Implant aesthetics

Since 1980s, osseointegration with dental implants has become a predictable dental procedure with high success rate of over 97%.[1, 2] Today making a fixed partial denture after reducing two adjacent teeth is not the treatment of choice, and, instead, a single tooth replacement with an implant-supported crown has become the most frequent indication in implant therapy.3 In the posterior areas of the oral cavity, the most important objective of a single tooth replacement is to allow adequate mastication, while the aesthetic outcome is of lesser concern. In contrast, replacing the anterior teeth in the premaxillary zone - often referred to as the 'aesthetic zone' - requires a cosmetic finish to patient's satisfaction. This presents a major challenge for implant clinicians & technicians (Fig 1). There are major difficulties in placing the implants because of various local risk factors that can compromise the final aesthetic outcome (Table 1).

From our experience, the following criteria are important to prevent loss of hard and soft tissues to achieve optimum aesthetics:

1. All attempts should be made to place an implant immediately after extraction and definitely not more than four weeks after extraction, to minimize resorption of the labial plate of bone.

2. Extraction should be carried out with minimal damage to bone and soft tissues. The use of microsurgical blades, peri-ontomes and, finally, very thin luxators is highly recommended (Fig 2a-c).

3. Correct 3D placement of the implant should be achieved, especially in the buco-lingual region, taking care not to touch the fragile buccal plate. It is not necessary to fill the complete socket labio-palatally with a large-diameter implant; rather a space may be left labially, which can be grafted by autogenous or synthetic bone (Fig 5).

4. Implant should not have any polynished collar and should be surface-treated (roughened) right up to its top. This allows bone to grow right up to the platform of the implant resulting in minimal bone loss due to remodeling (Figs 6 and 5).

5. The implant abutment connection should be a conical-tapered one to prevent micro-movement and microleakage. This will help lead to stability of the peri-implant hard and soft tissue.

6. Implantation should be delayed, if the tooth to be extracted is infected and loss of the labial plate of bone is expected. After waiting for 5 weeks for the soft tissue closure, implant can be placed with guided bone regeneration along with a modified Maryland bridge (Fig 6a-f). To better explain the concepts for achieving optimum aesthetics, we here are providing two case reports.

**Case report 1**

A male, aged 62 years, reported with a fractured central incisor and requested to be rehabilitated urgently with a fixed restoration. It was decided to do an immediate implantation with a fixed provisional restoration on a final abutment. The 'ANKYLOS' implant system was selected for using in this patient due to its numerous advantages in immediate implantation and provisionalisation.

The tooth was extracted atraumatically as described earlier. After preparation of the osteotomy as per the protocol of 'ANKYLOS', a 4.5 mm diameter and 14 mm long implant was motor driven into place (Fig 7a). The final ratcheting was done by hand to place the implant 5 mm away from the free gingival margin (Fig 7b). We achieved good primary stability in the region of 55 Ncm and therefore it only by hand pressure. The conical-tapered connection of the 'ANKYLOS' system can be friction-locked with very little torque. An alginate impression was taken of the abutment and a crown was fabricated on the prepared cast using the unique shading system of the composite Ceram-X (Dentsply) to match the color of the adjacent lateral incisor (Fig 7c). After a period of 4 weeks to allow heal-

**Table 1: Barries in placing implants in the pre-maxillary zone**

<table>
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<th>Barries in placing implants in the pre-maxillary zone</th>
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<td>• High incidence of missing labial plate of bone</td>
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<td>• High potential loss of interdental papillae leading to black triangles</td>
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<td>• Less than optimal bone quality</td>
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Fig. 1. Although this implant is surviving and is functional to the patient, aesthetically it is not a success due to the labial placement of the implant.

Fig. 2a, b & c: Atraumatic extraction of the tooth starting with microsurgical no 15 blade followed by peri-ontomes in fig 2b and finally a thin luxator in fig 2c. The periotomes and luxators should apply pressure on the mesio-distal surfaces and the palatal surfaces only. The microsurgical blade may be used to sever the periodontal ligament fibers on the labial aspect.

Fig. 3. Correct labio-palatal placement of the implant in the extraction socket with space of about 2-3 mm on the labial aspect, which may be grafted with particulate synthetic bone like Algipore (Dentsply, Friadent, Germany).

Fig. 4: Shows the unique 'ANKYLOS' implant (Dentsply Friadent, Germany) with progressive thread design and conical tapered connection.

Fig. 5: Case report 1. A male, aged 62 years, reported with a fractured central incisor and requested to be rehabilitated urgently with a fixed restoration. It was decided to do an immediate implantation with a fixed provisional restoration on a final abutment. The 'ANKYLOS' implant system was selected for using in this patient due to its numerous advantages in immediate implantation and provisionalisation.

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Fig. 6a: Healing of soft tissue after three weeks of extraction.

Fig. 6b: Buccal defect on labial aspect after the removal of cover screw and placement of sulcus former.

Fig. 6c: Grafting of the defect with mineralized red alga (Algipore, Dentsply, Friadent).

Fig. 6d: Covering of grafted bone with absorbable collagen membrane (BioGide, Geistlich, Switzerland).

Fig. 6e: Grafting of the defect with mineralized red alga (Algipore, Dentsply, Friadent).

Fig. 6f: IOPA radiograph of the 'ANKYLOS' implant with sulcus former in place to further support the soft tissue.

Fig. 7a: Placement of the 'ANKYLOS' implant 5 mm away from the free gingival margin.

Fig. 7b: The final ratcheting was done by hand to place the implant 5 mm away from the free gingival margin.

Fig. 7c: The final ratcheting was done by hand to place the implant 5 mm away from the free gingival margin.

Fig. 7d: The final ratcheting was done by hand to place the implant 5 mm away from the free gingival margin.
Fig. 7a: Placing of the implant with motor.

Fig. 7b: Apico-coronal placement of implant 3 mm from the free gingival margin.

Fig. 7c: Provisional crown custom made with Ceram-X (Dentsply, DeTrey Germany).

Fig. 7d: Final PFM crown cemented. It was decided not to duplicate the color of the left central incisor since the later it was discolored.

Fig. 8a: Exact position of the abutment transferred from the model to the patient mouth using an accurate resin transfer jig.

Fig. 8b: Exact duplication of contralateral central incisor with PFM crown due to excellent laboratory support.

Fig. 8c: Exact position of the abutment transferred from the model to the patient mouth using an accurate resin transfer jig.

Fig. 8d: Final PFM crown cemented. It was decided not to duplicate the color of the left central incisor since the latter it was discolored.

After placement of the implant and waiting for 6 months for the hard and, more importantly, the soft tissue to stabilize, an implant-level transfer impression was taken. The technician with the aid of a soft tissue model very accurately prepared the abutment in the laboratory. It was then transferred with the aid of a resin transfer jig to the patient’s oral cavity (Fig 8a). The final PFM crown is cemented.

Note the exact duplication of color, anatomy and texture of the adjacent central incisor due to the excellent laboratory support (Fig 8b).

References


About the author

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