

Advanced Removable Prosthodontics

Dr. Theodore Berg

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Flange Extensions

Decide what you need to give the person their face back. If you need a full flange, put a full flange there. This person doesn't need a full flange. He needs a so-called 'half flange'. When you make this border just make it fit in. [Now Dr. Berg describes the path of the border of the flange from a slide.] If it's supposed to go up to the maxillary frenum, put it up there. And we're going up a little bit and up in here where the central incisor is extracted. Now it's coming back down again, since there is no tooth extracted there. And now it's going back up again, since the lateral incisor was extracted. Now it's coming around and snugging around the canine. Then this part fills the black triangle. This part up here is taking the place of the papilli where there was recession next to the canine. Make sense?

Now this lady doesn't have a full flange. She doesn't even have a half flange. She has a little bit of acrylic to hold her teeth on. The part for her papilli, and to close up her black triangle, has been tinted with a stain. This has been done to not make it appear pinky-pinky. So why is this? Well, she has lost teeth, but hasn't lost any ridge. So what if the ridge does resorb? Well, then we'll add [acrylic] on. We can add on to it in plain old acrylic. Then you can stain it. Now we look at the teeth and we see the fake teeth, then the natural teeth, and then back to the prosthetic teeth again.

Excellent Prosthetic Esthetics

What about this guy? What does he got? I will tell you that some of these anterior teeth are prosthetic. I want somebody to tell me which of these are prosthetic and which are PFM's, and what are natural teeth. [At this point the class starts mumbling about the possibilities and then starts to yell out guesses. A vote is taken and some people vote for PFM teeth and some for prosthetic and some for natural.] We have a split vote here. [Then Dr. Berg shows the next slide.] It turns out everything is prosthetic. This was done by a fall quarter senior.

The patient had a deep tight overbite, or vertical overlap, so that almost all the occlusion is in metal. We'll look at the other side in a minute. And there's nicks in the back to keep the anterior prosthetic teeth on, which will like bonded laminated veneers. Here are the prosthetic teeth that were ground out to be like fake teeth veneers that can then be bonded on. The premolar is prosthetic. The canine, both canines are prosthetic. If you look from

the occlusal side you can see both centric and disclusion. Fabulously stable because this was an overdenture. It just goes right over.

Rotational path of insertion.

You'll hear about it and I'll show you a fairly straightforward case so you can understand what happens. Rotational path of insertion, a majority of the time, is used to avoid clasps or attachments in the anterior. There are examples of posterior, but they get really complicated. In this case, this partial actually goes into a mesial undercut and if you try and shove this partial straight on then it isn't going to go down. There is no way this acrylic can go into this undercut. But there is still such a way to do it so that you put in the anterior first into the undercut and then swing up the posterior. In the posterior we use the common clasp. I'll show you the secret. Now the first thing that is important is to identify that mesial undercut. We must make the rests and guideplanes so that they will follow the posterior and go into place. So notice that all the minor connectors facing distally, and all the guiding surfaces facing distally, have two components to them. The occlusal half is curved. The cervical half is pretty much the way you would make a guiding surface, straight-up with the path of insertion.

So the first part has to rotate. What would the pivot of that rotation be? It would be the canine rests. These are the first rests that will go into place, then the premolars, then the molars. [Now Dr. Berg shows us the x-ray of these teeth. It shows that the most posterior molar has drifted mesially.] It is a tipped tooth here that is going to become a gold crown, the third molar. And it's up here into the second molar position really and towards the distal of the first molar. You can see how these little creatures [the teeth] can travel. Actually this ended up, for periodontal and esthetic reasons, becoming a 3 unit bridge and the partial has rests on both ends of the bridge. These are circular concave rests, one on a natural tooth and one on a crown. So the first thing is that you've got to allow this thing to rotate into place. If you don't design these guideplanes and the rests surface and polish up the edges you'll never get the metalwork to go up to place and when you put on the plastic it really is impossible.

Now this lady that lost a lot of anterior ridge in an automobile accident. She opted against implants and didn't like the diagnostic wax-up that was proposed for a 6 unit bridge. She's had one partial for years and has worn the partial. She says that if it stayed in place it would be better, but she says that she does good with the one she's got. She has broken her so-called 'flipper' though. We're actually restoring occlusion, not only on the PFM's, but on the partial. So the rests should be part of the occlusal scheme. So you say, "Well, we got to have a rest there and it's right where the centric stop goes." OK. That's cool. So make it deep enough in the crown so that it can not only be a rest, but also be a centric stop. It can be both.

The third molar had a fair amount of mobility and a very guarded prognosis so this isn't able to support a bridge. That is why we're not bridging there and we're not bridging here, but we are bridging over here [over on the opposite side]. We're toughening up this situation so that these two premolars and the canine can help this little third back here. So

what do we avoid by keeping that third molar? We avoid an extension base. And by avoiding an extension base we can lock the anterior in with a rotational path of insertion.

OK. So we've done the wax-up. It's going to be acrylic instead of all-metal for two reasons here. We found that during our try-in that we have a phonetic problem. Not the try-in for the framework, but the diagnostic try-in. When we finally got done playing with it we realized that we wanted a f and v platform with one pair of rugae and an incisive papilla. We don't put on a cingulum because teeth don't usually come with good cingulum, so I ground off that knob that they put on so the person can get a nice sharp f and v. We can put the papilli in and then also get rid of the black triangle space. You can really do it on the (rotational axis)(?). That's where we need to get our retention anyway and that's going to help block the dreaded black triangle.

So how do you pip it in the mouth and take off every you bit you absolutely must ? At delivery you put pip inside of the partial. Then you go to insert it and you find, hmmm, it won't go into place. Pull it out and look and you see that the back half is preventing the front from seating. So you adjust just the most minute amount three or four times until this will fit to place. You will see blanching, whitish tissue initially. You adjust that only if the blanching stays there when the back half goes to place. If it doesn't then the blanching is only temporary from the front half tipping in until the back half is seated. Don't grind this out unless you have to! You'll have a space there where food collects.

Break time. If you guys want a break go ahead, but I'm going to keep going.

Advanced Cases

Now we're going to zip along through extension base, and what you learned in summer, fall, and winter. What you learned then was the basic fundamentals. Get the five parts of a partial, master cast, design cast, index, write a work authorization and get it in. This is part one, and is under the framework design. The basic fundamentals, that is what we did. You also learned how to do the functional adjustment, the physiologic adjustment. This will learn how to do this in the clinic. You have go to learn how to master this. If you have an instructor who is a bit foggy on it or doesn't believe in it then go over to another instructor. We all have different strengths and weaknesses. Don't go through decades of ignorance if you don't have to.

Now we get into the toughy nasties.

Some people don't have what you want. This patient has at least plus 1 mobility, 60/40 crown root ratio and a nice canine with a crummy little guide plane. A scrawny guide plane and a big arch. Now you know that the retainers on that won't be very good because we don't have good solid teeth. We don't have good guide planes. But the periodontist says that you can pretty well stabilize the partial and this has a pretty good prognosis. Because of the sinus lift necessity and the patient not wanting a sinus lift, the patient did not want to have implants. The periodontist also felt that there would be other

teeth lost over the years. So we want something that is reversible and is economically reasonable. We are getting a partial.

So we're putting in our rests and we're putting on rests on teeth that might not normally also have rests with a partial [because of the perio problem]. To compensate for these little guide planes we're doing full palatal coverage. Now the finish line, instead of just coming around to the hamular notch, traverses over to the other side. Little metal handles are made off of the finish line to hold the acrylic. It also has a regular retention base ladder over here like any extension base would have. Coming around the finishing line to the other side are these little metal loops so that the plastic and metal will stay married together.

Maxillary Unilateral Partial

Now this is a nasty [slide of a maxillary arch that is completely edentulous on one side and only had a couple of teeth on the other side]. You think, should I do a full denture? You're not so sure. But a partial could do very well. For this particular individual he simply just didn't want to lose any more teeth and it came right down to that. The partial was successful and it maintained stability that you wouldn't get out of a denture. The secret was that the axis of rotation was not front to back, but is mesio-distal. The critical thing on this unilateral partial is that you must get bracing on the other side of the teeth. It works out better, regardless if it is an I-bar or C clasp, if the retention is on the palatal or lingual. That will drop out of contact when the partial is pushed into the tissue on the other side of the mouth. You then get the reciprocation on the buccal. If you don't do that and catch the tooth then this thing is not going to stay up in the mouth.

Mandibular Unilateral Partial

Let's look at some mandibular, which is would be more common. Usually when you get down to one or two or three teeth, they usually wind up being in the mandible. How many teeth in the mandible do you need in the mandible to have a partial denture? One good one. The most valuable one is the canine. What can the canine do for you? If it gives you nothing else it gives you horizontal stability. So that way you avoid that horizontal scrubbing around that you get from a lower complete denture. Alternatives to the canine would be implants. Or you could also have implants along with the canine. You can also have the canine and a premolar. The secret with these limited partials is full coverage! Notice that the acrylic goes down into the lingual. This is for tongue control so that the tongue is always sitting on top of the base. If you made the partial like normal the tongue could get underneath and pull the partial up.

Here' a one-toothier. It looks sort of ridiculous. You give the person retention that they wouldn't have unless they had an implant. If the tooth is lost then you can just add the prosthetic tooth and acrylic on.

Metal Framework Immediates

Can you do a metal framework that is an immediate? Generally not. If you do an immediate treatment partial [with metal] you must have tried in the framework before going to surgery. Never go to surgery with a framework that you have not tried in, because they are fussy to put in. [This means that the metal can only be in those areas where surgery and extractions are not being performed.] They are not like plastic where you can grind parts away and add to it.

In this case the vestibule is so deep that we can put the retention around and miss the four teeth that are being extracted. We can try it in. We can do an axis of rotation adjustment. We can actually do an altered cast in all posterior areas. Then we'll cut these teeth off and set them after we remount the case just like we did last fall in your immediate denture course.

In this other case we have a patient who will lose the incisors. The patient doesn't want a treatment partial and will go directly to the cast partial. Can we do it? Yes, but only because there is enough space here [in the vestibule] to tip-toe into it with adequate framework and hold these teeth and plastic. If there was not adequate bulk the patient would break the teeth right off. Again in this case we can do axis of rotation adjustment and do altered casts.

Mandibular Partials (with very few teeth)

One of the secrets for these handicapped partials on the mandible is to develop the lingual like a real good mandibular full denture. A real good mandibular partial will have a curved lingual surface and in the retromylohyoid eminence it goes into the retromylohyoid fossa and that curves a little bit. It's not for retention, it's to guide the tongue up on top of the partial so that it does not grab the edge of the partial and pull it up. So in the second molar area everything is curved and curves right down and follows the floor of the mouth a little bit. Over the genioglossus and back down you can see the curve and the part in the retromylohyoid will guide the tongue on the tongue platform.

There are teeth down here under the altered cast. We're not going to talk about the once piece altered cast. Now in some of these cases we have a root that we can not do a crown on due to the amount of root there. So we have two options. We can do an overdenture with a little attachment there or we can cut the other canine down and do endo there and do a bar between them.

Overdenture Bar

Now in this particular case we did a crown and overdenture and put this thing in. Nowadays most would use the bar method. All these attachments are very interesting. The bar is really common especially with implants. Dr. Nishimura will give you the course on implants this summer. Bars are especially common with implants because you can pretty much align things the way you want to. They make bars by the handful. With

natural roots they can be really tough. These roots that take the post or the dowel dome are not in the same direction so you have to cement one and then cement the other. Then you lock the bar down and then have an attachment so that the bar will fit into place. The example of the dowel domes and bar on the slide was a type 4 gold alloy. A plastic clip fits over the bar and actually allow for rotation so that you get an axis of rotation here.

Major Connector on the Buccal

Here are unilateral molars tipped to the lingual. You can't get a major connector on the lingual so you put it on the buccal. I show you this just to open your mind. To make you think big. Not, "I can't do it". You can do all kinds of things. Put the major connector on the buccal if it doesn't fit on the lingual. So what!

Close Tuberosity Space

Here we have a guy who is periodontally compromised. First he had a distal rest cut on the crown before, so don't use it. The heck with it. Just cut a mesial rest in. If you perforate it, just stick an amalgam in. Who cares?! There also was not enough space between his tuberosities in the second molar area. Now if you look at this and say, "I want to do tuberosity surgery." But, NO! Expand your thinking. How do we handle this? Try to give him as much coverage as you can do spread out the force as much as possible. So we're not going right across here at the vibrating line, since he's a gagger, but up just a little bit so we can get as much support as we can. Now we get back here and we have a thinness problem. We know that if it gets thin it is going to fracture. So what are we going to do? We're going to make him a brassier. How do you do these things? You do these by making an altered cast impression. Make sure there is metal here and you can take down the chrome cobalt to .3 to .5 mm and it won't perforate (where acrylic needs to be at least 2 mm thick or it will start to crack and split with time). You need to figure which way this will fit on so you *temporarily* take a round bur and make two divots and put some wax on to this little handle. You have made the framework first so you make these with the second framework casting. You don't put them on this first framework because we haven't done the altered cast yet.

So you do the first framework try-in using chloroform and rouge, then you do the altered cast and then you send these guys out for casting. What are we doing when these are out for casting? We're making a registration base. Of course, knocking off the little bumper, and taking a face bow and a bite and doing a try-in. So we're not losing any time. After we get it back from casting we'll grind off the orientation knobs, so we know we've got them in the right place. It's amazing what you can do with basic common materials and techniques.

Here we've got some little handles, some little loopers here. That can give us a very thin covering that is incredibly strong and still have a flange. You still have the option of relining this. You can run relining material over this flange and all the way around.

Overclosed Vertical Dimension

Lets look at this in a little more detail. Overclosed vertical dimension. He's on social security. He doesn't have much money. He doesn't have Delta Dental. What can you do for him? First we can teach him to brush off plaque better. We can put in one PFM and in for the rests, they can be put in natural teeth and where they perforate we can put in amalgam. It's not bad. Then the partial goes in and remember for the lower buccal cusp you come up on the lingual. OK. Map out the minor connectors and put them where there will be enough room and they will be strong and they will accept those lower anterior teeth. You can see on this premolar that the buccal cusp is a 'lookin' cusp' and the lingual cusp and the plastic behind it will be the chewing cusp. All the lower buccal cusps will be going against metal, acrylic, and whatever so that you can restore vertical dimension. Put them in strong and acceptant fossa.

Hypodontia

Many years ago one of our graduates left and went to New Mexico and I was on vacation. When I got back from my trip I saw that there was a package for me. He said there was a case he wanted me to see, but now it was too late. They had already extracted all the teeth from a 16 years old girl. She had hypodontia. [This made Dr. Berg upset.] You extracted all of the teeth because of hypodontia?! I don't want anybody in this room today to do this. Think it out and if you have to wait for me to get back from retirement or vacation or whatever.

A young adult presents with an overclosed vertical dimension. She had a familial twin sister who had absolutely gorgeous teeth and a brilliant personality. This high school girl, however was very shy and introverted and never, ever smiled. She is closed down. She is potentially a very pretty little lady, but has no social life and no dates. This is what we built for her. Aren't these interesting dentures? We didn't extract anything or crown anything. We didn't restore anything or even prepare anything. We took an impression. Notice that the upper has a bead seal so that her tough doesn't drive food in. You wouldn't put one in the lower, because the tissue is too thin. These dentures were incredibly retentive, because there was so much parallel tooth surface. Exotic, but simple. It's exotic because it's simple. The upper lingual cusps go into lower fossae out of metal. She will not lose any vertical dimension. Over the years the school has built her about three prostheses. You see the prosthetic teeth are essentially veneers. This is lingualized occlusion. We articulated the refractory casts so that we could get the cusps and fossae lined up right. The upper lingual cusps go down in there. Her vertical dimension is restored. At the 24 hour check she begrudgingly started smiling. When we had decided what to use for teeth we got her twin in and took the shade and size of teeth off the twin and found the mold that fit the best. We then took an impression of the twins teeth and made a study model. She went on to get married, has a couple of kids and lives in Hawaii. Her life changed. This was a student case. A couple students out in clinic changed this woman's life.

Hypodontia without reduced vertical dimension

This young adult came down from Bakersfield, also hypodontia. He had both permanent and secondary teeth. This guy did not have reduced vertical dimension. This would be the first thing to decide in this sort of case. Is the vertical dimension adequate or not? This farmworker had a mixture of permanent and deciduous teeth. We put him into a holly bow with lingual springs and planned to put in rests and finish him with partial dentures at the existing vertical dimension.

Hypodontia

Another case was a law student who didn't have two nickels to rub together, but was really a nice lady. She had a partial that she had to hold in with a half a pound of fixodent when she would go up to present her cases. She was very embarrassed about her teeth. She had hypodontia. Someone proposed that these teeth come out. NO WAY. If you take these out she'll have no jaw bone left. Take these teeth out if they have a dentigerous cyst, but otherwise don't. That is modified bone and part of her ridge. Her framework is going to be full palatal coverage. In the mandibular arch we have two incisors out in the vestibule and the denture sits over them. We brought the framework right out there and sat on them. Over in the back the teeth were tipped so we couldn't fit the major connector on the lingual so we put in on the buccal. We then went around and got retention on the lingual. See the finishing line? The major connector is on the buccal. If she doesn't get enough retention from her lower partial then we'll add a clasp to these front two incisors. What if she needed this clasp and the clasp irritated her lip. Well then we'd do an endo. Then we could put a crown on with an attachment. But in this case we didn't need it. She ended up with real good occlusion. Viola. I'll see you next week. [Applause]