



Congenital Agenesis of Upper Lateral Incisors and their Treatment Possibilities

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Abstract

The possibilities of treatment for agenesis of maxillary lateral incisors (AILS) make many researchers and professionals in the field of orthodontics have doubts about what direction to go to solve these specific cases. There are two ways to solve this problem, one of them would be to open space to perform a prosthetic replacement in the future or to fill the space using the canine and later anatomizing it for a better aesthetic. The objective of this article is to show that both forms of treatment can be performed, but there needs to be consistency between the factors of each case.

Introduction

Dental anomaly is characterized as a deviation from normality, usually associated with the embryonic development of the teeth, which may result in the absence or change in shape. The aesthetic and functional impact that the agenesis of these teeth causes is very relevant, constituting a concern not only for those with the anomaly but also for health professionals who find this planning a great challenge. (Cobourne, 2007)

Several therapeutic actions can be taken in the absence of one or more ILS. You can choose to: create adequate space for replacing the missing tooth or teeth or close the space available in the dental arch, providing contact between the central incisor and the canine, subsequently causing the canine to be reanatomized, transforming it into a lateral incisor. (Cobourne, 2007)

In the first case, the prosthetic rehabilitation of the spaces created is varied, and it is possible to opt for a removable prosthesis or, alternatively, for fixed teeth through the creation of a tooth-supported or implant-supported fixed prosthesis. (SabriR, 2009)

Orthodontic Treatment Planning with Space Closure

Some researchers believe that orthodontic space closure may be indicated or contraindicated, depending on the malocclusion. Depending on the degree of crowding, size and shape, diastema, and occlusion. Factors favoring space closure are patients who have a tendency toward upper crowding, or with a balanced profile and anterior teeth with normal inclination, canines and premolars of equal size, protrusion, Class II malocclusion, and lower crowding. Space maintenance is best seen in a patient

who does not have a malocclusion and normal intercuspation of posterior teeth, generalized diastema, Class III malocclusion, and retrognathic profile. (Rose, 2006)

Kokich and Kinzer (2005) carried out a study with the aim of defining the requirements that should be considered in these cases of orthodontic space closure. The best choice of treatment should take into account factors such as the malocclusion, the patient's facial profile, the color and shape of the canines and the height of the smile line. The determination must prioritize the option that conserves the most and that seeks the requirements of function and aesthetics. The authors opted for a clinical sequence, in cases where the treatment of choice is space closure and reanatomization of the canines, replacing the missing lateral incisors, one should remember the importance of a multidisciplinary approach.

When one chooses to close the spaces by repositioning the canines in place of the lateral incisors, the aesthetic and functional function requires adjustments, necessitating the mesial movement of the canine, with tooth extrusion associated with the extrusion of the first premolar, thus obtaining an adjustment the contour of the gingival margins of the anterior teeth, in addition, it is necessary to correct the torque of the crown of the canine that was displaced mesially to reproduce the torque of the crown of the lateral incisor, together with the adjustment of the torque of the crowns of the premolars moved mesially . (Almeida, 2002)

Esthetic recontouring of the canine crown to fit the shape and size of the lateral incisor needs to be done, in addition to a combination of grinding and addition of resins or porcelain veneers. To implement esthetics and function, it is important to augment the crown with resins or porcelain veneers, modifying the width and length of the crown from the first preface. Molar that has been intruded. Finally, performing minor surgical procedures for localized crown lengthening. The assembly of orthodontic appliances must be planned in such a way as to favor the aesthetic finish of the case and the final adjustment of the occlusion. One of the fundamental requirements for the esthetic adjustment in cases of space closure is the leveling of the contours of the gingival margins, with the extrusion of the canines and intrusion of the premolars. This adjustment can be performed at the end of the treatment by bending or repositioning the brackets. Another possibility is the initial assembly of the brackets already prioritizing the necessary movements, so that at the end of the leveling, this gingival adjustment has already been achieved. (Garib, 2010)

The central incisor bracket must be positioned according to the way the professional usually uses it, then measure with a dry point caliper the distance from the central incisor bracket slot to its gingival zenith. Assuming an example of 5mm for this case, we can then propose a distance 1.0 mm smaller for the canine (which will replace the lateral incisor) and the same 5mm for the first premolar (which

will replace the canine). In this same example, therefore, the canine bracket slot would have a distance of 4.0mm to its gingival zenith and this distance in the first premolar would be 5.0mm. As the leveling is carried out, it will be necessary to adjust the wear on the cusp of the canine, leaving no occlusal interferences. (Lima, 2004)

The bracket that should be used is the canine bracket or the lateral incisor bracket. It is recommended for this tooth to induce lingual root torque, to reproduce the greater buccal inclination of the lateral incisor crown and also to camouflage the greater volume of the canine root. If the canine root is lingual, it will also facilitate its mesial movement, reducing contact with the buccal cortex. To achieve this objective, one possibility would be to use the lateral bracket on the canine, as it generally presents positive torque, which is necessary in this situation. Due to the greater convexity of the canine face, there may not be a perfect adaptation of the bracket. Another option would be to invert the canine bracket, rotating it 180°, maintaining the angle, with the torque changing from negative to positive. (Lima, 2004)

In most cases, individualized torque adjustments are required, which must be introduced into the orthodontic archwire. Depending on the extent of canine movement, the bracket may also be distally counter-angulated to compensate for the distal tipping tendency of the root. The torque of the first premolar must also be changed. As this tooth will replace the canine, it must receive crown lingual torque, adapting to the position of a canine. To facilitate this adjustment, the first premolar can receive the canine bracket. (Tuna, 2009)

It is important to avoid lingualization of the central incisors during space closure with the consequent loss of torque, which is very common. To avoid this situation, the mesial movement of the posterior teeth must be carried out, controlling the anchorage, which is a more delicate task. If the canines are mesialized with support on the incisors central, the adverse effect will be greater, due to the roots of the canines that are more voluminous. The tendency is for there to be a greater distal movement of the centrals than the mesial movement of the canines. If this option is necessary, reinforcement of the anchorage of the central incisors with a base arch and buccal crown resistance torque is indicated. The option for the use of headgear anchorage can avoid overloading the centrals, but triggers the need for a huge collaboration of patients with an uncomfortable type of device. Class III elastics can eliminate the adverse effect on maxillary central incisors, but their side effects on mandibular teeth need to be evaluated. (Schwaninger, 2007)

Orthodontic Treatment Planning with Space Opening

Suguino and Furquim (2003) show disadvantages of treating agenesis with opening space for the installation of dental implants. They state that the disadvantages are the cost of the treatment and the need to wait for the craniofacial growth to finish.

The option of orthodontic treatment with the opening of space involves, in a certain phase of the treatment, the replacement of the lateral incisor that does not exist. There is a consensus among dentists from different specialties that implants are the best option, as they have many advantages over conventional prosthetic methods, such as adhesive and fixed prostheses. In adult patients, implants can be installed at any time during case resolution. The stock tooth, which is fixed to the orthodontic wire, must be kept until it is possible to install a temporary crown. In the treatment phase in which the implant has already received the crown, it is important not to fix the bracket on it, as the resistance offered by the implant influences the movements of adjacent teeth. The option would be not to glue the bracket or just keep it attached to the orthodontic wire, as if it were a detached bracket, just to fulfill the aesthetic role. In young patients, however, due to the growth of the face, there are restrictions for implants. Installation of implants should only be recommended when the growth period has ended. (Sabri R, 2009)

The determination of the amount of space to be reserved for the lateral incisor should be based on the maintenance or recovery of the correct mesiodistal proportion between the anterior teeth. It is important to consider all the anterior teeth together, as often some other tooth may have too much or too little tooth mass. Adequacy of the prosthetic space can be achieved by distalizing the posterior teeth. If this distal movement is necessary, intraoral distalizers can be used, such as pendulum or mini-implants. Open nickel-titanium springs can also be used between the central incisor and the canine to achieve the final fit. Due to the reciprocal action of the spring, care must be taken to avoid deviations from the midline or projection of the central incisors, especially in cases of unilateral agenesis. Careful attention should be paid to preserving the parallelism between the roots of the central incisor and the canine, in order to leave a suitable place for the implantation of the lateral incisor. (Cobourne, 2007)

During the finalization phase, the adjustment of the anterior guides must be carried out similarly to cases in which the complete permanent dentition is available. The missing lateral incisor can be supplied by fixing a stock tooth and attaching it to the orthodontic wire. Larger rectangular wires provide better stability, being the most suitable for this procedure. Immediately after removing the orthodontic appliances, it may be necessary to make a temporary prosthesis before making the definitive work. Temporary prostheses are well-accepted alternatives when, after orthodontic

treatment, there is an indication for whitening before rehabilitation or while waiting for the correct moment to install the implant. (Kokich, 2005)

The most common solution is to make a retainer with a stock tooth to replace the missing lateral incisor, which has the disadvantage of leaving the prosthetic spaces visible when the appliance is removed from the oral cavity. Another viable solution is the installation of temporary adhesive prostheses. This is a more sophisticated and more expensive resource, but it offers greater comfort to the patient. In the literature, good results involving both types of treatment have been presented. However, some authors warn that, when the exposed requirements are not observed, the replacement of the lateral incisor by the canine can generate aesthetic results that do not appear to be natural. They also reveal that esthetic restorations sometimes need more frequent maintenance than expected. Some authors argue that the main contraindications for restorative treatment in young patients can be avoided with the currently available minimally invasive restorative procedures. (Kokich, 2005)

In a retrospective study, 50 patients were identified, of whom 30 had been treated with orthodontic space closure and 20 with space opening and installation of a prosthesis. Patients' opinion of the esthetic outcome was assessed using the Eastman Aesthetic Index questionnaire. Functional status, tooth contact patterns, periodontal condition and quality of prosthetic replacement were evaluated. In general, subjects treated with orthodontic space closure were more satisfied with the appearance of their teeth than those using a denture. No significant differences in the prevalence of signs and symptoms of temporomandibular disorders were observed. However, patients with prosthetic replacements had impaired periodontal health, with plaque accumulation and gingivitis. The conclusion of this study is that orthodontic space closure, when compared to prosthetic replacements, produced results that are well accepted by patients, not harming the temporomandibular joint and promoting periodontal health. (Robertsson, 2000)

Conclusion

Reports in the literature and the clinical experience of countless successful cases, considering the two approaches for the treatment of lateral incisor agenesis (opening and closing spaces), do not allow us to state that one treatment option is superior to the other. It is noticed, among the authors surveyed, a slight preference for closing spaces. However, there is a consensus that several factors should be analyzed when planning orthodontic treatment, including the opinion of the patient and those responsible for them, in order to individualize the treatment of each case. The need for a multidisciplinary approach is clear, regardless of the treatment option adopted.

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