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Implant impressions: Improving accuracy and decreasing practitioner stress

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Implant impressions: Improving accuracy and decreasing practitioner stress

ABSTRACT

Implants are becoming an increasing clinical treatment modality. As part of the restorative phase of treatment, communication of the implant's orientation in the arch is required for prosthetic fabrication. Different impression techniques are available to communicate that information, all having pros and cons. This course will discuss those different techniques and the use of verification stents to improve the accuracy of implant impressions.

EDUCATIONAL OBJECTIVES

At the conclusion of this educational activity, participants will be able to:

1. Describe the types of implant impression techniques available
2. Identify limitations for the different implant impression techniques
3. Explain why verification stents are recommended and how to fabricate them

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INTRODUCTION

The majority of impressions taken in clinical practice utilize vinyl polysiloxane (VPS), whether for teeth, implants, or a combination of these within the arch. Traditional impressions of implants taken intraorally involve use of an impression material, but there are different types of impressions that can be taken to initiate their restoration.

CHALLENGES WITH IMPLANT IMPRESSIONS

Several challenges present with impressions of implants compared to capture of natural teeth. These relate to the absence of a periodontal ligament (PDL) with implants when restoring adjacent implants that will be splinted via crowns or a bridge. A slight discrepancy between natural teeth being restored can be accommodated by the individual tooth's PDL, allowing seating of the fixed prosthesis, and over the short term, the abutments can microshift orthodontically to result in a passive fit of the bridge. Unfortunately, with the lack of PDL around implants, they are essentially ankylosed to the bone, and a lack of passive fit of the prosthesis on the implants may result in crestal bone loss on the aspect of the bone under compression. Additionally, seating of the prosthesis on either the implants (screw-retained) or abutments (cement-retained) may prevent full seating, leading to a need to remake the prosthesis. Minor mis-seating may allow insertion of the prosthesis, but the stress placed on the fixation screw may prevent proper tightening of the screw, leading to screw loosening or possible screw fracture under loading. Therefore, accurate impressions of the implant are necessary to prevent those issues and ensure accuracy of the final prosthesis.

TYPES OF IMPLANT IMPRESSIONS

There are three impression techniques for intraoral implant impressions utilizing a tray. These are based on the type of impression abutment and how it is captured. They consist of abutment-level, open-tray, and closed-tray. There are pros and cons for all of these techniques, which will be discussed in detail.[1,2]

1. Abutment-level impressions

An abutment-level impression consists of placement of a final stock restorative abutment that, once placed, is not removed from the implant. This would then be captured intraorally and essentially treated like a prepared tooth. Abutment-level restorative components are designed with an antirotational feature (a flat plane) on the abutment. Once placed, the other components orient to that aspect of the abutment, capturing the rotational orientation of the abutment in relation to adjacent teeth or other implants being restored. The components are provided in a kit that consists of the restorative abutment, impression coping, an analog, plastic provisional coping, and plastic waxing components.

The practitioner determines the emergence diameter, the gingival cuff height required based on distance from the implant platform to the gingival margin of the sulcus, and the height of the abutment from the margin to the coronal height. The kit contains the components that fit for that particular abutment. Dependent on the implant brand and its platform, the abutment may consist of an abutment and fixation screw. Once the abutment is placed, mating with the implant's internal or external antirotational aspect, the screw is introduced and tightened to fixate the implant and abutment together. Alternatively, implants with a conical tapered connector are offered with an abutment that has the fixation screw as an integral part of the abutment. When placed, the abutment with screw portion is rotated clockwise until the conical connector of the implant and abutment engage frictionally at the recommended torque. Regardless, once the abutment is placed, it is left in the implant and not removed. The benefit of this type of system is the abutment can be placed at uncovering by the surgeon, so the restoring dentist does not need to manage healing abutment removal and restorative abutment placement. This may be beneficial to dentists who prefer not to manage this aspect of implant placement. Surgeons may consider this an added benefit to their referring dentists.

This type of impression technique is initiated by removal of the cover screw or healing abutment and placement of the stock abutment-level restorative abutment (figure 1). A flat area on the side of the abutment prevents rotation of the crown once it is luted onto the abutment intraorally. The impression coping snaps onto the restorative abutment intraorally, aligning the flat area on the abutment with a corresponding flat area inside the impression coping. It is key that these flat areas be oriented when the impression coping is snapped on the abutment. When they are not aligned, the impression coping will not snap onto the abutment. When properly aligned, the impression coping will have an audible snap when inserted. The impression coping extends higher than the coronal

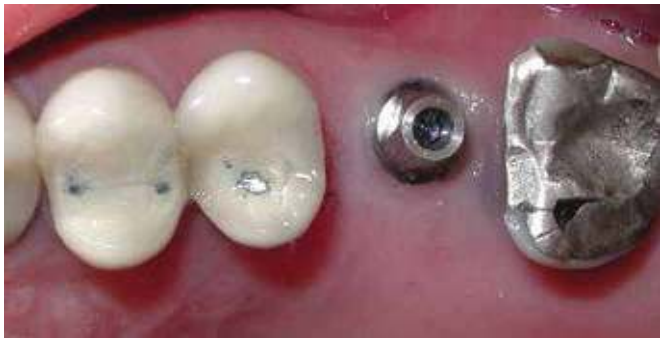

FIGURE 1: An abutment placed on the implant that will be used with an abutment-level impression.

FIGURE 2: An abutment-level impression coping has been snapped onto the abutment upon the implant.

top of the abutment and has retention grooves and a wider top that will be captured and retained in the impression material. These are also designed to prevent rotational movement in the set impression material so that accurate capture of the rotational orientation of the restorative abutment is achieved (figure 2).

Since the impression coping will extend higher than the adjacent teeth, dual-arch trays cannot be utilized for these impressions. A custom or stock full-arch tray is recommended for abutment-level impressions. Because the impression coping will be retained in the impression when removed intraorally, a stiffer, less-elastic viscosity VPS or polyether material is recommended. A heavy-body material provides the needed stiffness to retain the impression coping but will allow removal intraorally from the adjacent teeth upon setting. Selection of a stiffer impression material (putty, tray, bite) may hamper intraoral removal due to locking in undercuts on the adjacent dentition. Monophase (medium-body) VPS is not recommended for this type of impression as it is not stiff enough to retain the impression coping in its captured position and can add to inaccuracies in the final restoration. There is potential with monophase that when the impression is removed intraorally, the impression coping is still retained on the abutment. This would require removal of the impression coping intraorally and inserting it into the corresponding area of the impression. This creates the potential of not seating fully in the impression or being slightly off rotationally from its intraoral position. With proper selection of the impression material viscosity, upon removal, the impression coping is securely contained in the impression. Light-body or monophase can be placed sparingly at the gingival to better capture that aspect if desired, but the impression coping should not be covered as it will hamper retention in the set material. Light-body or monophase VPS can be used for patients with excessive or deep undercuts that may cause locking in order to provide more spring of the set material upon impression removal.

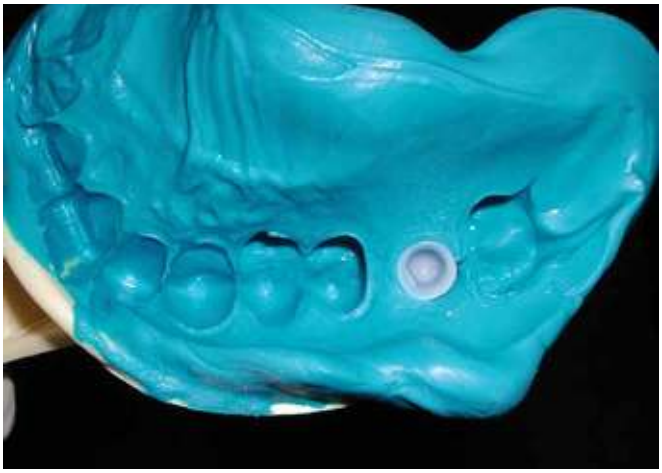

FIGURE 3: The abutment-level impression removed intraorally demonstrating the abutment coping embedded in the impression with orientation flat present in the coping.

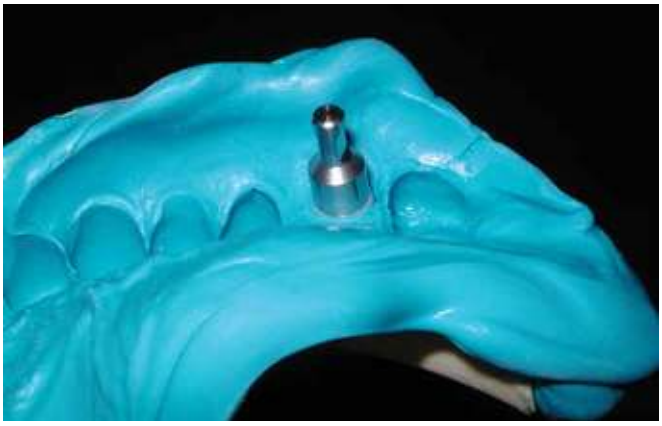

FIGURE 4: The analog replicating the implant and abutment are placed into the embedded abutment coping in the impression, engaging the flat areas between the two parts.

Upon removal of the abutment-level impression, the impression coping will be securely fixated in the set impression material with a flat area noted in the coping corresponding with the flat area on the restorative abutment (figure 3). The corresponding analog is then snapped into the impression coping in the impression, aligning the flat area of the impression coping with that on the analog (figure 4). Should the practitioner not feel comfortable inserting the analog, the part can be sent to the lab with an impression to assemble prior to creation of the soft-tissue master model. Should the practitioner feel comfortable inserting the analog, it can be sent to the lab for fabrication of the soft-tissue model and does not obligate the dentist to make the master model unless he/she is fabricating the restorations in-office.

Should the restoring dentist be placing the restorative abutment from the kit, he/she can place the provisional coping on the abutment following impression capture and add resin to this to create a provisional crown. Provisional cement can be placed marginally in this fabricated provisional crown and luted to the abutment until the final restoration returns from the lab. A minimal amount of provisional cement is placed at the marginal area of the provisional restoration as excess luting material can prevent full seating of the provisional related to hydraulic pressure preventing complete insertion. The provisional coping can also be placed either by the referring surgeon or the restoring dentist as a healing coping over the abutment when in the posterior and esthetics do not require that a provisional crown be placed. This will make the area more comfortable to the patient's tongue between appointments. The remaining components of the kit (plastic waxing copings) are sent to the lab with the analog. Since crown fabrication at the lab has moved away from wax and cast processes and CAD/CAM milling is done predominantly today, the lab most likely will not use these copings during the fabrication process.

Abutment-level impressions can be utilized for single implants or adjacent nonsplinted fixtures.[3] They may also be used for splinted implant cases, but the implants need to be parallel or the resulting prosthesis will not fully seat once fabricated. These are ideally suited for restorative abutments that do not require modification in height or circumferentially. Should the abutment require modification intraorally, it is best to treat the abutment like a prepared tooth and take a conventional impression. Use of the abutment-level impression coping will not communicate the modifications to the lab, and seating issues may result with the final restoration.

2. Closed-tray impressions

Closed-tray impressions are commonly used and popular among most restoring dentists. These consist of an impression abutment that is placed into the implant at the platform level and picked up in an impression. Upon impression setting, the impression coping remains intraoral when the impression is removed. The restoring dentist will then need to remove the impression coping intraorally and replace it with a healing abutment. These impression abutments have orientation geometry on their exterior (figure 5) to allow insertion back into the impression in the same orientation as was found in the mouth (figure 6). These will also have a short retention screw that allows complete encasement of the impression abutment and associated screw in the impression without piercing the impression tray upon insertion intraorally. Upon removal of the impression, the impression abutment is removed intraorally from the implant and an analog is attached to the impression abutment, which is then inserted into the impression for fabrication of the soft-tissue master model (figure 7).

Several potential problems are associated with this technique concerning vertical placement of the impression abutment in the impression and its rotational orientation.[4] Depending on the brand of implant, different manufacturers have created geometry on the impression abutments that have varying degrees of positive engagement back into the set impression. As the impression will need to be removed intraorally and the impression abutment reinserted back into it, the impression viscosity needs to allow some flexibility to allow removal without tearing the impression material. Additionally, it needs to have sufficient flexibility to allow the impression coping to be reinserted and have intimate contact when fully seated back in the impression without movement that may lead to restorative inaccuracies. With too stiff of an impression material (heavy-body, tray, or putty), intraoral removal and replacement of the component back into the impression may be difficult. Impression materials that are too flexible (light-body) will allow easy intraoral removal and component reinsertion, but the impression abutment and analog may have the orientation altered, thus affecting the accuracy. Therefore, selection of an impression material viscosity that does not tear upon removal, allows reinsertion of the components within it, and is stiff enough to capture the correct orientation of the resulting master model compared to its intraoral position is desired. Monophase VPS is recommended for closed-tray impressions as they meet the desired criteria for open-tray impressions. Light-body VPS can be injected around the gingiva if desired but should be used in minimal volumes, and the majority of the open-tray impression abutment

FIGURE 5: Closed-tray impression abutment seating on the implant intraorally.

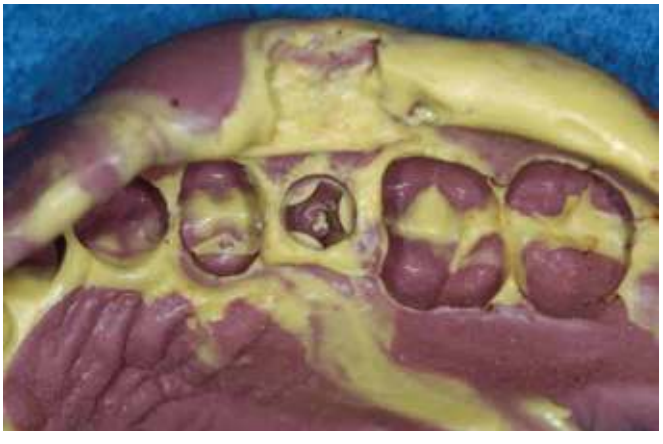

FIGURE 6: The impression following removal intraorally demonstrating the site to accommodate the closed-tray impression abutment.

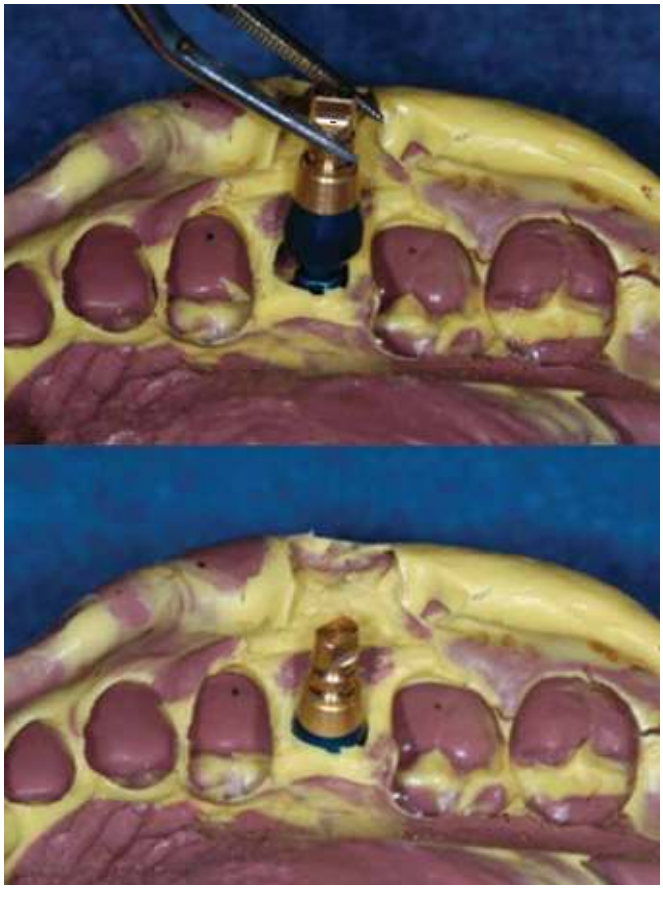

FIGURE 7: The closed-tray impression abutment is placed on an analog and inserted into the impression with orientation matching the flat areas between the abutment and receiving area.

needs to be in contact with the monophase impression material. When capturing adjacent implants that will be splinted prosthetically, a slight variation in orientation to each other may prevent passive seating of a screw-retained prosthesis or incomplete seating of a cemented prosthesis on abutments fabricated on the master model.

A potential hampering factor to reinsertion into the impression abutment with analog relates to impression material that captured the hex at the top of the impression pin (bottom of the closed-tray impression area on figure 7). This will prevent full reinsertion of the closed-tray impression abutment into the impression. Placement of wax or other material into the pin's hex prior to taking the impression will prevent this tag from being formed. The other option is removal of the tag from the impression prior to reinsertion of the impression coping into the impression. As with the abutment-level impressions, the practitioner can choose to send the components to the lab, which will be fabricating the soft-tissue master model, and have the lab reinsert the components into the impression.

3. Open-tray impressions

Open-tray impressions provide the most accurate capture of implants intraorally, especially when implants will be splinted prosthetically.[5] Specifically, this relates to the impression abutments being retained in the impression when it is removed intraorally. These impression abutments are longer in the vertical axis than closed-tray impressions, with a much longer fixation pin that will project through the impression tray (figure 8). They are designed not to be removed from the impression, so they will have deeper retention grooves. In order to limit their inventory, some manufacturers have designed identical closed-tray and open-tray impression abutments, with the only difference being the length of the pin. Unfortunately, this is a poor design. With one technique, you want the impression to remove from the impression abutment intraorally (closed-tray), and with the other technique, you want the abutment to be securely fixated in the impression (open-tray). Having an impression abutment that can do both means it will not fixate as well when doing the closed-tray technique.

As the goal is to capture the open-tray impression abutment in the impression material, locking it in an accurate orientation, a stiff material is desired in the tray. Higher viscosity VPS, such as heavy-body, tray, or putty materials, are ideally suited for this application. Because stiffer VPS materials may create folds in the material, as they do not adapt as well when inserted, they are typically used with either a light-body or monophase material placed at the gingival aspect to make sure the gingival contour and adjacent tooth morphology are properly captured. This intraorally expressed impression material should be confined to the gingival aspects so that the stiffer material in the tray is in direct contact with the majority of the open-tray impression abutment.

Tray selection is either a custom tray fabricated on the preliminary model by the office or dental lab or use of a modified stock tray. With the accuracy and dimensional stability of today's impression materials, a custom tray has become unnecessary. Whether a custom tray or stock tray is used, holes need to be created on the occlusal aspect of the tray to allow the long pins to protrude once the filled tray is inserted (figure 9). Rotational orientation of the tray can be problematic to get the pins to protrude from the previously placed holes in the tray. Try-in of the unfilled tray usually allows easy alignment of the pins with the holes. However, once filled with impression material, alignment becomes more difficult, and juggling the tray left to right becomes challenging to get the pins to emerge through the tray. A unique stock open-tray impression tray was developed to address the problems with pin emergence that were encountered with custom and stock trays. The MiraTray Implant Advances (Hager Worldwide, Hickory, NC) is a stock tray with clear cellophane on the occlusal aspect of the tray (figure 10). When filled with impression material, the tray is inserted until the pin pierces through clear film, so that the pin does not have to emerge through a preset hole (figure 11). As with other open-tray impressions, a stiffer VPS, such as a heavy-body or tray material, is used as the bulk of the impression material in the MiraTray. When the impression material has set, the long pin(s) are removed intraorally and the impression is removed, containing the open-tray impression abutments. An analog is inserted into the open-tray impression abutments, and the previously removed long pin is used to fixate the two components together. The impression is ready to send to the lab for that aspect of the treatment.

FIGURE 8: Open-tray impression abutment placed on the implant intraorally.

VERIFICATION STENTS

To eliminate orientation errors between implants when restoring the arch, the accuracy of the impression is critical. This is not a factor when individual implants are being restored, but it is a factor when the implants will be splinted prosthetically.[6] Even a slight difference in orientation of the implants being joined prosthetically will prevent passive seating of the prosthesis. Lack of passive fit creates crestal strain around the implants that may lead to bone loss over time. Additionally, lack of prosthetic passive fit may prevent complete seating of the prosthesis, leading to marginal discrepancies that may allow accumulation of oral biofilm (plaque), leading to gingival inflammation and its associated consequences. Passive-fit issues are more problematic with a screw-retained prosthesis as the misfit is at the implant's platform close to or at the crestal bone. The lack of passive fit may not allow the fixation screws to fully seat in the prosthesis and may lead to screw loosening or possible screw fracture under loading over time. This is less problematic with a cemented prosthesis as the abutments are placed individually, and then the fixed prosthesis is seated over this to be cemented to the abutments. This can cause marginal discrepancies and associated gingival inflammation issues.

Typically, when a multi-implant prosthesis is planned, the lab will fabricate a verification stent on the master model to confirm that the orientation of the implant analogs in the model are an accurate representation of what is present intraorally. This verification stent is returned to the practitioner who tries it in and verifies that it seats passively—both radiographically and through patient feedback. (Does the patient feel any pressure when the stent is screwed into place?) If the verification stent does not seat passively, it is sectioned, the individual sections inserted, and then reattached with additional resin intraorally in the passive position. This is then sent to the lab, which will modify the master model and reposition the analogs as necessary to have an accurate representation of the intraoral positions of the implants. The verification stent is created with open-tray impression abutments that are connected using a resin.

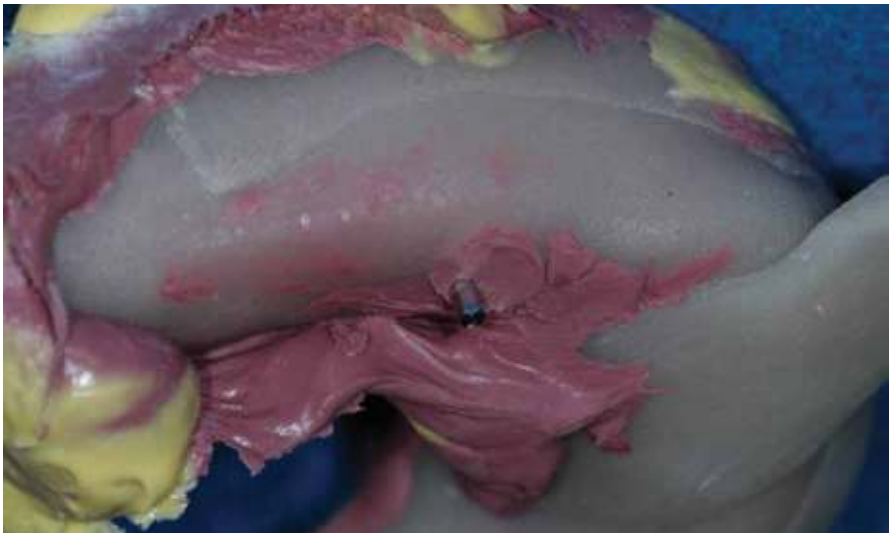

FIGURE 9: Custom tray being used to take an open-tray impression for a single implant.

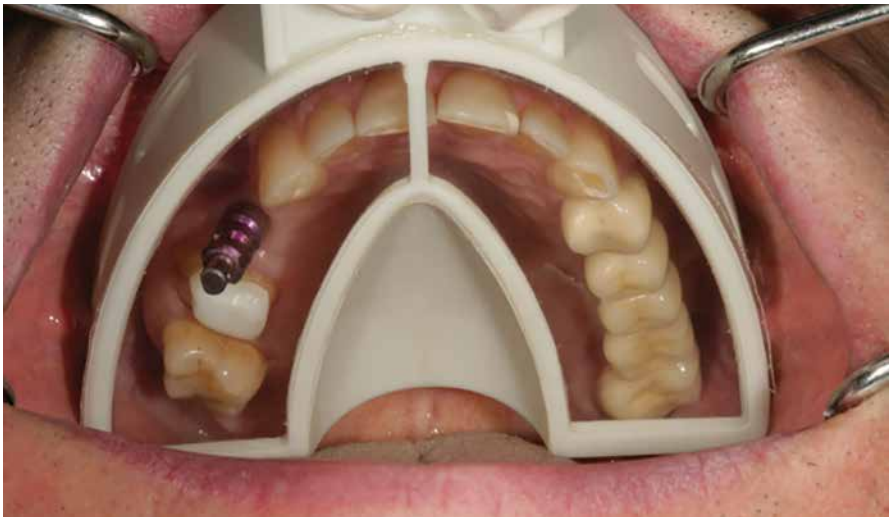

FIGURE 10: Try-in the MiraTray Implant Advanced demonstrating positioning of the open-tray abutment in relation to the tray.

FIGURE 11: MiraTray Implant Advanced inserted to take the open-tray impression with the open-tray pin piercing the clear cellophane top of the tray.

FIGURE 12: Verification stent fabricated intraorally, then sectioned and luted again to eliminate polymerization shrinkage in the stent.

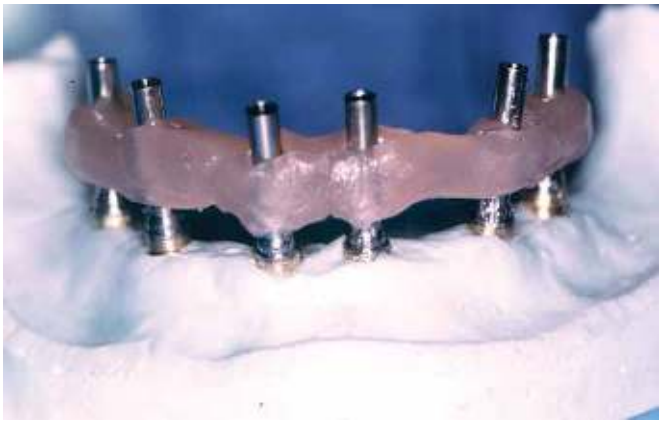

FIGURE 13: Resin verification stent fabricated on a model with implant analogs present from a preliminary impression.

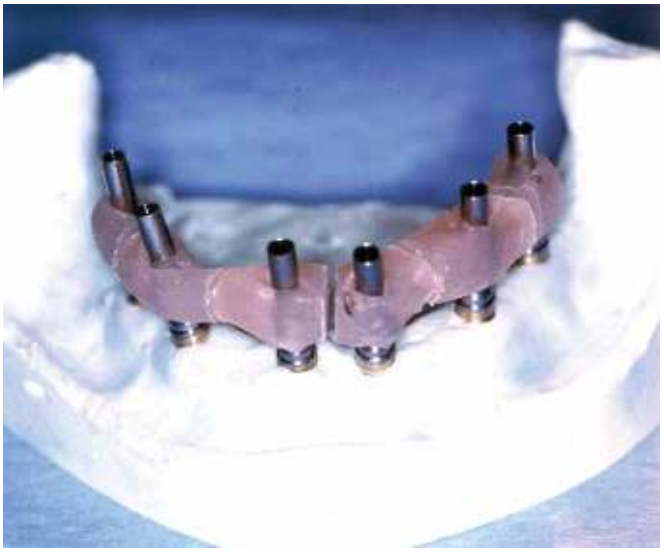

FIGURE 14: The resin verification stent is sectioned between the units.

Whether an abutment-level or closed-tray impression technique is used, the verification stent needs to be created separately from the impression capture of the implants. Yet, when an open-tray impression technique is used, the verification stent can be created and captured in the impression, thus eliminating a step at the lab and shortening treatment time. This can be done by a direct or indirect method.[7]

The direct method consists of creating the verification stent intraorally on the open-tray impression abutments. Dental floss is loosely looped around the open-tray impression abutments, which will support the resin being placed to create the stent. A light-curable resin such as Triad Gel (Dentsply Sirona, York, PA) or self-cure resin such as GC Pattern Resin (GC America, Alsip, IL) is placed incrementally on the floss, allowing each segment to cure before attaching to adjacent segments. Since all resins have polymerization shrinkage, and shrinkage is percent of volume, larger volumes will have greater shrinkage related to polymerization than smaller multiple volumes. Thus, allowing small volumes to set before connecting to an adjacent volume will result in less total polymerization shrinkage. Another option is to cure the entire stent together, and then section between the implants and lute the segments again with additional resin (figure 12). The verification stent is then picked up in an open-tray impression and sent to the lab. The practitioner needs to inform the lab that there is a verification stent within the impression, since it can't be seen, so the lab will know that the impression is accurate and can proceed to fabricate the prosthesis.

The indirect method involves taking a preliminary implant impression. To simplify the process, this can be done with closed-tray impression abutments. Implant analogs are attached to the impression abutments and a stone model is made. Open-tray impression abutments are placed on the model, and resin is used to link them into a verification stent (figure 13). The stent is sectioned between the units (figure 14) and the segments inserted intraorally and connected with additional resin (figure 15). This would be similar to the technique used when the lab creates the verification stent and increases treatment time as it requires an additional appointment.

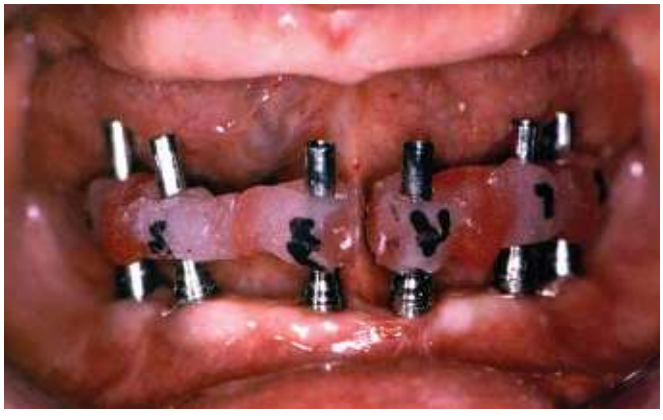

FIGURE 15: The sections of the verification stent are inserted intraorally, and the sections are connected with additional resin to eliminate potential for polymerization shrinkage of the resin used to make the initial verification stent.

IMPORTANCE OF RADIOGRAPHS

Component mating is critical with implant prosthetics. This includes how the screw-retained hybrid or single crown mates to the implants or mating of stock and custom abutments. As the connection is subgingival, it is difficult to visualize how well the prosthetic connects to the implant connector. Bone or soft tissue may hamper full seating, or the abutment may be rotated slightly so the abutment and implant connector are not ideally aligning. Tightening of the fixation screw may provide the perception that the parts are mated, but radiographically they are not properly mating (figure 16). It is also important to radiographically verify that impression abutments are fully mated so that inaccuracies are not amplified as the prosthetics are fabricated (figure 17).

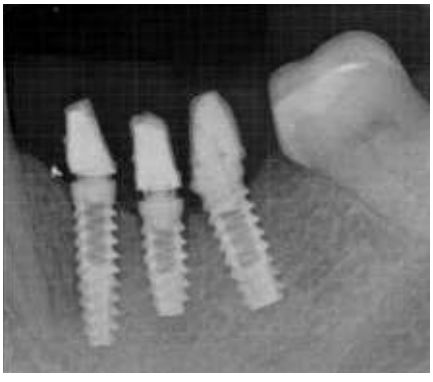

FIGURE 16: Radiograph demonstrating incomplete mating of the abutment heads on the middle and mesial implants with proper mating on the distal implant.

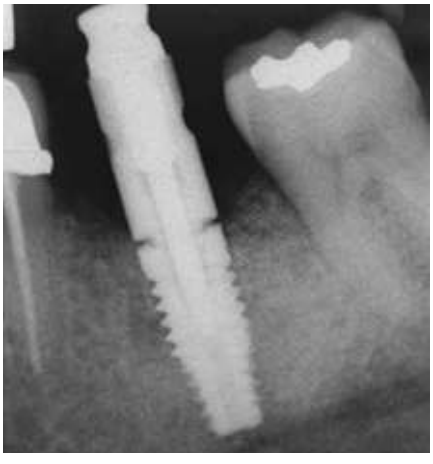

FIGURE 17: Radiograph to verify complete mating (seating) of the closed-tray impression abutment on the implant indicating incomplete seating of the parts.

THE FUTURE

Intraoral scanning is growing as an alternative to impression materials for teeth or edentulous arches. This is also changing how implants are captured for the restorative phase of treatment. Scan bodies are used instead of impression abutments. These are implant brand and diameter specific and have a head geometry that is coordinated in the computer software. The intraoral scanner captures the portion of the scan body that is supragingival and the software knows what the entire scan body looks like. Specific geometry on the top of the scan body orients the implant platform rotationally so that the implant connector is accurately positioned in the scan. The software extrapolates the portions of the scan body that are subgingival and creates a virtual model of the implants and arch. The scan data is then transmitted to the lab for creation of the virtual models, design of the prosthetics, and CAD/CAM milling to complete the prosthesis. As the cost of intraoral scanners decreases, their use will increase in the dental office and will become more common for capture of implants for the restoration phase.

CONCLUSION

Accuracy of implant restorations begins with accurate impressions that capture the implant's orientation to adjacent implants and natural teeth, plus the implant's connector orientation. When accuracy is achieved, the prosthesis fits passively, and stress is removed from the fixation screw. The result is an improved long-term prognosis of the restorations and bone surrounding the implants.

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QUESTIONS

1. The majority of impressions taken of implants and natural teeth involve:
A. Use of rigid impression materials
B. Use of flexible impression materials
C. Use of polyvinyl siloxane impression materials
D. Use of calcium sulphate-based impression material

2. The difference between impressions of teeth and implants that will be splinted centers around:
A. Periodontal ligament
B. Restoration margin placement
C. Type of impression material required
D. Type of tray required

3. Passive fit of the prosthesis with splinted units is:
A. Not a consideration
B. Comparable with natural teeth and implants
C. Easier with implants
D. Easier with natural teeth

4. Minor stress between splinted teeth upon insertion of the fixed prosthesis:
A. Will dissipate due to micro-orthodontic movement of the abutments
B. Will lead to crestal bone loss over time
C. Is not a clinical consideration
D. Will lead to increasing occlusal issues

5. Minor stress between splinted implants upon insertion of the fixed prosthesis:
A. Will dissipate due to micro-orthodontic movement of the abutments
B. Will lead to crestal bone loss over time
C. Is not a clinical consideration
D. Will lead to increasing occlusal issues

6. Mis-seating of a splinted implant prosthesis may result in:
A. Inability to fully mate the prosthetic components
B. Prevention of fixation screw seating
C. Fixation screw loosening
D. All of the above

7. An advantage of abutment-level impressions is:
A. Once placed, it is not removed from the implant
B. Lower restoration cost than stock abutments
C. It can be modified as needed
D. Universality, not implant brand dependent

8. Abutment-level restorative components are designed with a(n):
A. Retentive shape to lock into the impression material
B. Feature for use with screw-retained restorations
C. Antirotational restorative feature
D. Antirotational connector feature

9. Abutment-level restorative components are ordered based on:
A. Supragingival height available
B. Gingival height
C. Emergence width required
D. All of the above

10. Use of abutment-level restorations allows:
A. Fewer parts to deal with than stock abutments
B. The lab to determine what part to use
C. The restoring dentist to have the surgeon place at implant uncovery
D. Use only with splinted implants

11. Once an abutment-level part is placed in the implant with a conical connector:
A. An abutment-level part is not recommended for conical connector style implants.
B. The restoration needs to be immediately placed.
C. It can be removed and communicated with the lab.
D. It should not be removed since the antirotational aspect of the restorative portion will not seat in the same position when reinserted in the implant.

12. When taking an impression of an abutment-level restoration:
A. The plastic impression coping is reinserted into the impression after removal from the mouth.
B. The plastic impression coping acts as a healing cover during appointment visits.
C. The plastic impression coping snaps onto the abutment.
D. The plastic impression coping is passively placed on the abutment.

13. Which viscosity impression material is recommended for abutment-level impressions?
A. Low viscosity VPS
B. Medium viscosity VPS
C. Monophase VPS
D. Rigid VPS

14. When not properly aligned, the impression coping:
A. Will not engage the abutment-level component
B. Will still engage the abutment-level component
C. Will still communicate the information to the lab for them to correct before crown fabrication
D. Can be corrected with the analog in the impression

15. What type of tray is not recommended for abutment-level impressions?
A. Dual-arch trays
B. Stock tray
C. MiraTray Implant Advanced
D. Custom tray

16. Upon removal of an abutment-level impression from the mouth:
A. The coping is reinserted into the impression.
B. The abutment is removed intraorally and sent to the lab.
C. An analog is attached to the abutment and inserted into the embedded coping.
D. An analog matching the abutment is inserted in the embedded coping.

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QUESTIONS

17. Before the patient is dismissed after the abutment-level restorative abutment is placed:

A. Provisional coping or crown is placed on the abutment
B. Abutment is left uncovered in the posterior to allow gingival healing
C. The previously fabricated final crown is inserted
D. The impression must be taken at the same appointment

18. A provisional crown placed on the abutment-level restorative abutment is retained by:

A. Frictional fit
B. Moderate amount of provisional cement
C. Minimal amount of provisional cement
D. Permanent cement to ensure retention

19. The remaining components of the abutment-level kit are:

A. Sent to the lab
B. Discarded as not needed
C. Returned to the implant company for credit
D. Retained should they be needed for that patient

20. Modification of an abutment-level restorative abutment:

A. Allows customization based on the patient at chairside
B. Is recommended prior to impression taking
C. May be performed by the lab prior to crown fabrication
D. Does not allow use of the plastic impression coping since the modification cannot be communicated to the lab

21. When using closed-tray impression heads, what impression tray is not recommended?

A. Dual-arch trays
B. Stock tray
C. MiraTray Implant Advanced
D. Custom tray

22. What viscosity of impression material is recommended when taking a closed-tray impression?

A. Low viscosity VPS
B. Medium viscosity VPS
C. Heavy-body VPS
D. Rigid VPS

23. Upon setting of the impression material with a closed tray impression, what is the next step after removal of the tray from the mouth?

A. The impression head is used to create a provisional crown.
B. The impression head is removed from the implant.
C. The impression head is removed intraorally with the impression.
D. An analog corresponding to the shape of the impression head is inserted into the impression.

24. Which is not a potential problem with closed-tray impressions?

A. Vertical orientation discrepancy
B. Rotational orientation discrepancy
C. Horizontal orientation discrepancy
D. All of the above

25. What type of tray is not used with an open-tray impression?

A. Dual-arch
B. Modified stock
C. MiraTray Implant Advanced
D. Custom

26. What viscosity of impression material is recommended when taking an open-tray impression?

A. Low viscosity VPS
B. Medium viscosity VPS
C. Monophase VPS
D. Rigid VPS

27. The MiraTray Implant Advanced overcomes what problem with modified stock or custom trays when taking an open-tray impression?

A. There are no differences between the tray types.
B. Rotational issues when inserting the filled tray to allow pin emergence through the tray
C. Vertical insertion errors of the filled tray
D. Less impression material needed

28. Even a slight difference in orientation of the implants being joined prosthetically may:

A. Prevent passive seating of the prosthesis
B. Not allow the fixation screw to fully seat
C. Lead to fixation screw loosening over time
D. All of the above

29. Verification stents are used with what type of impression?

A. Abutment-level
B. Closed-tray
C. Open-tray
D. All of the above

30. A verification stent is used:

A. To communicate orientation of the implants to adjacent natural teeth
B. To communicate orientation of adjacent implants to eliminate impression discrepancies
C. With single units or those that will be splinted
D. To record occlusal records

PUBLICATION DATE:	JULY 2020
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Implant impressions:
Improving accuracy and decreasing practitioner stress

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EDUCATIONAL OBJECTIVES

1. Describe the types of implant impression techniques available
2. Identify limitations for the different implant impression techniques
3. Explain why verification stents are recommended and how to fabricate them

COURSE EVALUATION

1. Were the individual course objectives met?

Objective #1: Yes No Objective #2: Yes No

Objective #3: Yes No Objective #4: Yes No

Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 0.

2. To what extent were the course objectives accomplished overall?	5	4	3	2	1	0
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4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	19.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	20.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	21.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	22.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	23.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	24.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	25.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
11.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	26.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
12.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	27.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
13.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	28.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
14.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	29.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
15.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	30.	Ⓐ	Ⓑ	Ⓒ	Ⓓ

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