

The fusion of artistry and function: CoCr Fixed Bridges with ATLANTIS[™] ISUS

SUMMARY

PATIENT: A 63-year-old male patient presents with fractured, decayed, mobile, non-restorable teeth, missing multiple teeth, and ready to begin the process of restoring both arches utilizing fixed prostheses.

CHALLENGE: To create a natural appearance, excellent occlusion and function combined with easy maintenance and cleansability for our patient, chrome cobalt and porcelain was chosen for the excellent esthetics, durability and limited space requirements.

TREATMENT: Removal of the non-restorable maxillary teeth and fabrication of a maxillary acrylic partial to establish maxillary incisal edge position and occlusal plane. Once the desired maxillary esthetics was achieved, a second appointment was scheduled to remove all mandibular teeth for placement of four angled ANKYLOS implants (two 4.5 x 17 mm and two 3.5 x 17 mm), and same-day conversion of the lower provisional prosthesis.

After three months, an impression was made for the final prosthesis and several appointments later, the layered ceramics CoCr prosthesis was delivered. Approximately one year later, the patient was ready to proceed with a SmartFix concept prosthesis on the upper. Teeth were removed, six ANKYLOS implants placed (four 3.5 x 14 mm and two 4.5 x 17 mm) and the provisional denture converted. Following the same procedure as the lower, a final maxillary prosthesis was delivered five months later.



FIG. 1 A 63-year-old male patient presents with fractured, decayed, mobile, non-restorable teeth.



FIG. 2 An ATLANTIS ISUS suprastructure in cobalt chrome and porcelain was chosen for the excellent esthetics, durability and limited space requirements.



FIG. 3 Angulated Screw Access allows for optimal positioning of the prosthetic screw for improved function and esthetics.



FIG. 4 Great care is taken to create a smooth, convex ridge contacting surface. Ridge-lap designs will create hygienic concerns.

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INTRODUCTION. For many years there has been a definite divide in the laboratory industry between fixed and removable protocols. Since the introduction and subsequent evolution of fixed bridge protocols, we have seen a fusion of the two, once separate and often competing facets.

The fixed bridge concept has proven to be a very predictable clinical protocol with exceptional long-term clinical results, but in some cases, acrylic wear and fractures have proven to be problematic. Although technically a very sound process, acrylic fixed bridges do not allow ceramists the opportunity to display their artistry through this concept.

The introduction of zirconia substructures for bridges brought back some of the artistry, but the use of this material is often limited by the lack of occlusal clearance, specialized knowledge needed by the ceramists to process large zirconia frameworks and, most of all, concerns over post-delivery substructure failures.

In today's competitive laboratory marketplace it is crucial to have a comprehensive range of predictable restorative options to offer our clinicians. ATLANTIS ISUS suprastructures in CoCr (Fig. 2) offer the restorative team an extremely strong and highly esthetic prosthesis combined with a predictable technical process. It is also an exceptionally valuable resource in cases with reduced vertical clearance or bruxism where acrylic or zirconia substructures simply would not hold up to the occlusal forces.

When restoring a case with OsseoSpeed (ASTRA TECH Implant System) or ANKYLOS implants, »

- » the restoration must be processed at the abutment level. Although it is highly recommended to restore fixed bridges at access-corrected abutment level, the introduction of the new ASA (Angulated Screw Access) (Fig. 3) allows for implant-level restorations for other implant systems.

THE PROCESS. In most cases, the patient will return from the surgeon with either an immediate tissue-borne or surgically converted implant-retained prosthesis (Fig. 4) used during the healing phase.

THE FIRST APPOINTMENT is an impression appointment. The implant-retained temporary denture is removed (Fig. 5) by drilling the composite plug covering the access to the implant screw. The prosthetic screw is unscrewed and completely removed from the denture. The Balance Base Abutment C/ (ANKYLOS implant system) (Fig. 6) is kept on the implants as this will be the restorative level.

The impression copings (Fig. 7) are screwed onto the abutments using a hand-held screw driver. The impression copings are not torqued in place.

A supporting bridge is built between the impression copings to tie them together (Fig. 8). This helps to stabilize the impression copings inside the PVS material and facilitate a more accurate impression. Multiple techniques prove to be effective i.e. Floss with Duralay, Triad Dualine (DENTSPLY) etc.

Light or medium body impression material is applied between the “acrylic bridge” and soft tissue (Fig. 9). This anatomical information is crucial when processing the final prosthesis. The custom tray is filled sufficiently to capture the impression copings, vestibule and palate (Fig. 10). A good anatomical impression will allow for a more stable wax, tooth try-in. The impression pins are unscrewed fully for removal of the impression tray from the mouth. The accuracy of the impression is verified by lightly pushing against the impression copings (Fig. 11). If any movement is detected on the impression copings inside the PVS, a new impression will be needed.

Lab Rx: Five days in-lab required for this step

- Implant supported wax-rim for bite registration (Fig. 12)
- Model verification jig (Fig. 13)

THE SECOND APPOINTMENT is a model verification and bite registration appointment. It is important to verify accuracy between the model and mouth before proceeding to the next step. The model verification jig is placed in the mouth by lightly positioning it on the abutments. If needed, the jig can be secured with only one screw to minimize forcing the jig into seating.



FIG. 5 Implant-retained temporary denture in place.



FIG. 6 Balance Base Abutments exposed after removal of the denture.



FIG. 7 Impression copings in place.



FIG. 8 A supporting bridge is built between the impression copings to tie them together.



FIG. 9 Light or medium body impression material is applied between the “acrylic bridge” and soft tissue.



FIG. 10 The custom tray is filled sufficiently to capture the impression copings, vestibule and palate.



FIG. 11 The accuracy of the impression is verified by lightly pushing against the impression copings.



FIG. 12 Implant supported wax-rim for bite registration.



FIG. 13 Model verification



FIG. 14 The bite-rim is used to register a bite using traditional protocols for removable dentures.

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FIG. 15 Waxed-base tooth try-in.



FIG. 16 Indexing of incisal edge position from patient approved wax-base tooth try-in.



FIG. 17 Fabrication of a custom design guidance support structure.



FIG. 18 Precise placement of the support structure is crucial for long-term success of the prosthesis.



FIG. 19 ATLANTIS ISUS can be digitally designed without this structure through a scan of the approved denture.



FIG. 20 View of ATLANTIS ISUS suprastructure design.



FIG. 21 Milled ATLANTIS ISUS suprastructure.



FIG. 22 Custom option of metal occlusal surfaces requested for reduced vertical applications.



FIG. 23 A metal lingual bar design can assist with a smooth palate to prosthesis transition.



FIG. 24 Upper and lower ATLANTIS ISUS suprastructures in CoCr layered with Shofu Halo ceramic powder – Most current high fusing ceramics are compatible.

Seating of all platforms is visually verified. If the abutment interfaces are sub-gingival, an x-ray can be used to verify full seating.

If any discrepancy is noted, the verification jig should be cut between all connections, secured individually onto the abutments and the connections re-luted with acrylic. The PVS impression technique should be repeated as before.

The bite-rim is used to register a bite using traditional protocols for removable dentures (Fig. 14).

Shade expectations as well as tooth mold and size is discussed with the patient.

Lab Rx: Five days in-lab required for this step

- Tooth set up for traditional wax try-in. The tooth try-in is stabilized by engaging one or more implants.

THE THIRD APPOINTMENT is a tooth try-in and patient expectation appointment. At this appointment, it is our goal to establish and satisfy all patient expectations by doing a wax based tooth try-in (Fig. 15). Any adjustments to the bite, incisal edge position, tooth shape etc. will warrant a second wax tooth try-in before proceeding to fabrication of the suprastructure. To ensure long-term success, precisely positioned support structures are crucial. The ATLANTIS ISUS suprastructure in CoCr is fabricated based off the tooth positions approved by the patient and cannot be changed after fabrication (Fig. 16).

If any adjustments are needed, the patient should be scheduled for a second tooth try-in.

Lab Rx: 10-15 days in-lab required for this step

- The CoCr suprastructure is fabricated based off of approved tooth try-in position.
- Absolute Lab process: Fabrication of a custom design guidance support structure. This structure will assist the CAD process of the final structure (Fig. 17). Precise placement of the support structure is crucial for long-term success of the prosthesis (Fig. 18).
- ATLANTIS ISUS can be digitally designed without this structure through a scan of the approved denture (Fig. 19/20).
- The milled ATLANTIS ISUS suprastructure is returned ready for ceramic application. (Fig. 21).
- Possible variations:
 - Metal occlusion* and lingual (Fig. 22).
 - A metal lingual design allows for a thin prosthesis and smooth palatal transition (Fig. 23).
- Request for next appointment: CoCr suprastructure for try-in only or layer ceramics for final delivery (Fig. 24-28).

*Not a standard option.

» **THE FOURTH APPOINTMENT** is a final delivery appointment (Fig. 29). **D**

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FIG. 25 Try-in before final delivery.



FIG. 26 Try-in before final delivery.



FIG. 27 Group function is established to protect the prosthesis under function.



FIG. 28 Final occlusal adjustments are made before implant screws are torqued to final manufacturer suggested values.



FIG. 29 Final prosthesis delivered.