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Three Solutions for Congenitally Missing Lateral Incisors: A Photo Essay

By Ricardo Mitrani (/spear-review/author/ricardo-mitrani/) on June 21, 2022 | (/bookmarks/bookmark/39923)

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Addressing congenitally missing lateral incisors is a common condition that justifies an interdisciplinary solution, such as canine substitution, resin-bonded single retainer bridge (resin-bonded fixed dental prostheses or RBFDP), cantilever bridge, or a single-tooth implant (https://www.speareducation.com/spear-review/category/implants). But delivering the most efficient and predictable solution can be challenging based on a patient's specific situation, such as age, space availability, hard and soft tissues, finances, and patient preference. This photo essay covers the first three of the four solutions. An upcoming article will discuss the fourth solution for addressing congenitally missing lateral incisors, a single-tooth implant.

Solution #1: Canine Substitution for Missing Lateral Incisors

Canine substitution is the least invasive option and a popular alternative, but it often poses esthetic (/spear-review/2013/08/evaluating-facial-esthetics-facial-profile) and functional challenges that need to be considered and cleared (Fig. 1). From an esthetic standpoint, the canine's shape and shade must be considered. From a contour standpoint, the width of the canine should be evaluated because they are generally larger than lateral incisors.

Figure 1: Accentuated dissimilar contours between the canine and the peg-shaped lateral make for a challenging esthetic situation.

But the most critical aspect to manage is the CEJ width because it cannot be narrowed. The wider the tooth at the CEJ, the more difficult it is to make a canine look like a lateral incisor. Moreover, canines typically present with a very distinctive root eminence, and if it is particularly accentuated it could become yet another esthetic challenge — one that is commensurate with the patient's lip mobility.

For patients where the gingival outline is concealed by a low lip line, there is no major esthetic concern, but if there is high lip mobility and the gingival outline is not concealed, such eminence could represent an unacceptable esthetic problem.

From a shade standpoint, canines are normally the teeth with the most saturated chroma in the maxillary arch, which often creates an esthetic challenge where this oversaturation is evident.

Consequently, considering these aspects, the ideal clinical scenario for canine substitution (/spear-review/2013/11/when-is-canine-substitution-appropriate-ed) would be in patients with smaller shaped canines that are not oversaturated with chroma and in patients who display low lip mobility.

Solution #2: Resin-Bonded Fixed Dental Prostheses (RBFDP)

RBFDP is a proven solution for congenitally missing lateral incisors (Figs. 2-12). Although it is considered an interim restoration, there is a substantial body of evidence in the literature that supports its long-term potential. However, the clinical performance of an RBFDP is significantly superior to that of a bilateral retainer, and this is explained by the dissimilar mobility of the abutment teeth.

When placing an RBFDP (https://pocketdentistry.com/minimally-invasive-restorations-resin-bonded-fixed-dental-prostheses-rbfdps/) from a central incisor to a canine, each abutment wants to move under occlusal load, but because of the position each tooth occupies in the arch, loading occurs in different vectors, therefore, leading to debonding of the retainer of the abutment tooth with the least mobility. When considering which one of the adjacent teeth will work best as the abutment, the clinician needs to evaluate:

- Which tooth has more enamel?
- Which tooth has more interocclusal clearance?
- Which tooth is exerting less functional load?

From an occlusal standpoint, patients with shallow overbites or a large amount of overjet make better candidates for RBFDP and it is important to avoid the pontics in all lateral excursions, including crossover.

Space requirements and connector dimensions depend on material selection. Utilizing zirconia (https://online.speareducation.com/course/adjusting-and-polishing-zirconia-restorations) has been proven to be more predictable over time, and recommended connector dimensions are:

- 3 mm in height
- 2 mm in width
- The retainer wing thickness is 0.7 mm

The amount of tooth reduction is based on available interocclusal space, and often there is enough space requiring minimal preparation. The key is to stay in enamel. It is also advisable to stay 2 mm away from the incisal edge so that the zirconia retainer does not affect the translucency of the natural tooth.

If the patient has a deep overbite, proclined, or mobile abutment teeth, then an RBFPD may not be the best treatment option. This is why they are more often used as a long-term provisional until the patient is old enough to have an implant placed.

Figure 2: Post-orthodontic with bilateral congenitally missing lateral incisors.

Figure 3: Post-orthodontic with bilateral congenitally missing lateral incisors.

Figure 4: Post-orthodontic with bilateral congenitally missing lateral incisors.

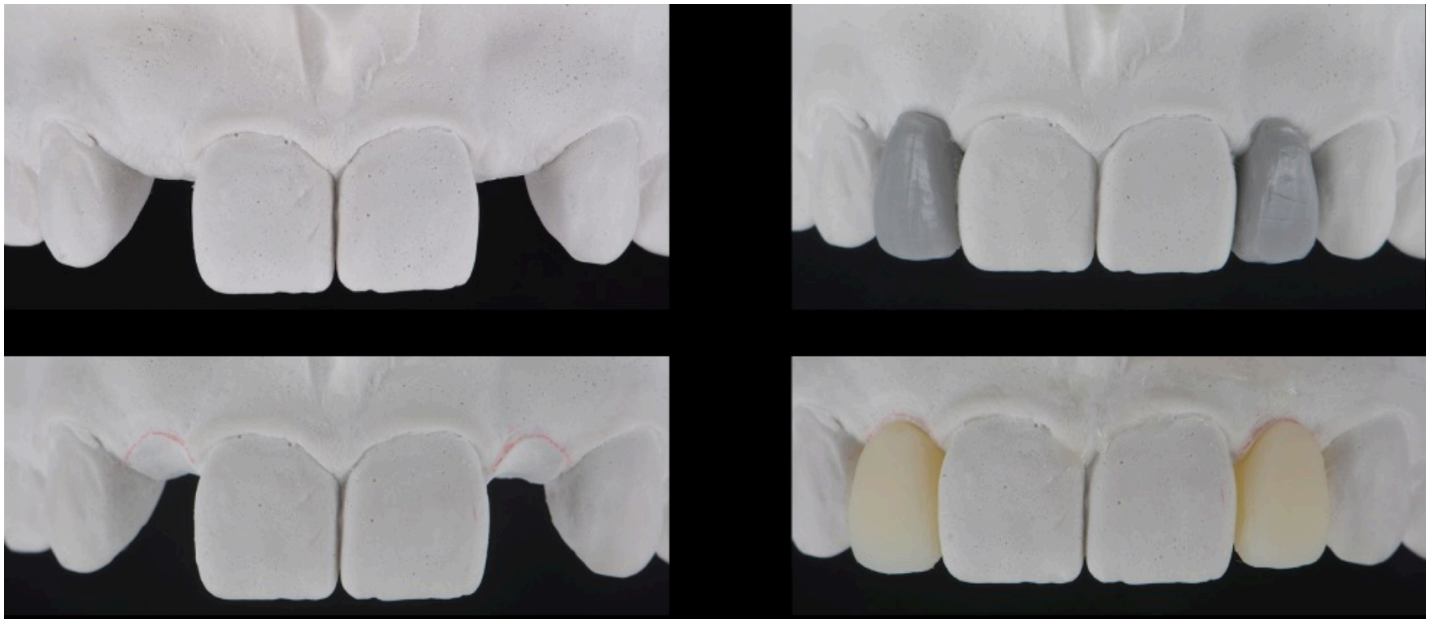

Figure 5: Fabrication of a flipper-type of provisional to groom the soft tissues.

Figure 6: The gingival architecture is groomed to create a more pleasing outline.

Figure 7: A zirconia-layered single retainer RBFPD is fabricated.

Figure 8: A zirconia-layered single retainer RBFPD is fabricated.

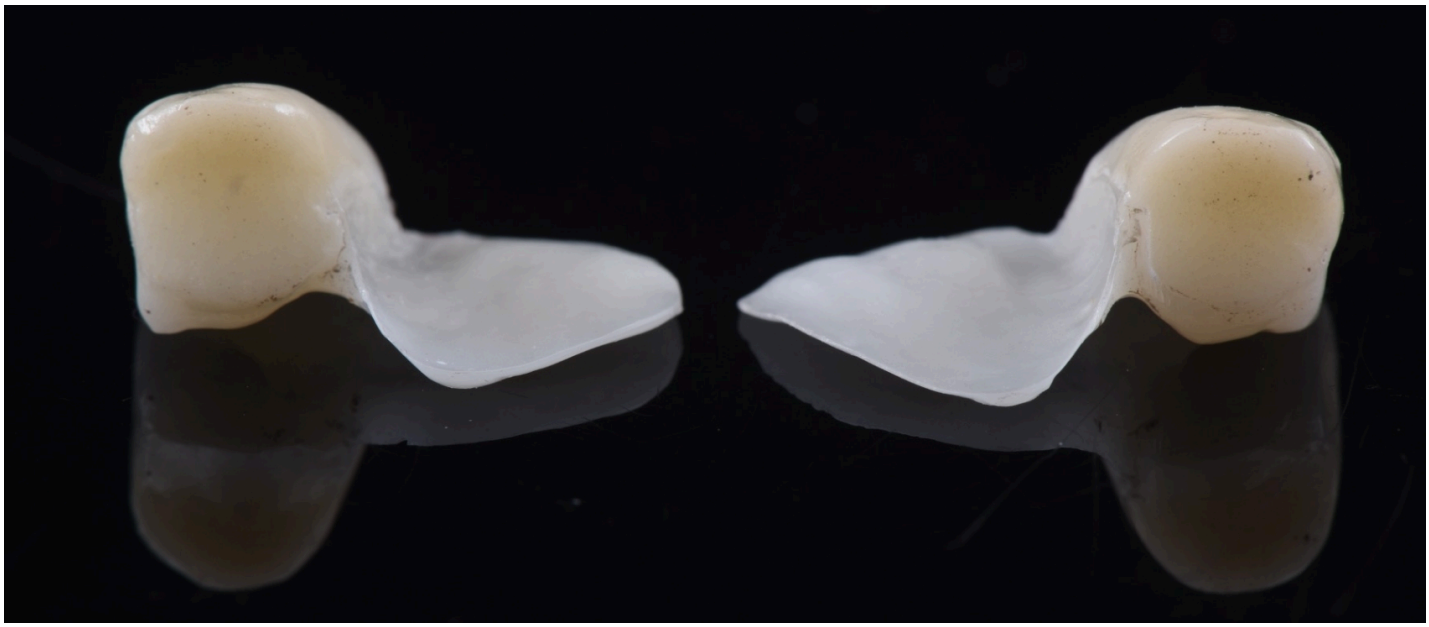

Figure 9: A zirconia-layered single retainer RBFPD is fabricated.

Figure 10: RBFPD is bonded in place.

Figure 11: Occlusal aspect of the single-retainer RBFPD.

Figure 12: Dento-labial integration of the RBFPD.

Solution #3: Cantilever Bridge

A fundamental principle in contemporary therapy is to conserve tooth structure by being as minimally invasive as possible. Today, doing a full-coverage restoration on intact natural teeth is extremely difficult to justify, but there are specific conditions where a cantilever bridge can be considered a choice solution.

In this case, a 16-year-old female (Figs. 13-23) presented with congenitally missing lateral incisors with significantly under-sized canines that were out of occlusion. Both these specific features meant that from a functional and esthetic standpoint (tooth position and size) the canines required additional contour to attain a favorable occlusal contact, as well as, a more dominant contour, which is characteristic of a maxillary canine.

Hence minimal preparation was needed to meet the space requirements needed for the restorative material. A purely additive wax-up was required to attain a mockup, verifying that the proposed contours were esthetically pleasing. This can be obtained either by an analogic approach (Fig. 15) or a digital approach (Fig. 16).

Incisally, there was no reduction required, the reduction was minimal, and from a cervical perspective, a 0.5 mm finish line was prepared (Fig. 17). This allowed our team to do a fundamentally additive design.

It is important here to emphasize that even if the age and preference of the patient allowed us to plan for an implant-supported restoration (https://campus.speareducation.com/seminars/implants-the-surgical-restorative-connection/details/syllabus/) to replace the lateral incisors, the need to enhance the contours of the canines would still be required to provide a functional and esthetically pleasing result.

The under-sized canines were out of function, which removed all excursive protection for the lateral incisors. This provided a unique opportunity and indication for the most conservative scenario of a cantilevered RBFDP.

When considering a zirconia crown (https://allreddentistry.com/whats-so-special-about-zirconia-crowns/), we needed to ensure there was sufficient room for the wall thickness to be a minimum of 0.3 mm (ideally between 1.0 mm and 1.5 mm), an incisal reduction of 2.0 mm, and visible and continuous circumferential chamfer with a reduction of at least 0.5 mm at the gingival margin. The patient's preliminary condition allowed us to accomplish these space requirements with hardly any tooth reduction (Fig. 17).

RBFPD has an exceptional record so this cantilever bridge can be considered a long-term solution, but if in the future an implant-supported restoration is desired, the pontic of this cantilever can be removed and an implant could be placed and restored.

Figure 13: A pre-op image of a post-orthodontic patient with congenitally missing maxillary lateral incisors with significantly undersized canines and interocclusal space.

Figure 14: A pre-op image of a post-orthodontic patient with congenitally missing maxillary lateral incisors with significantly undersized canines and interocclusal space.

Figure 15: Analog wax-up and mockup.

Figure 16: Digital wax-up and mockup.

Figure 17: Sagittal view of the silicone matrix showing the minimal reduction needed to attain optimal space for the ceramic restoration.

Figure 18: Occlusal and facial views of the scanned preparations.

Figure 19: Facial and intaglio aspects of the zirconia layered cantilevered RBFPD.

Figure 20: Clinical intraoral views of the zirconia layered cantilevered RBFPD.

Figure 21: Clinical intraoral views of the zirconia layered cantilevered RBFPD.

Figure 22: Pre-operative and post-operative images.

Figure 23: Over imposition of the pre-and post-operative images depicting the additive nature of the restorations.

Solutions for Congenitally Missing Lateral Incisors

This photo essay covers the first three of the four solutions for addressing congenitally missing lateral incisors. These were canine substitution, resin-bonded single retainer bridge (resin-bonded fixed dental prostheses=RBFDP), and cantilever bridge. The next article in this discussion will address the fourth solution for congenitally missing lateral incisors, a single-tooth implant.

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