

## HYBRID VS CERAMOMETAL IMPLANT PROSTHESIS

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### *Abstract*

A completely edentulous patient has few treatment options in conventional dentistry. Fixed prosthesis is often preferred as the first treatment option. Oral rehabilitation for a patient with loss of alveolar bone and soft tissue presents a challenge to clinicians. Replacing teeth with dental implants requires extensive planning. It is a paradigm shift for the patient to adjust to completely fixed set of teeth from edentulism. Planning treatment steps and designing of the implant supported fixed prosthesis are primarily important to respond to the esthetic and functional requirements of a fully edentulous patients<sup>1</sup>.

### *Keywords:*

### **Introduction**

#### **Case Report**

A 85 year old male patient reported to the clinic with a chief complaint of difficulty in mastication and fractured acrylic teeth of his old complete dentures. He also complained of halitosis and severe food lodgement underneath the denture. On examination it was seen that patient was wearing a screw retained implant over-denture. Radiographic evaluation revealed 6 implants in maxillary arch and 6 implants in mandibular arch. On examination of the denture it was found that few of the acrylic teeth of the denture were fractured (FIG.1). Patient was uncomfortable using the prosthesis due to bad esthetics and inability to masticate. So he desired some permanent solution.

Old prosthesis was unscrewed and healing abutments were placed. Oral hygiene regimen was advised to the patient and recalled after a week to check in reduction of inflammation. After reduction of inflammation, new diagnostic jaw relation was taken to check the amount of inter occlusal space. Sufficient space was available for planning fixed prosthesis. Option of fixed ceramo-metal prosthesis was discussed with the patient. Entire procedure was explained to the patient. Patient's consent was obtained and appointment scheduled accordingly.

After the inflammation was reduced, healing abutments were removed to make impression for fixed prosthesis. Open tray impression technique was used as implants were not parallel<sup>2</sup>. Impression copings were placed in the mouth. Perforations were made in the stock tray at the desired sites to use it as a custom tray for impression procedures. The copings were splinted together to avoid movements and rotation<sup>3</sup>.

Silicone impression material was used for making impression<sup>4</sup>. Open tray Impressions were made of both the arches. After the impression material was set, impression copings were unscrewed and impression was removed carefully from the mouth (FIG.2,3)

Implant analogs were attached to the impression copings and cast was poured in die stone. Jaw relation was recorded. The casts with embedded analogs were mounted as per the jaw relation. UCLA abutments were placed on the upper and lower cast. Milling of abutments was done accordingly to reduce the undercuts, correct angulations and give sufficient interocclusal space (FIG.4,5,6). The casted abutments were checked in the mouth for fit. (FIG. 7,8)

Wax pattern of final prosthesis with resin base was fabricated on the abutments and checked intraorally for fit (FIG.9). Maxillary prosthesis was split in three parts due to severe angulation on anterior implants placed in canine region. Mandibular prosthesis was single piece. Casting was done. Metal framework trial was checked intra orally for marginal fit and clearance (FIG.10). Ceramic was then layered on the metal copings. Bisque trial was done (FIG.11).

Occlusion was verified. Implant protected occlusion was given by narrowing the occlusal table, providing proper intercuspation and avoiding torquing forces.

Implant failures related to overload include those situations in which the functional load applied to the implants exceeds the capacity of the bone to withstand it. Failures that happen between abutment connection and delivery of the prosthesis, probably caused by un-favourable loading conditions or induced by the prosthetic procedure, considered to have an overload etiology<sup>5</sup>.

After doing the necessary adjustments, final staining and glazing was performed. Final prosthesis was provisionally luted for a span of 15 days using TEMPLUTE (non-eugenol). After 15 days, final prosthesis was luted using IMPLACEM (FIG.12-16). Patient was advised on maintenance of intraoral hygiene and recalled every 6 months for follow up.

## Discussion

### Classification Of Implant Impressions<sup>6</sup>-

#### 1. Classification by Impression Level:

- 1) Fixture-level impression:
- 2) Abutment-level impression.

#### 2. Classification by Impression Coping:

- 1) Pick up Impression Vs Transfer Impression
- 2) Open Tray technique Vs Closed Tray technique
- 3) Direct Vs Indirect Method

### Indications for open tray technique<sup>7</sup>:

- Multiple implants. ( more than 3 implants)
- Non parallel / divergent implants.

### Criteria for selecting impression materials<sup>8</sup>:

- In transfer impression, the use of robust impression materials is more advantageous in terms of repositioning the transfer impression copings.
- In case of pick-up impression, any combination of impression materials can be used when copings are splinted. If each of the copings stand alone, the use of robust impression materials may prevent the copings from turning when they are connected to the lab analog.

### Occlusion For Implant Prosthesis

- 1) Direct the forces along the long axis of the implant.
- 2) Minimize the lateral forces.
- 3) Place lateral force as anterior as possible.
- 4) When it is impossible to minimize or move lateral forces anteriorly distribute them over as many teeth & implant as possible.

### Implant Protective Occlusion-Conditions To Decrease Stress<sup>9</sup>

- a. No premature contact or interference.
- b. Influence of surface area.
- c. Mutually protected occlusion.
- d. Implant body angle to occlusal load.
- e. Cusp angle of crown.
- f. Cantilever or offset distance.
- g. Crown height .
- h. Occlusal contact positions.
- i. Implant crown contour.

- j. Protect the weakest arch.
- k. Occlusal materials.

Dental reconstruction and rehabilitation in edentulous patients can be performed by using screw-retained hybrid prosthesis, screw-retained metal ceramic prosthesis and cement-retained metal ceramic prosthesis. Use of screw-retained prosthesis is recommended for patients suffering from weak denture retention because this type of prosthesis can be easily placed and retrieved. Apart from the abovementioned advantages, hybrid prostheses can also replace soft tissue defects. However, lack of passive fit in the framework and distortion (which is possible to occur anytime during the fabrication) are major obstacles in the process of prosthesis fabrication. On the other hand, low volume of bone in edentulous patients is another problem for an ideal treatment. Such patients have to undergo bone augmentation before implantation. Generally, hybrid prosthesis is the recommended treatment for patients suffering from severe alveolar ridge resorption.

In screw-retained prostheses, sometimes the screw access channel has to be placed in buccal, lingual or occlusal aspect of the prosthesis due to the position of the implant which may interfere with the esthetics and morphology of occlusal surface. On the other hand, the cement-retained prosthesis can compensate for the improper position of implant through customized preparation of the abutments or use of oblique abutments. Passive fit of the framework and esthetics of the prosthesis are among other superiorities of the cement-retained prostheses over the screw-retained restorations.

Use of customized abutments in such cases can correct the path of insertion for implants placed obliquely and restore the esthetics of prosthesis. The disadvantages of cement-retained restorations include their difficult retrieval, repair and maintenance. Excess cement in the gingival sulcus is another drawback that should be considered in cement-retained crowns. In this case, the soft tissue was replaced using the gingival-colored porcelain<sup>10</sup>.

## Conclusion

High patient expectations can be met by implant supported full arch ceramometal reconstruction. This procedure preserves bone volume enabling better function and esthetics. The use of ceramometal restorations may be the most comfortable way to rehabilitate a patient because of its durability and resemblance to natural dentition.

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## Figures



*Fig 1. (a) Pre op denture*



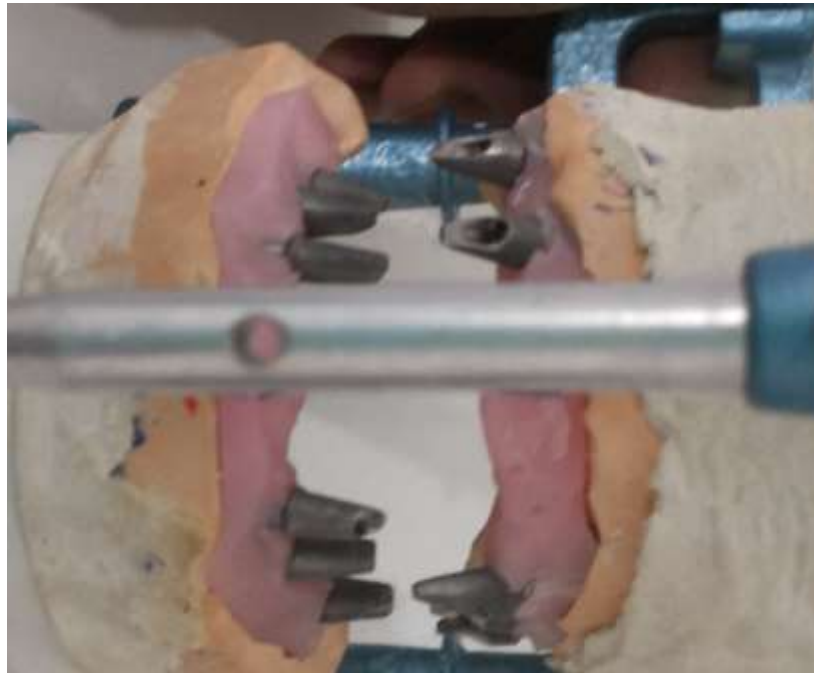
*Fig.1 (b) Pre op denture*



*Fig. 2 Open tray*



*Fig 3. Open tray*



*Fig. 4 milled copings frontal*



*Fig. 5 milled copings maxillary*



*Fig. 6 milled copings mandibular*



*Fig. 7 Copings trial maxillary*



*Fig. 8 Copings trial mandibular*



*Fig. 9 wax trial frontal*



*Fig. 10 metal trial*





*Fig. 11 bisque trial*



*Fig. 12 final prosthesis frontal*



*Fig. 13 Final prosthesis left lateral*



*Fig. 14 Final prosthesis right lateral*



*Fig. 15 Final prosthesis occlusal*



*Fig. 16 Final prosthesis occlusal lower*