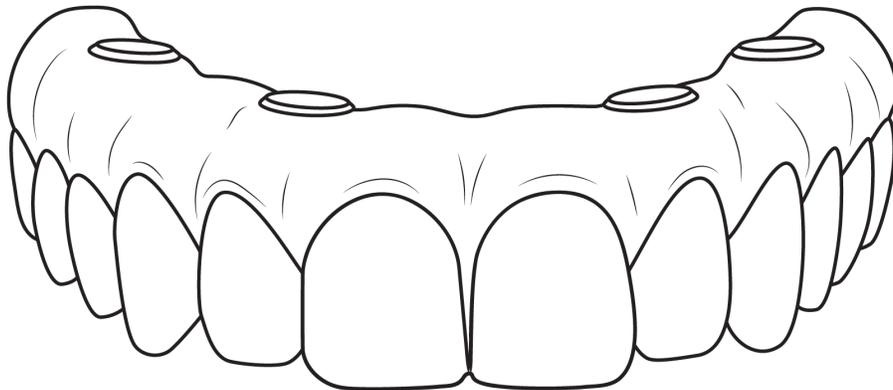


Workflow Guide:

3D Printing for Same-appointment Fixed Hybrid Dentures with OnX Tough 2



With 3D printing, you can provide fixed hybrid dentures in a single appointment to more patients for a fraction of the cost of other methods. This guide will walk you through the process of data gathering, design, fabrication, preparation, and placement.



This guide covers the post-surgical placement of fixed hybrid dentures. For information on 3D printing for surgical guide workflows, consult the relevant IFU/workflow guide.

Workflow at a Glance

1. Pre-surgical Data Capture

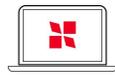


Time:
15 mins



Tools:
- Intraoral scanner
- Camera

2. Schedule Design Appt



Time:
5 mins

Tools:
- Computer with internet
- Patient data
- Pre-surgical data

3. Post-surgical Data Capture

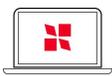


Time:
15 mins



Tools:
- Intraoral scanner
- Camera (optional)
- Photogrammetry scanner

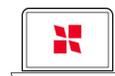
4. Get Design



Time:
45 mins

Tools:
- Computer with internet
- Patient data
- Post-surgical data

5. Create a Print Job



Time:
5 mins



Tools:
- Computer with internet
- SprintRay account

6. 3D Print



Time:
30 mins



Tools:
- SprintRay Pro S 3D printer
- OnX Tough 2 resin

7. Wash and Clean

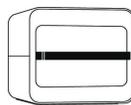


Time:
10 mins



Tools:
- SprintRay ProWash S
- Micro applicator
- Compressed air

8. Post Cure



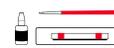
Time:
16 mins

Tools:
- SprintRay ProCure 2

9. Prepare for Placement



Time:
20 mins



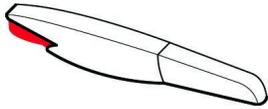
Tools:
- Vita Akzent LC kit
- Lab handpiece
- Handheld curing light
- Abrasive fiber wheel
- Other optional tools

1. Capture Pre-surgical Data

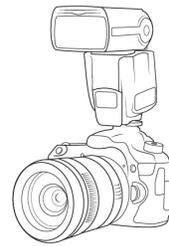
Time

15 minutes

Tools



Intraoral scanner



Camera

1.1 Intraoral Scans

Take upper and lower scans of the patient's current dentition before surgery. This will allow our designers to create the template for the post-surgical hybrid denture.



Upper scan



Lower scan



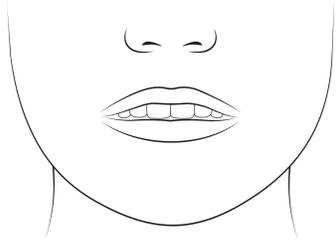
Bite scan



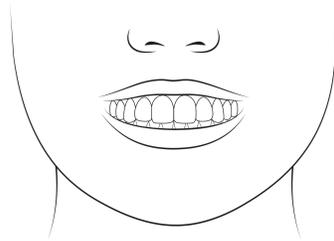
If the patient is already edentulous and has a denture, perform pre-op upper, lower, and bite scans of the denture; you'll submit these during the planning phase

1.2 Patient Photos

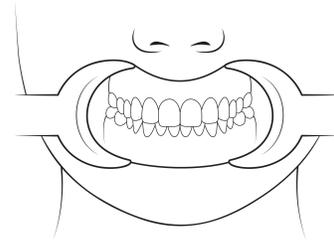
Photos of the patient allow your designer to create a fixed hybrid denture with the perfect aesthetics. Capture the following intraoral photos:



Rest position



High line smile



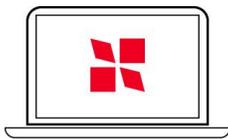
Retracted

2. Submit Data & Schedule Appointment

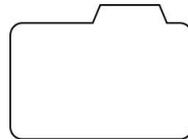
Time

5 minutes

Tools



Computer with internet
access



Pre-surgical patient data



SprintRay account

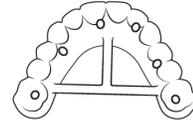
2.1 Submit Request on Cloud Design

Visit dashboard.sprinray.com and sign in or sign up for a SprintRay account.

Select or add your patient, then choose the 'Hybrid Denture' treatment type. Follow the prompts on the screen to upload all the data you gathered during step 1.



Hybrid implant dentures designed by SprintRay will feature a T-bar to improve accuracy. If you design the prosthetic yourself or use another lab, we recommend this feature.



2.2 Schedule Appointment for Date of Surgery

During the treatment request form, you'll be given a link to schedule the date & time of your hybrid placement appointment. When choosing your appointment, **select the time when you will be ready to send us the post-surgical files.**

Our designer will be on standby during the appointment window you select. You'll simply upload post-surgical data, then receive the 3D printable design within 30-45 minutes.

2.3 Review Provisional Hybrid Design

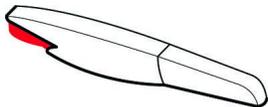
3 days after submission, we'll send you the provisional hybrid denture. Work with the designer to create the exact hybrid denture you want, which will be used on the date of surgery. We'll use this exact design, just with screw channels added with post-surgical data.

3. Capture Post-surgical Data

Time

15 minutes

Tools



Intraoral scanner



Photogrammetry scanner

3.1 Intraoral Scans

Once the surgery is complete, take an intraoral scan of the patient's tissue with the healing caps positioned over the implants. This will give your designer an understanding of the position of the implants.



Upper tissue scan



Lower tissue scan

3.2 Photogrammetry Scans

Attach the scan bodies to the implants, then perform photogrammetry to the manufacturer's specifications. This will record the exact, final positioning of the implants so that your lab partner can adjust their design accordingly for a good passive fit.

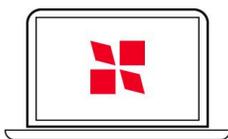
Keep the entire folder of information intact - you'll upload it all at once during the treatment planning phase. If you have any questions about this process, please contact the manufacturer of your photogrammetry scanner.

4. Get Final Design

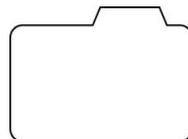
Time

45 minutes

Tools



Computer with internet



Post-surgical patient data



SprintRay account

4.1 Open Case in Cloud Design

Sign in to Cloud Design and open the patient's case during the allotted appointment slot. During this appointment, you'll use the chat function to send the post-surgical patient data to your designer.

Once the files have been transferred, your designer will prepare the hybrid denture design. This will take a maximum of 45 minutes.

4.2 Review and Approve Design

Once the printable hybrid denture is ready, your designer will send the printable file for you to review. If you'd like changes, you can communicate with your designer live via the chat function.

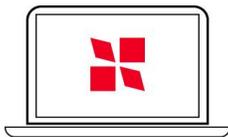
Once you approve the design, you'll be able to download the design and close out the appointment.

5. Create a Print Job

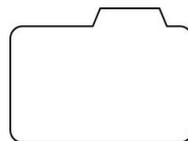
Time

5 minutes

Tools



Computer with internet
access



Hybrid denture design file(s)



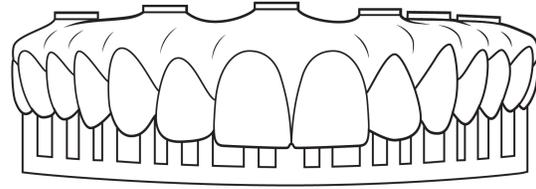
SprintRay account

5.1 Build Job in RayWare

Visit rayware.sprintray.com and sign in with your SprintRay account. Go to Cloud Design and select the hybrid denture case, then open the job in RayWare.

Print Setup:

- **Printer:** Select your printer
- **Material:** OnX Tough 2
- **Orientation:** Occlusion facing the platform, occlusion parallel to platform
- **Supports:** Default settings, at least 3 supports on the incisal edge, no supports around screw channels



5.2 Send to Printer

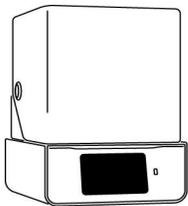
Once you've set up the print job, use the 'Send to Print' button, then select your printer. Click the 'Send to Queue' button to send to the printer.

6. 3D Print

Time

30 minutes

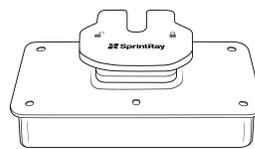
Tools



SprintRay Pro S



OnX Tough 2

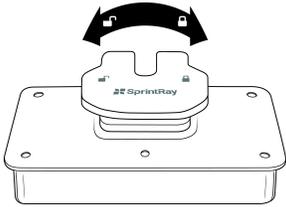


Print Platform

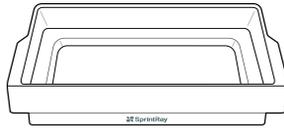


Resin Tank

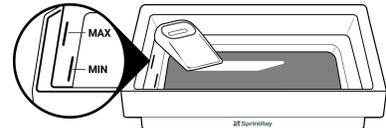
6.1 Prepare the Printer



Check that the platform is locked



Check that the tank is seated in its cradle



Fill the tank to the max line and stir the resin

6.2 Start the Print Job

On the printer touchscreen, go to the 'Queue' tab and locate your crown print job. Select 'Start Print'. It may take a few minutes before the printer arm starts to lower, depending on whether or not the resin tank and/or build platform need to be heated up.

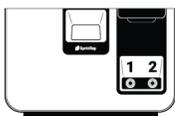
You can view the progress of your print on the printer's touchscreen, including how much time is left before your job is complete. This information can also be viewed via RayWare Cloud.

7. Wash and Clean

Time

10 minutes

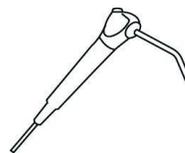
Tools



SprintRay ProWash S



Micro applicator



Compressed air



Spray bottle with IPA

7.1 Create and Run a Custom Wash Cycle

If you are using SprintRay ProWash S, run a custom OnX Tough 2 wash cycle by tapping Custom Cycle on the home screen. If you are using Pro Wash/Dry, run a Single Cycle Wash by tapping on the wrench icon on the home screen.



Wash 1

3 minutes



Wash 2

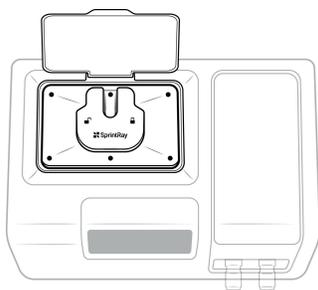
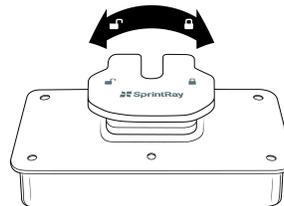
0 minutes



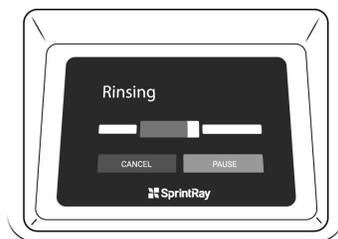
Dry

3 minutes

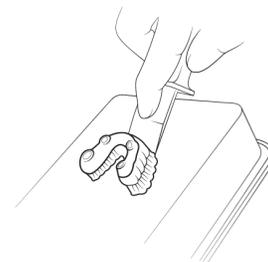
Unlock the build platform and gently pull it toward you to release it from the printer.



Transfer the build platform to ProWash S



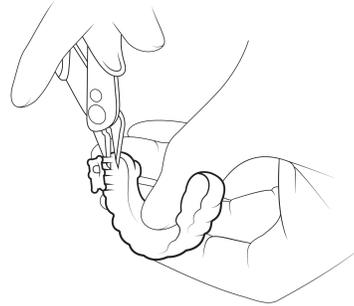
Run the custom cleaning cycle described above



Remove the hybrid denture from the build platform

7.2 Remove Supports and T-bar

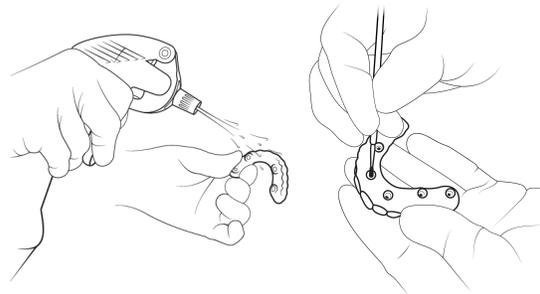
If there are any supports remaining on the hybrid denture, use flush cutters to clip them off. Don't worry if there are still small stubs left on the model, you'll remove those later.



7.3 Clean Screw Channels

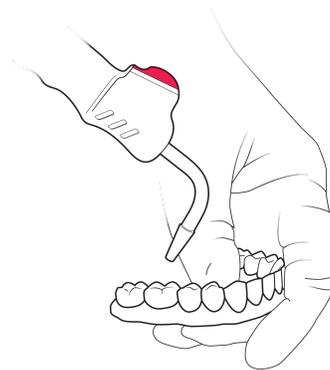
Because of the extremely high dimensional accuracy requirements for hybrid dentures, the screw channels demand extra attention.

Spray each screw channel with IPA. Dip the micro applicator in IPA and use it to thoroughly clean the screw channels to remove resin.



Use compressed air to remove final debris and evaporate any IPA that is trapped in the screw channels.

Repeat as needed until the channels are clean. Make sure the hybrid denture is dry and free from IPA.



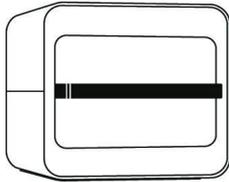
Do not let IPA stand on the surface of the prosthetic for more than 30 seconds, otherwise it may develop a chalky surface finish that will require sandblasting

8. Post Cure Prosthetic

Time

12 minutes

Tools



ProCure 2

6.1 Place in ProCure 2

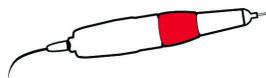
Place the prosthetic in ProCure 2. On the touchscreen, select the OnX Tough 2 profile. If you are signed in on all your devices, simply check the queue for this production job. If using ProCure 1, place the prosthetic in the chamber and run a custom profile of 60 minutes at 60°C.

9. Prepare for Placement

Time

20-30 minutes

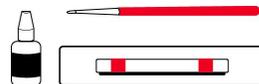
Tools



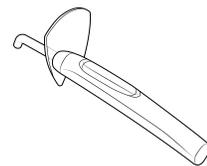
Lab handpiece



Abrasive fiber wheel



Vita Akzent LC kit
(Optional)

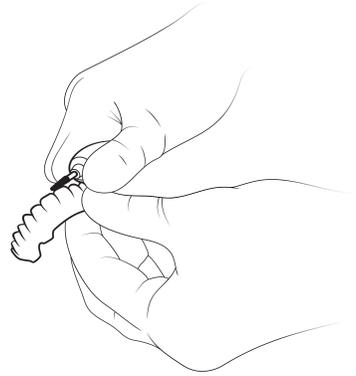


Handheld curing light
(Optional)

9.1 Smoothen the Prosthetic

Use a fine lab carbide bur or an abrasive fiber wheel attachment to remove remaining stubs leftover by the support structures until the surface is smooth and uniform.

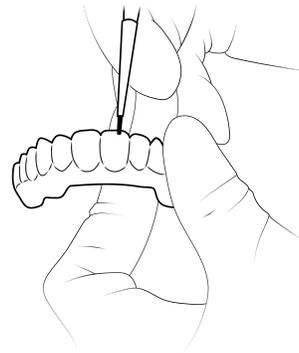
Use a lab handpiece and cutting disc to remove the T-bar.



9.2 Characterize (Optional)

This step is optional, but we recommend it for the best patient experience and aesthetics. We recommend Vita Akzent LC™ for the best cosmetic effect, which you can layer and light cure to your desired aesthetics.

There are many great techniques to characterize a hybrid denture. For a natural-looking 3D printed restoration, we recommend the following:



1. Use pink composite or create pink Vita Akzent LC with 1 drop of red and 1 drop of pink - you can experiment using your own mix to get the desired shade of pink
2. Use a fine brush to stain the gingiva with pink stain to add more depth and character
3. Use a blue stain at the incisal edges to create a translucent effect
4. Use other stains (like cream, brown, and orange) to create a more natural look
5. Paint the entire surface (except the intaglio) with a thin layer of clear glaze

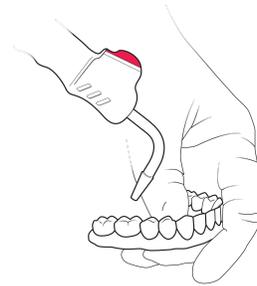
Tack cure in between steps using a handheld curing light. Final cure the hybrid denture in the ProCure 2 for 5 minutes.



Always check the manufacturer's IFU and recommendations before using a handheld curing light to cure glaze

9.3 Disinfect

Disinfect the denture using a steamer if available, then brush lightly with dish soap before placement. Make sure that the hybrid is completely dry before placing it.



9.4 Cement TiBase to Hybrid (If using)

If you're using the direct screw delivery method, skip to step 9.5 - Sequence Torque Bolts.

Apply Primer to the Screw Channels

Apply Clearfil Ceramic Primer Plus to the inner surface of the screw channels. Dry the adherent surface with compressed air.

Clean and Prepare Tooth or TiBase

Follow the manufacturer's instructions for Clearfil Ceramic Primer Plus for priming the TiBase.

Apply Cement

Apply the cement to the intaglio surface of the inner surface of the screw channels, distributing evenly. Press the TiBase into the screw channels and hold firmly. Apply gentle pressure until it is fully seated.

Initial Polymerization

Remove excess cement from the margins of the TiBase and light cure for 5 seconds. Remove the remaining excess cement with a dental hand instrument.

Final Check

Perform a final check to ensure that the TiBase is fully seated and there is no excess cement.

9.5 Sequence Torque Bolts

Turn each screw gently until you feel contact with the screw channel collar, then stop. Do not tighten until you've seated all the screws. Once seated, begin tightening each screw in an alternating pattern.



Failure to follow proper torque bolt sequencing may result in a poor fitting appliance; always follow the sequencing method provided for passive fit