Orthodontics and esthetics: A multidisciplinary approach

Authors: Julia Garcia Baeza, DMD, and David Garcia Baeza, DMD

These days, we are seeing a growing number of adult orthodontic patients. However, adult cases present unique challenges to the orthodontist. Missing teeth, root canals and periodontal problems are all common situations when dealing with adult patients.

 Unrealistic esthetic expectations are another challenge when dealing with adult patients. This is the patient who comes in with a request that his (or her) smile look like his favorite movie star. That’s why it’s important to make sure the patient has a firm grasp of what is possible and what is not.

 The patient should know that we have the ability to level and align teeth, to coordinate arches and to improve occlusion, but we do not have the ability to change the texture of the enamel or the shape or form of teeth.

 With adult treatments on the rise, establishing a good multidisciplinary team is essential. This is a two-way street. Just as a secondary team of specialists can be essential to achieving a successful orthodontic outcome, orthodontics is also a valuable tool for other specialties to have at their disposal. This includes esthetics, but can also be a means to improving the health of the soft and hard tissues.

 We’re going to look at a case that will highlight the importance of the orthodontist in working with other specialties.

 Case report: Part I

 In this case, the patient had a trauma and presented the left central incisor apically displaced (Fig. 1). The patient not only showed a fracture of the left central incisor, but also an apical displacement of the root (Fig. 2), taking the gingival margin to a higher situation (Fig. 3).

 This case could be approached in two different ways: extracting the damaged tooth and placing an implant or extracting the damaged tooth and regeneration (with the risks that regeneration entails).

 The risks associated with implantology include the loss of soft tissue and the loss of volume when implants are placed. This means that if the starting point of the gingival margin is higher than it should be after the implant placement, the gingival margin will be even more apically. This means a complete asymmetry of the soft tissues.

 With this aspect in mind, the vision of a prosthodontist is to extract the damaged tooth while trying to increase the soft and hard tissues to avoid the gingival margin asymmetry between both central incisors.

 These types of treatments are technique sensitive when mucogingival procedures are involved. Orthodontists must show their colleagues that they have the tools to help improve situations such as the one presented in this article.

 In this case, the orthodontist can make the situation more favorable for the prosthodontist. The left central incisor was to be extruded in order to bring the gingival margin even lower than the right central incisor. As we said before, what the prosthodontist is simply looking for is a favorable situation.

 When the gingival margin of the left central
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incisor is higher than the right central incisor, the situation is complicated. When the gingival margin is at the same level, it is less complicated. However, when it is even lower, the problematic situation of losing soft tissue might not be entirely solved, but it is a much more favorable situation.

In this case, the extraction of the tooth was expected from the very beginning, so why not use it before its extraction by bringing the soft tissue to a better position by using different orthodontic forces and vectors and facilitate the work of the rest of the multidisciplinary team?

Depending on the type of extrusion, soft or hard tissue can be extruded. The boundaries of hard and soft tissue extrusion are not clear in the literature. Yet, what is clear is that soft tissue will come down with an extrusion. In the case shown here, the new soft tissue formed after the orthodontic extrusion will help the outcome.

In the next peripheral radiographs (Fig. 4), the extrusion of the left central incisor is shown as a visual reference of the orthodontic extrusion, so the excess of gutta-percha can be used. A 4 mm displacement of the root was created, which was the amount of gingival margin needed for the prosthodontics to work (Fig. 5). At this point, the gingival margin of the left central incisor is even lower than the right central incisor. The amount of hard tissue extrusion in this case was almost imperceptible.

In these types of cases, an excess of soft tissue will facilitate the implant surgery (Fig. 6). Even though new soft tissue is formed orthodontically (vertical dimension), every time an implant is placed in the anterior zone, a soft-tissue graft is performed at the time of the surgery at the buccal zone. This is how the prosthodontist will reproduce the volume of soft tissue in the area of the implant (Figs. 7, 8). This will help avoid future translucency of the implant.

Once the braces are placed, the orthodontist can solve the small rotations to achieve a better situation in the anterior zone.

During the healing period (Fig. 9), no orthodontic movements must be done. It is of great importance that during this period, the temporaries perfectly seal the soft tissue. A comfortable temporary is fabricated to use during orthodontic treatment. Because of the round wire used at this point in the treatment, we use a stainless-steel ligature to fix the brackets and avoid any orthodontic movement. The temporary will seal and protect the soft tissue of the compromised area (Fig. 10).

Two months after surgery, the soft tissue presents healthy and the soft tissue at the compromised area is below the level of the gingival margin of the right central incisor.

Case report: Part II

Orthodontic treatment in this multidisciplinary case was used not only to align the teeth but also to extrude the left central incisor (which was going to be extracted from the beginning) in order to create a more favorable situation for the rest of the specialists.

The treatment plan option for this case was set up before starting the orthodontic treatment. A tooth replacement was planned for the left central incisor, and a veneer was planned for the right central incisor to achieve a great esthetic result.

Knowledge of the treatment plan before beginning will allow the orthodontist to help improve future restorative procedures.
409
Cases currently in treatment

309
Cases awaiting treatment

379
Participating Orthodontists

$1,909,848
Value of treatment provided

$4,216
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Aligning for good

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At this point, everything that could possibly be done for the left central incisor was finished. However, could the orthodontist help with the future restoration of the right central incisor?

When tooth preparation is done for a future veneer, the prosthodontist will remove the enamel. Even though adhesion to dentin is good, adhesion to enamel is better. When prosthodontists work with veneers, if they can bond to enamel they will improve the result.

Having this knowledge, the orthodontist can still create a more favorable situation for his or her colleagues. In this situation, if the right central incisor was placed a little more lingualized, the amount of tooth structure that will need to be removed for the veneer preparation will be less.

Would it be possible for the orthodontist to lingualize that tooth? How is the orthodontist going to control the amount of tooth displacement? In this case, a composite veneer was built on the buccal face of the right central incisor (Fig. 11). The future veneer has a thickness of 0.5–0.8 mm. The same thickness was built for the composite veneer. A caliper was used to confirm the thickness before and after the composite veneer was placed. The orthodontist placed the bracket on top of the temporary veneer, and the tooth was palataly displaced 0.5–0.8 mm. This way, the tooth preparation will be less aggressive, and the final veneer will have better adhesion to the enamel than to the dentin.

With the orthodontic treatment in this case, we achieved a more favorable situation with the soft tissue around the tooth that was going to be extracted, and a more advantageous position for the other central incisor via a less aggressive tooth preparation. After the orthodontic treatment, it was time for the rest of the specialties to take over the case.

Model (Fig. 12) wax-ups for the temporaries (not only for the extracted tooth but also a wax-up of the veneer) (Fig. 13) enable us to achieve the best symmetry after orthodontic treatment. The relatively long temporaries phase (Figs. 14a, b) helps encourage a successful result (Fig. 14c). After the patient and the prosthodontist are satisfied with the provisional results, another specialist plays a role in the patient’s treatment. The lab technician needs as much information as we can offer to be able to achieve the proper color and shade. Color guidance (Fig. 15) photographs and models should all be provided to the lab technician.
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Figure 16 shows the minimal amount of tooth preparation that was needed before the veneer placement because of the orthodontic treatment. Figure 17 shows the importance of the soft-tissue extrusion and the connective tissue graft placement at the surgical site. This will maintain the buccal volume to achieve a great emergence profile to recreate the final tooth (Figs. 18–20).

**About the authors**

Julia Garcia Baeza, DMD, is a diplomate of the American Board of Orthodontics and a member of the Spanish Society of Orthodontics and American Association of Orthodontics. She received her DMD from the European University of Madrid; and her certificate in orthodontics and master’s of science in oral biology from the University of Pennsylvania. Garcia Baeza’s interest in research in orthodontic appliances now finds her in a PhD program at the University Complutense of Madrid. She has published in various research and orthodontic journals and presented an investigation at the 2010 IADR meeting in Barcelona and at the 2012 EOS meeting in Santiago.

David Garcia Baeza, DMD, is a 2002 graduate of the European University of Madrid. He received a certificate in dental implantology from the European University of Madrid in 2006 and a master’s in oral biology from the University Complutense of Madrid in 2007. Garcia Baeza has been running a multidisciplinary dental practice, CIMA, in Madrid since 2005. He also serves as both an associate professor and assistant professor at University Europea of Madrid and University Complutense of Madrid. He’s had numerous articles published in the leading Spanish-speaking orthodontic journals and remains a sought-after lecturer in the greater European area since 2008.