

Case Report

Successful Implant Supported Prosthesis Treating Lateral Incisor Agensis: A 5 Years Follow Up

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Article History

Received: 16.03.2021

Accepted: 21.04.2021

Published: 04.06.2021

Journal homepage:

<https://www.easpublisher.com>

Quick Response Code



Abstract: Agensis of Maxillary lateral incisor is a common dental problem which requires a multidisciplinary approach. Many treatment modalities are available. Many factors should be taken in consideration such as occlusion, angle and skeletal class, profile type If the patient had undergone a space opening, the most suitable treatment is implant supported prosthesis. Nevertheless, the successful Single implant supported restoration in anterior region is always a challenge for practitioner. The objective of this article is to present a successful clinical situation of bilateral lateral incisors agensis treated with implant supported prosthesis while focusing on prosthetic stages. The paper aimed also to highlight steps from which would depend the successful of the implant therapy especially in anterior region.

Keywords: Agensis, Implant supported prosthesis, lateral incisor, esthetic, success.

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INTRODUCTION

Agensis of Maxillary lateral incisor is a common dental anomaly. This had been confirmed by a Méta-analysis of Polder and Van Der Lindent [1] who reported percentages ranging from 1,55 % to 1,78 % of missing lateral incisors among world population. Because of its strategic position in the dental arch and its esthetic contribution, it should be carefully managed and requires a multidisciplinary approach. Treatment options may include abstention, space opening or closure [2–5]. Many factors should be taken on consideration such as skeletal class, angle canine and molar relationship, profile type, available space and patients expectations. Both vigilant clinical and radiological examination have to be performed to ensure patient satisfaction. Orthodontic Space closure is specially indicated for young patient with balanced or mild-convex profile [6]. It could be also an adequate solution for Class II malocclusion [6], where permanent maxillary canines would be mesially positioned. Space opening is indicated for Class III malocclusion, concave profile and aims to provide sufficient space for the missing tooth which will be prosthetically replaced [7]. Many authors consider implant supported prosthesis as the most suitable solution for such

situation, as it is conservative and non-invasive. It allows also, respecting canine and first premolar morphology. Consequently, conserving both the canine guidance and initial occlusal context. [4-6, 8]. Predictable long-terms results of this therapy have been shown in the literature [6]. In modern dentistry; successful anterior implant is mainly related to esthetic outcome and survival rates [9]. Achieving stable soft tissue around anterior single implants ensured by material of abutment, as well as appropriate emergence profile and an integrated interdental papilla are challenging for clinicians. Salam's classification can be useful to predict the height of the interdental papilla, when planning, for esthetic soft tissue contours around implants [10]. This article aims to detail prosthetic stages to ensure successful implant supported prosthesis rehabilitation replacing both missing maxillary lateral incisors. It would give tips to succeed such therapy.

CASE REPORT

A 25-years healthy female patient consulted the fixed prosthetics department (2016), requesting esthetic rehabilitation after orthodontic space opening. The profile view revealed a plate profile with a

retruded upper lip. Clinical examination showed, an open bilateral space between central incisor and canine (figure 1). A Hawley plaque was placed for splinting and space maintaining. For esthetic reasons, missing incisors were provisionally replaced by prosthetic crowns contained in the plaque. Dental axes were checked through radiograph examination. The parallelism of proximal teeth was confirmed by panoramic radiograph, which was in favor of implant placement (figure 2). Mesio distal space left between central incisor and canine was sufficient referring to lateral incisor width and confirmed through the diagnostic wax up. Implants dimension were determined through Sectional tomographic radiograph. Then, implants were carefully placed.

After healing period of 6 months, osseointegration on the periapical radiograph was confirmed by the presence of 1 mm bone thickness around the implant. Healing abutment, therefore, were placed to create enough room for the crown contour (figure 3).

2 weeks later, the master impression should be performed: here an open tray technique was chosen. The corresponding implant coping were placed. At this step, a peri apical radiograph is necessary to confirm their adaptation to the implants. The radiograph showed that they were well screwed (figure 4). As gingiva was thick, titanium abutment were chosen, then modified by the laboratory technician, and checked intra orally. The frameworks were performed and checked as well (figure 6). This was followed by shade matching. After Ceramic veneering, cervical adaptation, emergence profile, crown shape and morphology as well as were clinically verified and validated. Finally, static and dynamic occlusion was checked according to the following occlusal concept: crowns were excluded from contacts in both normal occlusion and propulsion. However, in tight occlusion, contacts must exist (figure 7). After glazing, due care was given to removal of cement excess. The esthetic outcome was pleasant for the patient and the papilla was naturally regenerated (figure 8). A regular control was performed each 3 months, then 6 months. The 5-year follow-up illustrated stable gingival architecture (Figure 9).

DISCUSSION

An adequate space for the missing teeth, presents the first key step to successful esthetic rehabilitation. This space has to be left while the orthodontic treatment. Generally the lateral incisor width is between 5-7mm. For optimal esthetic outcome, a previous determination could be done using Bolton analysis, golden proportion or diagnostic wax-setup [11].

The second key step is related to implant three dimensional position, which directly affects esthetic

integration through a natural emergence of the prosthesis in dental arch and integrated interdental papilla (10) without unsightly black holes. Many studies pointed the importance of distance between the contact point and the peak of proximal crest bone (d). Jemt *et al.* [12,13] proved a significant relationship between (d) and Papilla presence. Tarnow has concluded in his clinical study that when d is more than 6mm, it would reduce the probability of having intact papilla [14, 15]. According to Choquet *et al.* [16], when d is under 5 mm, the papilla would be almost present. However Jemt *et al.* [13] and Henriksson *et al.* [17] didn't find a significant effect of this distance on papilla presence. A cohort study of Khoshhal reported inverse relationship between papilla index and the distance of contact point to bone crest [12]. It has also been demonstrated that peri-implant papilla height depends on the interproximal bone height of adjacent natural teeth [14, 18]. A distance of 1 to 1.5 mm between implant and proximal teeth is necessary. Moreover, Thick mucosa seems to be more resistant to recession than thin biotype and allows soft tissue maintaining (19). According to Steigmann *et al.*, ideal implant position, including apicocoronal mesiodistal and labiopalatal directions, directly affect the profile emergence. Malpositioned implant would create esthetic problems, especially those placed too labially [19]. Some authors recommend placing the platform of the implant 2 to 4mm above free gingival margin, while long axis direction must be slightly lingual to incisal edge [10]. Others suggest that implant must be placed 1.5mm apical to the cement-enamel junction of adjacent teeth [17]. Minor mismatches of implant placement could be compensated through adjusted emergence profile according to Steigmann [19]. The third key step is related to Prosthetic stages which have to be well performed as it was illustrated in the clinical case. An adequate impression would transfer faithfully the clinical situation to laboratory (figures 4, 5). Besides, a biomechanically controlled occlusion ensures implants longevity [20]. Long lasting results requires a proper occlusal concept without overloading causing peri-implant bone loss. For those reasons, contacts at light bite should be avoided. However, contacts, in heavy bite, should be verified as it was shown in the clinical case (figures) [20].

For maxillary lateral incisors agenesis, some authors recommend the importance of permanent canine eruption in the placement of missing teeth. Afterward, by distally repositioning them, an adequate amount of bone will be developed on future implant site, which may create better perspectives for optimal esthetics [22].

CONCLUSION

Early investigation of maxillary lateral incisor agenesis, as well as careful evaluation of the clinical situation through a multidisciplinary approach, is

essential for the proper management. Restoring anterior teeth with implant supported crowns is a challenging task. Optimal implant placement could be considered as a first key step to ensure satisfactory esthetic result. Prosthetic stages have to be properly performed. Emergence profile which maintains the soft tissue volume is mandatory to ensure harmony with natural teeth. Finally, the adequate occlusal context provides the restoration longevity.



Fig-1: Opened space between central incisor and canine

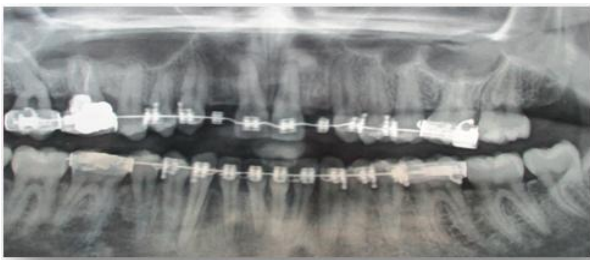


Fig-2: Panoramic radiograph



Fig-3: Placed Healing abutment

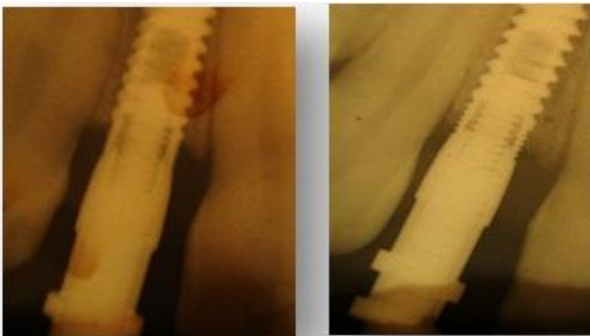


Fig-4: X Ray radiograph showed that implants coping were well screwed

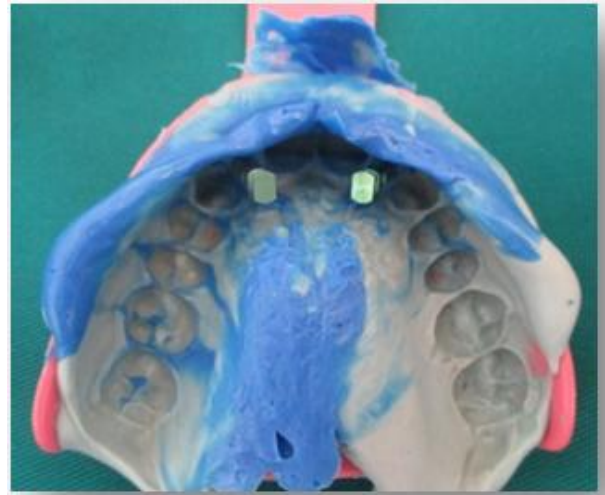


Fig-5: Impression with placed implants analogues



Fig-6: Frameworks checking



Fig-7: Contacts in normal and tight occlusion



Fig-8: Final outcome



Fig-9: 5 years follow up photo

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Cite This Article: Rim Kallala *et al*. Successful Implant Supported Prosthesis Treating Lateral Incisor Agenesis: A 5 Years Follow Up. *EAS J Dent Oral Med*, 3(3), 82-85.