International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Case Report

Agenesis of the Maxillary Lateral Incisor: Contribution of Bonded Cantilever Bridge

Marwa Chakroun, Ameni Adli, Zohra Nouira, Mounir Cherif

Department of Fixed Prosthodontics, Dental Clinic of Monastir, Tunisia.

Corresponding Author: Ameni Adli

Received: 23/03/2016 *Revised: 03/05/2016* *Accepted: 31/05/2016*

ABSTRACT

Agenesis of the permanent lateral incisor is a major aesthetic problem that often requires long-term multidisciplinary treatment.
In this clinical case, following the agenesis of the maxillary right lateral incisor, an orthodontic treatment to open space has been achieved. This treatment option allowed us to maintain the perimeter of the arch and avoid a concave profile.
At the end of the orthodontic treatment, the patient B.F was referred to our department in order to replace the missing tooth. The implant-supported solution is ruled out because of the lack of space and root proximity. A cantilever bridge was indicated and gave a good esthetic result.

Key words: agenesis, implant, lateral maxillary incisor, cantilever bridge, IPS emax CAD.

INTRODUCTION

Agenesis of the permanent lateral incisor is a fairly common condition [(1,2)] causing a major aesthetic problem because of their strategic position in the smile.

Two orthodontic options commonly used are first space closing (in this case canines will replace lateral incisors), second the pre-prosthetic space opening: [(3)] this will help recreate the space for the maxillary lateral incisor and restore or maintain the arch perimeter and canine function. [(4,2)] After opening the space, different prosthetic options to replace the missing tooth may be discussed: implant-supported crown, bridges and bonded cantilever bridges. [(3,5,6)]

CLINICAL CASE

Miss B.F, a 23 years old patient was referred to our department -at the end of her orthodontic treatment carried out to correct a class II- to replace the agenesic right lateral incisor.

Clinical examination revealed the mesiodistal space was insufficient to place an implant (fig1). In addition, tooth #11 and #13 showed convergent roots (fig 2). As a result, the implant supported prosthesis option was ruled out.

Fig1: extra-oral vue

Since the patient refused to redo the orthodontic treatment in order to correct the axis of the teeth and given the risks that can

happen during a second treatment such us the apical root resorption which is one of the major side effects associated with orthodontic treatment [7,8] our decision was naturally the bonded bridge.

An Essix plate was performed with a prosthetic lateral incisor (fig3). This acts as a space maintainer avoiding recurrence and space closure, has a major role in improving smile and avoiding the black hole corresponding to the missing tooth. Despite it is a temporary and removable treatment, it positively influences the behavior of the patient by establishing a patient-practitioner confidence.

Fig 2: periapical radiography

Fig 3: Essix plate

Bonded bridge: a wing or two-wings?

The technique of bonded bridges was introduced in 1963 by Rochette. It was the first type of noninvasive fixed prosthesis. [9,10] Its principle consists in bonding a metal frame on the teeth adjacent to the edentulous ridge. These adhesive bridges have experienced significant development from their conception to the present. [11,12]

The absence of tooth preparation, very attractive in the early years, was nuanced because of repeated failures. In fact, bonding does not replace preparations, it cannot replace the retention or resistance to occlusal forces (loosening and shear) provided by the preparations.

Nowadays, it is widely accepted that a minimal preparation of the supporting teeth is essential to ensure the sustainability of the bonded prosthesis. [13-15]

The bonded cantilever bridge is an efficient minimally invasive treatment of the anterior missing teeth. [16] It is also a suitable alternative to replace two-wing bonded bridges [17] with low biological complications [18] and satisfactory results in the medium and long term. [19-22] This could be explained by the following points:

- The results of follow-up tests indicated that the bridges bonded to three elements have failure rates lower than wider bridges (Kerschbaum et al. 1986 & Pröbster Henrich 1997).
- Two-wings bonded bridges showed practical problems such as finding a common axis of insertion when respecting the principle of minimal preparation.
- The increase of the adhesion surface must be preferably carried out on a single tooth, respectively number reduced tooth adjacent pillars in the edentulous area (Marinello et al. 1988),
- Favorable clinical monitoring results of adhesive bridges with two or even a single wing. [23-26]

Operating Protocol

The wax-up was achieved on the model cast to assess the size of the permanent lateral incisor. After setting models on the articulator and simulating jaw movements, the preparation edges were drawn on the canine avoiding points of occlusal impact then reported on teeth. (Fig 4, 5, 6)

Tooth preparation started using a round drill with a depth of 0.5 to 0.7 mm at

the edges already drawn. Then, a chamfer was performed to ensure strength and a maximum recovery of the face (fig 7, 8). Ultrasonic inserts can be used to obtain clear edges on the impression. [27-30]

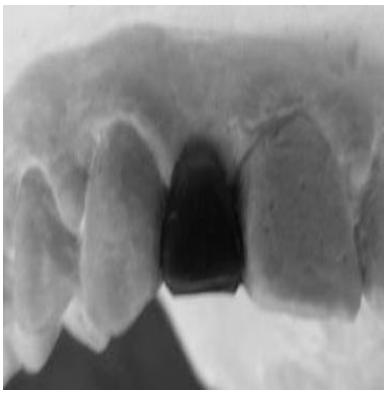

Fig 4: wax-up

Fig 5: model setting on articulator

Fig 6: preparation edges

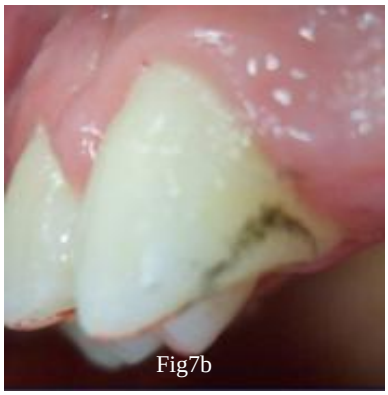

Fig 7(a, b): the preparation edges

Fig 8: tooth preparation

Fig 9: provisional restoration

A temporary cantilever bridge was realized by isomoulage technique using the chémopolymérisable resin (Protemp 4)and

cemented using a temporary cement based on calcium hydroxide (LIFE Kerr) (fig 9).

The master impression was made using a standard tray and a polyvényl-siloxane elastomer (3M) then send to the laboratory with occlusal registration.

The cantiliver bridge was manufactured with Emax Cad/Cam technique which has the advantage of alliing accuracy of adaptation and aesthetic outcome. [31-34]

At the last appointment, the try-in concerned insertion, adaptation, occlusion and aesthetics fitting (fig11). Finally, the bridge was bonded using a self-adhesive and self-etching resin "TotalCem" (fig12) . Dental tissues required no prior treatment,but it was important to clean the prepared surface. As for the prosthetic surface, hydrofluoric acid was applied for 20 seconds followed by thorough rinsing and drying after what a silane was used and spread in a thin layer.

After curing, minimal occlusion recitifacations were performed then followed by a good polishing , the final esthetic result satisfied our patient (Fig 13,14).

Fig 10: cantilever bridge conception and manufacturing

Fig11: clinical try-in

Fig12: Bonding material

Fig13: Photo polymerization

Fig 14: Final result

CONCLUSION

Today, the bonded cantilever bridge is an alternative to implant supported prosthesis when replacing a single missing tooth in the anterior region. In fact, it meets the requirements of a minimal invasive dentistry and periodontium respect. In addition, the esthetic outcome is remarquable especially when it is made in all-ceramic, without forgetting its proven durability in the medium and long term.

REFERENCES

1. Movaghar AS, Brochery B, Movaghar R .Agénésie des latérales et canines incluses: Mise en place chirurgico-orthodontique. L'information Dentaire. n° 14 - 6 avril 2011: pages 16-21.
2. Brincat T, Novo S, Mouret L. Traitement implantaire des agénésies des incisives latérales maxillaires. Le fil dentaire, n°72, Avril 2012, 18-22
3. Sabri1R, Aboujaoude N. Agénésie des incisives latérales maxillaires: approche orthodontique et implantaire. Orthod Fr 2008; 79:283-293.
4. Barthelemi S, Russe P.Collaboration between orthodontist and implantologist for the treatment of anterior segment edentulousness. International Orthodontics 2005 ; 3 : 101-113
5. Zarone F, Sorrentino R, Vaccaro F, Russo S. Prosthetic treatment of maxillary lateral incisor agenesis with osseointegrated implants: a 24–39-month prospective clinical study. Clin. Oral Impl. Res. 17, 2006 / 94-101
6. Le Norcy E. Anomalies dentaires et résorption radiculaire apicale externe au cours du traitement orthodontique: une étude radiographique rétrospective sur l'incisive centrale maxillaire. Rev. Orthop. Dento-Faciale 2009; 43:143-151.
7. Canal P, Cannagatti V. Les résorptions radidulaires d'origine orthodontique. Revue d'Orthopédie dentofaciale, Volume 1 1996, pages 1-30.
8. Dahan L. Le point sur les bridges collés. Les 10 points-clés en collages; pages 60-65.
9. Degrange M. In memoriam Alain Rochette. The journal of adhesive dentistry ; vol 10 num 6 2008, pages 415 ;416
10. Folch H, Abgrall S, Armand S, J Verge. Bridges collés. Encycl Méd Chir 2000; pages 1-5.
11. Pospiech P, Rammelsberg P, Goldhofer G, Gernet W .All-ceramic resin-bonded bridges a 3-dimensional finite-element analysis study. Eur J Oral Sei 1996: 104: .m)-395.
12. Ziada H. M., Benington I. C. Photoelastic stress analysis in perforated (Rochette) resin bonded bridge design ; Journal of Oral Rehabilitation 2000 27; 387-393
13. Soualhi H, El Yamani A, El Bernoussi J. Édentement unitaire: réhabilitation par bridge collé. Actualités Odonto-Stomatologiques - n° 250 - juin 2010; pages 163-173.
14. R Holt L, Drake L .The Procera Maryland Bridge: A Case Report. J Esthet Restor Dent 20:165–173, 2008
15. K. A. Durey et al, Resin bonded bridges: techniques for success .British Dental Journal. vol 211 n. 3 Aug 13 2011 ; 113-118.
16. Sun Q, Chen L, Tian L, Xu B. Single-tooth replacement in the anterior arch by means of a cantilevered IPS e.max Press veneer-retained fixed partial denture: case series of 35 patients. Int J Prosthodont 2013; 26: 181–187.
17. Kern M, Sasse M. Ten-year survival of anterior all-ceramic resin-bonded fixed dental prostheses. J Adhes Dent 2011; 13:407-410.
18. Lam WY, Botelho MG, McGrath CP. Longevity of implant crowns and 2-unit cantilevered resin-bonded bridges. Clin Oral Implants Res 2012; 24:1369-374.
19. Decock V, De Nayer K, De Boever J, Dent M. 18-Year longitudinal study of cantilevered fixed restorations. International Journal of Prosthodontics 1996;9(4):331-340
20. Michael G, Botelho § al .A retrospective clinical evaluation of two-unit cantilevered resin-bonded fixed partial dentures; JADA 2006; 137:783-8.
21. Sasse M. All ceramic resin-bonded fixed dental prostheses: treatment plannig, clinical procedures and

outcome .Quintessence Int, vol 45, num 4 2014, 291-297.
22. Attal JP, Tirlet G. Le cantilever: une nouvelle géométrie pour les bridges collés: Revue de la littérature. Réalités Cliniques 2015. Vol. 26, n°1: pp. 25-34.
23. Bühler-Frey C, Carlo P. Marinello. Quelle est la place des ponts adhésifs métallo-céramiques à l'époque du tout céramique et de l'implantologie? Rev Mens Suisse Odontostomatol Vol. 121 7/8/2011 693-704.
24. Prasanna BG. Clinical evaluation of conventional cantilever and resin bonded cantilever fixed patial dentures: A comparative study. The journal of contemporary dental practice; 2012, 13(6), 793-798.
25. Djemal S, Setchell D, King P, Wickens J. Long-term survival characteristics of 832 resin-retained bridges and splints provided in a post-graduate teaching hospital between 1978 and 1993. Journal of Oral Rehabilitation 1999 26; 302–320
26. Chan A W K, Barnes I E. A prospective study of cantilever resin-bonded bridges : An initial report ; Australian Dental Journal ; 2000(1), 31-36
27. Attal J P, Coudray L, Tirlet G. Bridge collé cantilever en céramique de haute ténacité. Le fil dentaire, N°37, novembre 2008; 38-42.
28. Roux T, Cazier S. Intervention minimalement invasive: remplacement d'une dent antérieure par bridge colléesLes entretiens d'odontologie stomatologie de Bichat 2014; pages 1-5.
29. Emami E, Georges A, De Grandmont PTwo unit cantilevered resin-bonded fixed partial denture as a substitute for a prosthodontic orthododntic treatment plan : A 5-year case report ; J Can Dent Assos 2012 ; 78 67 ; pages 1-7.
30. Barwacz C, Hernandez M, Husemann H. Minimally Invasive Preparation and Design of a Cantilevered, All-Ceramic, Resin-Bonded Fixed Partial Denture in the Esthetic Zone: A Case Report and Descriptive Review .Journal of esthetic and restorative dentistry · December 2013pages 314-323.
31. Montenero J. La CFAO indirecte dans un laboratoire de prothèse. Réalités Cliniques vol. 20 n°4 2009: 257-263.
32. Cordelette M, Jordan-Combarieu F. Évolutions majeures de la CFAO directe. L'Information Dentaire n° 20 - 21 mai 2014 pages 1-9.
33. Koubi S, Margossian P, Weisrok G, Lasserre JF , Faucher A , Brouillet J L, Koubi G, Tassery H .Restaurations adhésives en céramique: Une nouvelle référence dans la réhabilitation du sourire. L'Information Dentaire n° 8 - 25 février 2009 pages 363- 374
34. Pelissier B. Matériaux et CFAO dentaire.Le fil dentaire, N°51,Mars 2010 ; pages 58-62.

How to cite this article: Chakroun M, Adli A, Nouira Z et al. Agenesis of the maxillary lateral incisor: contribution of bonded cantilever bridge. Int J Health Sci Res. 2016; 6(6):370-375.

****