Journal of
Periodontology
&
Implant Dentistry

Case Report

Management of a Congenitally Missing Lateral Incisor with Orthodontics, Bone Grafting and Single-tooth Implant: A Case Report

Majid Reza Mokhtari[1]* • Fateme Farazi[2] • Ali Forouzanfar[1] • Amirtaher Mirmortazavi[3]

[1]Assistant Professor, Department of Periodontics and Implant Dentistry, Dental School, Mashhad University of Medical Sciences, Mashhad, Iran
[2]Post-graduate Student, Department of Oral Medicine, Dental School, Mashhad University of Medical Sciences, Mashhad, Iran
[3]Post-graduate Student, Department of Prosthesis, Dental School, Mashhad University of Medical Sciences, Mashhad, Iran
*Corresponding Author; E-mail: mokhtarimr@mums.ac.ir

Received: 15 January 2012; Accepted:14 April 2013
J Periodontol Implant Dent 2013;5(2):75–78 | doi: 10.5681/jpid.2013.013
This article is available from: http://dentistry.tbzmed.ac.ir/jpid

Abstract

Careful treatment planning, space management, augmentation of bone and attention to the details of implant surgical and prosthetic techniques are important factors when treating anterior maxilla, especially in the replacement of missing teeth. This case report addresses the fundamental considerations related to replacement of a congenitally missing lateral incisor by a team approach.

Key words: **Dental implant, lateral incisor, case report.**

Introduction

Implants are successfully used to replace congenitally missing lateral incisors in adolescent orthodontic patients. Successful esthetic results of dental implant placement in the esthetic zone require knowledge of various concepts and techniques, and an interdisciplinary team approach is necessary to provide the most predictable treatment outcome. This interdisciplinary approach may involve preprosthetic orthodontic treatment following consultations with an oral surgeon or a periodontist and a restorative dentist to ensure that orthodontic alignment will facilitate the surgical, implant and restorative treatment.[1]

For patients with congenitally missing lateral incisors, who have over-retained primary lateral incisors or canines, keeping the primary tooth as long as possible should be considered to preserve the supporting alveolar bone for future implants.[2] When planning for the placement of a single-tooth implant, the orthodontist must ensure adequate space between the crowns and roots. Both the quantity and quality of alveolar bone must be assessed before implant placement is considered. To accommodate a standard implant there should be a minimum of 10 mm of inciso-gingival bone and a minimum of 6.0 mm of facial-lingual bone.[2] In cases where there is insufficient alveolar bone for implant placement, ridge augmentation may be necessary in addition to ortho-

dontic repositioning of adjacent teeth.[3] Adequate space for the implant is also required between the adjacent roots. The average dental implant fixture is 3.75 mm wide, and 1 to 2 mm of space is necessary between the fixture and the adjacent roots.[3] Typically, between 6 and 8 mm of bone between the central and canine roots is recommended. Creating adequate space between the roots must be specifically addressed since the central and canine roots may be brought into closer proximity when the teeth are initially aligned orthodontically.[2] To create adequate space for the implant, further orthodontic treatment may be necessary to move the roots further apart. Space for the coronal restoration must also be assessed. The average implant platform, which is 4.0 mm wide, requires a space of 1.0 mm mesially and distally between the platform and the adjacent tooth to facilitate proper healing and the development of a papilla postoperatively; thus, a minimum of 6 mm of space for the lateral crown is required.[4,5]

Case Report

This case was a 20-year-old female (Figures 1) who had congenital missing of lateral incisors and her chief complaint was missing of the lateral tooth and the diastema.

The treatment plan was:

- Initial therapy (SRP)
- Orthodontic therapy for alignment and achievement of sufficient space
- Surgery: ridge augmentation and implant placement
- Prosthesis
- SPT (supportive periodontal therapy)

First the space required for implant placement was achieved by orthodontic therapy (Figures 2).

To place the implant in a proper position, a bone graft was placed labially to create an adequate ridge width because the tomography showed that the ridge width was insufficient for implant placement.

The donor site was the external oblique ridge site and the lateral aspect of the ascending ramus (Figure 3).

Surgery

Lateral ridge augmentation was carried out using autogenous bone by using a trephine bur and an envelope flap (Trephine Bur Bone Harvest).[6] The implant was placed after 6 months (Figures 4).

Blocks of grafts from oblique ridge and the lateral aspect of the ascending ramus were harvested and used to create an adequate ridge width anatomy and

Figure 1. Intraoral view of the patient.

Figure 2. Orthodontic treatment for space management.

the collected bone was used as space filler. Six months later, one implant (Implantium, USA) with a diameter of 3.8 mm and a length of 10 mm was placed (Figure 4). Six months later, the second stage surgery and aesthetic surgery for leveling of gingival margins were performed and the final restoration was placed (Figures 5).

Conclusions

Dental implants are treatments of choice for most patients with congenitally missing laterals. An implant will preserve the tooth structure and alveolar bone and provide esthetics and function. However, successful restorative treatment involving implants depends on interdisciplinary treatment planning, preprosthetic orthodontic tooth alignment to achieve sufficient space, bone grafting for augmentation of ridge width, implant surgery and prosthetic treatment.

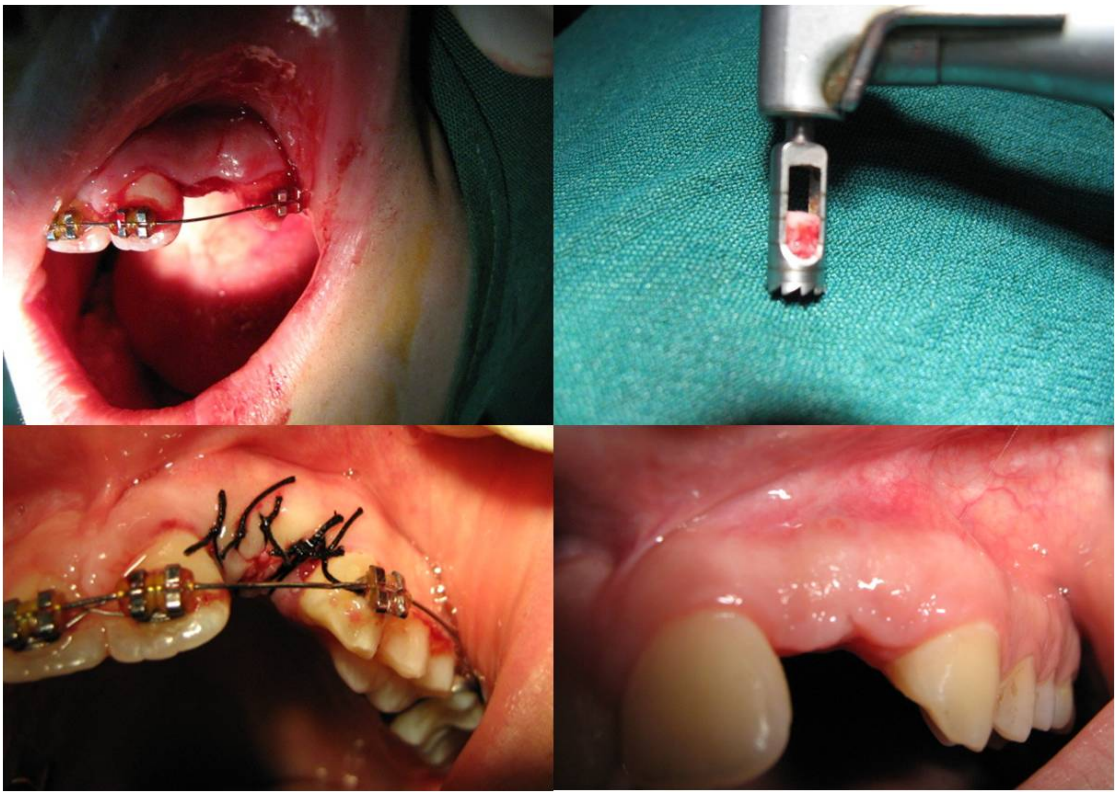

Figure 3. grafting procedure and Healing of the recipient site after 6 months.

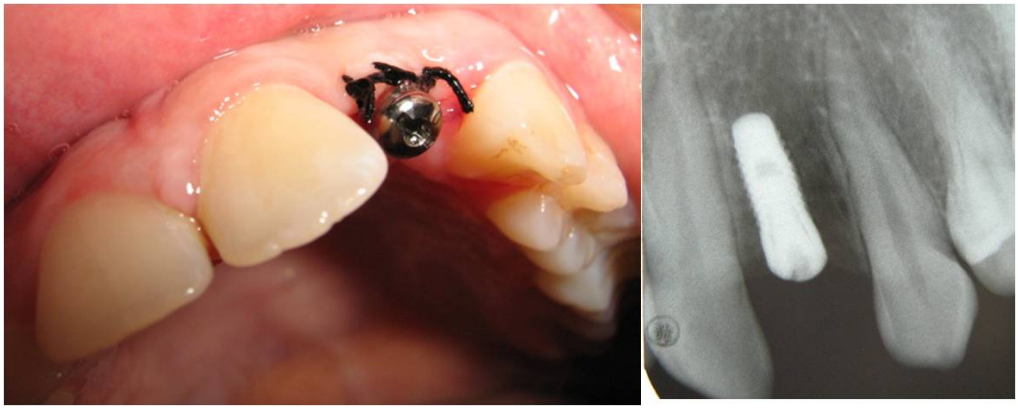

Figure 4. Implant placement and radiograph of implant

Figure 5. Abutment placement and Final restoration

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