Case Report

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

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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 e.max 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 as 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 (fig 3). 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.

**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)

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 cantilever 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 rectifications 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

Fig 11a  Fig 11b
Fig 11: clinical try-in

Fig 12: Bonding material

Fig 13: 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 remarkable especially when it is made in all-ceramic, without forgetting its proven durability in the medium and long term.

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