A Simple, Comfortable And Accurate Dual Arch Single Crown Impression Technique

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An accurate impression is essential for a precise fit of an indirect restoration. Many clinicians and patient’s feel that taking a crown and bridge impression is the most stressful procedure in restorative dentistry (Figs. 1 & 2). Taking great impressions can be simple for both the dentist and patient if the dentist chooses the correct impression tray, achieves adequate retraction with no bleeding and uses a rigid impression material and light body wash to capture clearly the sharp detail of the preparation. Above all, a consistent technique protocol is paramount to achieving exceptional results.

The majority of crown and bridge impressions sent to dental technicians are of single tooth preparations. Simultaneous dual arch impressions offer the practitioner many benefits and if used properly will produce single unit restorations requiring minimal or no adjustment.1,6 Dual arch impressions have several benefits 1) Only a single tray and impression is required for both opposing arches 2) The bite is registered simultaneously in the impression 3) Patient’s are much more comfortable not having full arch trays in their mouth. 4) Less cost of materials 5) Less cost in time as three procedures (two impressions and bite registration) are performed simultaneously (Fig. 3).

A dental impression material begins in a fluid state and is then placed in an impression tray which is placed over the oral structures we wish to reproduce. The fluid impression material is converted through physical change, chemical reaction, or polymerization into a negative replica of the architecture of the dentition. This impression can then be poured into a high strength stone to duplicate the prepared tooth and the oral structures.2 The dental technician is then able to use this accurate model to create the prescribed restoration to be permanently placed in the patient’s mouth.

When taking sectional arch impressions a thicker consistency material is preferable as their rigidity offers maximum support. Heavy body silicone is generally used as a base material and placed in the impression tray. After a low viscosity material is injected around the tooth the impression tray filled with heavy body is then placed over the teeth displacing the light body (low viscosity), into the crevices, surrounding the preparation. After the material is allowed to set the impression tray is removed from the patients mouth yielding extremely accurate reproduction.

Affinity Inflex 3rd generation hydroactive impression material (Clinician’s Choice) is a maximum support tray material designed specifically for the dual arch impression technique. It has an ideal flow to drive the Affinity Light Body XL material into the sulcus and has a short two and a half minute set time once placed in the patient’s mouth. This yields less time for patient discomfort, gagging and tray movement when swallowing, reducing the introduction of deformation to the impression. Affinity impression materials (Clinician’s Choice) have a chemistry which grafts a hydroactive surfactant to a branched resin allowing the material to become very rigid when set which allows it to provide maximum support as a tray material. The corresponding Light Body XL
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wash has a very high tear strength and is designed to flow on its own into any sulcus even those less than .2mm in width.

The choice of an appropriate impression tray is paramount. When a dentist places an impression material using many of the commercially available plastic impression trays in a patients mouth, the inherent flexing of the plastic automatically causes deformation in the final impression.3 Although the impression may look perfect, even the most minute bending of the tray on placement and removal will create inaccuracies in the final models. The subsequent restoration fabricated on the die will not exactly correspond to the actual tooth preparation causing adjustment to be necessary when placed in the patients mouth.

A metal dual arch impression tray should be chosen that fits passively and doesn’t rub against any tooth or anatomic structure so as not to create any interference when the patient bites down. If a tray cannot be found to fit passively conventional full arch impressions should be taken. We find that the Quad Tray Extreme (Clinicians Choice) is best shaped to accommodate most patient’s dental arches. It’s rigidity creates extremely accurate impressions when used with compatible rigid impression materials. Plastic impression trays should never be used as they flex creating inaccuracies.

The Quad Tray Extreme is made from rigid aluminum which does not flex and has a wide surface which can be squeezed and bent to accomodate most patient’s arch size. The tray has internal retention bars which lock the impression material to the tray preventing material dislodgement. Patient’s find this tray extremely comfortable as it has a thin distal bar decreasing impingement in the retromolar area and a shorter lingual wall preventing impingement on the lingual of the patient’s teeth. The low sidewalls of the Quad Tray prevent an axial roll of the tray to occur when the patient bites down which can create deformities in the impression material.

The secret to capturing a perfect dual arch impression is ensuring that the patient closes fully into maximum intercuspation to be able to capture an accurate occlusal pattern. Many dentists have difficulty getting their patient’s to close into a loaded dual arch tray and their frustration has caused them to abandon the dual arch technique in favour of full arch impressions. Patient’s just cannot be depended on to be able to close completely and correctly. When they don’t it is messy, frustrating and time consuming as we are required to wait for the material to set, clean up and start again.

We have developed a simple technique protocol to assure that the patient bites down fully in the correct position every time. At the beginning of the appointment, before the patient is anesthetized, we capture a bite registration with Quick Bite (Clinician’s Choice) on the opposite side of the patient’s mouth to the tooth we are going to prepare. We generously inject the Quick Bite (Fig. 5) and have the patient bite down. We can easily ascertain if the patient is biting fully into maximum intercuspation as we can clearly see if the natural teeth (not being registered) are fully touching (Fig. 6). When the patient is biting down I border mold with the patient’s cheek to create a buccal wall in the registration to help the patient easily reproduce this bite at a later time. Quick Bite (Clinician’s Choice) is a hard, rigid material with a durometer hardness of 90. This preliminary bite registration is removed from the patient’s mouth and is placed
aside as it will later serve as a bite key when taking the final Quad Tray impression. This rigid bite key will guide the patients closure to be sure that the patient is biting in the correct position and is in maximum intercuspalition (Fig. 7). It is a good protocol to have the patient practice closing into the Quad Tray at this time using the bite registration as a guide to ascertain that the tray fits passively with no anatomical interference (Fig. 8).

The patient is then anesthetized, the tooth prepared for the prescribed restoration and gingival retraction achieved if necessary. We are now ready to take the final impression and we now replace the Quick Bite key guide on the opposite side of the mouth to the preparation. At this time we should practice placing the Quad Tray once again.

After several practice runs of placing the tray with the bite registration in place on the opposite side the dentist must simply place impression material into the Quad Tray and place it in

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the manner that they previously practiced. The bite registration will serve as a guide to assure that the patient is in complete closure. The Affinity XL Light Body (Clinician’s Choice) is injected into the sulcus of the prepared tooth in a 360 degree motion keeping the tip of the impression gun submerged in material so as not to entrap air bubbles (Fig. 9). Simultaneously the Quad Tray is loaded with the Affinity Inflex tray material with enough material dispensed to create buccal and lingual support walls when set. The tray is seated and the patient is instructed to close fully into the Quick Bite registration key (Fig. 10) The patient remains fully closed in this position for the 2:30 minute intraoral setting time of the Affinity materials. A practice that I find very beneficial is to direct the filled Quad Tray towards the arch with the prepared tooth (as if taking a single arch impression) and then have the patient close into it with their opposing teeth. This technique captures every minute occlusal detail and provides the dentist with a consistent technique protocol.
Once set the Quad Tray is removed and inspected (Fig. 11). 1) The preparation margins should be easily readable with a homogeneous blend of tray and wash material. 2) The occlusal surfaces of the adjacent teeth should be accurately captured as indicated by the ability to see through the Quad Tray mesh. 3) The Affinity Inflex tray material should create walls so that the impression can be easily poured in the lab.

**CONCLUSION**
Capturing an accurate dental impression is one of the most stressful and challenging steps in restorative dentistry. Many different protocols, techniques and materials are used. There is no one way that is right or wrong. Whatever works in your hands is best for you.

Although new developments and the promotion of intraoral scanners and CAD/CAM technology to create master casts and definitive restorations are being promoted to the dental profession does not appear that these technologies will enter the majority of private practices in the near future.

By understanding fundamental dental principles, following a pro-
protocol, and carefully choosing impression trays, method of retraction and appropriate impression material dentists everywhere can easily achieve comfortable, efficient and consistently accurate single crown impressions.

Dr. Elliot Mechanic is Oral Health’s editorial board member for esthetics. He is a diplomate of the American Board of Aesthetic Dentistry, a fellow of the European Society of Cosmetic Dentistry and the International Academy of Dental Facial Aesthetics.

Oral Health welcomes this original article.

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