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A Simplified Technique for Gathering Lab Information in Full Arch Cases

By Ricardo Mitrani (/spear-review/author/ricardo-mitrani/) on March 16, 2023 | (/bookmarks/bookmark/39991)

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When fabricating an implant (https://www.speareducation.com/spear-review/category/implants)-supported reconstruction in a full arch case, there are a number of steps that are fundamental to attain success esthetically, biomechanically, and functionally. Once the implants have fully osseointegrated and the soft tissues have matured, the clinical team is responsible for gathering and transferring information to the lab technician so they can fabricate the definitive restorations (https://campus.speareducation.com/workshops/implant-restorative-dentistry/details/syllabus/) in the most accurate and efficient way. This article describes a simple technique that can help you effectively obtain multiple parameters in just one appointment.

These parameters are:

- Three-dimensional position of the implants / topography of soft tissues.
- Desired tooth position: Incisal plane and occlusal plane orientation.
- Intermaxillary records at the correct vertical dimension of occlusion.

Before I describe that simplified technique, let's look at how the process is traditionally done.

The Conventional Approach for Full Arch Cases

The conventional analog approach to obtaining and transferring information for full arch cases consists of, first, making an open tray impression from which a master cast with analogs will be poured, then fabricating a base plate and wax rims in order to establish the midline position and the orientation of the maxillary incisal plane/occlusal plane, as well as determine that the wax rim is providing the right lip support in a sagittal plane.

Once this is validated, then the mandibular wax rim (https://www.ffofr.org/education/lectures/complete-dentures/record-base-and-wax-rim-fabrication/) is adjusted and an intermaxillary record is made at the right vertical dimension, which is typically determined by the patient's facial esthetics.

Another step that is often used is a facebow registration, in order to transfer the orientation of the maxillary cast within the articulator. (Many clinicians choose to bypass this step and perform an arbitrary mounting without the facebow transfer, as the value of this kind of facebow transfer has been debated for some time.)

Once these procedures are carried out, the dental technician can mount the case in an articulator and start working on a tooth set-up in order to verify that the information provided was ac
then sends it back to the clinician who validates that the set-up looks right in the
intercuspation (occlusion) is also adequate.

The set-up is then sent back to the lab for the fabrication of the prototype restoration, as described here (/spear-review/2022/10/4-key-elements-of-esthetic-dentistry-and-importance-of-prototype).

A Simplified Technique for Full Arch Cases

All the steps described above are considered standard procedures in most restorative practices for full arch cases. But as clinicians we are always looking for ways to be more efficient by reducing chair time allotted for specific procedures, as well as reducing the number of appointments. The following technique allows the clinical team to perform multiple steps in a single appointment.

The caveat for this procedure is that the patients are conventional denture wearers (which most edentulous patients are). It is important to assess if the design and configuration of the dentures can assist the treating team to accurately conduct the subsequent procedures.

A checklist of the following parameters should be evaluated:

- Tooth position, incisal/occlusal plane orientation, tooth mold if appropriate
- Relative stability of the dentures
- Adequate vertical dimension of occlusion

If these parameters are met, then a duplication of conventional dentures can be conducted. The duplication technique has been described in a previous article (/spear-review/2018/04/steps-for-denture-duplication-a-visual-essay).

Once the dentures have been duplicated using clear acrylic resin, they are now ready to become the principal device, since it becomes a custom impression tray, while also facilitating jaw-relation records at the appropriate vertical dimension of occlusion (https://campus.speareducation.com/workshops/occlusion-in-clinical-practice/details/syllabus/).

With that duplication performed, the simplified technique I recommend for gathering information for the lab involves the following steps:

1. A preliminary wash with light body impression material is made in order to identify the position of the implants and—using a round bur—the tray is perforated accordingly.
2. The impression copings are secured in place, and it is verified that these are not binding in the tray circumferentially. Failing to do so could prevent the tray from being repositioned in the correct orientation. (If they bind, this automatically affects tooth position transfer.)
3. A thin coat of tray adhesive is applied to the intaglio surface of the dentures.
4. Light body impression material (polyvinylsiloxane) is loaded in the intaglio surface of the duplicated dentures and then gently seated intraorally and held in place until the material sets.
5. The same step is carried out for the opposing arch.
6. At this point you should validate that the intermaxillary stability and vertical dimension of occlusion (VDO) appear to be adequate. This step involves two important aspects:
    - Border molding, which provides additional stability of the duplicated dentures (customized impression tray)
    - Position of the implants (circumference of the healing abutment or transmucosal abutment)
7. The next step consists of capturing/picking up the copings to the tray using low-polymerization shrinkage material (GC pattern resin (https://www.gcamerica.com/lab/products/PATTERN_RESIN_LS/)), injecting the material using a monojet syringe while holding the tray in place.
8. Once this is accomplished on both arches, ensure that the shanks of the impression copings are not preventing the patient to close to the proper VDO. If this is the case, those shanks need to be

removed momentarily to allow the patient to fully close.

9. Using silicone registration material, an intermaxillary record is then obtained. This ensures that all the parameters are properly transferred to the technician to pour the master models, mount the case in the articulator, and obtain the desired tooth position (midline, incisal/occlusal plane orientation) so that they can continue with the fabrication of the prototype restoration, followed by the definitive ceramic reconstruction.

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Following are images illustrating the technique:

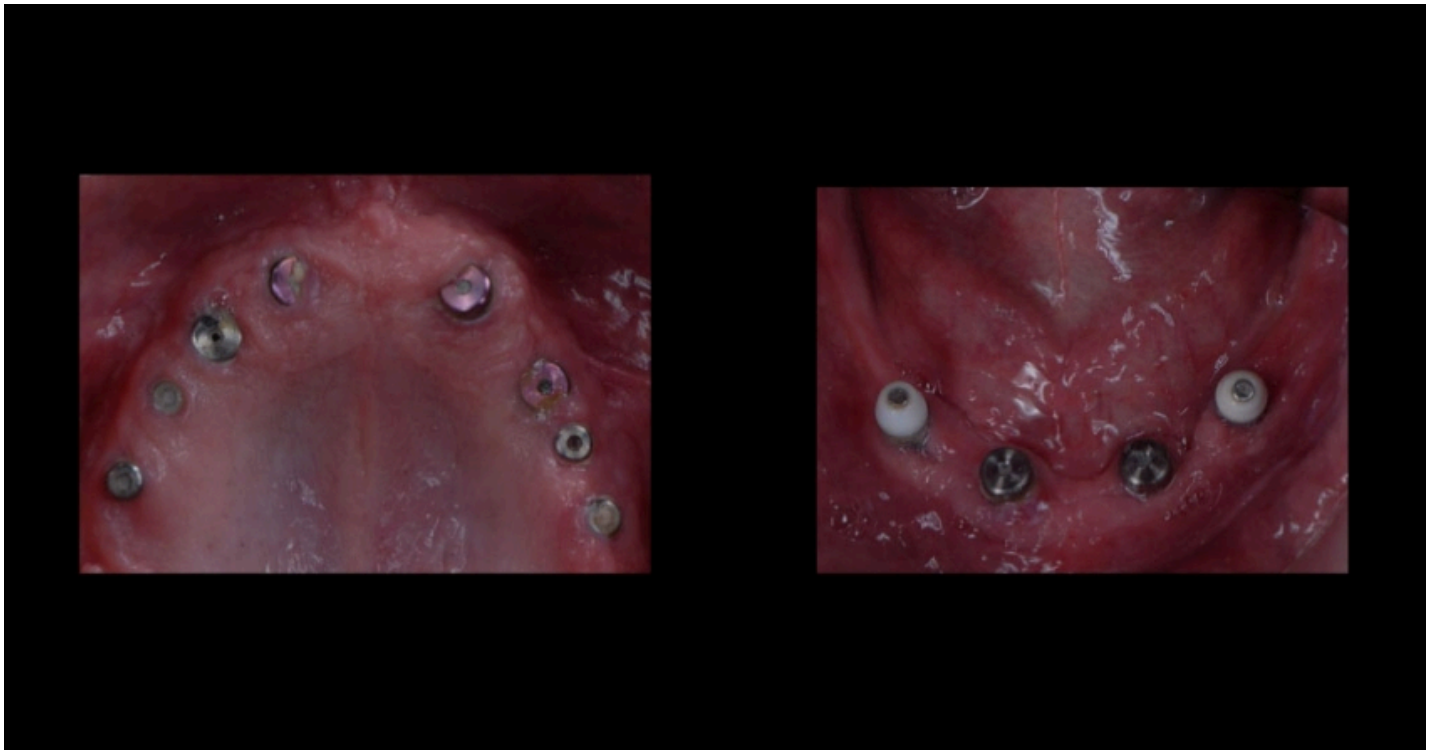

Figure 1: Occlusal view of healing abutments of osseointegrated implants.

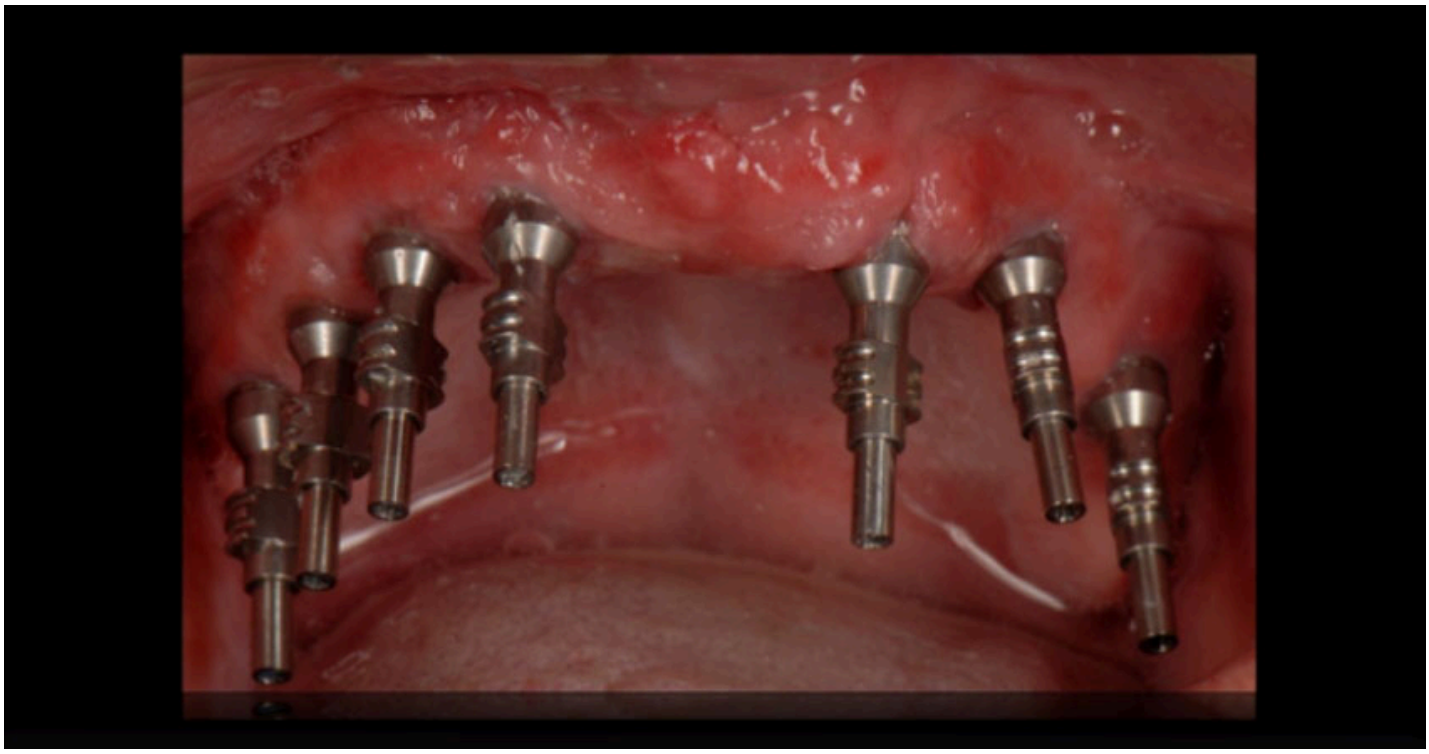

Figure 2: Open tray impression copings are secured to transmucosal abutments.

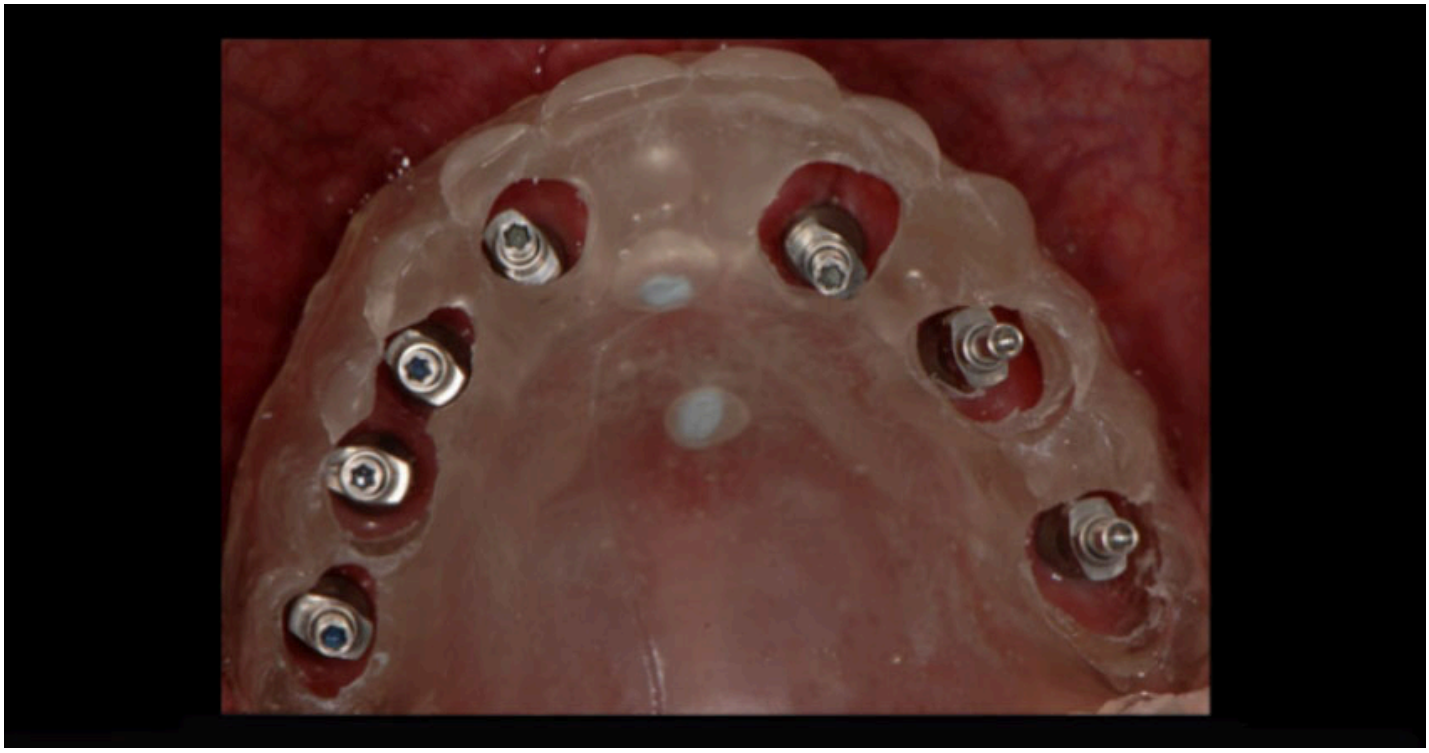

Figure 3: Open tray impression copings are secured to transmucosal abutments.

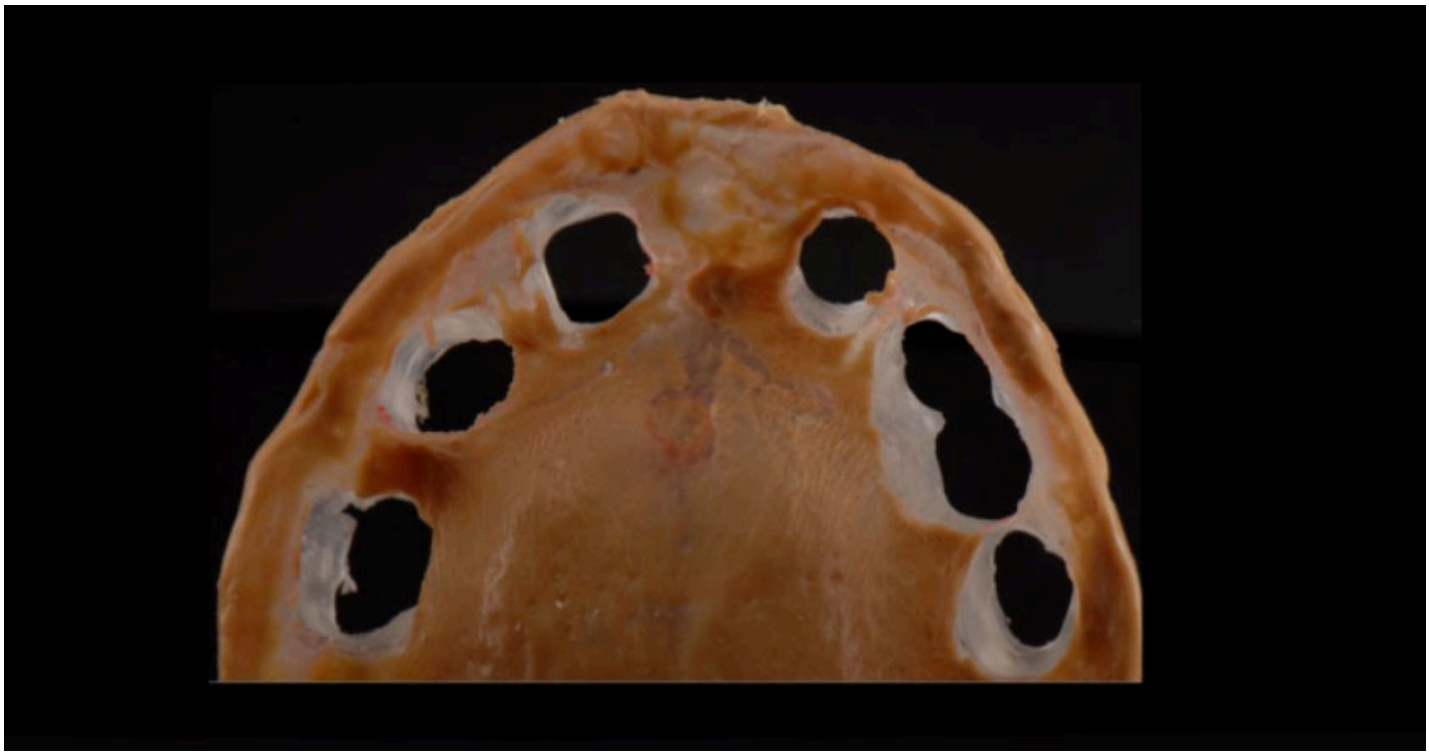

Figure 4: Light body impression material (polyvinylsiloxane) is used to border mold and capture the soft tissues.

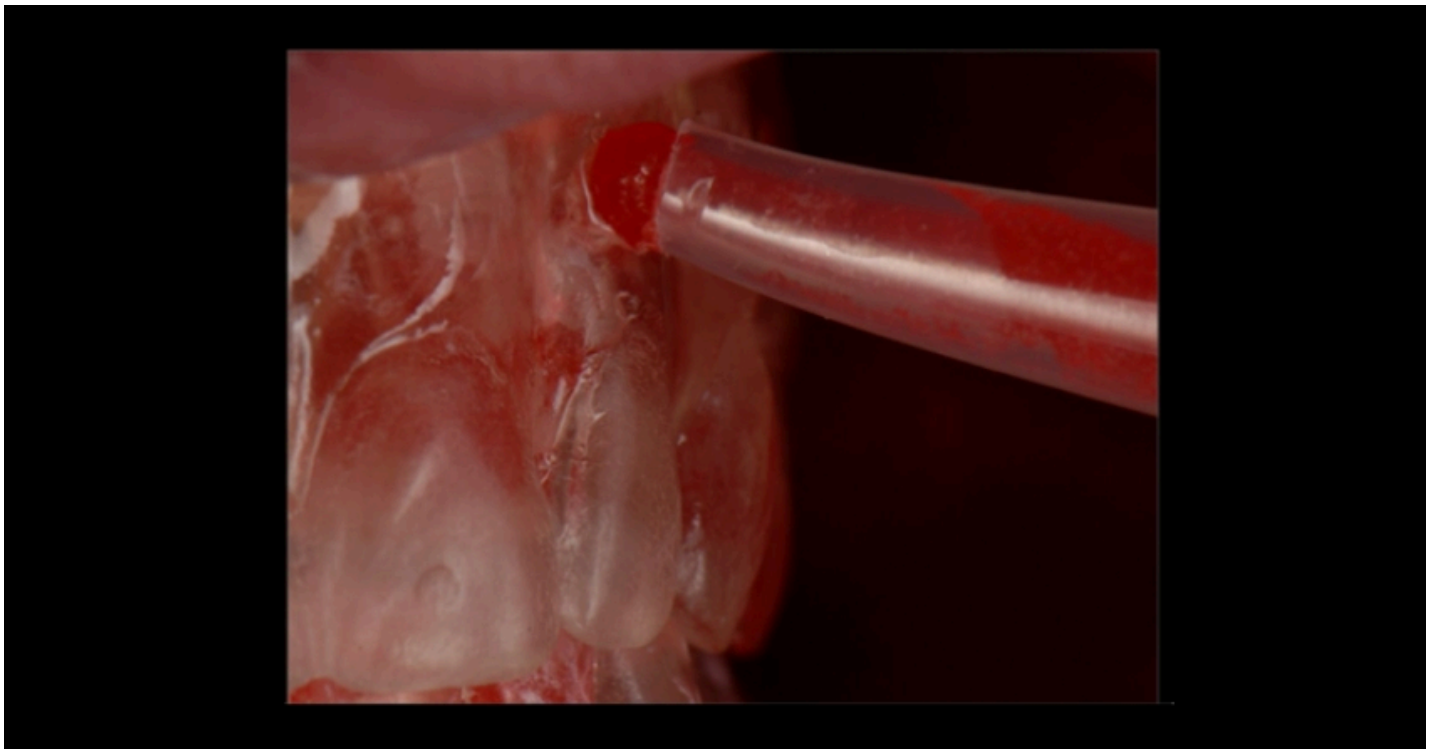

Figure 5: Low polymerization shrinkage material is injected to capture the impression copings.

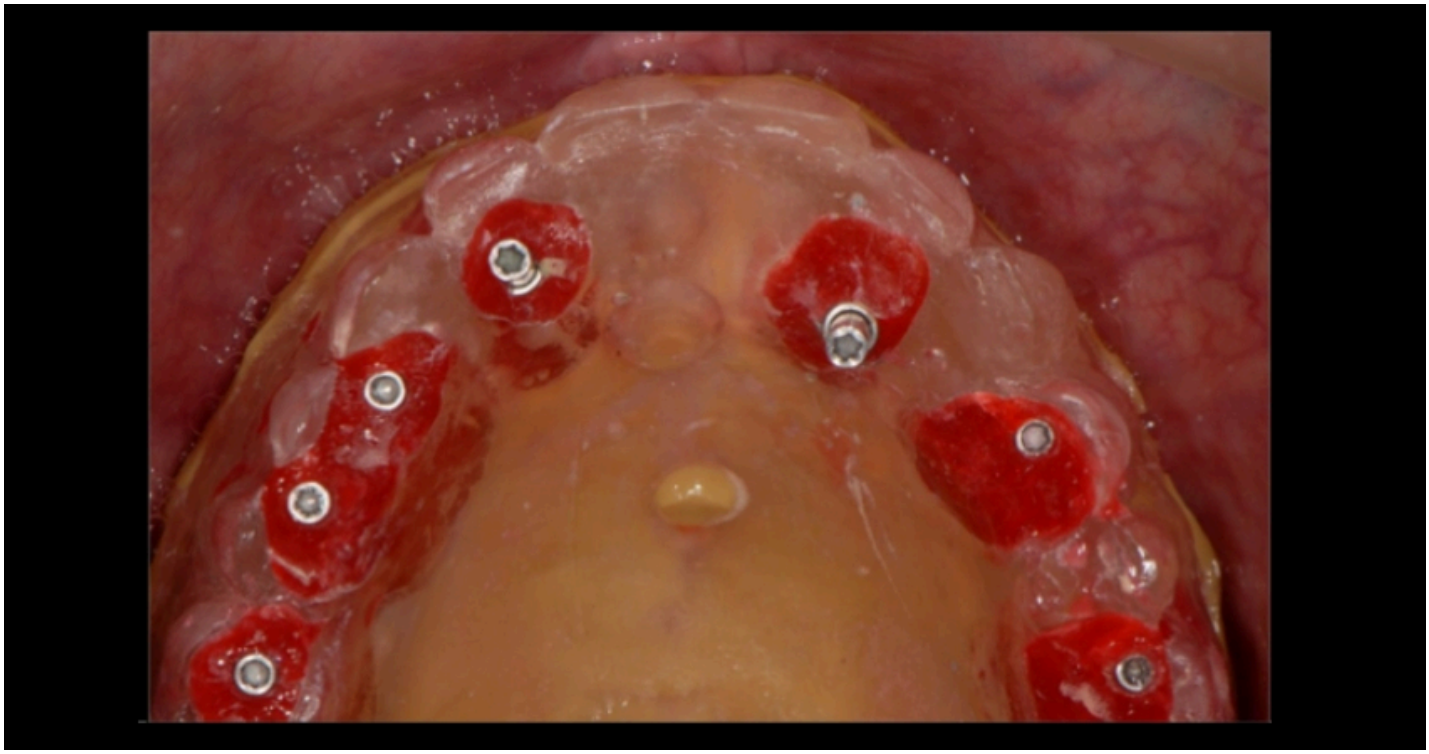

Figure 6: Occlusal view of the picked-up impression copings within the duplicated tray.

Figure 7: Intermaxillary record with duplicate dentures and picked up copings.

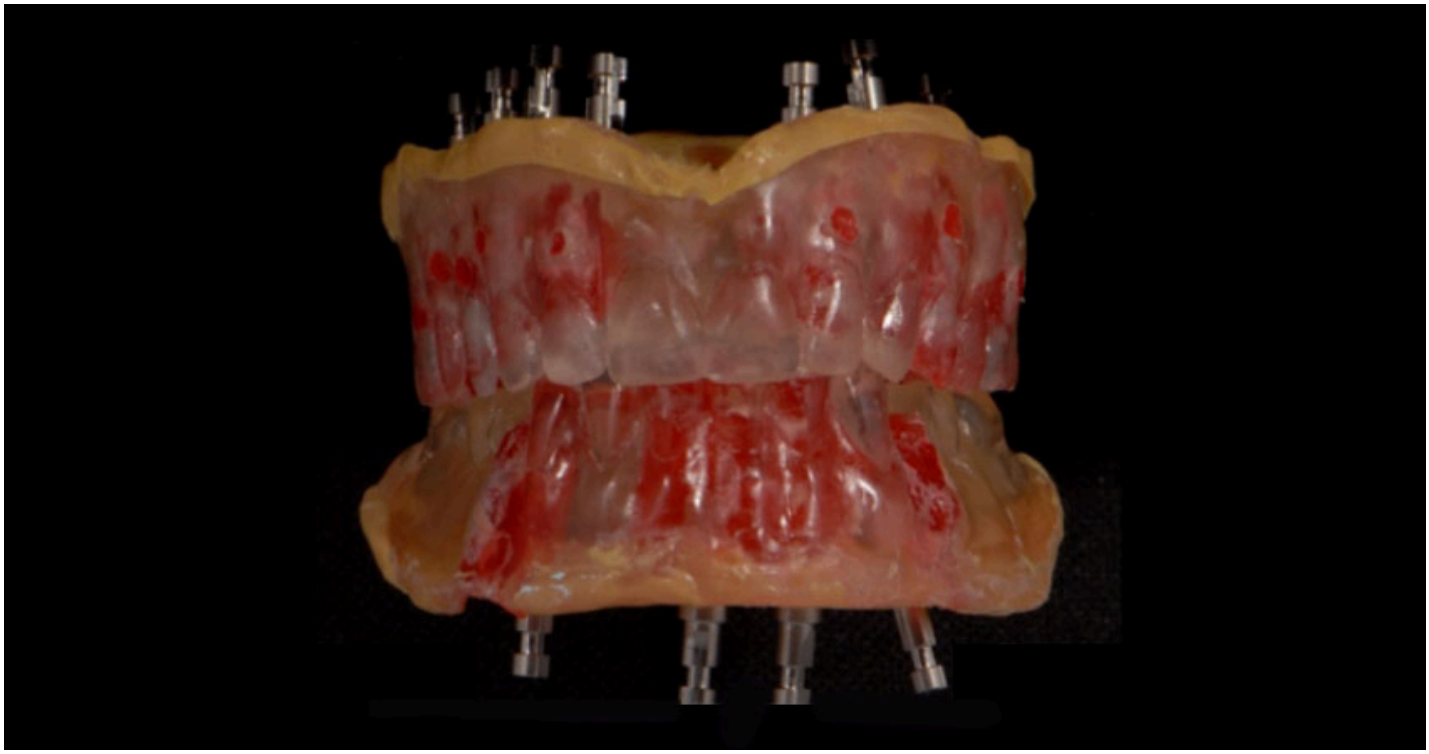

Figure 8: Analogs are secured on the impression copings prior to pouring the casts.

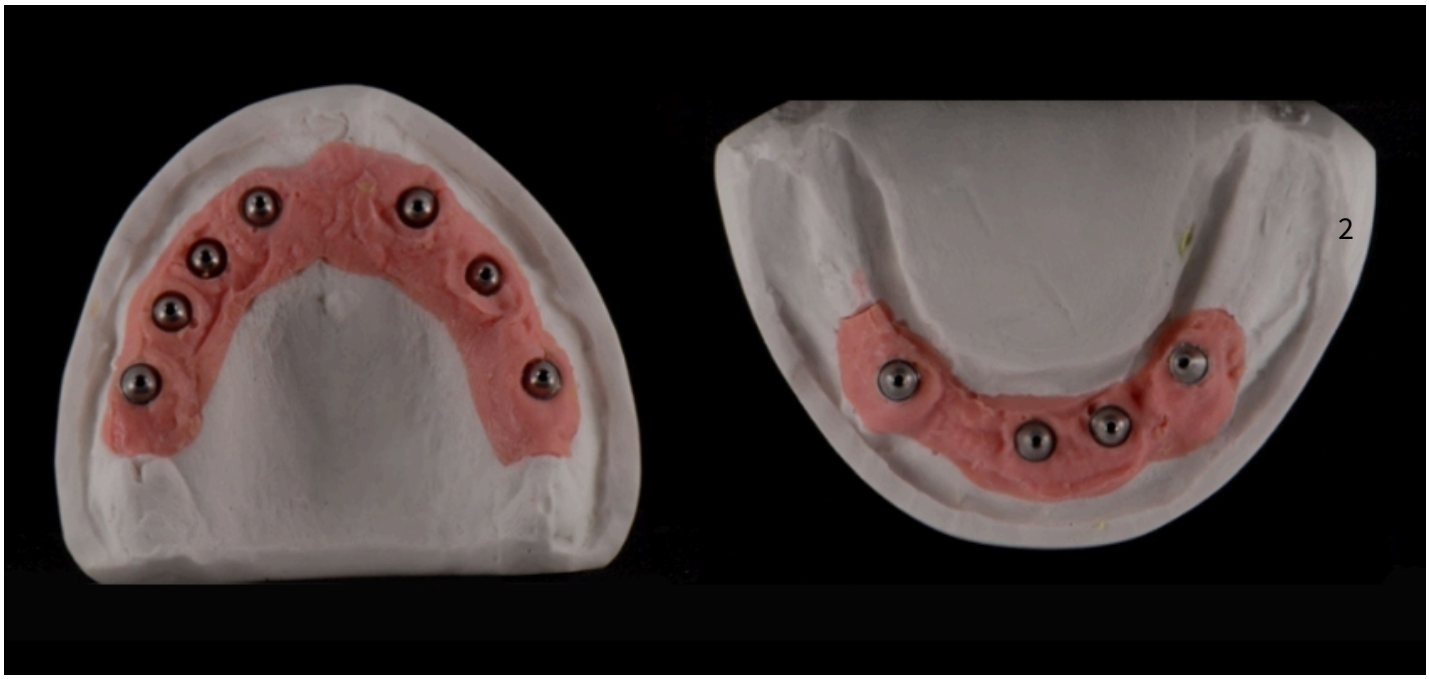

Figure 9: Poured master casts ready for the fabrication of the prosthesis.

Figure 10: Tooth set-up of the prototype provisional restorations.

Figure 11: Try in of the set-up, to validate that all parameters are met.

Figure 12: Fabrication of the definitive ceramic full arch case implant-supported reconstruction.

Digital Versus Analog Workflows

This article has outlined a simplified technique for gathering information for the lab for the fabrication of full arch case implant-supported restorations using an analog approach. While it can be argued that today these procedures can be carried out using an intraoral scanner and a fully digital workflow (https://campus.speareducation.com/workshops/digital-adoption/details/syllabus/), it should be noted that the use of conventional workflows is still valid for full arch implant-supported restorations. Analog techniques such as this are worth mastering, as there may be instances when we may not be able to use a digital workflow (https://www.meetdandy.com/articles/the-top-5-benefits-of-a-digital-workflow/). And ultimately, clinicians who master both digital and analog workflows are better equipped than those who favor just one specific workflow.

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