

TECHNICAL REPORT

A Simple Modified Open Tray Implant Impression Technique in a Patient with Fixed Orthodontic Appliance Therapy.

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ABSTRACT

Background: Implant based restorations are an integral part of orthodontic treatment currently and this combination provides increased treatment options. Making impressions for implant based restorations in subjects undergoing orthodontic treatment is a challenging task.

Aim: This article presents a simple technique to achieve precise impressions utilizing commonly available materials in dental operator.

Case Description: Patient undergoing orthodontic therapy requiring replacement of missing lateral incisor was planned for implant placement and crown fabrication simultaneously during fixed appliance therapy. A modified open tray implant impression with polyvinyl siloxane was made during the prosthetic phase for successful rehabilitation of the edentulous space in the anterior region.

Clinical Significance: Multidisciplinary approach to treatment is time saving, which includes simultaneous Orthodontic and Prosthodontic procedures. A simple modification of the open tray impression procedure can result in an accurate final cast in the region of interest to overcome the difficulties of impression making in a patient with fixed orthodontic appliance.

Keywords: Implant Impressions, Open tray impressions, Fixed appliances

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INTRODUCTION

Interdisciplinary dentistry is an effective way to utilize skills of various specialties. Implant based restorations are now an integral part of orthodontic treatment and this combination provides increased treatment options. Objectives of treatment are achieved in the best possible way with reduced treatment time in certain situations with a multidisciplinary approach. Making impressions in subjects undergoing orthodontic treatment is a challenging task.¹ Preliminary impressions with irreversible hydrocolloid are routinely advocated for diagnostic casts for orthodontic patients²; however, final impression with irreversible hydrocolloid impression material for implant restorations is not an option. The presence of brackets, arch wires, bands make the removal of set impression difficult or it might cause tearing of the impression or debonding of the orthodontic brackets.³ Open tray impression technique is recommended for the passive incorporation of the impression copings.⁴ Several techniques have been advocated for implant impressions in orthodontic patients.⁵ The use of optical impression with implant scan body can give

us a more precise and accurate details of implant position but cost of the scanner and need of expertise in newer technology still makes conventional impression technique as the preferred option.⁶ There is no single technique presented in the literature for implant impressions in patients undergoing fixed appliance therapy utilizing only polyvinyl siloxane impression material. Following is a simple technique that helps overcome this difficulty by using a sectional impression with open tray technique using medium viscosity polyvinyl siloxane impression material. The clinical technique followed utilizes commonly used materials in the dental operator.

TECHNIQUE

A subject undergoing orthodontic therapy was referred for replacement of the right lateral incisor. On examination it was noticed that the space available for the lateral incisor was more than required to achieve favorable esthetics. It was decided to place implants prior to cessation of orthodontic treatment as it was indicated. Simultaneous orthodontic and prosthodontic therapy saves time. Hence an endosseous implant was placed

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with flap technique after careful evaluation of the edentulous site. Upon completion of four months, osseointegration was found to be satisfactory; a healing collar was attached during the second stage surgery. Final impressions had to be made for a metal free full veneer restoration after a 14 day period.

A precise final impression for an implant restoration is a requirement to transfer spatial relationships of implant from the mouth to the master cast. It facilitates passive fit of the restoration. Polyvinyl siloxane impression making during orthodontic treatment would result in the impression material getting stuck to the brackets, bands and wire, making it impossible to remove the impression without distortion and tearing. A simple modification of the open tray impression procedure enabled an accurate final cast in the region of interest.

Steps in the Implant Impression making:

1. Make a diagnostic impression of the maxillary arch and mandibular arches with irreversible hydrocolloid impression material (Jeltrate, Dentsply, India); Pour the impression with Type III gypsum product (Gem Stone, Shruti Products, India).



Figure 1: Wax Spacer on cast

2. Fabricate a sectional custom tray using pink auto-polymerizing acrylic resin (DPI RR Cold Cure, DPI, India) as follows: Adapt one sheet thickness of wax spacer (Hindustan Modeling wax No.2, Hindustan Dental Products, India) from right second premolar to left second premolar on the diagnostic cast (Fig. 1). Make four tissue stops on the non functional cusps. Extend the tray 1.5 mm beyond the wax spacer. Cover the wax spacer with a layer of aluminium foil (Freshwrapp, Hindalco, India) (Fig. 2). Apply sodium alginate separating medium (DPI Heat Cure Cold Mould Seal, DPI, India) over the cast. Fabricate the auto-polymerizing resin tray as planned 24 hours before the impression procedure (Fig. 3). Cut open the custom tray in the region of the implant for securing the open tray transfer coping.

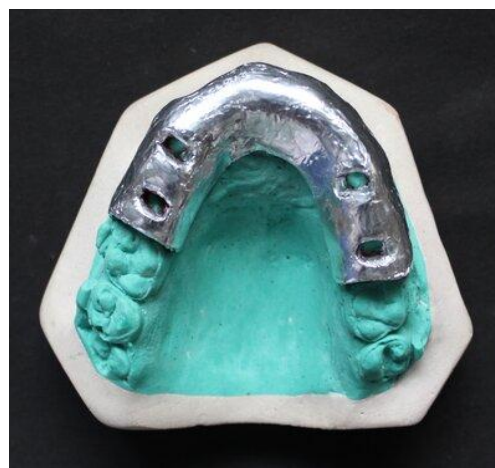


Figure 2: Aluminium foil adaptation over wax spacer



Figure 3: Custom tray on cast

3. Remove the orthodontic wire prior to the final impression procedure. Intra orally, block the orthodontic brackets utilizing modeling wax (Hindustan Modeling wax No.2, Hindustan Dental Products, India) (Fig. 4).

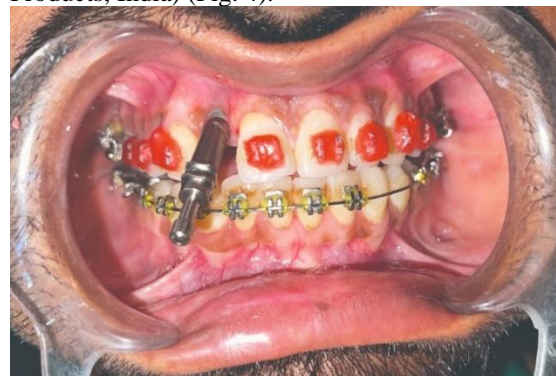


Figure 4: Wax block-out of orthodontic brackets

4. Secure the open tray Impression coping to the implant fixture and confirm its position using

radiovisiography. Apply tray adhesive (Caulk Tray adhesive, Dentsply, India) on the tray before impression. Make the final impression with medium viscosity Polyvinyl siloxane impression material (Aquasil Monophase, Dentsply, Milford DE). Remove the impression from the patient's mouth after unscrewing the impression coping (Fig. 5). Retrieval of final impression from the mouth after loosening the open tray impression coping is done without any difficulty.

5. Secure the implant analog to the open tray transfer coping. Apply polyvinyl siloxane material to reproduce the soft tissue around the neck of the implant analog and pour the cast with Type IV Die stone (Kalrock, Khalabhai, India).

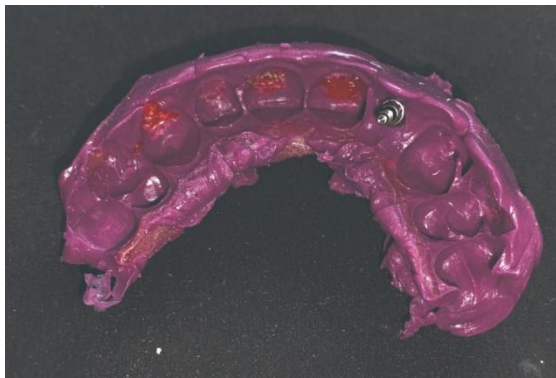


Figure 5: Medium viscosity PVS final impression

DISCUSSION

Several techniques have been proposed in literature to overcome the problem associated with fixed appliances.^{3,5} However, irreversible hydrocolloid impression materials cannot be utilized for implant final impressions owing to their lesser dimensional stability and inadequate reproduction of details. Polyvinyl siloxane in various consistencies is the material of choice but difficulty is encountered due to their rigidity after setting, especially in patients undergoing fixed appliance therapy.⁵ Multidisciplinary treatment protocol of simultaneous implant placement during orthodontic therapy had been considered in the present scenario to reduce treatment duration. Taking into account the axis of the implant body, a simple technique was followed by blocking out with the basic dental materials available in any dental practice. The technique followed the principle of copying relevant and critical details necessary for the final implant impression technique.

The technique presented was easy to use with no discomfort to the patient. One of the disadvantages was that since the brackets were blocked, that portion of the tooth was covered and the entire natural tooth was not completely visible to the dental technician. This was overcome by sending high quality images of the patient's teeth taken before the impression making procedure.

CONCLUSION

Precise impression making with polyvinyl siloxane material can be arduous in patients undergoing fixed appliance therapy. The technique described includes removal of orthodontic wire before impressions, preparation of orthodontic brackets with wax blockout, use of custom fabricated sectional tray for medium viscosity polyvinyl siloxane impression material.

Multidisciplinary approach to treatment is time saving; this also includes simultaneous orthodontic and prosthodontic procedures. The technique restricts impression making to the regions of interest and fabrication of sectional impression trays for final impression in subjects undergoing fixed orthodontic appliance therapy.

CONFLICT OF INTEREST

There is no conflict of interest

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