SOCKET AREA BEFORE TEMPORIZATION TO PROTECT AREA FROM EXTRUDING TEMPORARY MATERIAL INSIDE SOCKET

FIG. 10: RETRACTED FRONTAL VIEW WITH MAXIMUM INTERCUSPATION SHOWING HEALING AFTER EXTRACTION AND SITE IS READY FOR IMPLANT PLACEMENT

FIG. 11: RETRACTED FRONTAL VIEW OF MANDIBULAR ANTERIORS SHOWING HEALING AFTER EXTRACTION AND SITE IS READY FOR IMPLANT PLACEMENT

FIG. 12: REFLECTIVE MANDIBULAR ANTERIOR VIEW SHOWING HEALING AFTER EXTRACTION AND SITE IS READY FOR IMPLANT PLACEMENT

procedures). With the extraction socket as a guide, the surgeon can also more easily determine the appropriate parallelism and alignment relative to the adjacent and opposing residual dentition. The surgical requirements for immediate implantation include extraction with the least trauma possible, preservation of the extraction socket walls and thorough alveolar curettage to eliminate all pathological material. Primary stability is an essential requirement, and is achieved with an implant exceeding the alveolar apex by 3-5mm, or by placing an implant of greater diameter than the remnant alveolus. Esthetic emergence in the anterior zone is achieved by 1-3mm sub-crest implantation.

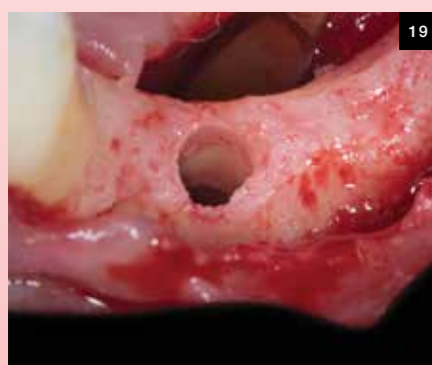
Patients may suffer real or perceived detrimental effects following the

loss of one or more teeth. Psychological effects range from minimal to neuroticism. Tooth loss contributes to loss of confidence, avoidance of laughing in public, reluctance to form close relationship, especially when anterior teeth are missing.

Present case reports the immediate esthetic rehabilitation of mandibular anterior teeth followed by extraction with preservation of soft and hard tissue architecture.

Case History

A 38-year-old female patient reported to the clinic with a chief complaint of mobile lower anterior fix prosthesis (acrylic tooth 31-41) and requested for immediate solution. Clinical and radiographical examination reveals fixed acrylic bridge in the lower anterior region with grade 3 mobility in relation to and 31 and 41, with grade III calculus in the lower anterior region, bleeding on probing and inflamed gingiva. Patient diagnosed with tongue thrust habit and because of this patient had open bite (teeth flared outwards) and to close the spaces previous dentist fixed the acrylic bridge (Figures 1-3).



As patient was not on regular dental checkups and routine prophylaxis, this facilitated calculus build up substantially with advanced Periodontitis on lower central incisors which had grade 3 mobility. Patient was explained about all the treatment options available with possible drawbacks of each. She was very concerned about her esthetics and was willing for earliest possible replacement of teeth in question. Hence, she readily opted for procedure of immediate implant with immediate loading.

Treatment Plan

Patient was advised to go in for orthodontic treatment to correct open bite, protrusion and habit breaking. But patient rejected treatment due to her busy corporate schedule. So it was decided to remove mobile tooth no. 31 and 41 along with faulty bridge and place fixed implant prosthesis along with tongue crib (habit breaking appliance).

Phase 1

Mandibular arch A-silicon impression was made and sent to the lab for diagnostic wax mock-up of area 31 and 41. The instruction given to the technician was to remove tooth 31 and 41 and an extra added tooth from the cast and make accurate anatomy wax mock-up with the closing gap in between 31 and 41 by adding additional tooth and expected design was to be like Maryland bridge.

Phase 2

Beautiful wax mock-up arrived as per requirement (Figures 4-6). The putty index made in hard putty for delivering temporary crowns, patient call for extraction of mobile teeth 31 and 41. After administering appropriate antibiotic and analgesic, induction of local anesthesia was carried out using lignocaine with adrenaline.

Deep cleaning is done for all teeth. As preservation of alveolar bone is key to success of implants, extraction of tooth has to be atraumatic, so using periostomes and small periosteal elevators, the tooth was luxated without excessive enlargement of the socket, the teeth along with bridge was slowly luxated and pulled out of the socket using the lower anterior

FIG. 13: INCISION MADE FOR RAISING FLAP

FIG. 14: RIDGE CONTOURING

FIG. 15: FLAP RAISED READY FOR OSTEOTOMY

FIG. 16: DISTANCE MEASURED FOR ACCURATE PLACEMENT OF IMPLANT

FIG. 17: PILOT DRILL

FIG. 18: ANGLATION OF OSTEOTOMY CHECKED

FIG. 19: CLOSE UP OF OSTEOTOMY SHOWING CORTICAL BONE

FIG. 20: OSTEOTOMY READY FOR IMPLANT PLACEMENT

FIG. 21: CHECKING PARALLELISM

FIG. 22: INSERTION OF BIOHORIZON 3.0X 10.5MM LASORLOK IMPLANT

FIG. 23: IMPLANT PLACEMENT DONE

FIG. 24: INTERRUPTED SUTURES WERE PLACED

forceps. The sockets were debrided with curettes. Teflon tape placed on socket area, spot etch and bonding is done on the lingual surface of adjacent teeth. Composite-based temporization material is inserted into the index and transferred into the patient mouth (Figures 7-9). Patient advised buying Waterpik to clean that area along with proper brushing instructions.

Phase 3

After thorough examination of CBCT, it was decided to place endosseous implant and place same provisional restoration to avail the benefits like preservation of bone and emergence profile. Patient recalled after two months for implant placing, temporary bridge was removed and surgical site cleaned. (Figures 10-12)

A BIOHORIZON laser lock implant was selected, internal hex implant was planned (3.0x10.5mm). Primary stability was achieved by wrenching the implant. The cover screw was placed and interrupted sutures were placed. (Figures 13-25) Postoperative instructions were given to the patient, and then was asked to report after 1 week. The patient received temporary acrylic crown bonded to the adjacent teeth with fiber-reinforced composite on the same day.

The sutures were removed after 7 days and IOPA was taken (Figure 25).

Phase 4

FIG 12: Reflective mandibular anterior view showing healing after extraction and site is ready for implant placement.

The rehabilitation of resorbed edentulous mandibles can be a challenge for a variety of reasons. These may include a lack of bone, exostosis, tori, genial tubercle obstruction or an elevated floor mouth (7). The use of osseointegrated implants as a therapeutic option for the rehabilitation of patients with severe mandibular atrophy has decreased the need for pre-prosthetic surgery (8). Nevertheless, such techniques should be taken into account when modification of soft tissues is required [lack of keratinized gingiva, soft tissue enlargement, decreased vestibular depth and elevated floor mouth] since they enhance prosthesis retention and create an adequate placement area, even when dental implants are going to be used.

The patient called after 2 months for 2nd stage surgery along with vestibuloplasty in the same region. During 2nd stage surgery, we found the growth of healthy bone around implant screw (Figure 26), after carefully removing screw we placed healing abutment (Figure 27), Vestibuloplasty did from region 32 to 42 (Figure 28) and after suturing same temporary bridge is fixed.

Phase 5

Patient was recalled after 15 days, healing abutment removed and open tray impression copings are fixed, the impression made with the custom open tray with silicon material (Figure 29). Impression send to the lab for Cad-Cam screw retained Czar metal custom abutment (Figure 30). This case was fabricated on the unique two-piece BioHorizons 3mm Diameter Tapered Internal Implant, which has the patented Laser-Lok surface treatment that exhibits a dual affinity towards both hard and soft tissue, helping maintain crestal bone levels and reduce probing depths. The framework was designed with the help of state of the art optical scanners, design software, and machined using a heavy duty 5 axis milling machines to achieve the most precise and passive fit possible. The



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FIG. 25: IOPA SHOWING IMPLANTS

FIG. 26: DURING 2ND STAGE SURGERY, WE FOUND THE GROWTH OF HEALTHY BONE AROUND IMPLANT SCREW

FIG. 27: HEALING ABUTMENT FIXED

FIG. 28: VESTIBULOPLASTY DID FROM REGION 32 TO 42

FIG. 29: OPEN TRAY CUSTOM MADE IMPRESSION TRAY IN A-SILICONE IMPRESSION MATERIAL

FIG. 30: THE FRAMEWORK DESIGNING WITH THE HELP OF STATE OF THE ART OPTICAL SCANNERS, DESIGN SOFTWARE

FIG. 31: CAD-CAM SCREW RETAINED CZAR METAL CUSTOM ABUTMENT MADE FROM HEAVY DUTY 5 AXIS MILLING MACHINES TO ACHIEVE THE MOST PRECISE AND PASSIVE FIT POSSIBLE

FIG. 32: IOPA SHOWING PERFECT FIT CZAR CUSTOM ABUTMENT

FIG. 33-35: SHOFU VINTAGE HALO CERAMIC LAYERING ON ABUTMENT GETTING CLOSER TO NATURAL TEETH

FIG. 36: HEALTHY GINGIVAL TISSUE NEAR IMPLANT

FIG. 37: RETRACTED FRONTAL VIEW WITH MAXIMUM INTERCUSPATION SHOWING FINAL PROSTHESIS AFTER FIXATION

FIG. 38: REFLECTIVE MANDIBULAR ANTERIOR VIEW SHOWING FINAL PROSTHESIS AFTER FIXATION

FIG. 39: RETRACTED FRONTAL VIEW OF MANDIBULAR ANTERIORS SHOWING FINAL PROSTHESIS AFTER FIXATION.

FIG. 40: RETRACTED SIDE VIEW SHOWING HOW NEW PROSTHESIS IS BLENDING WITH NATURAL PROSTHESIS

FIG. 41: RETRACTED FRONTAL VIEW WITH MAXIMUM INTERCUSPATION, BEFORE AND AFTER


FIG. 42: RETRACTED FRONTAL VIEW OF MANDIBULAR ANTERIORS, BEFORE AND AFTER



Cobalt Chromium alloys used in the framework are biocompatible, with ideal tensile strength, modulus of elasticity, Vicker's hardness and exhibit excellent characteristics for ceramic bonding.

Meanwhile, root canal treatment is done for tooth 42 as radiographically it was showing periapical infection. Abutment (Figure 31) trial checked for accurate fitting (Figure 32). Shade selection was done, color mapping done for accurate and natural shades. Anatomy discussed with ceramist for making natural looking prosthesis. Shofu Vintage Halo ceramic powders selected for layering. After few days the prosthesis arrived (Figures 33, 34, 35) and was fixed at 25 torque, screw hole sealed with composite (Figures 37, 38, 39). The patient was later send to orthodontist for making Tongue crip. Again all maintenances instruction given like Waterpik and proper brushing techniques.

Conclusion

Success in dental implants is a result of certain level of competence of the dentist along with use of products that ensure predictable functional balance between technology and biology, which predicts a lifelong functional and esthetic solution for the patient. However, this approach is considered highly technique sensitive and requires an expert dental implant team for its execution. Careful selection of cases, proper treatment plan and follow-up of surgical and prosthetic protocols are the keys to success. 

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