The need of the patients in the modern-day dental practice is highly demanding. In order to meet the demands of the patients and to achieve higher goals a number of treatment techniques have evolved in the past decade. One such successfully emerged treatment technique is the dental implants. With the introduction of implants by Branemark, the treatment modalities in dentistry have evolved into leaps and bounds. The implant treatments have overcome the various limitations of the conventional prosthetic treatment procedure. It has provided the perfect solution for the functional problems and psychological needs of the patient.

With this evolution, the osseointegrated implants have been proven successful in the treatment of edentulous and partially edentulous conditions. The success of the dental implants is influenced by various factors. One of the key factor effecting the outcome of the treatment is the impression procedure involved in the fabrication of implant prosthesis. Precision of implants impressions is a prerequisite for long term success of the implant supported prosthesis.

An impression is defined as the negative replica of teeth and the oral tissues. A good impression forms the basis for a successful prosthetic treatment. The oral environment presents a challenging task for the dentist, which he has to replicate for the fabrication of various prosthesis. In order to achieve a proper impression, one should have a knowledge of the oral anatomy, various impression techniques, material science of the impression material being used. Furthermore, the skill and appropriate selection of the material and technique plays a significant role.

The basic principle behind making an impression is to provide support, retention and stability for the prosthesis. An impression also will act as a foundation for the improved appearance of the prosthesis. At the same time the impression should record all the potential prosthesis bearing surfaces available.

A variety of impression techniques for the fabrication of implant supported prosthesis have evolved in the past decade. Selection of a specific technique depends on the evaluation of a particular patient and the clinical situation present.

In the fabrication of implants, the primary objective of impression making is to record and transfer the relationship between the non-yielding, osseointegrated fixture abutments and reproduce the relationship in the master cast. The impression technique which is selected for the particular implant supported prosthesis must record the soft tissue supporting areas and the accurate positioning of the implant components. The resilience difference between the implant and the mucosa should also be considered while making the impressions for implant supported prosthesis. Hence it is essential to obtain an accurate impression in implant supported prosthesis due to the nature of the fit of the impression hardware. Inaccuracies introduced during impression technique can cause misfit of the prosthesis which may lead to uneven force distribution and possible prosthesis complications such as abutment screw loosening and occlusal inaccuracies.

Though a variety of impression techniques has evolved for the fabrication of implant retained prosthesis each one has got its own limitations and it cannot be usedin all situations. Thus the selection of a particular impression technique, which greatly influences the outcome of the treatment still remains as a tough task. This library dissertation highlights the various techniques of impression making, their merits and demerits in the fabrication of implant supported prosthesis and also the selection of an appropriate technique for the corresponding clinical situation present.

Implant:

It is defined as a prosthetic device or alloplastic material implanted into the oral tissues beneath the mucosal or periosteal tissues, and on/or with in the bone to provide retention and support for fixed or removable prosthesis.

Fig.1

Implant Abutment:

It is defined as the portion of the implant that supports or retains a prosthesis or implant superstructure.

Fig. 2

Implant fixture:

It is defined as the portion of the implant system with in the bone.

Fig.3

Superstructure:

It is defined as a metal framework that fits the implant abutments and provides retention to the removable prosthesis. Abutments may use screws ,dental cements or attachment device to retain the superstructure. Based on this they can be classified in to fixed when cements are used, fixed-removable when screws are used and removable when the patient can remove the restorations.

Cover screw:

It is used to seal the occlusal surface of the implant during osseointegration, if a two-stage procedure is performed.

Fig.4

Fig.5

Implant analogue:

It is used in the fabrication of the master cast to replicate the retentive portion of the implant body or abutment.

Fig.6

Fig.7

Transfer copings:

These are the components used to transfer the position of the implant to the cast during the impression procedure. They are used in traditional prosthesis to position an analogue on the impression.

Fig.8

Fig.9

Prosthetic coping:

It is a thin covering usually designed to fit the implant abutment for the screw retention and serves as a connection between the prosthesis superstructure and the abutment.

The mayan civilization has been shown to have used the earliest implants dating from about 600 AD. They had used teeth shaped pieces of shelves to replace the missing teeth. The strong evidence for this comes from the fact that the mandible fragments of Mayan origin, dating about the same period as mentioned above was found during excavation. It has been observed that three tooth-shaped pieces of shell had been placed in the sockets of three missing incisor teeth. From the X-ray study of Bobblo in 1970 it was showed that compact bone has formed surrounding these implants.

Bone and ivory dental implants cited in the archeological records of China and Egypt before the common era give us an idea that implants were used during these prehistoric times. But there is no sufficient evidence and literature for this.

During the 16th and 17th centuries gold and ivory implants were in use. In 1809 Maggilo of paris placed a single stage gold implant without a crown to heal passively in the fresh extraction site. But this attempt was a failure since there was severe pain and inflammation of that site following the placement. In 1891 Znamenski implanted artificial tooth with porcelain, rubber and gutta-percha which had groovesin the root portion to facilitate tissue adhesion.

In 1913 Greenfield reported on the implantation of two-piece hollow basket irido-platinum cage fabricated from 24-guage iridium wire soldered with 24-carat gold into the alveolar process for supporting crowns and fixed partial dentures. In 1937 Adams designed a submerged threaded cylindrical implant with a round bottom,smooth gingival collar and healing cap. A ball head was screwed to the root which wasused to retain a overdenture. Marziuni in 1947 anchored complete dentures by means of porcelain or acrylic roots inserted in to sockets. The success of these trial and error methods were very minimal. The basic reason for this is, they were not in possession of a material, which was compatible with body fluids and a design that will best withstand the occlusal load.

An active development in the implant dentistry started in the 1960s.In 1963 ,Leonard I.Linkow Introduced the first self tapping endosseous root form implant, known as the ventimplant. The protocol advised was to immediately load these implants

with overdentures or fixed partial dentures. This concept later lead to the concept of immediate loading of implants.The year 1978 saw a major breakthrough in implant dentistry. During this year, Dr.Per-Ingvar Branemark of the university of Goteborg and institute of Applied technology –Sweden, revealed the concept of direct bone anchorage of implants, known as osseointegration.

However during this period of time there were two major school of thoughts regarding implants. In America, blade shaped implants were placed in to the bone and then posts were attached to the blade with bridgework affixed to the posts later.However in Sweden, Branemark was Doing research ,Placing a titanium cylinder into the bone, leaving it submerge below the gums for three to six months while the healing matured and the bone attached to the implant. Around 1980 Branemark brought his research ,which had overwhelming clinical and reasearch evidence in comparison to the American methods. Hence, Branemarks method was widely accepted throughout the world. After that there was a great development in this implant dentistry and today over 7 million Branemark system implants have now been placed and hundreds of other companies produce implants.

Osseointegration can be defined as a process where by clinically asymptomatic rigid fixation of alloplastic materials is achieved and maintained during functional loading. Such stable bone implants have an interface that mainly consists of bony tissue. It differs from the natural dentition, where the teeth are anchored to the surrounding bone by means of a highly differentiated connective tissue ,the periodontal ligament. The bond acting over an osseointesgrated implant is a biomechanical one. This means that bone will grow in to surface irregularities of the implants with a resultant three-dimensional stabilization.

The process of osseointegration is a time dependent procedure. The end result of this procedure is a very strong interface between the bone and implant. It is due to the unique property of the bone to remodel in accordance with the imposed functional load. If the implant is overloaded this process is compromised and a poorly differentiated interface will result which will ultimately lead to the failure of the implant. Thus a proper Osseointegrated prosthesis will have a good retention and stability, aesthetics, improved function, better patient comfort and also preservation of bone can be attained.

CLASSIFICATION OF IMPRESSION TECNHIQUES

The impression techniques for implants are broadly classified on basis of

1. Type of tray used
2. Type of technique used
3. Material used
4. Number of procedures

I) BASED ON THE TRAY USED: 1.OPEN TRAY TECHNIQUE

2. CLOSED TRAY TECHNIQUE II)BASED ON THE TECHNIQUE USED:

1. CONVENTIONAL IMPRESSION TECHNIQUE.

2. MODIFIED IMPRESSION TECHNIQUES

a) Functional impression technique

b) Trayless impression technique

c) Two step impression technique

d) Transfer type impressions

e) Impressions using splinted and non splinted copings

f) Impressions using tapered impression copings g)Impression using squared type impression copings

g) Pin retained transfer impressions

h) Snap impressions

i) Impression technique for angulated implants.

III) BASED ON THE TYPE OF MATERIALS USED 1.POLYETHER IMPRESSION

1. ADDITION SILICONE IMPRESSION
2. CONDENSATION SILICONE IMPRESSION
3. ZnoE + lastomeric impression material

IV) BASED ON THE NUMBER OF PROCEDURES

1. Single Step
2. Double Step

I) OPEN TRAY IMPRESSION TECHNIQUE:

The open tray impression technique is one of the commonest impression methods used in the fabrication of implant supported prosthesis.

ARMAMENTARIUM:

1. Stock tray
2. Tray adhesive
3. Boxing wax
4. Medium bodied and light bodied Polyvinyl siloxane impression material

PROCEDURE:

1. A custom acrylic resin tray is fabricated and Openings were created in the area where the implants are located.
2. The healing abutments are removed and implant impression copings are placed.
3. Then evaluate the impression tray intraorally. Ensure that is well adapted and that all the impression copings protrude through the opening(s) in the tray withoutcontacting the acrylic resin tray.

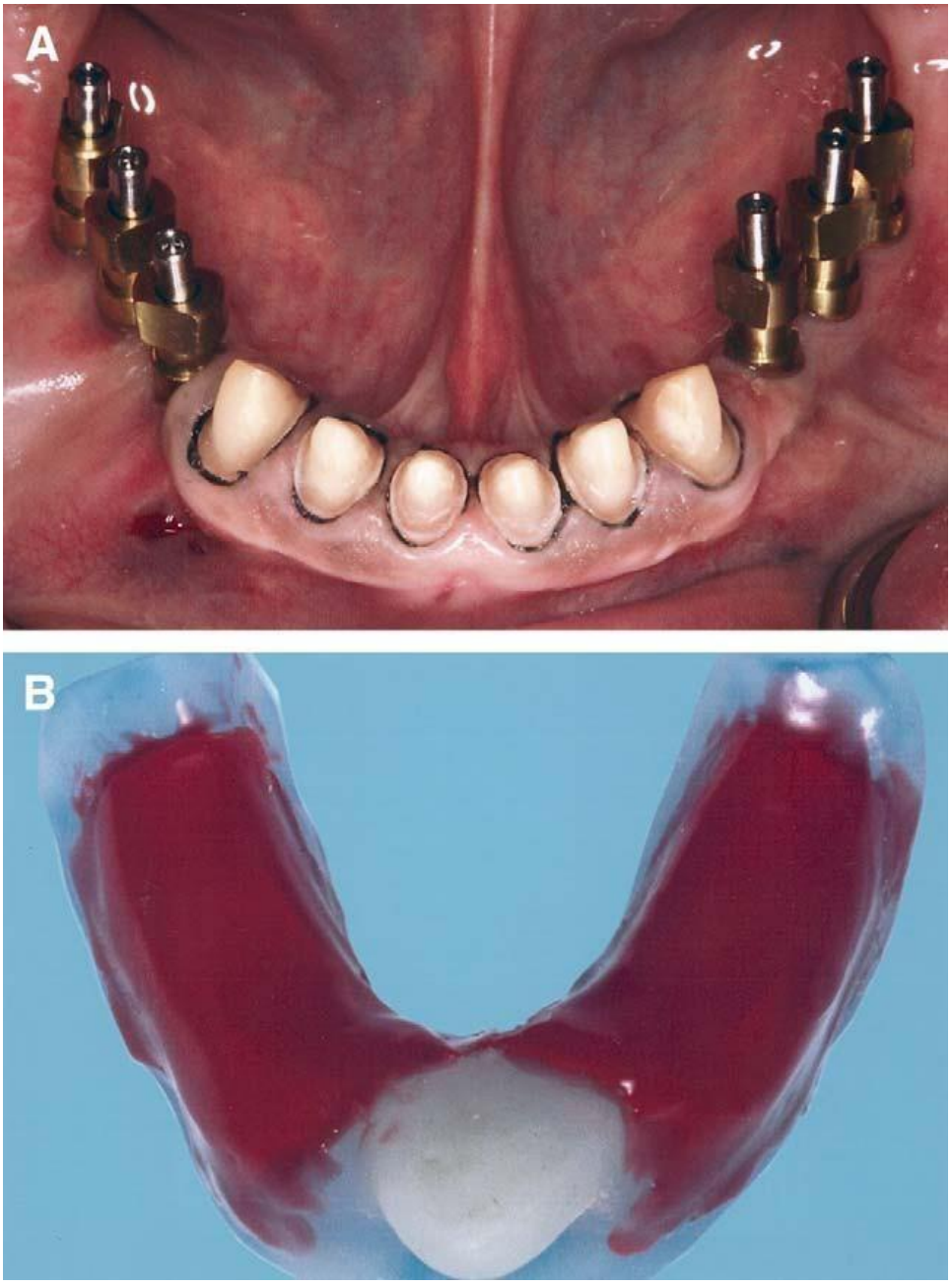


Fig.10

A. IMPRESSION COPINGS PLACED INTRA ORALLY B.BOXING WAX SEALED TO THE IMPRESSION TRAY

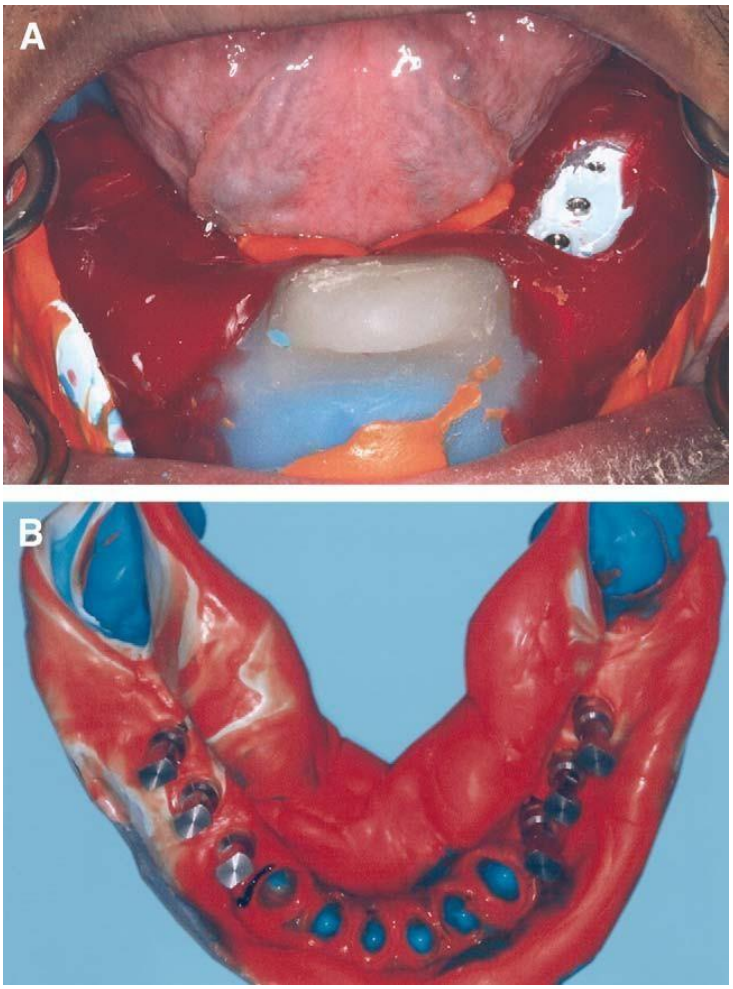


Fig.11

A.BOXING WAX CLEARED FROM GUIDE PINS ON THE LEFT SIDE B.LABORATORY ANALOGS CONNECTED TO THE IMPRESSION COPINGS

4. Remove the tray from the mouth and adapt a sectionof boxing wax in the tray and seal the wax to the tray using a hot instrument.

5. Then the tray adhesive is painted on the inside of the tray except where the wax is located, and allowed to dry.

6. Then the light-bodied Vinyl Polysiloxane impression material is injected around the impression coping near the gingival tissues and into the

interproximal areas between teeth. Then the tray is filled with either medium- or heavy-bodied VPS impression material in all areas, except where the wax is located.

7. The loaded tray is Placed intraorally and pushed on the wax until all impression coping guide pins have been located and protrude through the wax a few millimeters.

8. Allow the impression to completely polymerize.

9. Any wax or impression material on the guide pins are then removed to gain access for connection of the screwdriver .All the guide pins from the implants are then disengaged and impression is removed from the patient's mouth.

10. Then the impression is disinfected.

ADVANTAGES:

1. It is relatively inexpensive.

2. It is less technique sensitive.

3. Procedure is easy to perform.

II) CLOSED TRAY TEHNIQUE:

In this technique the impression copings remain in the mouth on the removal of the set impressions. After the removal of the impression, the impression copings are transferred to the impressions and then the cast is poured.

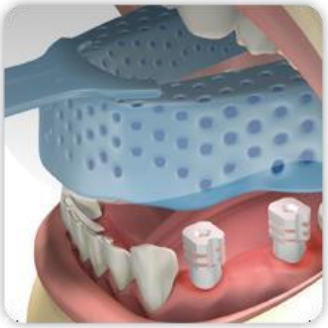


Fig.12

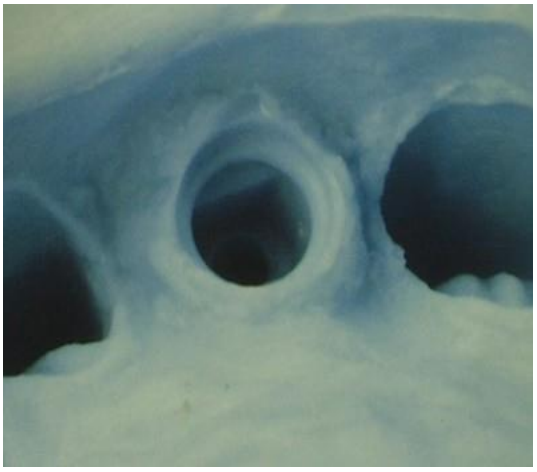


Fig.13

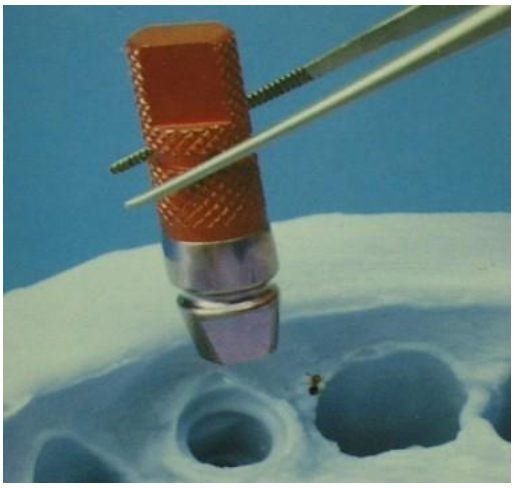


Fig.14

Indications:

Mainly indicated in resticted muth opening.

Advantages:

1.No need of custom tray

Disadvantages:

1. Poor accuracy.
2. Poor fit of the prosthesis.

III) CONVENTIONAL IMPRESSION TECHNIQUES FOR IMPLANT SUPPORTED PROSTHESIS:

The conventional method of impression making consists of two phases

1. Primary impression 2.Secondary impression

PRIMARY IMPRESSION:

The purpose of making the primary impression is :

1. For the fabrication of study casts.
2. Visualizing implant body angulations

3. Choosing the final prosthetic abutment

4. Fabricating a custom tray

Procedure:

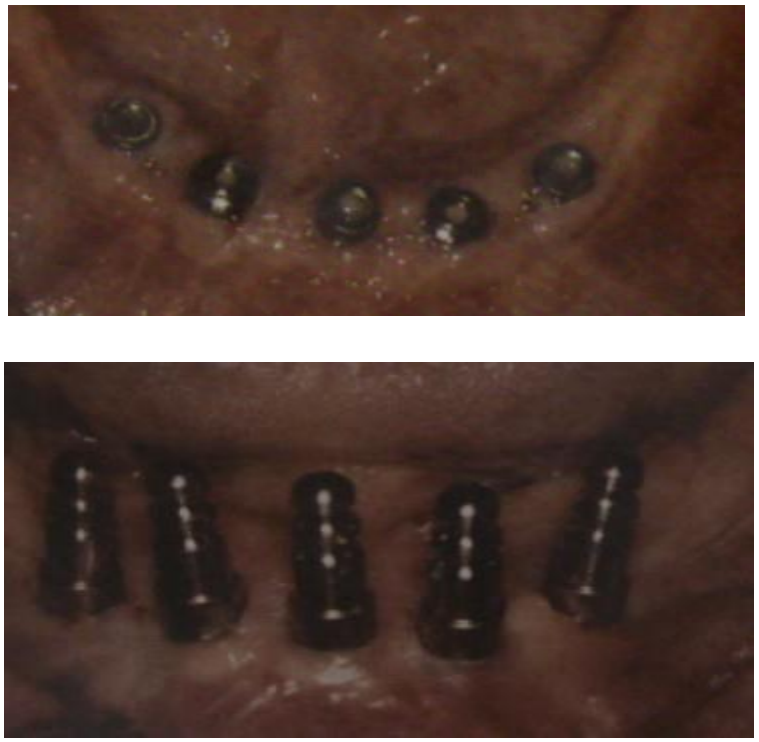


Fig. 15 Abutment for screw retention

Indirect impression transfers placed into mandibular bodies

Fig. 16 Working cast with abutments

1. The first step in the making of primary impression is to remove the healing cap.

2. Then Place the tapered hydrocolloid impression coping into the implant body

and the appropriate size stock tray is selected.

3. An alginate impression is then made.

4. The indirect copings from the fixture are unscrewed and implant analogues are attached.

5. Indirect impression transfer with analog is placed carefully into the corresponding hole in the impression

6. Then the cast is poured with dental stone

7. Recover the cast and remove the impression copings 8.Trim and Complete diagnostic cast

SECONDARY IMPRESSION:

Fig.17 Custom tray

Fig.18 Master impression

1. Then a custom tray is fabricated using the primary cast and then the final impression is made.
2. To make a fully bone anchored prosthesis, a stable and accurate impression material is used for final impression.
3. Remove healing caps, clean caps, clean the abutments, and rinse the tissues.
4. Connect the square impression copings with guide pins.
5. Conform the fit with radiographs
6. Try in the tray to verify fit intra orally
7. Inject impression material around each impression coping and surrounding tissues.
8. Fill the impression tray with remaining impression material.
9. Seat the tray intraorally and wipe excess impression material to expose the guide pins
10. Unscrew the guide pins and remove the impression and the final cat is poured.

MODIFIED IMPRESSION TECHNIQUES:

IV) TRAYLESS IMPRESSION TECHNIQUE:

A technique incorporating accuracy, simplicity, andspeed is desirable when making complex impressions. This trayless impression procedure, atechnique not identified in other articles within the dental literature. Using this method, which was originally intended to facilitate impression making in the surgicalfield, the author has made complete arch impressions at the time of surgery for the fabrication of immediately loaded, single-piece, screw-retained provisional restorations supported by external hex implants This technique is efficient and has alsobeen used for making definitive impressions. This trayless technique facilitates making impressions in edentulous patients with restricted access. Direct splinting has been shown to be the most accurate method for multiple abutment impressions.1 The prostheses fabricated using this impression technique are clinically and radiographicallyaccurate, using accepted in vivo evaluation procedures,

INDICATIONS:

1. In the fabrication of complete arch implant supported prosthesis.

2.In patients who have resticted mouth opening.

PROCEDURE

1. In this technique, implantlevel transfer impression copings are placed prior to suturing.

2. The upper half of the impression copings are left exposed. Then fast-polymerizing vinyl polysiloxaneimpression material is placed with generous extension over the tissues in the surgical field.

3. Following this using a disposable syringe or with the tip provided, place light-polymerized acrylic resin in manageable overlapping increments around the upper half of the impression copings to engage their mechanical retentive features, locking the copings into the resin. Keep the acrylic resin off the tissues and on the impression material. The impression material will act as an insulator from the warmth generated during polymerization. Use air and water spray coolant as soon as the resin stops flowing.

4. Then the impression is removed and the cast is poured with Type IV dental stone. Care should be taken while pouring the cast since there is no adhesive between the impression material and acrylic resin.

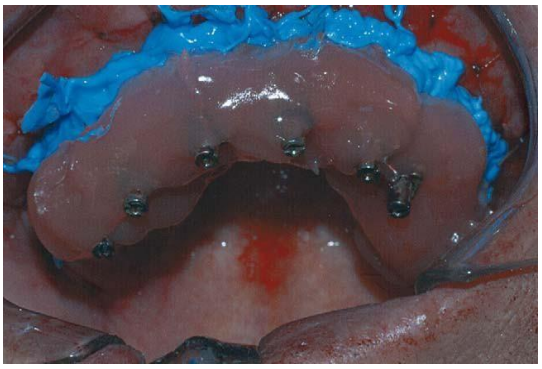


Fig. 19. Impression Copings and Impression

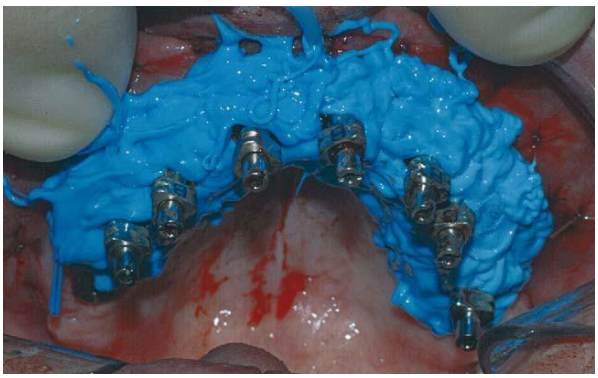


Fig. 20. Addition of Light-Polymerized Acrylic Material In Place. Resin

ADVANTAGES:

1. Accuracy and precise prosthesis can be fabricated.

2. Time consumed is very less.

DISADVANTAGES:

1. Tehnique sensitive

V. FUNCTIONAL IMPRESSION TECHNIQUE:

An overdenture impression must record the soft tissue supporting areas simultaneously with accurate positioning of the implant components. An implantretained overdenture has characteristics resembling those of a complete denture, with a combination of tissue support and implant retention. Thus, resilience difference between implant and mucosa should be considered for the impression of implant-tissue-retained overdentures. The functional impression technique records the mucosa in a functional state and simultaneously records the implant components in relation to the alveolar tissues. The primary advantage of this technique is to provide the accurate relation of the implant components and the supporting tissues. After insertion of the prosthesis, chair time decreases for postinsertionadjustments. However, the procedure is technique sensitive in recording the border relation with different impression materials, and it is more time consuming compared with the single- stage impression.

The functional impression technique records the mucosa in a fuctional state and it simultaneously records the implant components in relation to the alveolar tissues.In this technique ZnoE impression pate and elastomeric impresson material is used.

INDICATION:

Mainly used in the fabricaton of implant retained overdenture.

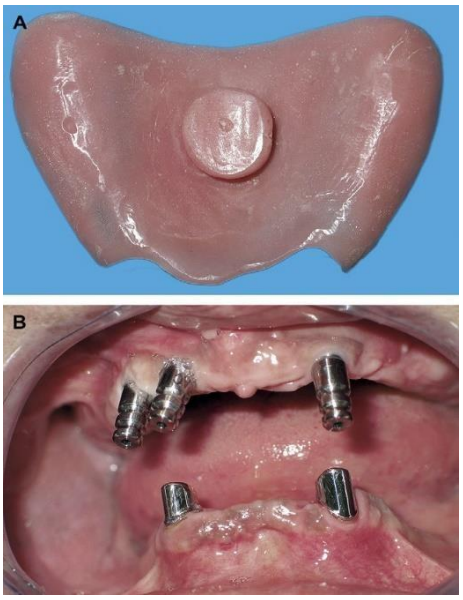


FIG. 21. A, MAXILLARY CUSTOM TRAY PREPARED FOR DEFINITIVE IMPRESSION.

B, INTRAORAL VIEW OF INDIRECT ABUTMENT TRANSFER COMPONENTS IN MAXILLA.

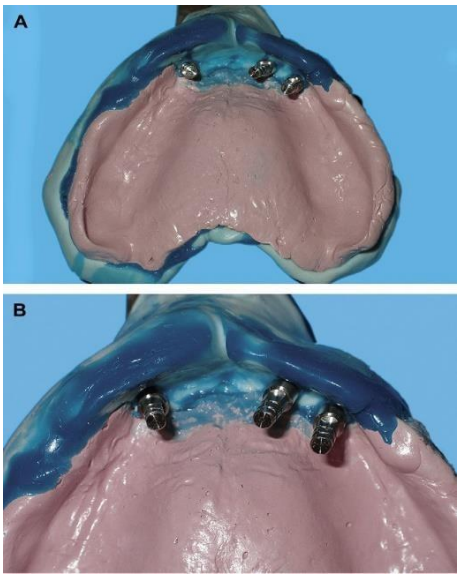


FIG. 22. A, DEFINITIVE IMPRESSION OF MAXILLA. B, SMOOTH TRANSITION BETWEEN IMPRESSION MATERIALS

After second-stage surgery,healing caps are placed on the tapered abutments in the edentulous ridge.Then preliminaryimpressions of the maxilla and mandible are made with irreversible hydrocolloid to serve as a guide for the fabrication of custom acrylic resin impression trays.Custom tay is Prepared , leaving an opening in the areas of the implants. A positive notch is formed on the midpalatal region for ease in supporting the tray intraorally with finger pressure.

The healing caps are removed and indirect abutment transfer components are screwed onto the tapered abutments Then border moulding is done with modeling plastic impression compound and the impression of the alveolar mucosa is made with ZOE impression paste .Upon completion of the impression procedure, remove excess impression paste from around the implant sites are removed and the tray is seated carefully intraorally once again.Then the light-bodied elastomeric impression material is injected around the implants through the open area in the tray .A definitive impression is made by inserting a stoc tray over the acrylic resin tray using heavy body impression material.Then the abutment transfer components are unscrewed and attached to the implant analogs.This assembly is then transfered to the impression and the cast is poured.

ADVANTAGES:

1. It provides the accurate relation of the implant components in relation to the alveolar tissues.

2. Less post operative adjustments.

DISADVANTAGES:

1. Highly technique sensitive. 2.time consuming.

VI) TWO -STEP IMPRESSION TECHNIQUE:

Passive fit of components is considered to be critical to the long-term success of implant treatment plans.Poor fit has been associated with biologic complications and component failure. Each laboratory and clinical stage may contribute to positional discrepancies in fit. Therefore, it is essential to minimize the variation at every step in the restorative process.The process of impression making for a mandibular overdenture

situation may be susceptible to several factors that can contribute to distortion in the final master cast. These include flexure of the mandible, distortions in the impression material, and problems with the impression procedure. The overdenture impression must record the soft tissue supporting areas simultaneously with accurate positioning of the implant components. This procedure that uses two steps. The first is conventional border moulding and impression in an individualized tray that fits over the implant abutments. The second step involves attachment of the implant impression copings to the tray and picking up the copings from the mouth.

PROCEDURE:

FIG 23. INTRAORAL VIEW OF IMPRESSION

FIG. 24. SEATING OF TRAY

COPINGS ON IMPLANTS

FIG.25. IMPRESSION COPINGS SPLINTED TO TRAY BY AUTOPOLYMERIZING RESIN

1. After healing from second stage surgery an irreversible hydrocolloid preliminary impressionof the arch is made with healing abutments in place. An acrylic resin tray is then fabricated on the resultant cast and the tray handle is placed between the abutments to accommodate access to the implants.

2. At the final impression appointment,An impression is made by means of conventional means.The impression is removed and pick-up type impression copings are placed on the implants .

3. Then the holes are drilled in the impression tray through the area ofabutment wide enough to permit the impression to be seated in the mouth without touching the impression copings .

4. When the impression seats fully and passively, an autopolymerizing acrylic resin or light-curing resinis injected around the copings.

5. After polymerization of the resin, the coping screws and the impression are removed. The copings are held rigidly by the tray . The analogs are placed in the copings, and the master cast is fabricated by conventional means.

ADVANTAGES:

1. Provides excellent fit of the prosthesis.

2. Accurate relation between the bar and soft tissue surface of the overdenture can be obtained.

DISADVANTAGES:

1.Time consuming 2.Technique sensitive

VII) DUAL IMPRESSION TECHNIQUE:

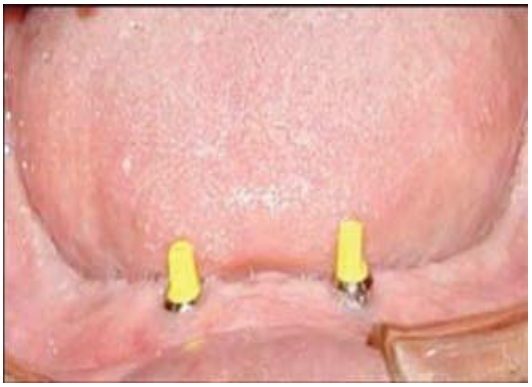


FIG 26 IMPLANT WITH DIAGNOSTIC ABUTMENT

Fig.27 APLLICATION OF WAX SPACER

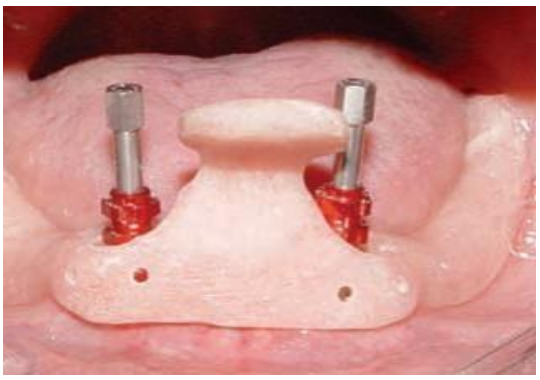


Fig. 28 CUSTOM TRAY FOR PICK UP IMPRESSION

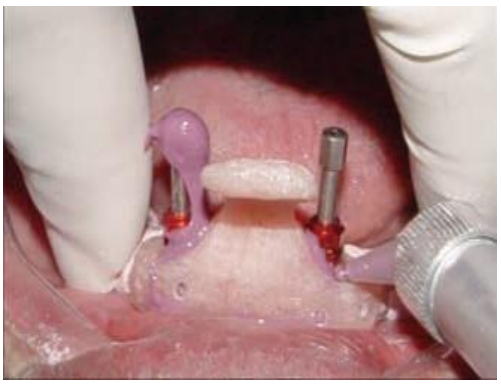


Fig. 29 INJECTION OF LIGHT BODY

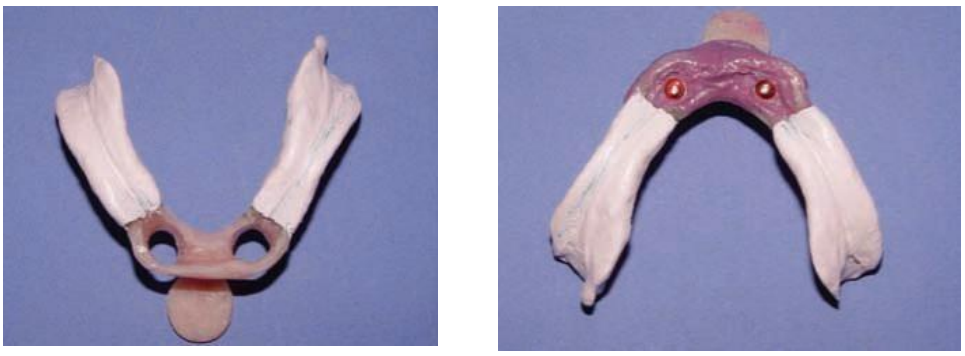


Fig. 30 FINAL DUAL IMPRESSION

In some aspects, such as force direction and distribution, implant-retained overdentures are similar to bilateral distal extension removable partial dentures (RPDs) (Kennedy Class I).1 Occlusal forces on RPDs must be distributed uniformly to the supporting teeth and residual ridges. Some authors believe that the difference in the displaceability between teeth and residual ridges cannot be captured by a single impression procedure.

1,2 Dual impression techniques were introduced to produce a ‘‘corrected cast’’ whereby the teeth will be registered in their anatomic position and the residual ridge will be recorded in their functional form.2-4 This can be used in implantretained overdentures as well. Two categories of dual impression techniques have been described in the literature. These are:

(a) Physiologic techniques and (b) selective pressure techniques.The physiologic impression techniques record the ridge portion in its functional form by placing an occlusal load on the impression tray during the impression procedure. Three physiologic impression techniques are:

(b) McLean-Hindels method (i.e., recording the tissues of the residual ridge in the functional form using a custom tray and then making a dual impression using a stock tray),

(c) Functional reline impression technique (i.e., adapting a wax or metal spacer over the ridge on the cast before processing the denture base, replacing with light-bodied polysulfide rubber base during a reline impression that will be substituted with denture base material), and (c) fluid wax method (i.e.,

registering the residual ridge by painting the fluid wax on the tissue side of the impression tray). The selective pressure impression technique equalizes support between abutment teeth and soft tissue and directs the forces to the portions of the ridge that are most capable of tolerating the forces. This is accomplished by relieving the tray in some areas, while allowing the impression tray to contact the ridge in other areas. Greater soft tissue displacement will occur in areas where relief is not provided. Although the technique is described in conjunction with the Straumann_ Dental implant system, it can be applied when other implant systems are used as well.

Indications:

Mainly in the fabrication of implant retained overdentures.

Procedure:

1. Remove the healing caps, place diagnostic abutments into the implantfixtures, and make a preliminary impression with irreversible hydrocolloid impression material.

2. Pour the diagnostic cast with Type III dental Stone.

3. Relieve the residual ridge by adding a thin layer of melted baseplate wax except on the primary stress bearing areas (i.e., buccal shelves).

4. Adapt one or two layers of baseplate wax on the abutments to maintain the space for the elastomeric impressionmaterial .

5. Make a custom impression tray using autopolymerizing or light polymerizing acrylic resin material. Use a carbide bur to make holes on the anterior portion

1. of the tray for injection of the elastomeric impression material (Fig 3).

6. Try-in the tray and border mold the tray distal to the abutments using a low-fusing modeling plastic impression compound

7. Make the impression of the residual ridge using zinc oxide eugenol paste .

8. Remove any excess material that is extended into the abutment region.

9. Inject the elastomeric impression material through the holes to make the impression of the abutments while applying finger pressure to the distal portion of the tray . This will record the soft tissue of the residual ridge under pressure and the abutments in their anatomic position.

Advantages:

The technique uses two impression materials that register the residual ridge under the load and record the implant abutments in their anatomic position

VIII) SNAP ON IMPRESSION TECHNIQUE:

Use of a custom tray with elastomeric

Impression material or a stock tray with a putty-wash method is recommended for making an impression of dentalimplants. For impressions of the transfer impression assembly, including the impression coping and positioning cylinder, a stock tray with putty impression material must be used to register an unmodified solid abutment. When abutments are prepared to provide adequate space for the restoration, relief of the putty impression material must be accomplished to provide sufficient space for the wash material. Inadequate space may result in displacement of the impression assembly and a distorted impression. The following technique can be used to provide space during the making of a putty impression for modified abutments.

INDICATIONS:

1. Mainly incase of inadequate abutment space. 2.In modified abutments.

PROCEDURE:

1. The impression coping is placed over the solid abutment after abutment preparation.

2. Then hard baseplate wax is softened over a flame and wax is added around and over the impression coping .

3. Then an impression with putty-type impression material is made.

4. The impression is then removed from the mouth after polymerization of the impression material.

FIG. 31. BASEPLATE WAX PLACED OVER IMPRESSION COPING.

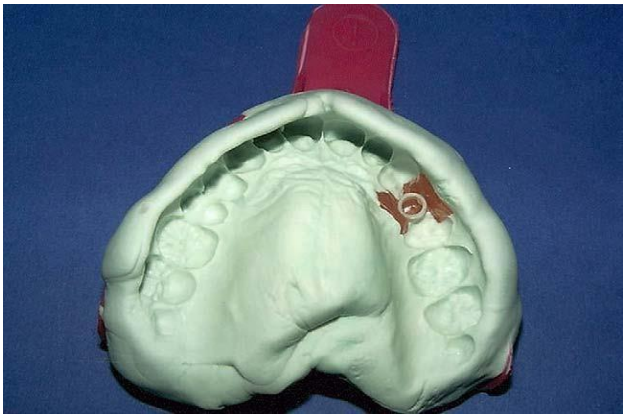


FIG. 32. IMPRESSION COPING CAPTURED IN

IMPRESSION WITHBASEPLATE WAX

5. The wax and impression coping from the putty is removed.

6. The wax from the impression coping is removed and the impression coping is repositioned intraorally.

7. Finally the impression is relined with the light-bodied impression material.

ADVANTAGES:

1. Highly accurate impression can be made. 2.Precise fit of prosthesis

Disadvantages:

1. Technique sensitive

IX) SCREW RETAINED IMPRESSION TECHNIQUE:

Making an accurate impression at the implant level, fabricating a simulated implant-level soft tissue cast, and mounting the cast in an articulator are common procedures that allow the dentist to evaluate and diagnose implant placement, abutment selection, and prosthodontic options.1 When implants are placed in limited space or have unfavorable positions or adverse angulations, a precise implant- level impression can be time consuming. Contact interferences between impression copings or adjacent teeth may complicate impression techniques and necessitate an increased number of radiographs to verify the fit of the impression copings to the implants. This technique describes the use of titanium or plastic implant index copings as impression copings for an implant-level impression. Implant index copings were invented to index the hexagon position of the implant and relate the implant position to the adjacent teeth at Stage I surgery. Indexing the implant at stage I surgery enables the appropriate abutment and provisional fixed prosthesis to be inserted immediately at stage II surgery. This technique saves time. Instead of waiting for soft tissue maturation 2 to 4 weeks after stage II surgery and provisional prosthesis placement even later, the patient receives a fixed provisional prosthesis on the day of stage II surgery. Index copings come in 2 varieties: a 2-piece screwretained titanium index coping and a 1-piece plastic frictional fit/snap-on index coping (Fig. 1). The connection between the implant and index coping can be achieved by means of screw retention (titanium) or the frictional fit/snap-on (plastic) design.

This connection relates the hex position to the implant analog. Whenused, the index copings can be connected to eachother and the adjacent teeth with autopolymerizing acrylic resin.

INDICATIONS:

Incase of Improper implant position and angulation

PROCEDURE:

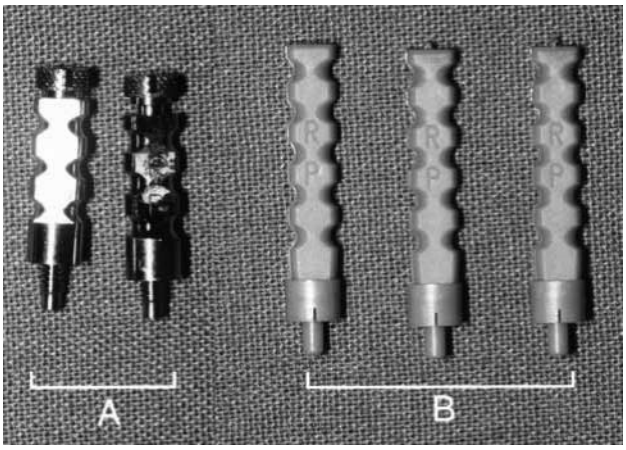
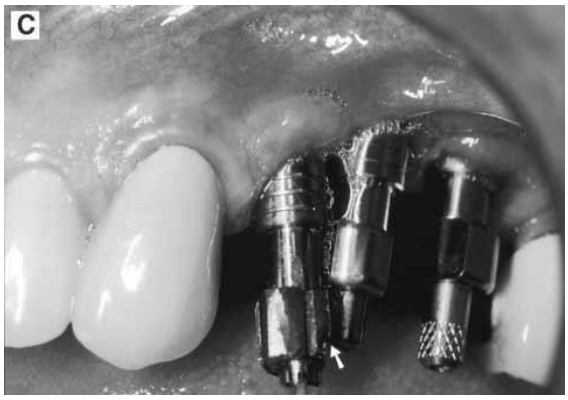


Fig. 33. Two-piece screw-retained titanium implant index copings (A)and 1-piece frictional fit/snap-on plastic implant index copings (B)

1. Initially the healing abutments are removed and implant position, angulation, or space limitations are identified with the use of either long guide pins or conventional impression copings. Determine whether the long guide pins or conventional impression copings present compromising contact interferences and whether these interferences are minor or major. If the interferences are minor,proceed to step 2. If the interferences are major, proceed to step 3.

Fig. 34. A, Long guide pin used to evaluate position, angulation, and available space.

B, Long guide pins reveal contact interferences and thus angulation problem between 2 of 3 implants in this edentulous space.



C, Conventional metal impression copings on all 3 implants show that aggressive modification at coronal portion would be necessary

Fig. 35. Screw-retained titanium implant index coping properly adjusted in limited space. Dental floss used to verify lack of contact interference at lateral border near mandibular left canine.

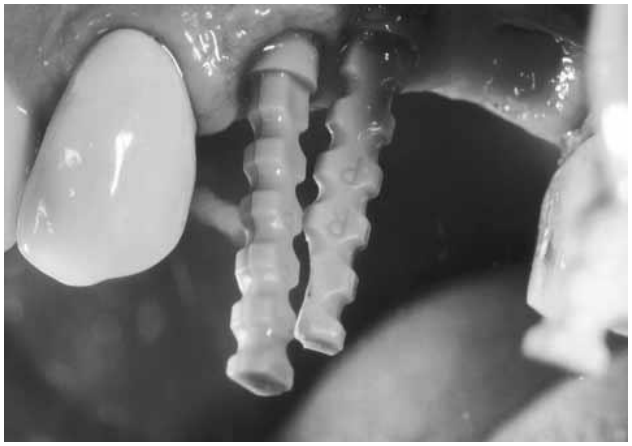


Fig. 36. Two easily modified plastic implant index copings.Note that interference between index copings has been eliminated fully and efficiently.

2. If the interferences are minor, remove the guidepins or impression copings, and attach a screwretainedtitanium implant index coping to the implant.

3. Use dental floss to locate the minor interferences between the coronal or lateral borders of the screw-retained titanium implant index copings and the adjacent copings or teeth. Eliminate the interference by removing the copings and grinding them with high sped diamond bur.

4. If the interferences are major, excessive modificationof titanium index copings may damage the head of the titanium screw.In such a case replace the titanium coping with a plastic implant index coping. Remove and grind the interferenceson the plastic index copings with a highspeeddiamond bur.

5. After all interferences have been eliminated, reseat the index copings. Floss should pass through easily with no snap sound.

6. Ensure that the height of the plastic index coping does not interfere with seating of the tray. If interferences occur, use a high-speed diamond bur to eliminate the coronal portion of the plastic index coping. Use light- activated acrylic resin or autopolymerizing acrylic resin to connect the index copings to each other to increase rigidity and accuracy prior to impression making.

7. Make an impression with an elastomeric impression material. Use an open-top tray for screw-retained titanium index copings or a closed toptray for

plastic index copings.

1. Place the implant analogs, and pour a soft tissue implant level gypsum cast . Use this cast to select the definitive implant abutments and to adjust the selected abutment-level impression copings, if necessary.

2. Place the definitive implant abutments in the mouth, connect the previously adjusted abutment-level impression copings, and make a final Impression.

ADVANTAGES:

1.These copings are smaller and easy to use

2.Less chair time

3.Less expensive

X) IMPRESSION TECHNIQUE FOR IMPLANT IN CLOSE PROXIMITY:

Correct implant placement is essential to establish proper esthetics, occlusion, and preservation of peri-implant tissue health. However, this is not always possible because of anatomic limitations, such as sinus proximity or roots of adjacent teeth, which can be restricting. As a result, implants may be placed either very closely, or with an angulation toward each other . These situations are challenging for the restorative dentist,as certain technical difficulties must be overcome, including making an impression of the implants. The impression copings provided by the manufacturers for the direct transfer method, which, according to some authors, is more accurate, are usually long and bulky in the upper region. The lack of space or the angulation between the implants may preclude the correct fastening of the impression copings to the osseointegrated implants, resulting in an incorrect registration of the positions of the implants .Precise impression procedures of implant positions are essential for the fabrication of accurately fitted implant- supported prostheses. This is generally a routine procedure. However, implants placed in close proximity or with adverse angulations can make impression making a difficult task. McCartney presented a method in which gold cylinders are substituted for the impression copings, whereas Chaimattayompol described an impression technique in which screw-retained titanium or frictional fit plastic implant index copings are used for implant position registration

when unfavorable implant positions are present. This Procedure presents a method to overcome the difficulties associated with the impression procedures of implants placed in close proximity or with adverse angulations, making the placement of the impression copings challenging.

INDICATIONS:

Implants placed in close proximity.

PROCEDURE:

Fig. 37. Two 3.75-mm-diameter implants positioned close to each other

Fig.38. Unmodified impression coping with accompanying screw and modified impression coping with short fastening screw (left to right). Notice undercuts made on upper portion of shortened impression coping.

Fig. 38. Shortened impression coping secured with autopolymerising PMMA resin to unmodified coping.

Fig. 39. Laboratory analogs secured with autopolymerizing PMMA resin.

1. Place a retained impression coping on 1 of the implants to be impressed and secure it with the accompanying screw.

2. Using a carborundum disc cut a retained impression coping to a point at which it does not interfere with proper seating on the second implant. Prepare undercuts on both surfaces of the copings .Alternatively, use a hex retentive element after it is cut to the proper height.

3. Secure the modified impression coping on the second implant with a short

4. Fastening screw, since the long fastening screw that accompanies the retained transfer impression coping may interfere with the screw of the adjacentcoping. If more than 2 unfavorably positioned implants are present, follow the same procedure for remaining implants

5. Make a periapical radiograph to verify complete seating of the impression copings.

6. Connect the impression copings with a low-shrinkage auto polymerizing polymethylmethacrylate resin engaging the undercuts on the surface of the shortened impression copings. After polymerization of the acrylic resin, remove the fastening screws from the modified impression copings.

7. Cover the access openings of the modified impression copings with auto polymerizing PMMA resin to prevent intrusion of the impression material, and proceed with the standard impression procedures. A custom tray made from PMMA resin with an access window directly above the region of the implants can be used for the direct transfer method. Make the impression with a medium body polyether impression material. Alternatively, use impression materials of various viscosities, but with similar accuracy and dimensional stability to those of polyether (vinyl polysiloxanes).

8. Unscrew the fastening screws from the unmodified retained impression copings and remove the impression. Disinfect the definitive impression.

9. Place the implant replicas on the unmodified impression copings and screw them into place with the accompanying screws. Hold an implant replica firmly on the modified impression coping while connecting the 2 adjacent replicas with autopolymerizing acrylic resin. Repeat this procedure if there is more than 1 modified impression coping.

10. If implants are very close to each other, block out the coronal portions of the interproximal areas of the adjacent implants with wax to prevent tearing. adverse angulations to each other but there is some space between them.

11. Place a gingival mask material around the implant replicas and pour the impression with a Type IV stone.

12. Complete the definitive restorations in the conventional manner.

ADVANTAGES:

1. Does not require any additional component 2.Highly accurate

DISADVANTGES:

1. Technique sensitive.

PLASTER AND SILICONE COMBINED IMPRESSION TECHNIQUE: To reduce the risk of prosthetic complications when restoring implants, passive fit of the framework is recommended. With increasing misfit of the framework, the external preload is magnified when prosthetic screws are torqued to specifications and static stresses raise the risk of prosthetic complications. Wee et al described various methods of improving the framework fit. Among these, the use of a dimensionally accurate impression material was reported to be the most critical factor, particularly when it is not possible to achieve fit of the framework by a sectioning and soldering procedure. The use of plaster as an index material for implant impression has been described for partially edentulous patients. For such techniques, an initial impression is necessary to make a custom tray. This technique uses a stock impression tray that allows for a 1-appointment impression procedure.

Although this procedure can be used for completely or partially edentulous patients, the situation presented is for a completely edentulous mandible.

PROCEDURE:

Fig. 40. Implant abutments are in place for fixed made in stock complete denture supported by 6 implants.

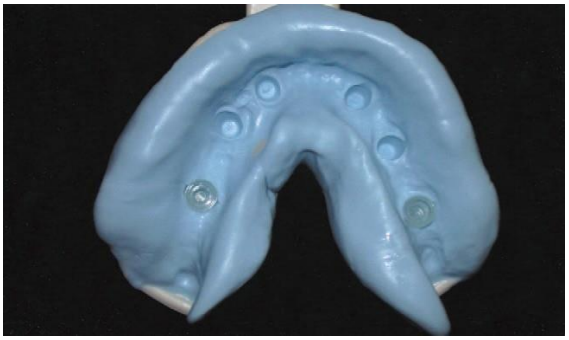


Fig. 41. Vinyl polysiloxane impression tray

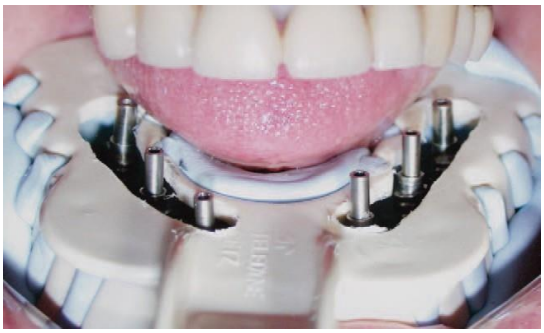


Fig 42. Intraoral evaluation of space around impression copings and access to guide pins

Fig. 43. Plaster index

Fig. 44. Definitive impression

1. A vinyl polysiloxane impression is made using a stock plastic impression tray. Then the prosthetic abutments are covered with healing caps.

2. Then the impression is evaluated and the silicone around the implant area and the top of the impression tray is removed.

3. The impression copings are then screwed in position with a guide pin that exits above the tray when the trayis placed intraorally. Ensure that sufficient space is present around the copings and access to the guide pins exists prior to proceeding to the next step.

4. Hold the tray with the polymerized impression in position during the plaster splinting index procedure.Inject impression plaster around the impression copings with a plastic disposable syringe.

5. After the plaster has set, unscrew the guide pins.The tray is then removed with the plaster index and the copings.Evaluate the plaster index for fractures or shifting.

6. Screw the implant analogs in place. Apply a thin coat of separator on the plaster. Pour the impression with a type IV plaster to obtain the definitive cast.

7. For partially edentulous situations, preserve the silicone material in the interdental spaces before the second stage and fill small voids with wax.

ADVANTAGES:

1. The flexibility of the elastomeric impression material captures the undercut of intraoral topography accurately.

2. The splinting effect of the impression plaster helps to improve the accuracy and fit of the prosthetic components.

XI) MODIFIED IMPRESSION TECHNIQUE:

Making a pick-up impression with a windowed tray is a routine technique for impressing dental implants. It may be difficult for the guide pins to protrude from the opening of the wax lid, however, because the impression material in the tray can obscure the guide pins during the procedure. It has been our experience that if the tray is repositioned several times, the impression may be distorted and/or contain bubbles.If the opening of the wax lid is too wide, or if the wax lid is out of place, the impression pressure may decrease, and the impression material may not extend over the soft tissue around the implants, especially in the maxilla.

Incomplete soft tissue impression around implants hinders the fabrication of a superstructure with a proper emergence profile. A modified implant impression technique is presented as a solution to these problems.

PROCEDURE

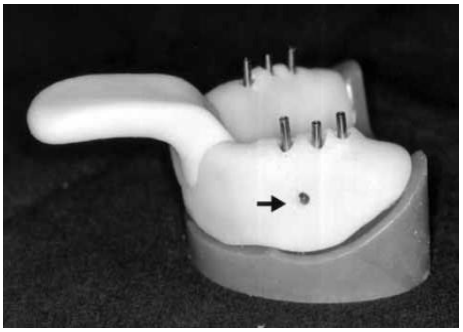


Fig. 45. Modified impression tray.

Arrow indicates side opening

Fig. 46. Impression material in tray for injection of impression material.

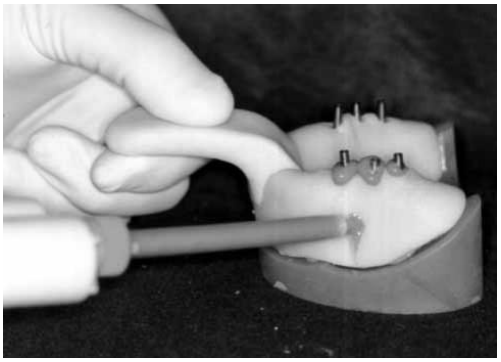


Fig. 47. Injection-type impression material outlines from around implants is added through side hole until it flows from side of guide pin.

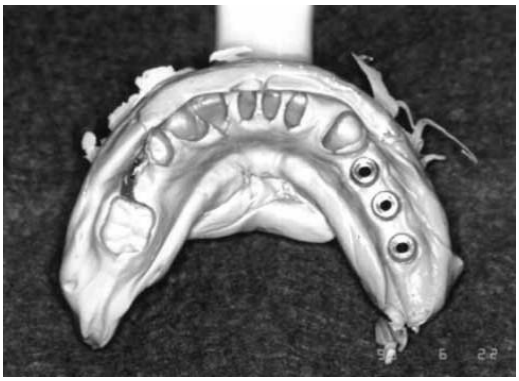


Fig. 48. Impression includes complete soft tissue

1. Seat the impression copings on the implants, and secure them with guide pins.

2. Prepare an opening on the buccal side of the tray near the implants. Prepare holes in the tray to allow the head of the guide pins to protrude without the contacting the tray during impression making.

3. Use light-bodied impression material to record the area around the remaining teeth.

4. Replace the tray in the mouth, and ensure that the guide pins are visible through the holes on the top of the tray.

5. Place injection-type impression material through the side opening until the material flows from the holes at the top of the tray and the lingual edge of the tray.

6. After the impression material has set, remove the impression containing the copings.

XII) IMPRESSION TECHNIQUES FOR ARCHES REQUIRING BOTH IMPLANT AND NATURAL TOOTH RESTORATIONS

There are clinical situations in which an impression of implants and preparcd teeth are made simultaneously. Both dimensional fidelity and fine detail reproduction are important when impressions are made of tooth preparations. However, when impressions are made of implants or implant abutments, only dimensional fidelity is important .Fine detail reproduction is not required when impression copings are used, because analogs are available to reproduce implant or abutment surfaces on the casts. To record the fine detail of tooth preparations, it is advantageous to use a light-bodied elastomeric impression material that has the consistency and flow to record the margins and fine dctail of the prepared teeth. A light-bodicd material is usually injected around tooth preparations with an impression syringe. When implant impression copings are in place to capture the position of implants, they may limit access to margins of the prepared teeth, which can result in an unacceptable impression. Adequate access may be significantly compromised when implant impression copings removed with thc impressions are used. This type of implant impression coping is preferred by many clinicians, because it has demon-strated dimensional accuracy in reproducing a master cast.'This technique is based on an impression technique described by Cannistraci and in which individual impression trays are made for tooth preparations. Using this technique, impressions of the tooth preparations are made independently from the impressions of the implants.

Impression copings for implants are attached after tooth preparations are impressed. An overimpression relates the implants and tooth preparations.

INDICATIONS:

In case of arches requiring both implant and natural teeth restoration.

Technique

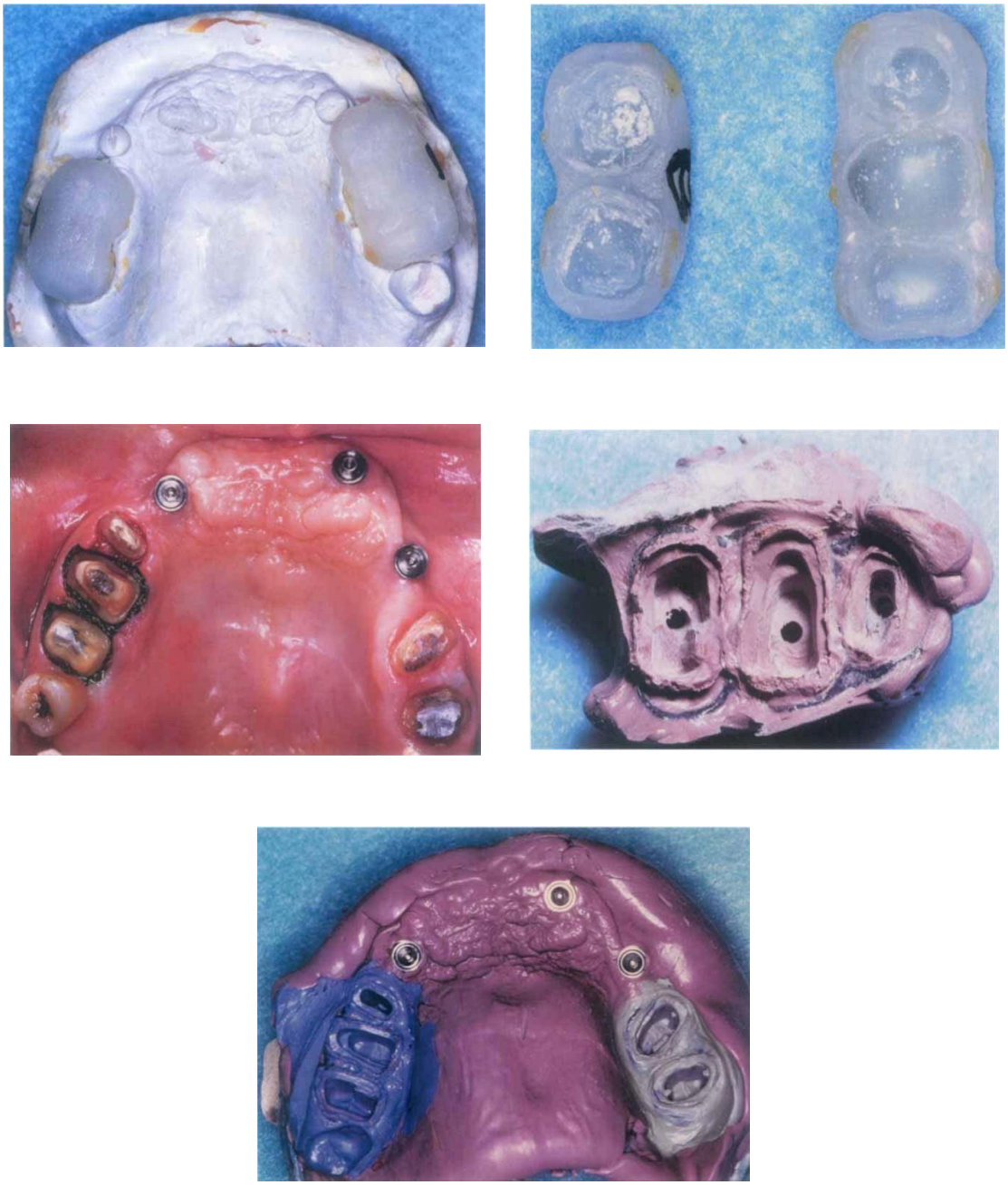


Fig. 49

1. A preliminary impression of the prepared teeth is made with irreversible hydrocolloid, and a cast is constructed.

2. Five layers of rubber separator are painted overprepared teeth to aid in separation of the trays from the cast. To allow for a thickness of approximately 1 mm of impression material, the trays are relieved internally.

3. Individual trays with external retentive undercuts for pick-up by the overimpression are made for tooth preparations . An overimpression tray with openings to access the implant impression copings is made over these individual copings.

4. The provisional restorations are removed and the preparations cleaned. Vinyl gloves should be used so that the setting of the polyvinyl siloxane impression will not be inhibited.

5. The individual impression trays are painted with adhesive internally and externally at least 7 minutes before making the impression. 6.Usually, tissue retraction is needed only if margins are more than 1 mm subgingival.

6. Heavy-bodied polyvinyl siloxane impression material is placed into the individual trays, and the trays are seated over the preparation(s).

7. Each tray is removed after the impression material has fully set and examined for completeness; this stage can be repeated if incomplete areas are found .

8. The individual impression and trays are perforated at the coronal aspect with a #6 round bur and the preparations re-dried. Light-bodied polyvinyl siloxane impression material is placed in the existing impression, and the impression and individual tray is re-seated on the preparation(s) slowly. Excess material escapes through the perforations and along the margins of the impression. The individual impression trays are left in place for the remainder of the procedure.

9. Next, the implant impression copings are attached and an over impression is made using a medium-bodied polyvinyl siloxane impression material

1 .The impression copings arc released and the impression is removed.

The advantages of the technique are:

1. Allows a master cast with both tooth preparations and implant analogs to be used to fabricate the restorations.

2. Facilitates adequate access to tooth preparations without interference of impression copings.

3. Allows the individual impressions of the teeth to be examined individually before the full-arch impression is made.

4. Reduces stress for the operator and patient, because impressions of the prepared teeth are made independently of the implants.

5. Minimizes trauma to the gingival tissues in some situations, because tissue retraction is not necessary when tooth preparations do not extend more than 1 mm subgingivally.

The disadvantages of this technique are:

1. Requires individual impression trays for the prepared teeth.

2. Limits access in placing the implant impression copings if the individual impression trays are in close proximity.

3. Increases bulk of the over impression tray because it must accommodate both the individual impression trays and the implant impression copings.

XIII) SINGLE STEP IMPLANT IMPRESSION PROCEDURE:

After the second-stage exposure of dental implants, it is essential to study their position to design the final prosthesis.

Abutment selection depends on the depth of the soft tissue sulcus and adequate emergence profile from either pre angled, wide base shouldered, or custom-cast abutments. Mounted diagnostic casts are helpful for this purpose and can serve as a convenient means to design the superstructure and communicate with the laboratory. A simplified one-step procedure for making the impression is described for implant reconstructions.

PROCEDURE

1. The patient's existing denture Is duplicated by clear acrylic resin by use of a denture-duplicating flask.
2. After the acrylic resin has set completely, the denture is removed from the mold and the excess flash is trimmed from the denture borders.
3. Finish and polish the denture.
4. Try the duplicated denture in the patient's mouth and make any necessary adjustments.
5. Remove the healing caps from the implants and place the impression posts on the implants. Make radiographs to confirm the seating of the impression posts.

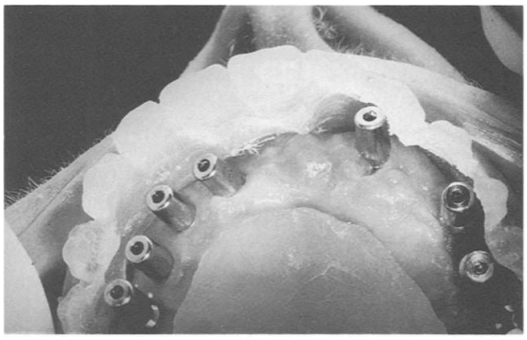


Fig. 50. Duplicate denture is cut out to permit seating without interference of impression posts as it is tried in.

Fig. 51. Duplicate denture is closed with Triad tray material to make impression tray.

Fig. 52. Impression is made and jaw relation is recorded after impression material sets.

6. Cut through the denture base so that it can be completely seated in the mouth without contacting the impression posts.

7. Add Triad VLC tray material or utility wax to the denture to close the portion that was removed. Do not pack the material around the posts, because it should touch only the exposed ends of the impression posts.

8. Use the duplicate denture as a tray to make an impression of the arch with an elastomeric impression material.

9. After the impression material sets, make a jaw relation record with a rigid elastomeric registration material .

10. After removing the impression from the mouth, screw implant analogs onto the impression posts and pour a soft-tissue model.

TABLE I SUMMARIZING THE INDICATIONS, ADVANTAGES AND DISADVANTAGES OF VARIOUS IMPLANT MPRESSION TECHNIQUES

IMPRESSIO N TECHNIQUE	INDICATIONS	ADVANTAGES	DISADVANTAGES
Open tray technique	For making master or secondary impressions	Inexpensive ,good accuracy	Technique sensitive
Closed tray technique	For making of primary impression	No need of custom tray, easy to perform	Poor accuracy, Poor fit of the prosthesis
Trayless impression Technique	In complete arch implant supported prosthesis, Restricted mouth opening	Accuracy and precise prosthesis can be fabricated, Less time consuming.	Highly technique sensitive.
Functional Impression Technique	In implant retained overdenture	Provides accurate relation of implant components to alveolar tissue, less postoperative adjustment	Time consuming, Technique sensitive.
Two step impression technique	Implant retained mandibular over denture	Excellent fit of the prosthesis, accurate	Time consuming
Snap on impression technique	Inadequate abutment space, in modified abutments	Highly accurate, Excellent fit of the prosthesis	Technique sensitive.
Screw retained Impression technique	Incase of improper implant position and angulation	Less chair time, less expensive	Technique sensitive

Impression technique for implants in close proximity	For implants in close proximity	Highly accurate in situations like this	Technique sensitive
Plaster and silicone	Partial and also in completely	Flexibility of silicone Captures	Time consuming, Technique
combined technique	edentulous condition	the undercut accurately, Splinting effect of plaster improves the accuracy and fit	sensitive.
Dual impression technique	In implant retained overdenture	Register the tissues both functionally and anatomically	Technique sensitive
Impression technique for arches requiring both implant and natural teeth restoration	For arches requiring both imlant and natural teth restoration	Adequate access to tooth preparations, Reduces stress to the operator and patient	Requires individual impresson tray to the prepare tooth, Increased bulk of the over impression tray

IMPRESSION MATERIALS

The cast is the foundation on which the prosthesis is indirectly fabricated. The use of the implant cast as a reference for extraoral implant framework fit facilitates the clinician's evaluation of fit. Strategies to achieve fit may be completed on the master cast before the patient's clinical appointment. Although absolute accuracy of the implant cast does not appear to be attainable at this time, it has been suggested that the distortion of the implant cast can be minimized during its fabrication to improve fit. The accuracy of the implant cast depends on the type of impression material, the implant impression technique, die material accuracy and the implant master cast technique. For this reason, meticulous and accurate implant prosthodontic procedures are recommended as a means to attain the best possible fit.

A number of implant impression techniques have been described, but the more common include the indirect, direct, and direct-splinted. The main purpose of an implant impression is to record and transfer the relationship between implant abutments or implants and to reproduce this relationship as accurately as possible. Implant impressions also serve a secondary but important purpose of recording soft tissue morphology. Most research indicates that the indirect impression technique produces a greater mean distortion than the direct -splinted and the direct techniques. When comparing the direct and direct -splinted techniques, conflicting results have been reported regarding their accuracy. studies found that the direct technique was more accurate than the direct-splinted technique. However is the implant impression technique, the impression material must fulfill 2 requirements:

(1) Rigidity and

(2) Minimal positional distortion.

Regarding rigidity, the amount of torque required to rotate a direct implant impression coping in different implant impression materials has not been thoroughly investigated to date and can be considered an important characteristic of direct impression technique for implant impressions.

Liou et al reported that indirect impression copings did not return to their original position when replaced in either polyether or addition silicones. It is assumed that the

same is true when direct impression copings are accidentally rotated. Therefore, the practitioner may be less likely to accidentally displace the impression coping by using a more rigid impression Material. Regarding positional distortion, Barrett eta did not find any significant difference between the accuracy of direct implant impressions that were made from polyether and those made from addition silicones.

In addition, the implant impression technique groups, namely, direct, direct splinted, and indirect, did not vary significantly in accuracy, a finding that is contrary to the results of other studies. Even though several impression materials are manufactured with a range of consistency, comprehensive comparison has been made to document the rigidity and accuracy of these materials/consistency types, as required for the direct implant impression technique.

Because of a low strain in compression (flexibility) and favorable hardness, POLYETHER has been recommended as an impression material for edentulous, multiple implant-retained restorations. The use of addition silicones has also been recommended as material for implant impressions. The properties of an impression material, including rigidity and accuracy, can influence the accuracy of the implant impression, the accuracy of the solid implant cast, and ultimately, the accuracy of the cast implant framework.

According to the authors these elastomeric impression materials possess excellent characteristics which makes it ideal to be used as the material of choice.These elastomeric impression materials are pseudoplastic impression materials.Hence when adequate pressure is applied it will have an excellent flow.The significance of this property is that the clinician can use a material whch is more stable and resistant to distortion.

The elastic modulous of these materials is quite high.Hence the rigidity of the set material is quite big.The high rigidity of these materials helps to hold the impression copings and to prevent accidental displacement of the copings.

These materials also possess excellent elastic properties.Hence it can withstand greater stress without undergoing much permanent deformation.They have a high elastic recovery of about 98.5%.Because of this elasticity and high elastic recovery greater accuracy can be obtained.Added to these properties these materials have an excellent

tear strength .Hence the impressions made from thes materials are resistant to distortion at the time of removal from the mouth.

Among the elastomeric impression materials addition silicone and polysulfides possess excellent dimensional stability since they o not elease any byproducts.Studies have shown that casts poured after one week were dimensionally stable.It records the surface details to the greatest accuracy and has good biocompatibility.

Choosing an impression material for implant–retained prosthesis requires consideration of several factors, including material accuracy, clinician's experience with material, length of time before the impression is poured, and amount of intraoral undercuts. Within the limits of various studies done practitioners to the specialty of prosthodontics may prefer using polyether (medium),addition silicone (high) given its greater overall rigidity. The type of material used for either the completely or partially edentulous multi-implant impression will depend on which factors are important to the practitioner.

TABLE II SUMMARIZING THE MERITS AND DEMERITS OF ELASTOMERIC IMPRESSION MATERIALS

Material	Merits	Demerits
Polysulfide	Long working time high tear resistance modest cost.	Powering should be immediately done. Stretching leads to distortion stains clothing obnoxious odur.
Condensation	Good working tome	High polymerization
Silicon	clean & pleasant.	shrinkage. Volatile by product. Low tear strength powering should be immediately done.
Addition	Clean & pleasant	Low tear strength.

silicone	Ideally Elastic Repeated Pouring Can be done. Stable dimensionally	High cost.
Polyether	Good stability Delay Pour Shelf life : 2 year	Bitter taste Leaches components Hig cost

TABLE III: COMPARISON OF PROPERTIES OF ELASTIC IMPRESSION MATERIALS:

PROPERTY	POLYSULFIDE	CONDENSATION	ADDITION	POLYETHER
TEAR RESISTANCE	+++	++	++	++
ELASTICITY	+++	++++	++++	++
ACCURACY	+++	++	++++	+++
DIMENSIONAL STABILITY	++	++	++++	++++

++ -Adeqate,+++ - Good, ++++ - Very good, -- Poor.

COMMON FAILURES WITH NON AQUEOUS ELASTOMERIC IMPRESSION MATERIALS

The failure to produce an acceptable die or a cast is more likely associated with the technique error rather than a deficiency in the material properties.The common failures and its causes are summarized in the following table IV.

TYPE OF FAILURE	CAUSES
Rough or uneven surface on impression	Incomplete polymerization resulting fom premature removalrom the mouth,Improper mixing,Too rapid polyerizatin because of hgh temperatures.
Bubbles	To rapid polymerization ,Air incorporation during mixing.
Irregularly shaped voids	Moisture or debris on the surface of tooth
Rough or chalky stone cast	Inadequate cleaning of impression,Excess wetting agent left on the impression,Premature removal of cast,Failure to wait atleast 20 minutes before pouring

DISINFECTON OF IMPRESSION:

When the impression are removed from the patient's mouth,it must be assumed that all impression materials have been in contact with the body fluids. They should be disinfected according to the recommended procedure for the material being used. After the impression is removed from the patient's mouth, it is immediately rinse with tap water and dried with an air syringe. Then suitable chemicals such as glutaraldehyde or iodophor spays should be used. Some disinfectants are perfectly suitable for one

material but unsuitable for the other. Because of its tendency to distort and absorb moisture,polyether or addition silicones should be sprayed and stored in a plastic bag rather than submerged and soaked in glutaraldehyde solution.Disinfection is an essential step to prevent cross infection and exposure of laboratory personnel.If it is performed properly,disinfection will not affect the accuracy or surface reproduction of the elastomer.

TABLE RECOMMENDED DISINFECTANTS FOR ELASTOMERS:

DISINFECTANT	POLYSULFIDE	SILICONES	POLYETHER
Glutaraldehyde 2% (10 mts.soak time)	Yes	NO	NO
Iodophors	Yes	Yes	No
Chlorine compounds	Yes	Yes	Yes
Complex phenolics	Yes	Yes	No
Phenolic glutaraldehyde	Yes	Yes	NO

EVALUATION OF THE IMPRESSION:

After disinfection ,the completed impression is inspected carefully before the working cast is made. The impression should be completely dried at th time of evaluation.

An impression that contains visible streaks of base or catalyst material should be rejected. This indicates that the material is not properly mixedand henceit is advisible to repeat the impression.

Another commonly occurring error is the exposure of the tray. This must be identified and its potential impact on he quality of impression is assessed.A common cuse for this is the inaccurate seating of the tray.This can result in tray contacting several teeth and

an uneven thickness of the impression material. If it occurs in the critical area the impression must be disarded and a new one has to be made. Occurrence of voids, folds or creases should have been avoided by careful technique,. However when it occurs in the non critical area the impression may be acceptable.

Separation of the impression material from the impression tray usually occurs as a result of improper application or inadequate drying of the adhesive. This is the most commonest cause for distorted impression.

IMPRESSION TRAYS:

Many clinicians and authors have addressed the idea that passive fit of implant prostheses is essential to long-term treatment success. Although it is assumed that a mishitting prosthesis between 2 or more implants may have a negative effect on the long-term stability of those implants, evidence to support this theory is lacking. Although there is some evidence that prosthesis misfit may not affect Osseo integration, there is evidence that prosthesis misfit is likely to increase the incidence of mechanical component loosening or fracture. The causes of component failure and loosening are multifactorial, but it must be assumed that prosthesis misfit plays an important role in complications such as occlusal and abutment screw loosening and fracture in linked implant restorations. Because of these concerns, prosthesis misfit should be minimized. One of the crucial steps for producing a well-fitting prosthesis is an accurate impression. Most of the available literature evaluating the accuracy of impression materials and comparing accuracy of stock with custom trays suggest that the custom tray impressions are more accurate and exhibhit a passive fit when compared to that of the stocktray impessions. It also seems prudent to use a rigid elastomeric impression material, such as polyether, because it is rigid and maintains impression copings accurately, is dimensionally stable, has a good resistance to permanent deformation, has a low strain in compression(flexibility), and has a high initial shear strength.

STOCK TRAY:

These are primarily used for indirect impression making

.They are mostly used for making primary impression since they are less accurate and their inability to produce a passive fit makes them less desirable.

CUSTOM TRAY:

A custom impression tray often results in less error in both inter abutment distance and cross arch distortion,compared with the stock trays.Cold or Light cured acrylic resin is used to fabricate a custom tray.The custom tray is placed over the regions of wax spacers and permits the long fixation screws to protrude through the top of the tray.The custom impression tray fabricated of the cold cure acrylic resin must be made 24 hours or more before the final impression.During this time the tray distorts and changes dimensionally because of monomer evapouration.If the custom tray can not be fabricated more than 24 hours before the final impression,two options are available. It may be inserted into the boiling water or more than 15 minutes to remove the excess monomer to eliminate the distortion or a light cured acrylic or thermoplastic material may be used to fabricate the tray .

An adhesive is used in the custom impression tray for retention of the elastic material .a very rigid addition silicone or polyether is the impression material of choice for the final direct transfer impressions.

PROCEDURE TO FABRICATE CUSTOM TRAY:

The first laboratory step for an implant supported prosthesis is the fabrication of an modified open tray.The preliminary impression with indirect impression copings and abutment for screw retention analogs are poured in dental stone.

Fig. 53Alginate impression made in a stock tray

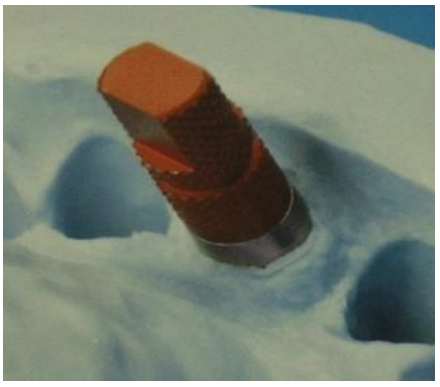


Fig. 54 Placement of laboratory analogs

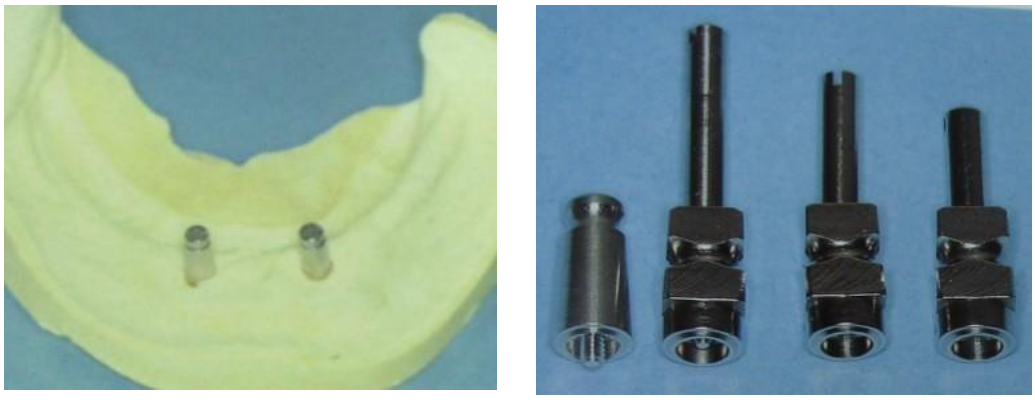


Fig. 55 Working cast with abutment for screw retention

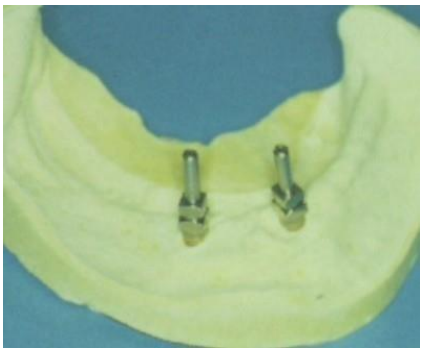


Fig. 56 Indirect impression transfers replaced with direct impression transfer

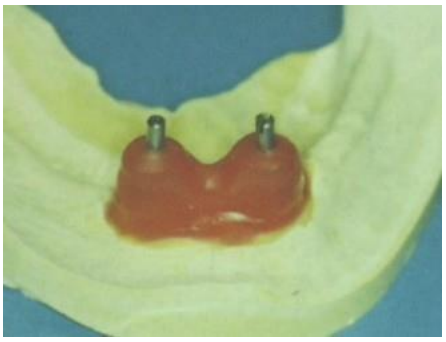


Fig. 57 Wax spacer placed around the impression copings

Fig. 58

The indirect impression transfers are then replaced with direct impression transfer copings with long fixation screws on the working casts.The impression transfers are blocked out 3mm around and between with base plate wax except for the top 7mm of the fixation screws. A 1mm wax relief is placed over the soft tissue regions of the residual alveolar ridge,to be captured in the impression with first molar tissue stops.The tissue stops will prevent the tray from touching the edentulous ridge which ensures room for impression material between the tray and soft tissue.

A custom acrylic tray is fabricated on the working cast.

The fixation screws protrude 3mm or more through the top of the tray.The tray is then removed,trimmed 1 to 2 mm short of the pheriphery .The holes for the fixation screws are increased to allow easy insertion and removal from the cast.The openings around the long fixation screws allow the custom impression tray to be consistently seated in the same intra oral position.

MODIFIED TECHNIQUE FOR CUSTOM TRAY FABRICATION:

Omiid Savabi and Farhanz described a method for the fabrication of custom tray for dental implants.

PROCEDURE:

1. In this technique the cover screws are removed from the implants and then the guide screws of the impression copings are inserted with the appropriate screwdriver.

2. An impression is made with irreversible hydrocolloid.

3. Place straight handpiece round burs in the depressions of guidescrews in the impression and pour the impression withtype III dental stone thus, the noncutting end of the round burs on thediagnostic cast demonstrates the axis of guide screws intraorally

4. Then Place appropriate impression copings upside down over the round burs on the diagnostic cast

5. Cover the diagnostic cast with a proper thickness of baseplate wax and cover the wax with tin foil to prevent wax impregnation on the acrylic resin custom tray.

6. Make the custom impression tray with lightpolymerizing Resin

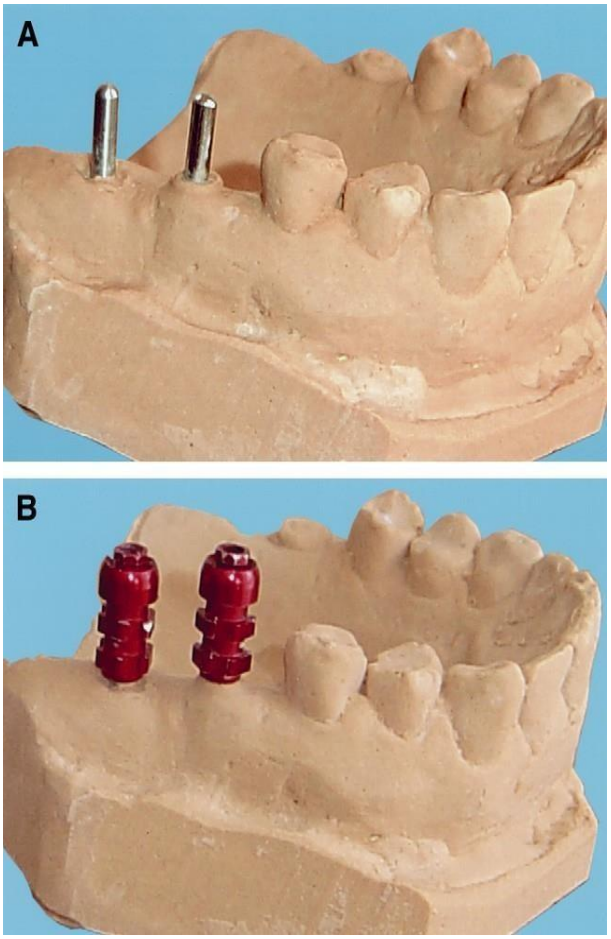


Fig. 69. A, Noncutting end of round burs demonstrates axis of guide screws.

B, Impression copings placed upside down over round burs.

Fig. 60. Custom impression tray.

GINGIVAL RETRACTION:

Gingival displacement during impression making has not been a problem with a screw-retained implant crown because most dental implant systems use either machined components or a plastic pattern that can be accurately adapted directly to a dental implant.

Machined components allow placement of an accurately fitting transmucosal abutment to the implant with a center screw. Under certain situations, a machined gold coping may also be used for a screw- retained crown. The cement-retained restoration is more popular because of better contour and esthetics, so an accurate impression, produced efficiently, is critical.

PROCEDURE

Three parts are used for this impression method (Fig. 1): a nylon gingival retractor impression cap, ashoulder analog, and a reinforcement pin for the die

1. Screw on the solid abutment with the ITI ratchet to the desired torque. (The abutment can be modified if necessary to correct the path of insertion or its length.)

2. Snap the white nylon gingival retractor impression cap over the abutments and on the exposed portion of the dental implant. Rotate the cap to verify that it is seated in position. The cap should snap to place and not impinge on adjacent teeth (Fig. 2).

3. Make a conventional impression using a stiff impression material such as polyvinyl siloxane or polyether. Select a stock tray because it allows space for the impression cap. Inject the lightbodied material into the impression cap and place heavy-body material, in the tray, over the impression caps.

4. Remove impression from the patient and inspect for accuracy. Secure the impression cap so that it has not been dislodged or so that its position has not been distorted.

5. Snap the shoulder analog on the white nylon gingival retractor impression cap in the final impression (Fig. 3). Ensure that no change of portion or distortion has occurred when snapping shoulder analog in the cap.

6. Pour the impression in type IV die stone. Place the reinforcement pin in the assembly as the impression cap/shoulder analog is filled with stone (Fig 4).

7. Section the cast to make a removable die after the stone has set. Trim the die so the shoulder analog is accessible

8. Construct conventional restorations with physiologic emergence profiles (Fig.6).

9. Cement the restorations with use of conventional techniques after fitting (Fig.7).

Fig. 61. White gingival retractor impression cap (upper left), shoulder analog (center), and reinforcement pin.

Fig. 62. White gingival retractor impression caps attached

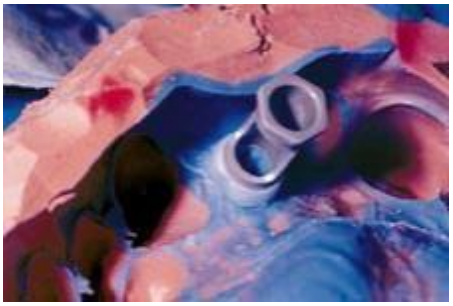


Fig. 63. Shoulder analog in placed in impression

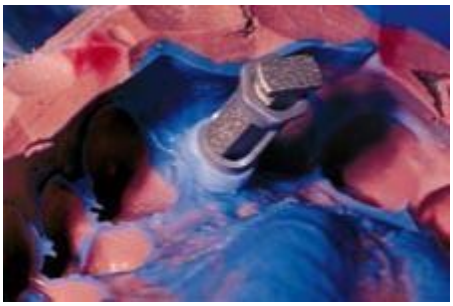


Fig. 64. Reinforcement post in place in shoulder analog.

Fig. 65. Dies sectioned and trimmed.

FABRICATION OF THE MASTER CAST:

MATERIALS USED FOR MAKING MASTER CAST:

The master cast for a screw retained restoration uses metal analog components which represent the abutment for screw retention. As a result surface hardness of the die stone is not very critical. instead the expansion percentage is very important as it may alter the inter abutment distance. Because all the impression materials shrink ,the die stone should expand to compensate for the dimensional change. In as much as addition silicone or polyether shrinkage is approximately 0.1% to 0.06%,and hence the expansion of the die stone should also be in this similar range. Generally the expansion of the dental stone is more when compared to that of the die stone.

Epoxy resins demonstrate properties comparable to those of the gypsum with added benefit of increased compressive strength, abrasion resistance and detail reproduction. However epoxy resin shrinks rather than expand at an average of 0.2%.Because impression materials also shrinks, epoxy resin should not be used for screw retained master casts. Hence it is suggested that if a polyether or addition silicone impression is made for a screw retained prosthesis, then the master cast should be poured with ADA classification IV die stone,which expands at a similar amount as the impression material shrinks.

PROCEDURE:

Fig. 66 Master impression

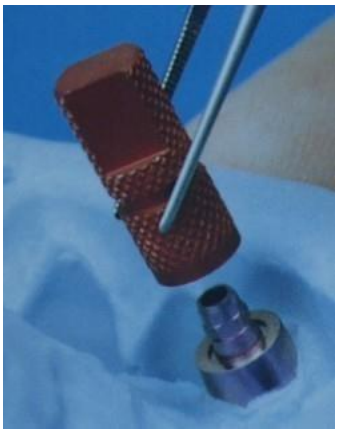


Fig. 67 Transfer of laboratory analogue

This phase corresponds to the fabrication of the master cast. Once the final impression is made the direct impression copings are trapped with in the impressions.No impression material shold be presnt between the impresson coping and abutment.The corresponding abutment for screw retention analog is carefully threade onto the direct impression transfer coping in the impression.The impression is trimmed and boxed with plaster and pumice and poured with dental stone .Once the stone has set completely ,the long screws are removed from the direct impession transfers and the impression is taken off the master cast.The rigid impression transfer copings may be reovered from the impression,sterilized and reused.

SUMMARY

The wide clinical applicability and ever increasing pace of the implantology research field has resulted in the evolution of various implant impression techniques. The options available for the dentist have improved in terms of the availaibility of various impression materials .Because of this, the selection of an appropriate impression technique that suits the patient's condition and the dentist's operation skill has become more challenging. Hence it is essential to have a knowledge on the various techniques in order to fabricate a successful implant supported prosthesis.

Though various techniques are available for making impression for implant supported prosthesis research has proven that the open tray impression technique has given the highest success rate.since a good impression forms the foundation for the fabrication of a successful prosthesis it is wise to choose the impression technique according to the clinical situation present.

Hence a good impression techniques will indeed results in better treatment and better patient care.