

Ceramic laminate veneers for multidisciplinary treatment of bilateral maxillary incisors agenesis: Case report with 3-year follow-up

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ABSTRACT

Dental agenesis, especially of maxillary lateral incisors, is the most common type of disturbances of teeth. Most of the time, it causes the disharmony of the smile and causes patient dissatisfaction. In addition, it requires multidisciplinary planning to define the best treatment option, aiming at a good aesthetic and functional result. The purpose of this clinical case is to report the multidisciplinary approach in a case of reanatomization of canines with ceramic veneers in a patient with upper lateral incisor agenesis and to evaluate the clinical performance 3 years after cementation. A 31-year-old male patient sought treatment reporting aesthetic dissatisfaction of the anterior teeth. Clinical examination revealed diastema and agenesis of teeth 12 and 22. Patient reported having undergone orthodontic treatment 10 years ago to close the spaces and reanatomize the

canines on the sides, however there was no adequate and desired completion. Planning started with the waxing diagnosis, followed by mock-up. The proposed treatment plan was to carry out gingivoplasty and osteotomy, followed by home bleaching, and final aesthetic restoration treatment by means of 8-element lithium disilicate veneers dental procedures. The patient returned to the clinic once a year, in which veneers evaluation, prophylaxis and plaque control were performed. After 3 years of follow-up, it was concluded that the reanatomization of canines in upper lateral incisors absent by agenesis, with veneers is a good alternative for aesthetic rehabilitation treatment.

Keywords:

Anodontia. Dental Veneers. Dentistry, Operative.

INTRODUCTION

The bilateral dental agenesis of maxillary permanent incisors is an anomaly of dentition development whose etiology is not yet fully known,¹ and may be related to the genetic and transcription factors involved in the dental development.² The observed prevalence is 1.55% to 1.78% of the population, with women having a slightly higher prevalence than men³ and bilateral cases are more common than unilateral (50.9% - 57%).^{1,4} A high relation of agenesis has been demonstrated with genetic, hereditary, environmental and other factors, such as endocrine disorders, pathologies and traumas.¹

The absence of these teeth is always challenging as it requires multidisciplinary approach to define the best treatment option, aiming at a good outcome, aesthetic and functional.⁵ The agenesis of maxillary permanent incisors may lead to alteration between the dental arches and is a predisposing factor to malocclusion and is frequently associated with other dental anomalies^{2,6} such as: developmental delays, ectopic eruption, re-

duction in tooth size and morphology, shortened roots, taurodontia and enamel hypoplasia,⁶ as well as the aesthetic discomfort, which is usually the main complaint of the patient.

Some basic principles like color, shape, size, texture and brightness, are fundamental to the composition of a harmonious smile, especially in the anterior region.⁷ The proper treatment of aesthetic imperfections depends on the interaction of knowledge related to aesthetics, materials restorers and the techniques currently available.⁸ Thus, veneers are a conservative option because they present properties related to resistance, longevity, biocompatibility and aesthetics.⁹

In this context, the objective is to report a clinical case of agenesis lateral incisors of permanent lateral incisors and reanatomization of canines with veneers, through a multidisciplinary approach and to evaluate the clinical performance 3 years after cementation.

CLINICAL CASE

A 31-year-old male patient sought care for aesthetic dissatisfaction of the anterior teeth. He reported that he underwent orthodontic treatment 10 years ago for space closure. Figure 1 shows the initial condition of the anterior teeth.

After anamnesis and clinical and radiographic examinations, it was verified that the patient had agenesis of dental elements 12 and 22, elements 13 and 23 occupied the space of lateral incisors and elements 14 and 24 the position of canines. In the initial lateral image of the teeth (Fig 2) it is possible to observe the reanatomization of the canines in lateral incisors with additions of composite resin. For the resolu-



Figure 1: Frontal view photo extrabucal (A) and intrabucal (B).



Figure 2: Lateral view: right side (A) and left side (B); the canines are reanatomized in lateral incisors.

tion of the case, in the first treatment plan, it was proposed to reinstall the orthodontic appliance to better distribute the spaces, which was not accepted by the patient.

Thus, a new planning was proposed, starting with a diagnostic waxing, followed by mock-up and indication of veneers. The mock-up was performed with Structur 2® bisacrylic resin (Voco, Cuxhaven, Germany) (Fig. 3) and applied with a silicone guide (Zetalabor®,

Zhermack. SpA, Badia Polesine, Italy) obtained with diagnostic waxing. The mock-up (Fig. 4) was customized with composite resin for better aesthetic restoration, involving teeth 15 and 25. Based on the planning, it was determined that the use of veneers based on lithium disilicate (IPSe.max® - Ivoclar / Vivadent, Schaan, Liechtenstein) in the central incisors, canines and premolars. After explanation and approval of the simulation by the patient the treatment was started.



Figure 3: Mock-up performed with bisacrylic resin Structur 2® (Voco).



Figure 4: (A) Mock-up (B) The mock-up was customized with composite resin.

Treatment with home bleaching for 30 days was started with 10% carbamide peroxide (Power Bleaching, BM4, Palhoça, SC, Brazil), with applications of 6 hours per day in the upper and lower arches. The result obtained was considered satisfactory (Fig. 5). After bleaching, the resin composite resin removal session was performed. For this purpose, diamond bur No. 2135 (KG Sorensen, Cotia, SP, Brazil) and Sof-Lex sandpaper discs (3M, Saint Paul, Minnesota, USA) were used.



Figure 5: Color of the teeth before (A) and after the home bleaching treatment with 10% carbamide peroxide (BM4, Palhoça, SC, Brazil) and removal of the composite resin from elements 13 and 23 (B).

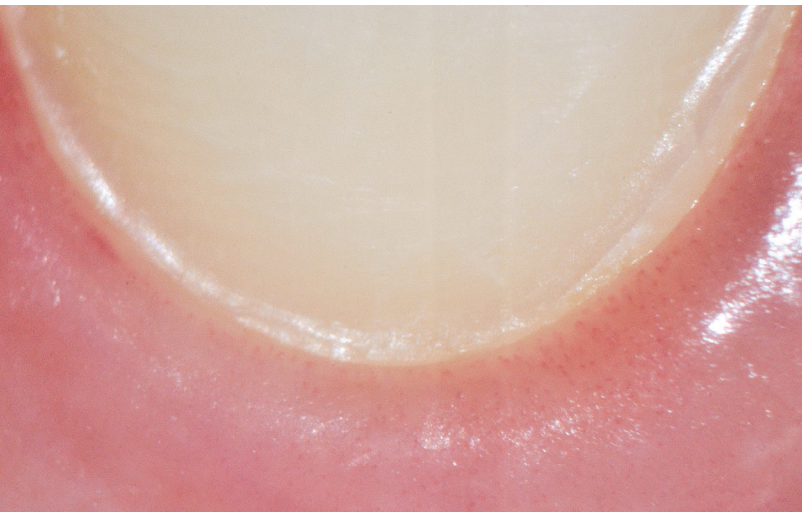


Figure 6: The end of the minimally invasive preparation and the healthy gingiva is observed through the microscope with increase of 25x.

Then, gingivectomy was performed with osteotomy of the elements 15 to 25, in order to harmonize the gingival architecture. 180 days were waited for complete healing of the periodontal and bone tissue before beginning the preparation step. Minimally invasive preparations were performed (Fig. 6), following the Galip Gurel technique,¹⁰ with a mean reduction of 0.3 - 0.5 mm in the vestibular face, using diamond burs 1013, 1016, 2135, 2135F and FF (KG Sorensen, Cotia, SP, Brazil), followed by multilayer 12-blade bur (Brightdent-NTI, Chicago, IL, USA), finalized with CRI (CVDentus, São José dos Campos, SP, Brazil) ultrasonic inserts. The final mold in silicone (Zetalabor R, Labordental, Brazil) was made using the technique of double mixing.



Figure 7: Eight veneers based on lithium disilicate (IPS e.max® - Ivoclar / Vivadent, Liechtenstein, Germany).

After the laboratory preparation, the veneers (Fig. 7) were tested in the mouth to verify and adjust the proximal contact points (Fig. 8). For cementation, the selected cement was value +1 (Variolink® Veneer, Ivoclar, Liechtenstein, Germany). Then, the prophylaxis of the elements with pumice stone and rubber cup (Microdont, São Paulo, SP, Brazil), insertion of retractor wire number 1 (Ultrapak, Ultradent, Utah, USA), for relative field isolation, and the adopted cementation sequence was the upper central incisors, followed by canines and, finally, premolars, with photoactivation for 40 seconds with the device (Radi-Call, SDI, Victoria, Australia).



Figure 8: Veneers in the mouth.

At the end (Figs. 9,10,11,12 and 13) the occlusion in the laterality and protrusion movements was verified, as well as the hygiene and patient care guidelines.

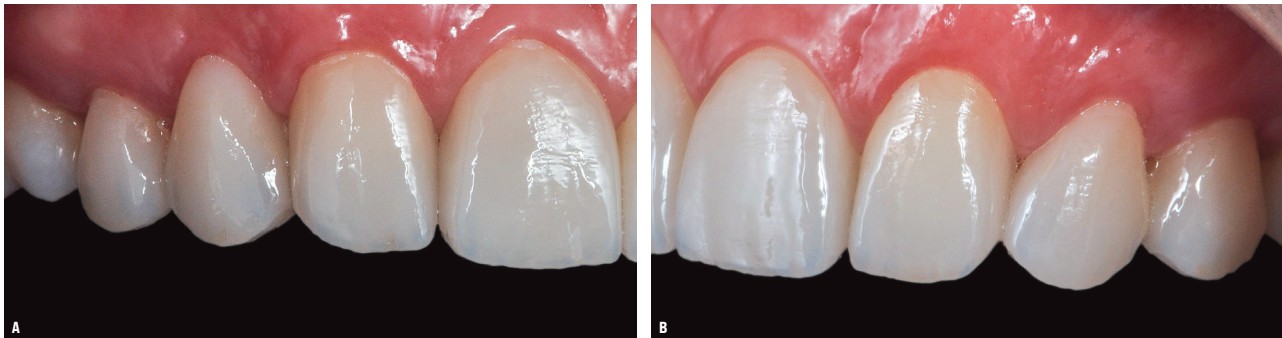


Figure 9: Right side view [A] and left side [B]; Aspect obtained after the cementation of the veneers.



Figure 10: Final frontal view after cementation of veneers.



Figure 11: Final frontal view.



Figure 12: Right and left lateral view before treatment (A and B) and after the treatment (C and D).



Figure 13: Initial extraoral photo (A) and after the treatment (B).

In the case presented here with a 3-year follow up, excellent clinical results and patient satisfaction were achieved (Fig. 14).



Figure 14: Frontal views of the clinical follow-up evaluation after 3 years (A) Intraoral (B) Extraoral.

DISCUSSION

Different approaches may be used in cases of maxillary lateral incisor agenesis, and usually the closure of the anterior teeth spaces with reanatomization of the canines, or opening and / or redistribution of spaces for prosthesis adaptation.^{11,12} To do so, certain clinical characteristics should be analyzed before deciding on the best therapeutic alternative, such as age of the patient, types of malocclusion, presence or absence of crowding in both dental arches and facial profile type.¹³

The authors who defend the indication of implants believe that the canine guide is ideal for a healthy occlusion in the long term.¹³ Aesthetically, this treatment is advantageous because one of the major problems is that the canines are different from the lateral incisors with respect to color, volume and root.^{14,15} Afterwards, prosthetic rehabilitation is necessary and several therapeutic options are available: implant-supported dental crown, resin fixed partial denture (FPD), cantilever FPD, full coverage FPD and autotransplant.¹⁶ Howev-

er, the additional waiting period for placement of a definitive prosthesis over the implant is a disadvantage.¹⁷

Reanatomization is an option whose main advantage is to present a healthier periodontal condition than observed in patients with fixed or removable prosthesis.^{13,18} Periodontal problems with implants in the anterior maxilla may be related to vestibular gingival retraction, papillary atrophy and bone loss around the implants.¹³ Moreover, according to DeMarchi et al. (2014),¹⁹ patients treated with canine reanatomization are more satisfied with the appearance of the smile than those treated with implants. The reason for this may lie in the fact that patients who choose to close the space with a later canine contour in lateral incisors maintain their natural teeth in the anterior region instead of receiving prostheses.⁵

For the clinical resolution of this case, the orthodontic treatment that had been previously performed was planned to close the interdental spaces, promoting the dental align-

ment and the aesthetic transformation of the canines in lateral incisors. However, the patient returned complaining about aesthetics. The composite resin is a good alternative for the treatment, due to dental preservation and lower financial cost.²⁰ However, some interdental spaces remained, compromising the smile. Thus, the new planning considered the use of indirect dental veneers, made in ceramics, as an alternative treatment, considering the high functional and aesthetic success that has been achieved with this type of material.^{9,21} In addition, the current adhesive systems and resin cements allow an effective interaction between the ceramic and the tooth structure. With such evolution, classic dental wear to receive indirect restorations has become atypical and more conservative.²² To assist in planning, diagnostic waxing and mock-up, as objective and efficient tools^{23,24} for validation of the proposed treatment for the patient, were essential.

There are, therefore, some possibilities of choice for the treatment of dental agenesis of maxillary incisors. Apparently, there is no scientific evidence that the closure or opening and / or redistribution of spaces for pros-

thesis adaptation to have any relation to alteration of occlusal function, increased prevalence of cervical abfraction, or signs and symptoms of TMD.^{11,12} There are also, studies that prove more or less cost for the choice of each treatment.¹² Thus, the clinician should have good judgment in the choice of treatment that will depend on the different clinical situations.

Several ceramics could be used to achieve an aesthetic result.²⁵ The E-max disilicate ceramic system, used in the clinical case, has high flexural strength, high fracture toughness and excellent optical properties,²⁶ as a color and translucency very close to the dental structure.²⁷ In addition to the choice of suitable ceramic material, the success of the ceramics will also depend on the correct selection of the cement,²⁸ which will guarantee the adhesion strength through a minimum thickness of the material to obtain high aesthetic quality.²⁸

Longitudinal accompaniments have shown satisfactory results in rehabilitation procedures by means of a conventional facet, showing low prevalence of ceramic part dis-

placement, minimum microleakage rates, low fracture risk and secondary caries.^{29,30} One study evaluated the clinical quality of 318 veneered porcelain veneers. The estimated survival rate was 94.4% after 5 years, 93.5% at 10 years and 82.93% at 20 years.³¹ Another study showed that only 4% of the restorations needed to be replaced after 10 years³⁰ and the aesthetic result of the veneers have been good, with high patient satisfaction.³²

These studies show that through correct indication and good case planning, it is possible to obtain satisfactory aesthetic results with veneers.²⁹⁻³³ Thus, in the present case, the factors that contributed to the success should be associated to the planning of the case, to the conservative preparation of the tooth, to the appropriate selection of the ceramic and to the selection and proper technique of cementation. Clinical outcomes and

veneers performance depend on occlusal conditions and patient habits, as well as on the quality of plaque control and maintenance through the dentist.³³

Therefore, considering the high degree of aesthetic and functional impairment caused by dental agenesis, the described technique represents a viable alternative.³⁴ Dental anomalies may be common in dental practice and the dentist must be aware of the nature of the problems encountered and the specific needs of the treatment.³⁵ This case involved specialties such as orthodontics, periodontics and dentistry, and the multidisciplinary approach is fundamental for preserving oral health and restoring aesthetics.^{5,36} In addition, regular professional follow-up and general guidelines and patient hygiene instructions for promoting self-care have certainly contributed to ensuring the longevity of veneers after 3 years of follow-up.

CONCLUSION

After 3 years of follow-up, it was concluded that the reanatomization of canines in upper lateral incisors absent by agenesis with veneers, result of multidisciplinary planning, is a good alternative for aesthetic rehabilitation treatment. The approach avoids dental structure wear compared to conventional crown making techniques and is more predictable and durable aesthetics than direct composite resin restorations.

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