

Walking Forward:

FINALLY! Easy Correction of Open Posterior Interproximal Contacts

by Rod Kurthy, D.M.D.

You've seen it just like I have. Those open contacts that occur in the posterior. They trap food, drive patients crazy, and in turn, our patients drive US crazy!

At a patient's check-up exam, you ask the patient how that crown (often a 2nd molar) is that you cemented six months ago, and the patient proceeds to tell you that they get everything stuck in-between the teeth next to the new crown every time they eat. And the patient is not too happy about it.

Uh-oh!! You already know what's happened. That darned distal molar has distalized, opening up a gap between the first and second molar. You're almost afraid to look. Yep, sure enough! There's an open contact that you could drive a truck through. And often times, the interproximal tissue looks like hamburger.

Geeze!! Now what? Do you tell the patient that the contact was nice 'n tight six months ago, and that you just don't know why the tooth moved? Do you do a class two filling on the adjacent tooth to re-establish a contact? Or with some embarrassment, do you tell the patient that you'll schedule them to replace the crown? And have you ever replaced a crown, only to have the next crown distalize too?! How about just telling the patient that the space is supposed to be there to make flossing easier, and to use floss every time they eat? (that's meant to be a joke)

If you're like most dentists, this situation has been a thorn in your side periodically. But how about if you could tell your patient that this happens sometimes, and that it's very easy to fix it, and that you can fix it right now, and it will only take a minute or two?

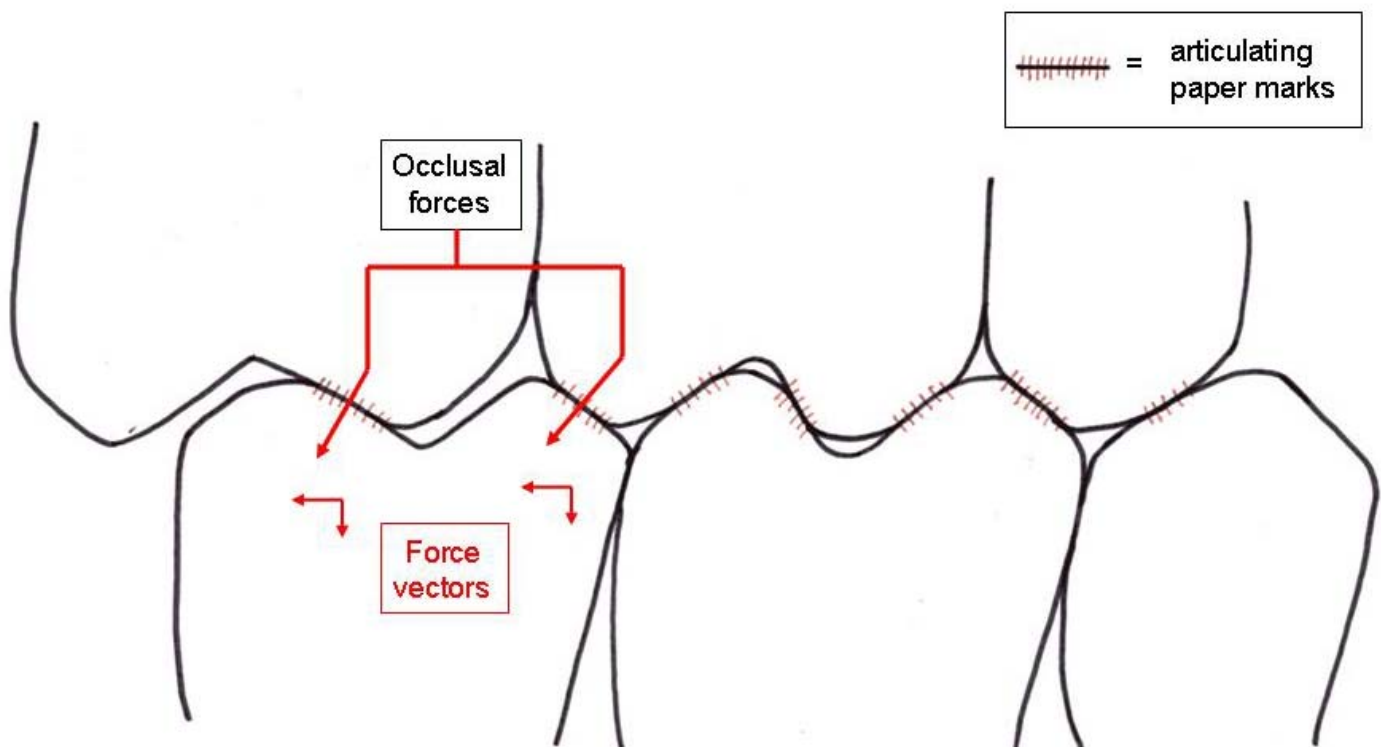
This article will teach you my "Walking Forward" technique, a non-invasive method which easily corrects the open contact and food trap by influencing the distalized tooth to migrate mesially again (Walking Forward).

The Cause

We know teeth move in response to orthodontic forces. And we know that the topography of the occlusal surfaces (cuspal inclines), when maxillary and mandibular teeth come into contact, cause various vectors of force in various directions. This is further complicated by the fact that our jaw does not function with a simple hinge movement – the potential excursions of the jaw are limitless. The sum total of these vectors of force will determine if a tooth migrates or not. In the diagram below you will see an occlusal situation (force vectors) that will cause the lower second molar to distalize.

Cuspal Incline Diagram – forces that originally caused distalization of the 2nd molar

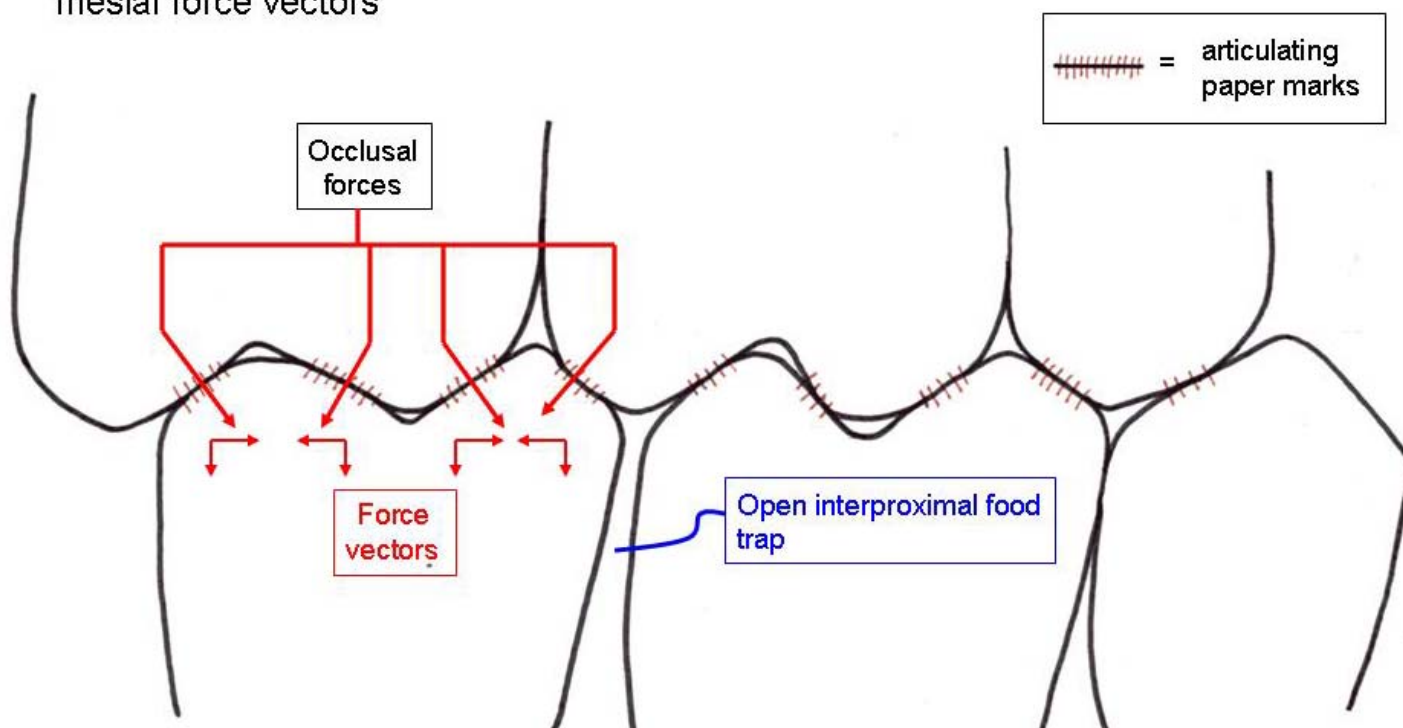
Below you will see the vectors of force responsible for causing teeth to distalize. You will see the contacts on the mesial inclines that will cause vectors of force moving the tooth distally.



In the next diagram you will see the tooth, having distalized to the point where all force vectors are equal (the mesial forces and distal forces are equal and cancel each other out). This is how your patient presents to you after the tooth has distalized.

Cuspal Incline Diagram – prior to any occlusal adjustments

The mesial and distal force vectors are equal and cancel each other out – tooth will not move mesially until all distal force vectors are removed, leaving only the mesial force vectors



Regardless of your attention to detail in creating an ideal occlusal scheme of a new crown, there will be at least some amount of movement of the tooth after the crown is installed. In our dental operatories, we cannot always duplicate all of the excursive movements that our patients have when they leave our offices. Most often, this movement is minimal and insignificant, and the tooth appears to maintain its position without problem. However, there are those times where a 'domino effect' occurs. The tooth moves a few microns, which brings it into contact with another cuspal incline. This creates a vector of force causing the tooth to drift in another direction, which in turn causes another contact against another cuspal incline, and so on and so on.

Before you know it, there is a gap between the molars and a food trap. We even see this with virgin teeth, simply because of normal wear of the teeth that creates changes in vectors of force, and the 'domino effect' can happen here too. But of course this domino effect drifting most often occurs after a restoration, especially a crown.

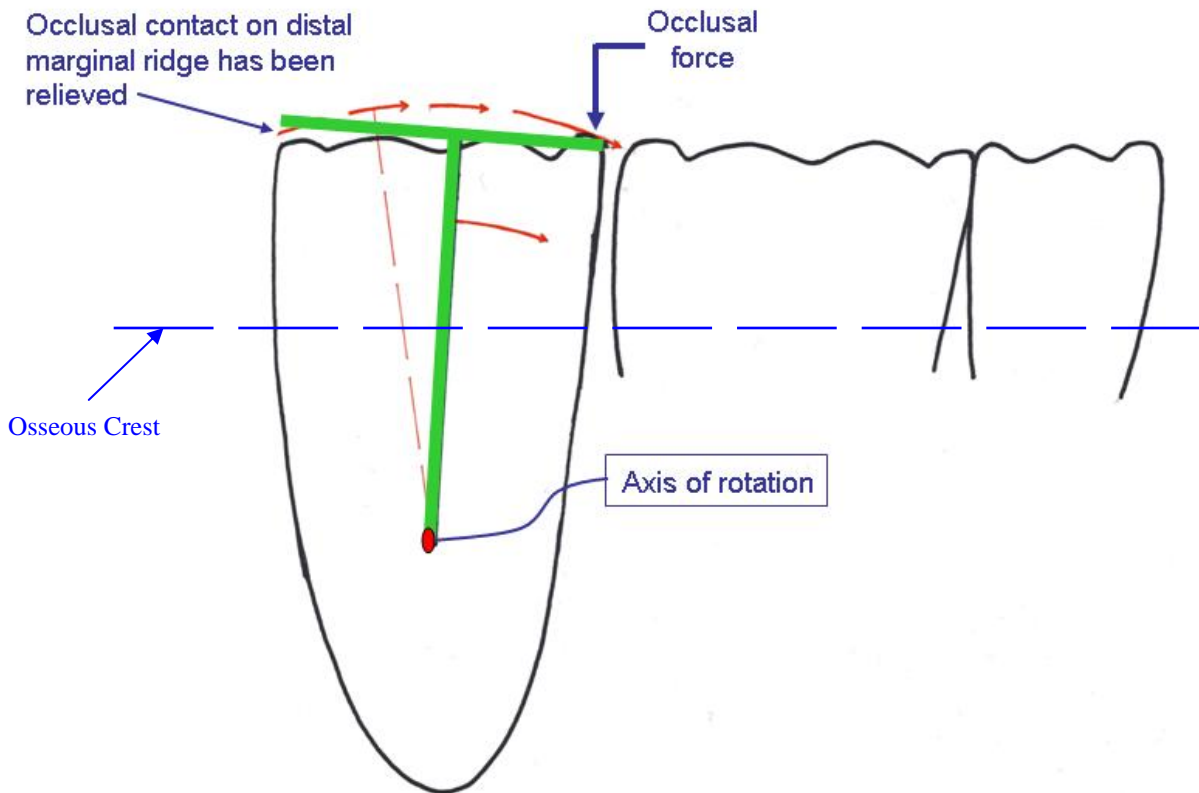
How do we fix this? Well, if vectors of force can cause unwanted movement to the distal, then it stands to reason that opposite vectors of force would cause active drifting to the mesial, thus closing the interproximal contact and correcting the problem.

Let's assume that the second molar has drifted distally, opening up a food trap between the first and second molars, often with accompanying intense gingival inflammation and edema in the open interproximal space. Mark the region with articulating paper and inspect the marks on the distalized second molar. You will see marks on cuspal inclines and on flat areas such as marginal ridges, cusp tips, and fossae. Look for vertical marks on the mesial marginal ridge of the distalized molar, and for marks on the distal inclines of the cusps on the mesial half of the tooth. These are the marks that will cause forces that move and tilt the tooth mesially (walk forward). These marks are "our friends". However, the marks on the mesial inclines and the vertical marks on the distal marginal ridge, as well as other vertical marks on the distal half of the tooth, are "our enemies", and cause the tooth to move distally. Marks on mesial inclines and the distal marginal ridge cause vector forces that push and tilt the tooth distally, which is the opposite of what we want. And the vertical stops on the distal marginal ridge and other vertical stops on the distal half of the tooth would tend to prevent the distal half of the tooth from moving in an occlusal (eruptive) direction, which is what happens when a tooth tilts (rotates) to the mesial.

See the green "T" in the diagram below. This represents the tooth and occlusal surface. This shows that teeth will not move bodily, but instead will rotate or "tilt". You can see that the axis of rotation is between the apex and the osseous crest, and that as the tooth tilts forward (which is what we want), the distal marginal ridge of the tooth moves occlusally (erupts). If the distal marginal ridge is in occlusal contact, this will prevent the mesial rotation/tilting. Therefore, the occlusal contact on the distal half of the tooth must be adjusted/relieved to make room for this portion of the tooth to erupt while the tooth rotates/tilts forward (Walking Forward).

Marginal Ridge Diagram

As the tooth tilts (rotates) to the mesial (around the axis of rotation) the distal marginal Ridge elevates (moves in an occlusal direction). If there is a vertical occlusal contact on the distal half of the tooth (such as the distal marginal ridge), or if during forced mesial movement (rotation/tilting) the distal again comes into vertical contact, this will prevent the further mesial movement of the 2nd molar. Another occlusal adjustment, removing distal vertical contacts would then allow more mesial movement/rotation/tilting.



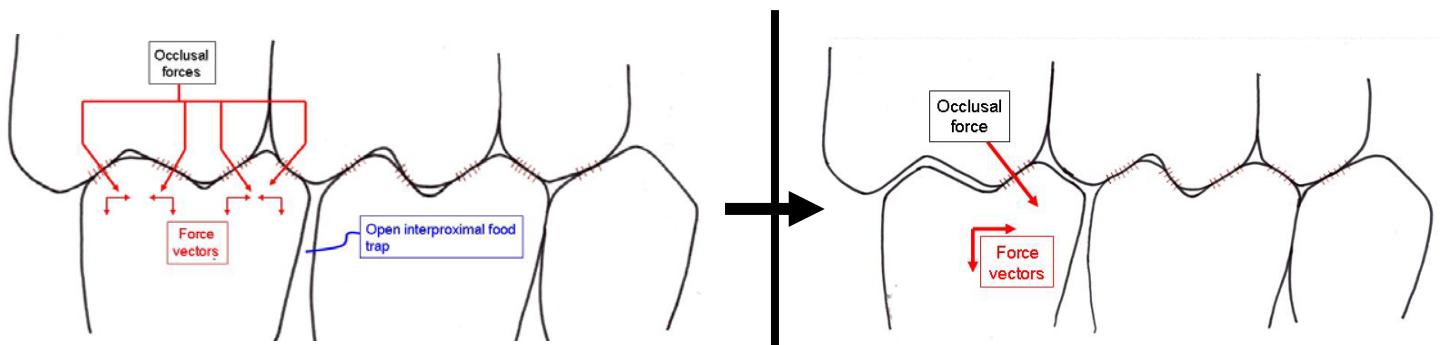
Correction Technique

Adjust the occlusion of the distalized tooth in the following way:

Leave vertical stop contacts on the mesial half of the tooth, especially the mesial marginal ridge. In the following photo you will see the distalized second molar, the large 'gap' interproximally, the intense gingival inflammation, and you will see that all other occlusal contacts have been relieved except the mesial marginal ridge. This tooth has been correctly adjusted to force Walking Forward of the distalized tooth.



If there is no contact on the mesial marginal ridge, create one by bonding a thin layer of composite on the ridge. Also, leave any contacts on distal inclines found on the mesial half of the tooth as seen in the following diagrams. In the diagram on the left, you see the condition the patient presents with. In the diagram on the right you see that all distalizing forces have been relieved, leaving only the distal incline of the mesial cusp to force the tooth to tilt mesially. This type of force, and especially vertical force on the mesial marginal ridge will cause the tooth to Walk Forward.



In the photo #1 above you may note that the only contact left after adjustment is on the mesial marginal ridge (no cuspal incline contacts were left) – this is because there was no incline contact on the mesial half of the tooth worthy of leaving. The most ideal situation would be to have BOTH a vertical contact on the mesial marginal ridge AND a contact on the distal incline of a mesial cusp. However, if you don't have both, you will simply utilize ONLY the mesial marginal ridge contact OR the distal incline of a mesial cusp.

The active contacts will now cause the tooth to tilt mesially – UNTIL the distal half of the tooth moves in an occlusal direction (due to the rotating) to the point where distal contacts are again re-established. At this

time the mesial movement will stop. Also, as the tooth tilts mesially, other cuspal inclines will come into contact. When the mesial inclines again come into contact, this will also prevent further mesial rotation. This will most often take about 2-4 weeks. Inform the patient that correction may take more than one adjustment visit.

If the open interproximal contact was originally minimal, often the contact will be fully closed at four weeks. However, if additional movement is needed, adjust the occlusion again and reappoint the patient in four weeks to again evaluate the movement.



In the above photo you will see that the second molar has moved medially. In doing so, it rotated mesially, causing the contact areas you see. Note the unwanted occlusal contacts. There is a contact on the mesial incline of the mesio-buccal cusp ridge. This is “our enemy”. Also you will see a vertical contact in the fossa area on the distal half of the tooth. This too is our enemy. In the following photo you will see that the enemy contacts have been relieved.



If the tooth has already moved mesially into contact, the above adjustment will not only prevent future distalization, but will secure that the contact pressure is adequate to prevent food trap. However, if the tooth had not moved mesially enough, this adjustment will cause it to continue moving mesially.

Whether or not the space has apparently closed fully, make appropriate adjustments. Most contacts will be closed after one or two adjustments, however, rarely more adjustments may be necessary.

In the event that there is no contact on the mesial marginal ridge, and if you do not have an adequate contact on a distal incline on a mesial cusp, it is very simple to acid etch the mesial marginal ridge and add a very thin layer of flowable composite to bring the mesial marginal ridge into occlusion. If the tooth in question has a porcelain crown, consider use of hydrofluoric acid to etch the porcelain on the mesial marginal ridge, followed by silane, bonding agent and flowable composite. Even though the flowable composite may not be as wear-resistant as we'd like, it will serve to help the tooth finish its mesial migration (tilting), and the other forces you've created should serve to hold it in place.

Use caution when using hydrofluoric acid in the mouth. It can be dangerous if it comes into contact with tissues. Use of eye protection and rubber dam with good interproximal seal is indicated. Also be sure that when you place this composite, you do not allow it to get into the open interproximal space, which would prevent the molar from Walking Forward fully.

Those with inquiring minds have already posed the question, "What about the physical law that states that each force has an equal and opposite force?" In other words, "Won't these vectors we are creating to influence the tooth to move mesially cause the opposing tooth to move distally?" This was also my original question. But in 25 years of performing this procedure at least 100 times on existing patients and new patients, I've yet to find even one case where the opposing tooth has moved distally. I think there may be three reasons for this. First, the opposing tooth has most likely been in a stable position for a number of years, and the tooth we are trying to move mesially has only recently (within a year or so) moved distally, opening up the interproximal contact. The bone may not be as dense around this tooth, and this tooth may be the one to "yield" instead of the opposing tooth. Second, we've all been told of the phenomenon of "mesial drift", which indicates that posterior teeth "want" to move mesially due to certain curvatures of the jaw. And finally, the vertical

forces on the mesial marginal ridge will typically occlude in a vertical fashion against the opposing tooth, striking it on a mesial cusp tip, causing it also not to drift distally.

In conclusion, the vertical stops will be your most important adjustments – if possible, make certain to have a nice, heavy contact on the mesial marginal ridge of the distalized tooth that you wish to “Walk Forward”. And remove all vertical stops on the distal half of this tooth. These vertical forces will cause mesial movement of the tooth in question with minimal to no effect on the opposing teeth. And keep in mind, when you make these adjustments you should tell the patient to be prepared to return to your office for additional adjustments after four weeks. I find that, depending on the size of the interproximal space, these usually require one to three adjustments. I may have had one or two cases with such large interproximal spaces that it required four adjustments.

Each time you make an adjustment, adjust ONLY enough tooth/crown structure to remove the articulating paper mark on the mesial inclines of the cusps, and all other markings on the distal half of the tooth.

It is my hope that the above information will save both you and your patients from the need to replace existing crowns, and that this information may also enlighten you regarding the occlusal contacts you should avoid when placing new restorations, so that you might avoid distalization whenever possible.

About the author:

Dr. Rod Kurthy is a full-time practicing dentist for over twenty-eight years in Southern California, USA. He is the author of six very popular books that teach dentists how to provide patients with incredible procedures that you'd have never thought possible, and how to flood your practice with patients who want YOU and are willing to pay for what they want. Rod has developed many clinical techniques, some of which you may be using, authored numerous dental articles, and his picture has appeared on the cover of several dental journals in the USA. He provides a DVD series that he periodically sends out to over 125,000 dentists throughout the USA. Rod is the recipient of numerous awards and other accolades. In March, 2005, Rod was selected the most respected and influential dentist of the last five years by over 60,000 members of www.DentalTown.com. You may find additional information at www.RodTheIdeaGuy.com.