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Temporarily Replacing Congenitally Missing Maxillary Lateral Incisors in Teenagers Using Transitional Implants

by Dr. G. William Keller

It is a common dilemma! A teenager whom recently completed orthodontic therapy with congenitally missing lateral incisors now requires some type of transitional appliance to replace those missing teeth. To this point in time, few restorative options have been available.

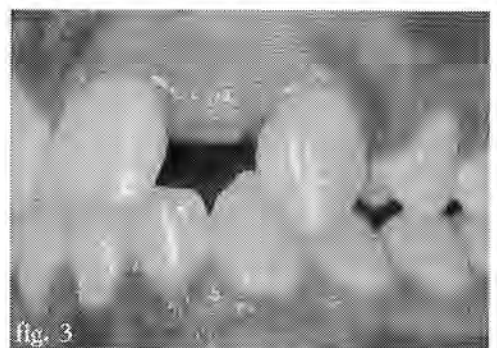
As a transition, the removable appliance is the first choice amongst orthodontists. Not only does it replace the missing teeth, but also functions as an orthodontic retainer. Orthodontic retention is very important post active therapy for at least 9-12 months in which the patient wears the retainer 24 hours a day to allow for proper bone remodeling. The inconvenience of this appliance is quite obvious, especially when eating and talking. The social embarrassment of showing "no teeth" when eating in front of their friends can be quite disturbing.

Bonded Retainer

The Maryland Bridge satisfies the dilemma of a removable prosthesis. However, we all know its disadvantages, especially if this is not going to be the final restoration. The bonded retainer is more difficult to maintain because of its fixed attachment to the adjacent teeth and tends to debond with occlusal stress. In order to create a more "permanent" appliance, undercuts or grooves may need to be placed on the lingual of the adjacent teeth.

Transitional Implants

A unique approach involves the use of transitional implants that are normally utilized to support partially and/or fully edentulous provisional restorations and have been widely discussed and documented in the literature.¹⁻⁴ Using these fixtures to retain a provisional restoration in a single tooth gap created by congenitally missing laterals in a teenager has not yet been published. This article describes such a process.



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The significant success rate of osseointegrated implants is well documented. The recommended minimum age for a patient considering such treatment is somewhat vague. If we use accepted criteria regarding implant placement in the growing child, then a number of young patients whom have congenitally missing teeth, specifically lateral incisors, will need to wait 3-5 years before having permanent replacements; the temporary alternatives have been limited with numerous disadvantages.⁵

The transitional implant work-up is similar to that of permanent implants. It is comprised of a thorough medical/dental diagnosis and history with periodontal evaluation, radiographs and models.^{6,7} The treatment plan coordinates the surgical, restorative and laboratory procedures so that the provisional restoration can be placed within 24 hours after MTI placement [Modular Transitional Implants – Dentatus, USA, (800) 323-3136].

In most cases, the patient has completed orthodontic therapy and is wearing a removable orthodontic retainer. It is important that the orthodontics has been completed and proper inter-radicular distance of the adjacent teeth is adequate, not only for placement of the transitional implant, but also the permanent fixture. The orthodontist will need to modify the existing retainer or remake a new one after the provisional teeth are in place.

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Surgery

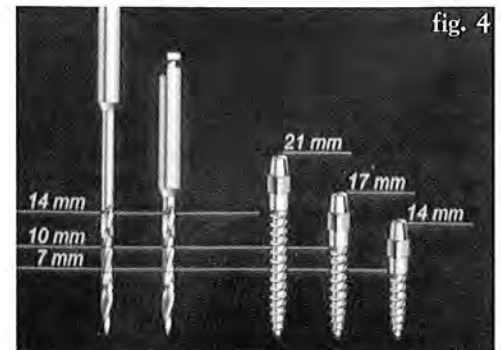
Before beginning the surgical procedure, the length of the MTI's are selected [14, 17, or 21 mm], as well as the MTI profile drills and ancillary items, which must be sterilized before use [fig. 4].

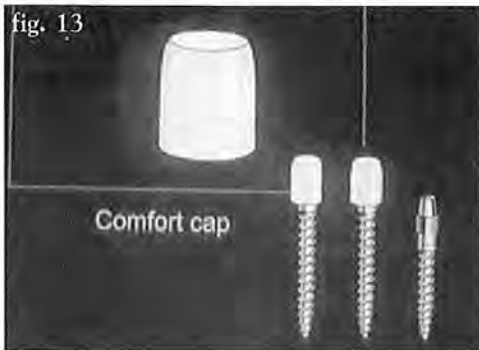
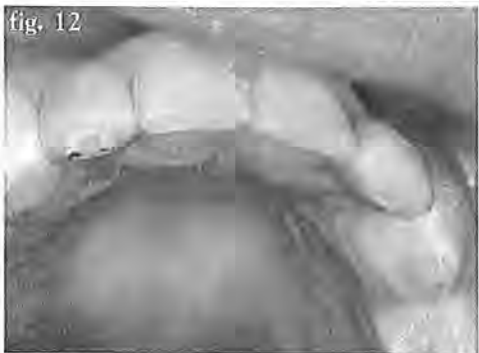
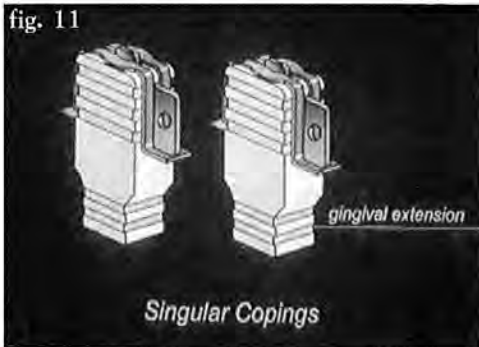
Once adequate anesthesia has been achieved, the osteotomies are performed in the edentulous sites created by the congenitally missing teeth. In most cases, the osteotomy is done without incisions or the use of a surgical flap. This is accomplished quite easily with the use of the pointed [long] 1.3 mm diameter profile twist drill. It is important to be parallel to the palatal taper due to the presence of labial concavities [figs. 5, 6].

Once you have achieved your pre-determined distance [it is recommended to drill to the deepest depth possible], you insert the MTI fixture manually or with the implant handpiece adapter. Due to the approximate 3 mm of transmucosal distance from the osseous crest, you must account for this when drilling the osteotomy. Once the MTI fixture is placed to the pre-determined depth, be sure the slot on the fixture is in a mesial/distal direction to accommodate the restorative component. The fixture can then be bent to the ideal position for restorative purposes.

Technique

When the surgeon is satisfied with the position of the MTI in all three dimensions, the patient undergoes one of two options: (1) Placement of an impression coping seated completely into the slots of the MTI fixture, so that a final impression can be taken. This





laboratory-fabricated provisional is returned within 24 hours for cementation by the restorative dentist. (2) A provisional crown is fabricated chairside using the proper modular unit. Preferably this should be done with a coordinated appointment between both surgical and restorative offices.

After the provisional is cemented with a permanent cement, it is not removed until the patient has matured biologically where a permanent fixture can be placed or if the provisional becomes loose or fractures. If the latter occurs, a decision will be needed whether to recement the present crown or fabricate a new one. It is recommended that if the laboratory fabricates a custom provisional, a duplicate would be made for situations where the original fractures or discolors.

Case Study

A healthy 14 year old white female presented to our office for a pre-implant work-up and evaluation of edentulous areas created by congenitally missing laterals at #7 and #10 [figs. 1, 2, 3]. She was in the finishing stages of her orthodontic therapy, and the orthodontist wanted to make sure that the space between the roots of the teeth adjacent to the edentulous apices [#s 6,8,9,11] were adequate for permanent implant replacement. At the time of our evaluation, the patient made numerous comments about how she "hated" her present removable appliance. I mentioned to both her and her mother that it would be approximately four years longer before she could have permanent implant placement but that we would satisfy her immediate need with the use of a single transitional implant in each tooth gap. Their excitement about this concept led to scheduling for this transitional implant procedure.

Surgical Phase

Infiltration of local anesthesia was used in the maxillary right and left anterior segments both labially and palatally adjacent to #s7 and 10. The osteotomies were performed with the longer size profile drill [fig. 4]. Its sharp point makes directional placement rather easy. In this instance, because the osseous anatomy was quite evident, no flap was required. To overcome the labial concavity in this area, the osteotomy must be drilled in a more palatal direction [figs. 5, 6]. When the osteotomy is complete, the 21 mm MTI was placed to the full depth [figs. 7, 8]. It is important to note that the labial/lingual alignment is not as important as the mesial/distal orientation. This is due to the ability to bend the MTI at the neck just below the rectangular portion. Once the alignment of the head of the transitional implant satisfies all the dimensional requirements, impression copings are placed, and the patient is ready for the prosthetic phase of treatment [fig. 9].

Prosthetic Phase

The patient, with the MTI transfer copings in place, arrives at the restorative dentist's office ready for the impression. The restorative dentist takes a rubber base or polyvinyl impression of the maxillary arch to pick up the transfer copings. An opposing model and bite registration is obtained, along with a tooth shade. Within 24 hours, a laboratory provisional is fabricated [figs. 10, 12, 14] using the singular modular coping supplied by the company [figs.11, 12]. During this short waiting period, soft rubber protective caps are placed over the MTI implants to protect the lip and tongue from any undue trauma [fig. 13]. It is important to make sure the laboratory designs the provisional crown with broad, tight interproximal contacts to allow for resistance to off-angled forces. The patient is instructed on appropriate oral hygiene procedures and evaluated. A new orthodontic retainer is fabricated or the existing one modified. Final radiographs are taken.

Summary

I have presented a unique approach to temporarily restoring edentulous sites in teenagers resulting from congenitally missing maxillary laterals. The prospect of eliminating a removable orthodontic appliance for a young teenager is incredibly exciting. Both patients and their families have expressed appreciation of this effort. It has been 18 months since the patient in the presented case has received her transitional restorations. All aspects of the MTI implant and both hard and soft tissue have

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remained quite healthy [fig. 15]. While I am convinced that this technique has great potential and merit, additional time will be required for us to be confident that these transitional implant-supported restorations will remain stable over 4-5 years.

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