Management of Multiple Impacted Permanent Teeth with Zygomatic Implants

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Abstract
Management of multiple impacted teeth in a nonsyndromic patient is a unique challenge especially if the condition involves the entire permanent dentition. A 36-year-old male patient reported to us with a complaint of loose upper and lower complete dentures. On radiographic examination all the permanent upper and lower teeth were impacted. The medical history and examination was not suggestive of any syndrome or metabolic disorder. The treatment plan to remove all the impacted teeth and place zygomatic implants in the maxilla with multiple implants to give a fixed prosthesis in the maxilla and mandible was carried out.

Keywords: Impacted tooth, management, zygomatic implants.

INTRODUCTION
Dental implants have become order of the day for oral rehabilitation of missing teeth. Situation where all the teeth have been impacted is unique and requires alternative treatment with implants. Multiple impactions is a compromised situation both in terms of the quality and quantity of available bone. All the teeth have to be removed, grafted and then implant placed for the rehabilitation. One of the modalities for such a compromised maxilla is zygomatic implants where implants do not depend on bone grafting but on remote anchorage from the zygomatic bone.

CASE REPORT
A 36-year-old male patient (Fig. 1) reported to our clinic with a complaint of ill-fitting upper and lower dentures. According to dental history, the patient did not recall having any permanent teeth (Figs 2 and 3) erupt into the oral cavity and had been, wearing the dentures from past 20 years. Clinically, the dentures were badly worn away and the patient desired alternative form of treatment. There was no family history for multiple impactions. On medical examination the patient was healthy with no signs of any systemic disorders and metabolic diseases. Since no syndrome could be identified the case was diagnosed as a nonsyndromic isolated occurrence.

Orthopantomograph (Fig. 4) and computed tomograms (Figs 5 and 6) were done to localize various impacted teeth with respect to their location and proximity to vital structures (Fig. 7). The detailed treatment plan was finalized with consultation with the patient and informed consent was obtained. It was decided to do the procedure in three stages with the removal of the impacted teeth and placement of autogenous bone along with two zygomatic implants in the maxilla in the first stage. Zygomatic implants were the treatment of choice as the amount of bone in the premolar region of the maxilla bilaterally was less than 1 mm (Fig. 8).

The first stage was performed under general anesthesia. A special technic of removal of impacted teeth was used using a lateral trephination approach with sectioning of the roots to elevate the teeth out and bone grafting to fill the defect. This method preserves the width and height of the crestal bone with the view of placing implants in the second stage. Branemark™ zygomatic (Figs 9 and 10) implants of 45 mm length were chosen once the length was measured on a CT scan. The full thickness flap was elevated with a crestal incision and vertical relieving incisions. The flap was elevated until the zygomatic buttress was fully exposed. A window of bone was removed to gain access and visibility and to obtain a sense of direction of the implant as it was traversing through the maxillary sinus. Drilling was first
done with round drill followed by the twist drill. The drill guard was used to prevent the drill from cutting into the cheek and lips while drilling. The drilling was continued until the drill came out of the lateral aspect of the zygomatic bone. The implant was positioned in such a way that the access screw hole is pointing towards the premolar (Figs 11 and 12).

The second stage was performed after 6 months when all the other four implants from Nobel Replace sizes in relation to tooth region of # 5, 7, 9, 12 (ADA Tooth numbering system) in the maxilla and 6 implants in relation to mandible in the regions of tooth regions in #20, 22, 24, 26, 28, 30 were placed (Fig. 13). Third stage was done after 5 months when all the implants were exposed and healing collars inserted with two weeks of healing. Impressions were made with open tray technic using transfer posts (Fig. 14). Impregum™ (3M ESPE) soft poly ether was used to make the impressions (Fig. 15). UCLA abutments were used at the implant level and frame work fabricated for a screw retained type of metal ceramic prosthesis. After ascertaining the fit of the metal frame work, ceramic was fired and the prosthesis finished and polished. The retaining screws were tightened at 15 N according to the manufacturer’s instructions (Figs 16 to 18). Postoperative orthopantomograph was taken to check the seating of the prosthesis (Fig. 19). Maintenance instructions were given and the patient discharged.

DISCUSSION

Multiple impacted permanent teeth have been reported associated with syndromes like cleidocranial dysostosis, Gardner syndrome and Yunis-varon syndrome.1-4 It has also been reported in mucopolysaccharidoses.5, 6 A thorough examination and history recording will reveal other features of the syndrome. In absence of all these syndromes it can be concluded that it is of a nonsyndromic origin and isolated phenomenon. Radiographic views of OPG, occlusal and CT scans will be diagnostic of the condition. Three-dimensional computed tomographic images will give an accurate positional relationship of the impacted teeth and neighbouring teeth. It may be helpful to decide the treatment alternative such as surgical or orthodontic options.7

Management of such cases with all permanent teeth impacted in the jaw will present an unique challenge in placing dental implants. Sometimes an impacted tooth may not be near the site of implant placement, it can be left without removal, but in cases with all teeth being impacted, removal of these impacted teeth before implant rehabilitation becomes necessary. Once the teeth are removed the amount of remaining bone will be negligible as the impacted teeth will show sign of ankylosis or obliterated periodontal ligament space resulting in difficult removal and also removal of bone to remove these teeth.

Stage wise approach of the present condition is beneficial as it gives adequate time for healing and consolidation. In the first stage, surgical removal of the teeth (impacted and unerupted) and two zygomatic implants under general anesthesia. After which a healing period of 6 to 12 months allows the bone to form in the sockets and the grafts to integrate. Preserving the crestal bone helps in maintaining the width of the bone. In the second stage, all the other implants from Nobel replace™ in the upper and lower jaws were placed.

Zygomatic implants are long implants placed in the compromised maxilla as a graftless solution. It is an alternative to sinus lifting and augmentation.8 Zygomatic implants are indicated if the available bone is less than 1 mm in the premolar region. The length is between 35 to 50 mm can be chosen with a CT scan.9-11 The implant placement is preceded by making of the osteotomy starting from the palatal aspect of the first premolar tooth and proceeds distally and posteriorly to pass along the lateral wall of the sinus into the zygomatic bone. The indication of angulation is confirmed once the drill perforates through the lateral aspect of the zygomatic bone. Drilling and implant insertion should be made with great caution as the drills are long and may fracture itself or the implant. Another advantage of the zygomatic implant is that it engages four cortical bones, one on the crest of the ridge, second on the floor of the sinus, third on the medial wall of the zygomatic bone and finally lateral aspect of the zygomatic bone. The thickness of the zygomatic bone itself is around 10 mm.12

Zygomatic implants come with an angulated head because of which the emergence of the abutment screw is straight down but the position of the implant itself is palatal to the crest of the ridge. This makes the prosthetic phase challenging. The impression technic used for rehabilitation can be either at the implant level or the abutment level. The abutment level prosthesis uses the multiunit abutments from Nobel biocare.13 An impression with open tray technic is mandatory for a zygoma implant as the implants are angulated and also positioned palatally. Prosthetic solutions for zygomatic implants can be either a hybrid or a metal ceramic prosthesis depending of the amount of interocclusal
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Fig. 1: Preoperative photo

Fig. 2: Preoperative maxilla

Fig. 3: Preoperative mandible

Fig. 4: OPG of the patient

Fig. 5: Panoramic view of maxilla hard tissue window
Fig. 6: Panoramic view of mandible hard tissue window

Fig. 7: Occlusal view of maxillary sinus

Fig. 8: Cross-sectional view of the premolar area

Fig. 9: Zygomatic implant kit

Fig. 10: Zygomatic implant mounted on contra-angled straight handpiece

Fig. 11: Zygomatic implant in place
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Fig. 12: After 1st stage surgery

Fig. 13: After 2nd stage surgery

Fig. 14: Open tray impression posts

Fig. 15: Open tray impression

Fig. 16A and B: Completed case

Fig. 17: Occlusal view
distance. Metal ceramic bridges are difficult to fabricate but are durable.

CONCLUSION
Remote anchorage like zygomatic implants should be considered as an option for cases with minimal bone height in the maxilla. The appropriateness of this option is evident from the studies conducted by various authors about the success rate of zygomatic implants being very high.

REFERENCES