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MANAGEMENT OF A PATIENT WITH CONGENITALLY MISSING LATERAL INCISOR: a multidisciplinary team approach

Tratamento de um paciente com ausência congênita de um incisivo lateral: uma abordagem multidisciplinar

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Abstract

OBJECTIVE: The present paper highlights a case where the patients presented with spacing in the upper anterior region due to missing right lateral and peg shaped left lateral incisor. **METHOD AND RESULTS**: The initial treatment was standard edgewise fixed orthodontic appliance to distalize the canine, correct the bite and create space for the lateral incisors and correct the midline. **CONCLUSION**: After the active phase of fixed orthodontic treatment, an implant was placed and the peg shaped lateral incisor was built up with composite.

Keywords: Congenitally missing teeth. Orthodontics. Prothesis. Dental implant. Multidisciplinary team approach.

Resumo

***OBJETIVOS**: O presente artigo refere-se a um caso em que o paciente apresentava espaços na região anterior da maxila devido à ausência de incisivo lateral direito e incisivo lateral esquerdo com coroa deformada. **MÉTODO E RESULTADO**: O tratamento inicial foi ortodontia fixa (edgewise) para distalizar o canino, corrigir a mordida e criar espaço para o incisivo lateral e corrigir a linha média. **CONCLUSÃO**: Após a fase ativa da ortodontia, utilizou-se um implante adequado na região do lateral direito e reconstruiu-se a coroa deformada do incisivo lateral esquerdo com compósito.*

***Palavras-chave**: Ausência congênita de dente. Ortodontia. Prótese. Implante. Abordagem multidisciplinar.*

INTRODUCTION

Permanent lateral incisors are the third most common missing tooth in the mouth after upper and lower second premolars (1). It is more common bilaterally and has a slightly higher female predilection. The prevalence of congenitally missing lateral incisors is between 1 and 2 percent (1, 2). Congenitally missing maxillary permanent lateral incisors often lead to an unattractive appearance and difficulty in treatment planning. Many factors must be considered before a decision is made both to close spaces and modify the canines, or to redistribute the spaces and replace the missing teeth with prosthesis. Good communication among patients, dental specialists, and general practitioners is necessary (1).

When a maxillary lateral incisor is missing, often the treatment options can be clearly defined, that is, substitute an adjacent tooth for the missing one; open the space for an implant, a bonded bridge or fixed bridge. Three treatment options exist for the replacement of congenitally missing lateral incisors. They include canine substitution, a tooth-supported restoration, and a single-tooth implant. Selecting the appropriate treatment option depends on the malocclusion, anterior relationship, specific space requirements, and condition of the adjacent teeth. The ideal treatment is the most conservative option that satisfies individual esthetics and functional requirements. Today, the single-tooth implant has become one of the most common treatment alternatives for the replacement of missing teeth (2). There must be coordination among the restorative dentist, the oral surgeon or implantologist and the orthodontist to obtain the optimum result (3).

CASE REPORT

A 22 year old male patient came to the orthodontic department of Manipal College of Dental Sciences, Manipal, India, with a chief complaint of spacing in the upper front region (Figure 1).

FIGURE 1 - Extraoral Frontal view showing spacing in the upper front region

On examination the following findings were observed: maxillary anterior spacing with congenitally missing right lateral incisor; peg shaped left lateral incisor; midline diastema of 2mm. Shift in the dental midline to the right of the facial midline by 2mm (Figure 2).

FIGURE 2 - Pretreatment photograph of the patient showing Maxillary anterior spacing with congenitally missing right lateral incisor, Peg shaped left lateral incisor, Midline diastema of 2mm, Shift in the dental midline to the right of the facial midline by 2mm

The maxillary right canine had drifted mesially and was in an end-on relation with its mandibular counterpart and the molar relation was Class I (Figure 3).

FIGURE 3 - Drift in the maxillary right canine and an end-on relation with its mandibular counterpart and Class I molar relation

Hence the aim of the treatment was to orthodontically open up space for the missing lateral incisor by bringing the upper right canine into class I relation and correcting the dental midline by moving the central incisors. Secondly, prosthetic replacement of the missing right lateral incisor with oral root formed implants and finally aesthetic restoration of the peg shaped lateral incisor. The multidisciplinary team included the role of an orthodontist, oral implantologist and prosthodontist.

Phase I - Orthodontic treatment

Fixed orthodontic treatment was initiated with standard edgewise appliance 0.022 X 0.028 brackets (Dentauram ™). Leveling and alignment were achieved using sequential 0.016, 0.018 curve of Spee round stainless steel wires in the upper arch over a period of 3months. The distalization of canine into Class I relation was done using a 0.019 X 0.025 stainless steel rectangular wire with open coil NiTi spring. Cervical pull head gear was used as an extra oral anchorage. Further space for the maxillary right lateral incisor was created by moving the maxillary incisors 2mm to the left. Doing so an 8mm space was achieved for the missing lateral incisor and the upper midline was simultaneously corrected. The total active phase of orthodontic treatment took 11 months. This was followed by a stabilization phase with 0.019 x 0.025 rectangular wires (Figure 4).

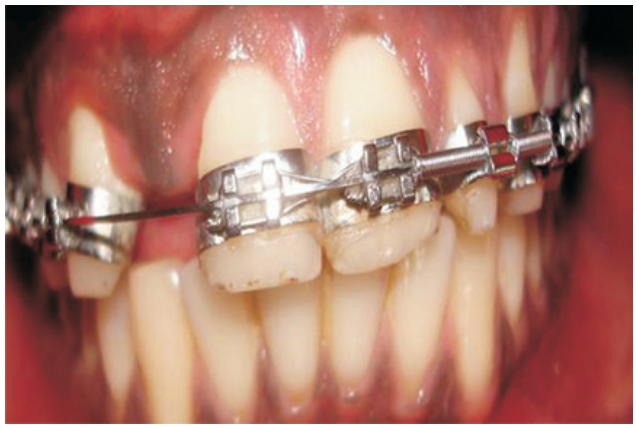

FIGURE 4 - Figure showing use of .019x0.025 stainless steel rectangular wire for canine distalization

Phase II - Implant placement

A preoperative orthopantomograph was taken to ascertain the height of the available bone for implant placement (Figure 5).

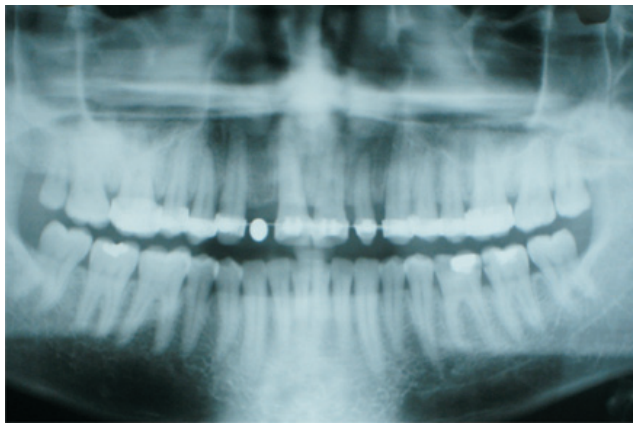

FIGURE 5 - A preoperative orthopantomograph taken to ascertain the height of the available bone for implant placement

Primary impressions were made for diagnostic casts and fabrication of vacuum formed surgical guide template using Biostar™, for which the missing lateral was replaced with an acrylic tooth and the template made over it (Figure 8).

Ridge mapping (Figure 6) was done to ascertain bone width and was found to be adequate to accommodate a 3.8mm wide, 13 mm length Frialit 2™ hydroxyappatite coated implant fixture.

FIGURE 6 - Figure showing Ridge mapping done to ascertain bone width

A mucoperiosteal flap was raised in the 12 region and initial bone preparation done using a pilot drill (Figure 7) with the surgical template as guide for proper angulations.

FIGURE 7 - Figure showing initial bone preparation done using a pilot drill with the surgical template as guide for proper angulations

After implant placement a cap screw was put into place and the flap sutured back. (Figures 8, 9, 10).

FIGURE 8 - Figure showing diagnostic casts and fabrication of vacuum formed surgical guide template using Biostar™, for which the missing lateral was replaced with an acrylic tooth and the template made over it

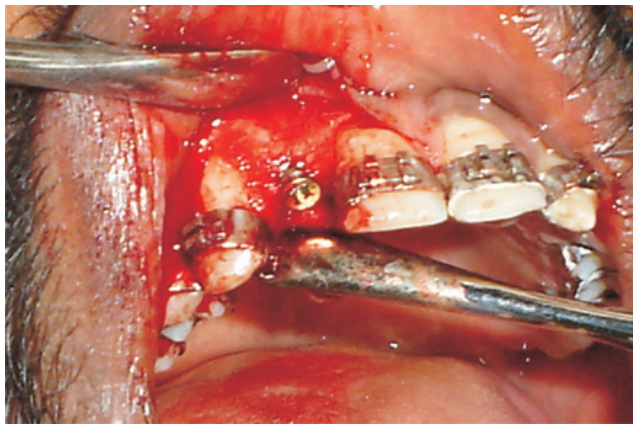

FIGURE 9 - Figure showing Frialit 2™ hydroxyappatite coated implant fixture in place

FIGURE 10 - Cap screw in place after implant placement

After 6 months the 2nd stage surgery was done using a tissue punch biopsy cutter so as to minimize bleeding and proper healing (i.e. flapless technique) with healing abutment or gingival former in place (Figures 11, 12, 13).

FIGURE 11 - Figure showing 2nd stage surgery done using a tissue punch biopsy cutter so as to minimize bleeding and proper healing

FIGURE 12 - Figure showing healing abutment in place

FIGURE 13 - Figure showing abutment in place

The final impressions were made after the healing abutments were removed using polyether (Impregum TM) for laboratory fabrication of final restoration (Figure 14).

FIGURE 14 - Figure showing final impression with lab analog

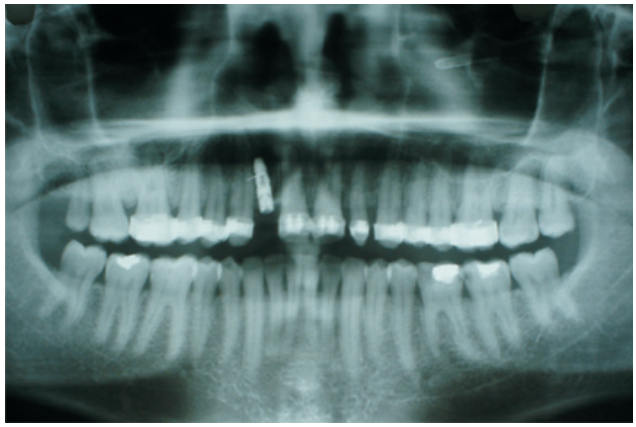

FIGURE 15 - Figure showing post-operative OPG

periodically radiographs were used to track implant position and osseointegration (Figure 15).

Phase III - Prosthodontic treatment

After selection of a suitable abutment, the implant fixture was restored with porcelain fused to metal crown. The contra lateral peg shaped lateral was restored using composites of appropriate shade (Figure 16).

FIGURE 16 - Figure showing restorations and final aspect anterior region of the maxilla

DISCUSSION AND CONCLUSION

Missing lateral incisor leads to an obvious asymmetry in the patients smile, shift in the dental midline. In addition the peg shaped lateral incisor further adds to the unsightliness of the smile. There seems to be an association between hypodontia and malformation of the maxillary laterals which may be reduced in size or simplified in shape, often becoming peg-shaped. It may even provoke an unfavorable response from others in society. The canine can drift mesially into an end-on or Class II relation which is functionally undesirable.

The early loss of permanent teeth following trauma or congenital aplasia and agenesia need to be corrected by orthodontic or prosthetic means, sometimes combined with implant therapy. Preprosthetic orthodontic measures (4) are often an integral part of comprehensive oral rehabilitation. The individual aspects of treatment are aimed at optimizing dentofacial esthetics and at improving masticatory function and hygiene potential of prosthetic restorations. The orthodontic solution results usually in different anatomic, functional, and esthetic problems. Prosthetic and implant procedures are very demanding and require long-term maintenance (4).

Absence of the maxillary lateral incisor creates an aesthetic problem which can be managed in various ways. The condition requires careful treatment planning and a consideration of the options and outcomes following either space closure or prosthetic replacement. Recent developments in restorative dentistry have warranted a re-evaluation of the approach to this clinical situation. Factors relating both to the patient and to the teeth, including the presenting malocclusion and the effect on the occlusion, are considered (5).

Implants are commonly used to replace congenitally missing lateral incisors in adolescent orthodontic patients. However, these restorations are often challenging for the orthodontist, surgeon, and restorative dentist. In some patients the space across the alveolar crest is too narrow to permit the surgeon to place the implant. Occasionally the root apices of the adjacent central incisor and canine are in close proximity. In other cases the ridge thickness could be inadequate and require augmentation. When the orthodontist opens the space, the papilla heights are adversely affected. Some adolescent patients have altered passive eruption after orthodontic treatment, which affects the level of the gingival margins.

Finally, questions commonly arise regarding the appropriate age for implant placement in these young patients. If not addressed, these issues could compromise the aesthetics of the implant restoration (6). From an aesthetic and functional point of view such patients need a combination of orthodontic, prosthetic and restorative care.

In this case, the use of a simple vacuum formed surgical guide template was found to be very cost effective and accurate for the implant placement.

Congenitally missing lateral incisor presents challenging treatment planning for the dentist as they are usually associated with other malocclusions and abnormalities. Selecting the appropriate treatment option depends on the malocclusion, the anterior relationship, specific space requirements and the conditions of the adjacent teeth. In order to obtain the best aesthetic and functional result, a multidisciplinary team approach involving the orthodontist, implantologist and prosthodontist is required.

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