

Orthodontic *versus* restorative: correction of mal-aligned anterior teeth

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The goal for this article is to help you think through the process of why you might consider orthodontics alone, or in conjunction with restorative dentistry, to help you treat your patients. Hopefully these six questions will give you a structure for that thought process. Every dentist has heard a patient say these exact words: “I don’t want orthodontics, can’t you make my teeth look better without me needing to wear braces?” The answer is sometimes yes and sometimes no – but how do you decide?

Introduction

The six questions you need to ask prior to making a decision, and also to convey the information that may be helpful in your conversations with patients are outlined below. What I know for sure, is that some patients with mal-aligned teeth can be treated only with restorative dentistry and get an excellent result, while others would be much better off with orthodontics.

I also know that a patient saying, “I don’t want braces”, doesn’t

necessarily mean they won’t do braces; it means they don’t **want** them. If after going through these six steps they say, “I won’t do braces,” there is a possibility they won’t, but in my experience there still is a chance they will.

Question 1: Will the teeth need to be restored even if orthodontics is completed?

One of the greatest benefits of orthodontics is that it can often eliminate the need for any

restorative dentistry, a great savings in terms of financial cost and tooth structure.^{1,3}

But if the teeth will need to be restored anyway, there has to be a compelling reason to do the orthodontics – something it brings that eliminates some other negative aspect that restorative dentistry alone can’t solve.

The first patient pictured is a perfect example of this question (*Figure 1*). She has very unaesthetic anterior teeth in terms of colour, facial erosion and failing old restorations.

Even if orthodontics was completed to align her teeth more ideally, she still would need the teeth restored.

In her case, orthodontics really wouldn’t eliminate the restorative need and all the other parameters of her case didn’t need orthodontics aside from correcting the alignment issue.

She was treated with restorative dentistry. (*Figure 2*)



Figure 1



Question 2: Can the occlusion be managed acceptably without orthodontics?

This question is used to address whether the occlusion can be developed to a level of functionality for that specific patient without orthodontics; it doesn't necessarily mean the patient should have an ideal class I molar or class I canine relationship.

The second patient pictured is a good example. (Figure 3) She is very young, early 20s, with an impacted maxillary right canine and peg lateral incisors. In addition the mandibular right canine is in cross-bite with the pegged lateral. She

presented for a second opinion regarding the impacted canine.

The first option was to devitalize the mandibular right canine, warp it to the lingual with a crown as much as possible to jump the cross-bite, extract the impacted canine, then do a three-unit FPD from the maxillary right first premolar to the maxillary right pegged lateral. This initial plan would be extremely compromised functionally over the remaining 70 to 80 years of her life.⁴ Instead, she was treated very conservatively with surgical exposure of the impacted canine, orthodontics to bring it into position and direct composites on the pegged lateral incisors (Figure 4).

Figure 2



Question 3: Is the most apical papilla level aesthetically acceptable?

This question is subtle and involves gingival aesthetics, specifically the levels of the interdental papilla. The reason this question is important is that it is easy to apically position a papilla surgically, which is often necessary in cases of anterior wear with secondary eruption, resulting in the teeth and soft tissues being coronally positioned.

But it is very difficult to surgically move a papilla coronally, and actually impossible if the reason for the apically positioned papilla is tooth alignment, such that the

Figure 3



Figure 5: Female who desires correction of the alignment of her anterior teeth, due to the rotation of the left lateral incisor, the papilla level between the left central and lateral is positioned apically.



Figure 5

Figure 4



Figure 6: image "A" shows the lateral rotation which has moved the contact apically between the lateral and the central blocking out the papilla. Image "B" shows the temporary central restoration with the correct width bonded in place, creating space, so ortho can correct the rotation.



Figure 6

interdental contacts extend too far apically. For this reason, if the most apically positioned papilla isn't acceptable, orthodontics is typically the only option for correction.

This is also true if the papilla is apically positioned due to interproximal bone loss; where extruding the adjacent teeth, and equilibrating their edges as they erupt, can move bone and soft tissue in a more coronal direction.

The third patient pictured is a good example for this question (Figure 5). She stated that she wanted an ideal smile in the form of 10 veneers and didn't want orthodontics. But the papilla between 21 and 22 is positioned apically due to the rotation of 22 (Figure 6).

She stated very clearly she would not consent to orthodontics, yet after helping her see that without orthodontics there would be a significant asymmetry between how the right and left sides looked after restoration, and that if she accepted the orthodontics she would only have to restore one tooth, the left central, she did accept orthodontic treatment. Because this is a problem

of tooth position, not bone, the papilla moved into an ideal position as 22 rotation was corrected^{5,6} (Figure 7).

Question 4: Is the most apical gingival margin level acceptable?

This question is similar to the third question, but involves the gingival margin levels. The largest difference between these questions involves the fact that it is very predictable to graft facial gingival margin levels in a coronal direction, if there is root surface exposed. In other words if the gingival margin is too far apical due to recession, but the tooth is properly positioned, then grafting is a great choice.

But if the most apical gingival margin level is unacceptable due to a lack of adequate eruption, and the tooth has no recession, orthodontic extrusion to bring the tooth and tissue coronally is usually the only predictable option.^{7,8} The fourth patient pictured is a great example for this question (Figure 8). This patient presented with irregular gingival margin levels, but the most

apically positioned gingival margins, the canines and 21 are acceptable, they don't need to be moved coronally. Instead, the more coronally positioned gingival margins on 11 and 22 need to be moved apically, which can be done without orthodontics.

But it is important to ask why the gingival margins are irregular – she has no tooth wear that would have lead to secondary eruption, and the eruption looks relatively normal when comparing incisal edge positions.

Instead what you see when looking from an occlusal view are the variations in facial lingual position of the anterior teeth. This leads to variations in facial gingival thickness, sulcus depth and gingival margin position. The right lateral and left central are positioned slightly to the facial, which thins the tissue, results in a facial sulcus depth around 1mm and more apically positioned gingival margins.

Teeth 11 and 22 are positioned significantly to the lingual, resulting in thicker tissue, deeper sulcus depths and more coronally



Figure 7



Figure 8

Figure 9



Figure 11

positioned gingival margins. The sulcus on the right central probes 2.5mm, the sulcus on the left lateral probes 4mm.

The challenge of not doing orthodontics in these cases, is managing the long-term post-surgical gingival margin position, since surgery isn't correcting the underlying root position, only the gingival margin position. This patient chose the non-orthodontic option. The first step in the surgical correction was to perform gingivectomies on 11 and 22, idealising the gingival margin position. In addition, the soft tissue dimension above bone on the left central, which had no surgery, was measured using sounding, it was 3mm⁹ (Figure 9).

The next step in the surgery is to sound to bone on 11 and 22, comparing the measurement to the normal 21. Even though 11 had 1.5mm of gingiva removed, and 22 had 3mm of tissue removed, both of their sounding depths remained 3mm, indicating no bone removal was necessary (Figure 10). The problem is the roots are to the

Figure 10



Figure 12

lingual, and the tissue will want to rebound.

Had orthodontics been used to correct the facial lingual position, the gingiva would have been correctly positioned and stable. As it was done surgically, and the teeth are to the lingual, the restorative emergence profile on the facial has to be quite prominent to avoid the rebound.¹⁰ The 10-year recall photograph of the final result shows an acceptable result on the 11, but definite inflammation and redness on 22 (Figure 11).

Question 5: Can an acceptable contour and arrangement be created without orthodontics?

This question addresses something I am asked frequently during workshops or seminars; a student walks up with a set of models and asks, "Do you think I can do this case without orthodontics?" The models typically show very crowded teeth, or teeth with large diastemas present. Often times in cases of crowding, the papilla levels or gingival margin levels will dictate

the need for orthodontics, if an ideal result is desired. But regardless of the presentation of crowding or diastemas, the definitive way to identify what is possible is to perform a diagnostic wax-up.

The fifth patient pictured is a perfect example (Figure 12). He presented with pegged lateral incisors, and large diastemas in both the maxillary and mandibular anterior. He desires an improved smile, and is willing to have orthodontics. He is in his 50s, and has no occlusal or functional issues and his papilla levels and gingival margin levels are acceptable. What orthodontics could potentially do is eliminate the need to veneer the centrals and canines, as the laterals would need to be restored regardless.

I presented the orthodontics versus non-orthodontics option, and explained the only way to truly visualise the result would be a diagnostic wax-up, which the lab completed (Figure 13). The wax-up shows the spacing is easily managed without any need for orthodontics. The challenge of diastema closure cases with

Figure 13



Figure 14



Figure 15



Figure 16

restorations is carrying the restoration subgingival on the interproximal. If you don't, you get essentially a ledge, or overhang of restorative material when carrying the contact to the tip of the papilla. In addition, the papilla will remain more blunted instead of taking on an ideal form. I personally find it easiest to manage the subgingival margin position with retraction cord, carrying the prep margin 0.5 to 0.7mm below the tissue. (Figure 14). This allows the laboratory to create a much smoother emergence profile interproximally, which ultimately leads to a better papilla form in the final result (Figure 15).

Question 6: Can the restorations be done without structurally debilitating the teeth if orthodontics isn't completed?

This question typically shows up when significant tooth preparation would be necessary to correct tooth malalignment, such as the facially inclined left lateral incisor seen in Figure 16. He is a male in his 50s, who desires a more pleasing smile, correcting the malalignment of the

anterior teeth. The position of his 22 is ideal in a facial lingual perspective, so the plan is to move 11 to the facial, and the 22 to the lingual. The problem is he doesn't want orthodontics. Prepping the 22 enough to bring it into alignment will not only devitalize the tooth but will leave minimal tooth remaining to retain the restoration.

I presented the option of leaving the 22 out to the facial to avoid endodontics, but he didn't want that either. He had already had a dentist who had tried to align the 12 with a crown and ended up requiring endodontics on it, so in the end he chose the orthodontic option (Figure 17). Because the orthodontics corrected the facial lingual inclination issues of all the anterior teeth, conservatively prepped veneers were used to correct the final position and appearance of all the teeth except the previously crowned 12 (Figure 18).

The one thing that orthodontics doesn't always predictably correct is facial gingival margin levels. In his case the previously crowned 12 had

its gingival margin level too far apically positioned, because the root is facially inclined. Eruption was used during the orthodontic treatment to attempt to move the gingival margin level to a more coronal position; the tooth erupted but the facial gingiva didn't move^{11, 12} (Figure 19).

What the eruption did do was to expose root, so had it been critical to have the 12 gingival level ideal – it would now be possible to move it coronally with grafting. In his case, since his high lip line never showed the gingival levels, it was left as is and the restoration carried to the gingiva to hide the dark root (Figure 20).

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Figure 17



Figure 19

Figure 18



Figure 20

