A Beginners Guide for Implant Impression: Review Article

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ABSTRACT

In modern dentistry dental implant play most viable role in the replacement of missing teeth. Implant not only restores form and function but also esthetics of the patients. The main aim of impression making for the implant is to relate coronal structure of the implant to other structure of oral cavity.¹ A good implant impression records three dimensional position of implant in oral cavity. Dental implants do not have periodontal ligaments like natural teeth for compensation of minor missing details in impression. So the impression for dental implants are very critical phase for the success of implant supported prosthesis. In this review article, various techniques for implant impression are reviewed.

KEYWORDS: Implant, Impression, Impression Techniques, Tray

INTRODUCTION

According to a glossary of prosthodontic terms nine, implant can be defined as “to graft or insert a material such as an alloplastic substance, an encapsulated drug, or tissue into the body of a recipient.”¹² Implant retained prosthesis can be of following types: implant supported single crown, implant supported bridge, full arch bridgework, and implant supported overdenture (removable prosthesis). The use of dental implants is well established, and high survival rates have been reported.³⁶

Nowadays implant is an essential part of general dental practice. Most important thing is increasing awareness of patients for the dental implant. An accurate impression is mandatory for the success of implant-supported dental prosthesis as an accurate recording of spatial implant position is required to obtain a proper support to definitive restoration with passive fitting(Fig. 1).

Benefits of Impression in implant dentistry is to record; Position, Depth, Axis/Angulation, Rotation-Hex position, Soft Tissue Contour (Emergence Profile).

In this review article, various techniques of impression taking for implant and their indications, contraindication, advantages, and disadvantages are discussed.

VARIOUS IMPRESSION TECHNIQUES FOR IMPLANT

The impression procedure for implant supported prosthesis consists of three different approaches. Each type has its own indications. The first type; closed tray impression technique, in this impression coping will be retained in patient’s mouth after removal of the set impression. Impression coping used in this technique is called closed tray transfer impression coping. The second type: open tray impression technique, in this impression coping is picked up with the set impression. The impression coping used in this technique is called open tray impression coping or pickup type impression coping.¹⁴ The third type; implant abutment level impression.

Two basic impression techniques are followed for dental implant impression.⁷

1. Closed tray impression technique
2. Open tray impression technique
3. Abutment level impression

1. Closed tray impression technique: The healing abutment/cap is replaced with closed tray transfer coping. The closed tray transfer coping (impression coping) is selected according to the shape and size of the fixture head and its fitting can be re-confirmed by radiograph. A stock tray, which covers all the important landmarks related to the implant supported prosthesis, is being selected. There should be adequate clearance for impression coping and impression material which is ensured before final tray selection.

Fig. 1 Successful implant impression criteria

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The impression can also be taken on a closed custom tray. For fabrication of custom tray; alginate impression is made after placing impression coping, a model is poured with type III gypsum product. Above dental stone model, a spacer is adapted for block-out the teeth and undercut areas, and a custom tray is fabricated. The spacer provides adequate clearance for the impression coping and the impression material.

Rubber base impression material (addition silicon or polyether impression material) should be the good choice for taking closed tray impression. The consistency of rubber base impression materials is the heavy body, light body or medium body (monophase) same as for crown and bridge cases. Light body and heavy body consistency used in combination while medium body is alone. As there is a requirement of repositioning of closed tray impression coping in impression, the medium body polyester material is good choice as light body consistency is less rigid.

Closed tray impression coping left in the mouth after the removal of impression. The impression should be checked for any irregularities and porosities. The closed tray transfer coping is being removed from the implant fixture in the mouth. The implant analog is tightened with the closed tray impression coping and it’s being repositioned into the impression. Impression coping should be recorded accurately for the fate of implant supported prosthesis.

Gingival former is tightened on implant fixture during implant placement or at the time of second stage surgery. Screwdriver/hexdriver: used for fitting and unscrewing various components on implant fixture.

2. Open Tray Impression Technique: First of all, an impression is taken with the irreversible hydrocolloid and is poured with type-III gypsum product.

On dental stone cast, a rigid custom tray is fabricated, and the window is cut over implant site on the tray.

Gingival former/healing abutment is removed and open tray impression coping is fitted on implant fixture. After fitting on implant fixture, splinting of these copings should be done together to provide rigidity and more accuracy.

Custom impression tray is tried in; it is ensured that open tray impression coping should emerge out from the window. This will give good support of impression copings by impression material and easy removal. Window area should be closed by wax.

Rubber base impression material is loaded, and the impression is taken on the open tray. Impression coping is felt below the wax sealed window area of the tray.

After the complete set, the impression copings are unscrewed through the window on the tray. As copings are tightened together, these will come out together without any moment and with greater accuracy from the mouth. The copings are easily removed with proper support of impression material.

Gingival former/ healing abutments are replaced on implant fixture.

Closed Tray Vs Open Tray: In the case of divergent implants, pickup type copings or open tray impression has to opt for easy removal. However in less mouth opening, limited access areas (posterior) and severe gagging patients, the closed tray impression technique is better choice.

The accuracy of open tray impression technique is more than closed tray impression technique as there may be chances of discrepancy during replacement of transfer coping in impression. However, some studies also proved that in the case of fewer implants (2-3), closed and open tray impression technique has no difference. When the number of implant is greater (more than 4), clinician has to opt open tray impression technique for more accuracy.

Abutment Level Implant Impression: If there is a requirement to replace old implant supported crown, abutment level impression is indicated just like crown and bridge cases.

MATERIALS FOR IMPLANT IMPRESSION

Armamentarium depends on the type of implant system. Each system has its own components designed to fit on implant fixture. Although basic impression components and techniques are similar.

Following components are used for implant impression:-

Impression trays: two types
1. Stock tray: - these are prefabricated impression trays, made up of stainless steel, plastic etc. These trays can be modified for open and closed tray impression technique.
2. Custom tray: - these are designed on primary impression of the mouth. There are made up of self cure acrylic resin by providing the spacer of suitable thickness.

Impression materials:- Rubber base Impression material should be the choice for taking the impression for implant cases. Eg: Polyvinylsiloxane (addition silicon) and polyether impression materials. Their consistency will depend on impression technique used for taking impression.

Components of Implant system: Various components are provided by implant system will play role in taking the impression.

Screwdriver/hexdriver: - used for fitting and unscrewing various components on implant fixture.

Permucosal extension/Gingival former/healing cap: It is fitted on implant fixture either during implant placement or at the time of second stage surgery (prosthetic phase).
After prescribed healing period, second stage surgery is done to place permucosal extension/healing cap. The healing cap develops permucosal seal around implant. The permucosal extension is available in multiple heights to accommodate soft tissue variations. It also can be straight, flared, or anatomical to assist in the initial contour of the soft tissue healing.16,17

**Implant Abutment:** According to GPT -9 abutment can be defined as “A tooth, a portion of a tooth, or that portion of a dental implant that serves to support and/or retain prosthesis”12

Abutments can be prefabricated or customized. Custom abutments are fabricated by cad-cam technique.

In one-piece implants, abutments are part of the implant. These are prepared by specific milling techniques and impression is taken similarly as for crown and bridge.

**Impression copings:** Fits on implant fixture during impression making. Impression copings transfer the position, angulations of implant fixture on the cast. There are two types of impression copings based on the impression technique in implant; closed tray impression copings and open tray impression copings as discussed above.16,18

**POST IMPRESSION LABORATORY STEPS**

After removal of impression, it should be critically evaluated for any irregularity, porosity etc.

Disinfected implant analogues and impression copings are attached with each other and carefully relocated it on impression (closed tray). Implant analogues will be embedded in the model and will mimic the angulations and position of implant fixture.18

Impression should be washed to remove saliva, blood debris etc and immersed in recommended disinfectant as guided by manufacturer.

The impression should be sent to the lab in sealed box with proper work authorization. In work authorization form; shade, type of prosthesis, type of implant system, any specific characterization, type of occlusion etc should be mentioned.18

**CONCLUSION**

A good impression is the main requisite of implant supported prosthesis. Without accurate impression, the prosthesis will be failed. Each impression technique has its own advantage and disadvantage. A well trained clinician knows the indication, contraindication, material and method of every impression technique for better results.

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