

Streamlined Clinical Protocol **Definitive Bridge from an Excellent Provisional Bridge**

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This particular protocol is used when you have a temporary fixed denture bridge. This could have been delivered as a Teeth-In-An-Hour provisional associated with Nobel Guide surgery or it could have been a Teeth-In-A-Day provisional that was a denture conversion to a provisional fixed bridge.

There are six clinical appointments encompassing about seven hours of clinical chair time. This treatment does require some significant lab support. If this is your first case, then it is advisable to use a lab that is well experienced in this technique. Contact me if you need some recommendations.

Prior to initiating this protocol, the existing provisional bridge should be evaluated to determine if it is appropriate for vertical, centric, incisal edge position, occlusal plane orientation as well as the size, shape and shade of the provisional teeth. When all that is within very close proximity to the desired final result, this protocol is ideal. When there are changes to be made to those issues - especially vertical, centric, incisal edge position or the occlusal plane - a separate technique should be utilized. You can obtain that technique under the heading: Clinical Protocol - Patti Bridge from a Denture.

This technique can also be used for partially edentulous cases or overdentures. It can be used for a porcelain fused to metal bridge or an acrylic “hybrid” bridge. It is the most accurate technique available. There are a lot steps to be done in the lab, but the clinical work is typically less than making a denture and completing a metal trial. It seems involved, but it really is easy work. Every step is outlined, including the work that would be completed by your lab technician. Nonetheless, the accuracy and confidence comes quickly with this technique.

The outline is broken down into steps identified here:

1. VISIT NUMBER, Procedure, Armamentarium and Schedule Time Estimate
 - 1.1. This level introduces the **treatment** that will be completed at this visit
 - 1.1.1. This level is a Step-By-Step outline of the restorative clinical techniques
 - 1.1.1.1. This level outlines the *Lab steps* that need to be completed

Clinical and Laboratory Procedures to Fabricate the Definitive Patti Bridge (Profile):

1. **FIRST VISIT:** Index Fabrication and Master Cast Impression – First we’ll make an index of the spatial position of the implants. Then we’ll make a pick up impression of that index to create a master cast. (60 to 90 minutes are needed for this appointment). Armamentarium - Long Guide Pins for each location, One Temporary Titanium Cylinder and screw for each abutment (typically Multi-Unit Abutments) and One Temporary Titanium Coping and screw for each implant level location (unique for Branemark System, Replace and Active). Replicas for each implant or abutment location. Pick Up Impression Material (PVS or Polyether), Stock Impression Tray and Photos.
 - 1.1. **Photos and Preliminary Records** – Do this before any other steps at this visit.
 - 1.1.1. **Photos** – these will be very helpful when working in the lab and setting teeth. Take full-face and close-up photos of a light smile, high smile and repose. Also take retracted photos of the teeth separated and in maximum intercuspation, in protrusion as well as both right and left working movements to show the occlusal scheme.

- 1.1.2. **Models** – make upper and lower provisional models and record the occlusal plane or make a facebow to transfer these models to the articulator.
- 1.2. **Implant Verification Jig** – The most accurate method of recording spatial position of the implants. If you poured a stone index with the Provisional Bridge the day it was fabricated, then the lab can make this IVJ for you in advance of this appointment and you skip step 1.2.2 and begin with step 1.2.3. Regardless, the use of a cross-arch connection with the IVJ is always recommended to increase accuracy.
 - 1.2.1. Remove the occlusal access hole filling materials from the provisional bridge. Remove the entire provisional bridge and use the torque wrench to ensure that all the abutments are torqued to the appropriate amount.
 - 1.2.2. Place the appropriate titanium cylinder with its guide pin on each abutment or implant position. Wrap waxed floss around and around the cylinders and criss-cross from position to position as well as across the arch from one terminal location to the other. Lute the cylinders together by filling the wrapped floss with GC Pattern Resin with a composite brush and a powder/liquid or injection technique.
 - 1.2.3. Once set, the verification jig should be removed and sectioned between each unit so that there is one segment for every implant position. It is advisable to label the implant positions prior to sectioning. If the IVJ was premade from your lab it is still necessary to section. Don't check for accuracy; just section. We want to create an accurate master cast, not determine if the mouth matches any model.
 - 1.2.4. Lute the individual sections together with GC Pattern Resin. This small area of Pattern Resin is the most accurate method of recording the spatial position of the individual implants to each other. Allow to set.
- 1.3. **The master cast impression** is the second step we'll complete in this visit. We will make a pick up impression of the IVJ that was just fabricated.
 - 1.3.1. Create an impression tray that will fit over the guide pins by drilling access holes or using a tray made for guide pin impressions such as Mira Tray by Hager Werken. Any stock tray will need to have the lingual walls for the lower or the palatal bump for the upper adjusted to fit over the cross-arch bar on the IVJ.
 - 1.3.2. Pick Up Impression - The impression is made with materials such as polyether or medium body polyvinyl siloxane. Inject material under the IVJ and then seat a tray filled with impression material. Remove when fully set.
 - 1.3.3. **Reprovisionalize** the patient - Seal the screw access holes.
 - 1.3.4. As an aside, there have been times where I've completed the first and second visit in one sitting. The patient needs to wait some time while the master cast is poured, mounted (noting the incisal pin measurement) and the moulage is made. The opposing model must be mounted during this time as well.
 - 1.3.4.1. **LAB STEP:** The model needs to be poured as a solid model with soft tissue moulage. This moulage will need to extend posteriorly estimating the full extent of the cantilever. The lab will use the occlusal plane or facebow to mount the provisional and opposing models in advance of the next visit.
2. **SECOND VISIT – MOUNTING and MOULAGE** – At this visit you will use the existing TIAD provisional bridge to mount the master cast and collect the “records” that are needed to fabricate a Procera Titanium Framework allow us to skip the conventional baseplates and wax rim steps associated with denture fabrication. (Expect 60-90 Minutes)
 - 2.1. A Centric Relation Record is created to mount the Master Cast. Place a Lucia Jig or Leaf Gauge between the incisors and have the patient bite for about ten minutes. This creates a Class III lever and seats the condyles in the most superior position against the eminence - CR. Ensure the Leaf Gauge or Lucia Jig opens the bite about 2 mm. Have the patient slide forward and back a few times, ending in the back. Make a full

arch bite registration with your typical material

2.1.1. Remove the provisional and place healing caps while mounting.

2.1.2. If your lab technician is not available (or necessary) to come to your office to complete the mounting and moulage the restorative dentist can complete this.

2.1.2.1. LAB STEP: *Mounting*. Remove the soft tissue from the cast to facilitate the proper seating of the bridge. Place the provisional bridge on the master cast. It is quite possible that the provisional bridge does not fit the master cast passively. That is okay, the master cast will be more accurate because it was made from the sectioned and luted IVJ – the most accurate spatial relationship of the implants to one another. The master cast is mounted with the bite registration that was made at the beginning of the appointment. Once mounted, remove the bite registration; loosen the incisal pin on the articulator and **NOTE THE INCISAL PIN MEASUREMENT. WRITE IT ON THE MOUNTING STONE IN BLACK MARKER.** There is no baseplate or wax rim with this protocol - without that note, you'll need to remove the provisional again just to determine the appropriate VDO.

2.1.2.2. LAB STEP: *Moulage*. Use an acrylic bur and make some index notches in the land area of the master model. This step can be done with the lab screws that hold the provisional on the master cast, but the use of long guide pins that go through the moulage is far superior in later steps. Additionally making a separate moulage of the palatal contours for upper arch bridges is also highly recommended for speech. Mix a large amount of putty (Coltoflax or any heavy body PVS putty) and make a *moulage* of the exterior and occlusal form of the provisional bridge on the master model.

2.2. Reprovisionalization.

2.2.1. Remove the provisional from the mounted master model, clean of excess stone and redeliver to your patient. Seal the screw access holes.

2.2.1.1. LAB STEP: You will need to send the lab: the mounted models, the incisal pin location, your articulator, your photos and information about the size, shape and shade of denture teeth and if you want minor changes.

2.2.1.2. The lab will use the IVJ as an acrylic base for a Pre-Bar Wax Trial. They will remove the cross arch bar and add any cantilever that will be necessary to support the teeth that will not be within the implants. The lab will need to trim the length of some temporary titanium cylinders for occlusal clearance. They will order a new set of denture teeth and place them into the moulage. The lab will flow wax under the IVJ acrylic bar, around the frame and lute the denture teeth to the bar. This will be festooned to mimic the proper palatal shape for speech, lingual shape for tongue space, buccal contour for hygiene and facial contour for lip support and speech. A forty-five degree angle is ideal to prevent ledges that can catch food. The lab should also try to create ideal tissue contact all around. The intaglio (undersurface) of the bridge should be 100% convex with no uncleanable concavities whatsoever.

3. THIRD VISIT: Pre-Bar Wax Trial with Soft Tissue and Centric Relation Verification. At this visit we will confirm the occlusal plane, midline, overjet, overbite, esthetics, incisal display, speech as well as tissue contact and contour. (60-90 minutes)

Armamentarium – Wax Trial with Prosthetic Screws, Shim Stock, Articulating Paper, Pressure Indicating Paste, Denture Wax, Bunsen Burner, Wax Spatula, Mirror, Torque Wrench with MUA Driver and Uni-Grip

3.1. **Pre-Bar Wax Trial.** Remove the provisional and seat the Pre-Bar Wax Trial.

- 3.1.1. Evaluate the occlusal plane, midline, overjet and overbite. Evaluate the incisal display and general esthetics. Confirmation of the appropriate size, shape and shade are all made with the patient. Changes are made or noted for the lab.
- 3.1.2. Have the patient practice their speech using denture protocols.
- 3.1.3. Evaluate the tissue contact and contour. The pink wax should apply light pressure to the residual ridge circumferentially. It should contact center on the bridge for the lower arch, but contact should shift toward the palatal in the upper arch as the bridge moves anteriorly to ensure proper speech patterns. On the facial and buccal, the wax contour should approximate forty-five degrees to the occlusal plane to minimize food entrapment and prevent the upper lip from being captured during a high smile.
- 3.1.4. **Reprovisionalize** the patient - Seal the screw access holes.
 - 3.1.4.1. LAB STEP *Framework Fabrication and Post-Bar Wax Trial*. The lab will design and order the Procera Framework as well as transfer the corrected Pre-Bar Wax Trial to the frame for a Post-Bar Wax Trial.
 - 3.1.4.2. All necessary corrections from the Pre-Bar Wax Trial are made.
 - 3.1.4.3. The soft tissue moulage that was made when the master cast was initially poured is removed. The finalized Pre-Bar Wax Trial is seated on the master cast and a new soft tissue moulage is injected under the wax up.
 - 3.1.4.4. Using the long guide pins, a fresh heavy body Moulage is made to transfer this new position to the frame when it arrives. Maxillary arches also receive a palatal moulage to ensure the contour work to idealize the speech gets replicated as well.
 - 3.1.4.5. Individual denture teeth are removed from the Pre-Bar Wax Trial and numbered. They are set aside for use once the framework arrives.
 - 3.1.4.6. The Pre-Bar Wax Trial now is scanned as well as the master cast using the Nobel Procera protocol. The scan of the wax without the denture teeth idealizes the space available for the framework without encroaching on the denture teeth and helps to ensure their strength in the future. I prefer the hybrid design with anterior fingers and retention elements. I request that there be 2 mm of acrylic all around the bar to simply final processing. The bar should be at least 4 mm tall and 4 mm wide. While no additional size is necessary for fracture strength of the bar, additional size is required to support the acrylic and minimize the risk of fracture of the acrylic.
 - 3.1.4.7. When the framework arrives from Nobel Procera, the lab will seat it on the master cast with long guide pins, use the moulages to flow wax under the bar, around the frame and lute the denture teeth to the bar. The moulages will be festoon the proper palatal shape for speech, lingual shape for tongue space, buccal contour for hygiene and facial contour for lip support and speech that was finalized during the Pre-Bar Wax Trial. The intaglio (undersurface) of the bridge should be 100% convex with no uncleanable concavities whatsoever.
4. **FOURTH VISIT: Post Bar Wax Trial (60-90 Minutes) Armamentarium** - Completed Post Bar Wax Trial, Prosthetic Screws, Articulating Paper, Shim Stock, Torque Wrench with MUA Hex and Uni-Grip Screwdrivers.
 - 4.1. **Post Bar Wax Trial** is completed to allow the patient one final chance to see how the case will look as well as a first chance as to how it will feel. The occlusion is scrutinized at this stage prior to final processing.
 - 4.1.1. Remove the TIAD Provisional and tighten all abutment screws. Angulated abutment screws to 15 Ncm and all MUA screws to 35 Ncm.

- 4.1.2. Seat the Post Bar Wax Trial. Use shim stock to confirm that each opposing tooth holds the shim stock. Should discrepancies exist, confirm that they are similar on the mounted casts. Have the lab correct these areas prior to processing. Confirm the eccentric movements result in the desired occlusal scheme. It is preferred to have group function of any teeth that are not on the cantilever – including the anteriors.
- 4.1.3. Use phonetics and evaluate esthetics to confirm the size, shape, shade and position of the denture teeth are appropriate.
- 4.1.4. Confirm the amount of pressure on the tissue is appropriate. Trim if necessary or add wax if large spaces exist. Make specific notes to your lab regarding areas that are to be modified with additions or subtractions.
- 4.1.5. Select an appropriate shade of pink acrylic.
- 4.1.6. Allow the patient to review these issues as well once you've confirmed it is ready for patient evaluation.
- 4.1.7. **Reprovisionalize** the patient - Seal the screw access holes.
 - 4.1.1.3. LAB STEP: *Lab processes acrylic.*
 - 4.1.1.4. When the lab processes, they should use an additional set of replicas to *pack and process the case*. The lab should not be processing using the master cast. Prior to processing they should complete the *final festoon* on the master cast. Your notes should indicate how the bridge fit to the tissue clinically to ensure this step is successful.
 - 4.1.1.5. The lab will connect a set of replicas to the bridge and pour a processing model with stone that comes half way up to the denture teeth.
 - 4.1.1.6. For processing, the Post Bar Wax Trial is connected to the processing cast with guide pins so that screw chimneys are properly created. The guide pins can be cut short if they are too long. The case will be invested in stone without the use of the master cast. That will preserve the mounted master cast. The case will be processed in any number of different techniques. All techniques will likely result in flash acrylic into the screw access holes (even with the use of the guide pins) that must be cleaned out prior to delivery. Occlusal adjustment, final polishing and a surface glaze are all completed. The use of lab protection caps is required. Remind the technician to remove the flash in the screw holes.

5. FIFTH VISIT: Case Delivery (Don't rush – give it 90 minutes)

5.1. Case Delivery and Occlusal Adjustment.

5.2. Armamentarium - Processed Case, Prosthetic Screws, Articulating Paper, Fermit Y, Torque Wrench with MUA Hex and Uni-Grip Screwdrivers.

- 5.2.2. Remove the TIAD Provisional and tighten all abutment screws. Also, evaluate the framework fit again for a brief moment as some distortion can occur with larger cases. Spend all the time necessary to perfect the occlusion depending upon the case design.
- 5.2.3. Clean and save the TIAD provisional the mounted master cast and the opposing model. It will prove useful if anything needs future repair.
- 5.2.4. Seat the Completed Bridge and tighten each of the screws a little before tightening any of them completely. If, upon initial delivery of the case, the patient complains of pressure from the pontic areas, check for blanching tissue and mark those areas with a wax pencil. Remove the case and polish to make the appropriate adjustments.
- 5.2.5. Torque tighten all gold screws to 15 Ncm for abutment screws and 35 Ncm for implant level screws.
- 5.2.6. Adjust the occlusion. Use a Huffman Leaf Gauge if necessary and refine centric

relation to have even contact right and left as well as front and back. Adjust eccentric occlusion to reduce forces from the cantilever with group function elsewhere. Create a cross-over occlusion with group function anterior disclusion.

5.2.7. Seal occlusal access holes with a loose cotton pellet and Tellio. Light cure the Tellio for 10 seconds and recheck the occlusion.

5.2.8. Make appropriate impressions for a night-time bruxism appliance. Make a fresh opposing model as well

5.2.9. Provide oral hygiene instruction to teach the patient to brush the acrylic-gingival junction as well as the denture tooth-pink acrylic interface. They should floss under the bridge using SuperFloss or the like.

5.2.9.3. LAB WORK: *Fabricate a biteguard* to fit over the completed bridge regardless of which arch it is to help protect it from opposing natural teeth. It is preferable to place the biteguard directly on the bridge rather than the opposing arch. Due to acrylic fit over the acrylic denture teeth in this bridge, a hard outer and soft inner (Dual) lined biteguard is preferred.

6. SIXTH VISIT: Post Op X-Rays, OHI, Photos and Deliver Biteguard (One Hour)

6.1. **Post Operative evaluation** and correction of any complications. Refinement of the occlusion. Oral hygiene instruction and recall planning.

6.1.1. Make a panoramic film of the case. These are considered baseline films and should show the interproximal bone level. Some periapical films will be necessary and some bitewings might help. Take photographs.

6.1.2. Refine the occlusion as noted at delivery. Use a Huffman Leaf Gauge if necessary and refine centric relation to have even contact right and left as well as front and back. Adjust eccentric occlusion to reduce forces from the cantilever with group function elsewhere. Create a cross-over occlusion with group function anterior disclusion.

6.1.3 Use a #45 endo file to rotate through the Tellio, engage the cotton pellet and pull up to remove the Fermit Y from each screw access hole. Check the tightness of each gold screw by trying to tighten them with finger pressure, then the torque wrench. All screws should be tight. If they are loose, it may be a sign of two problems. One concern is framework fit, the other is occlusal overload. If you notice a loose screw, first reconfirm framework fit (I have a framework fit clinical guide on my website for assistance), and then check for heavy centric or eccentric contacts. Never tighten loose gold screws without making some other improvement of the case. The loose screw is the result of a problem. Tightening the screw does not correct the root problem. Make the necessary adjustments and re-evaluate in 2 wks.

6.1.4. Seal the access holes with cotton pellets and Tellio for one year, then plumbers tape and composite. This allows us to follow the case easily for the first year. If something were unusual, it would be easy to remove the bridge and evaluate it because we have not placed composite yet.

The total chairtime is approximately 8 hours, the total lab cost goes from \$2,500 to \$4,500.

If you find the existing provisional bridge has inadequacies that you'd like to improve, the Step-By-Step protocol for that includes a wax rim and wax trial appointment that this one does not. Otherwise, they are very similar. For a copy of that protocol, visit DrSharifi.com.