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Implant Treatment of Hypodontia: A Challenging Case

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Abstract: Hypodontia is a developmental absence of permanent or deciduous teeth. In cases where narrow space is available in horizontal and vertical dimension the restoration with implants may be difficult. This case described the way of solving such a challenging case with Nanotite™ Tapered Certain® microminiplant. The limitations of the narrow space are discussed with a great focus on the implant solution.

Key words: Implant treatment, hypodontia, deciduous teeth, surgical bone, challenging case

INTRODUCTION

Congenital absence of teeth or hypodontia considered to be common with prevalence in the population to range between 3-7% if third molars excluded (Soame and Southam, 1999). Maxillary lateral incisors were second most common teeth involved in hypodontia (Gedik, 2002). Hypodontia may be subdivided into partial or complete pattern. Prosthetic treatment is usually required to restore functional and aesthetic aspects when maxillary lateral incisors are missing. Surgical implantology is the primary alternative of standard prosthetic techniques (Dhanrajani, 2002). Surgical insertion of dental implants required adequate bone depth and width and good bone quality. In cases were depth or width are inadequate, bone augmentation may be performed to increase quantity vertically or horizontally (Thor *et al*., 2005; Mannai, 2006). Possibly the only reason that could not give effective surgical bone augmentation in the 2 axes may be various anatomical variations such as tilted roots of adjacent teeth because drilling of the bone should be concentric.

In our case, we discussed the treatment options of such a clinical situation with implantation of tapered micro implants in an apical narrow space at the end of the orthodontic treatment.

CASE REPORT

A female patient, 16 years old presented at the clinic for the restoration of missing lateral maxillary incisors (Fig. 1). The individual was fit and well without local or systemic medical conditions. No allergies reported. The patient initiated orthodontic treatment one year ago for correcting teeth inclination. The full blood count was normal. The panoramic tomography revealed the tilted roots of central maxillary incisors towards to the canines (Fig. 2). The study model cast revealed that superiorly the major distance between crown periphery of 11 and crown periphery of 13 was 4.8 mm where the similar distance between the 21 and 23 was measured to be 5.2 mm (Fig. 3).

It was decided to insert narrow and short dental implants avoiding the injury of the adjacent teeth and their proximal periodontal structures. According to the measurements the insertion of 2 implants with length 8.5 mm and width 3.25 mm considered to be safe. The Nanotite™ Tapered Certain® microminiplant 3.25 mm (D) and 8.25 mm (L) selected for surgical placement in the narrow spaces for single crown restoration (Fig. 4).

The surgery performed under local anaesthesia using 2 ampules of 2% xylocaine with 1:80000 adrenaline. The trapezoid mucoperiosteal flap raised buccally with extension to the palatal mucosal margin for aesthetic reasons. A disposable round drill 2 mm (D) used for creating flat bone area. Afterwards, 2 twisted drills of 2 mm and 2.3 mm (D) used for vertical drilling of the alveolar bone. The quality of bone did not require the use of pilot drill or bone taps. The same technique performed for the tooth area 12 and 22. Finally, the 2 Nanotite™ Tapered Certain® microminiplant 3.25 mm (D) and 8.25 mm (L) inserted to the bone with 20 and 25 N cm^{-1} in area 12 and 22, respectively. There was no need for using bone grafts or other tissue regenerative techniques. The

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Fig. 1: Clinical picture of missing upper lateral incisors with limited interdental space

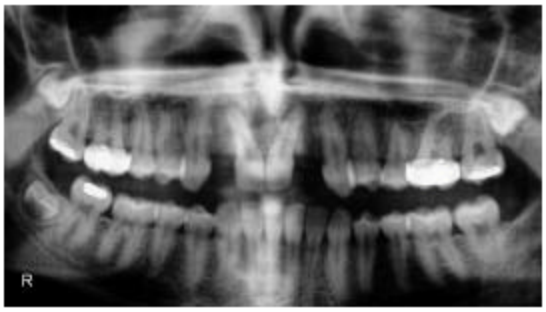

Fig. 2: The panoramic tomography revealed the tilted roots of the central incisors towards to the canines creating narrow horizontal and vertical space for implant insertion

Fig. 3: Study model used for evaluation of the dynamic and static movements. Furthermore the available interdental coronal space measured

mucoperiosteal flap sutured using rapid vicryl 3/0, 19 mm, 3/8 with triangular cross section needle for atraumatic insertion into the soft tissues. The usual cover screws 3.4 mm (D) used for covering the superior parts of the implants during the initial healing process.

A prescription (amoxicillin 500 mg, tds, 5/7) given to the patient for prophylactic antibiotic cover. Painkillers

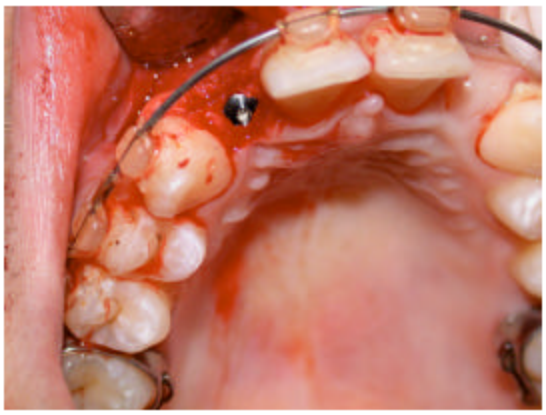

Fig. 4: Inserted implant in the narrow upper right area

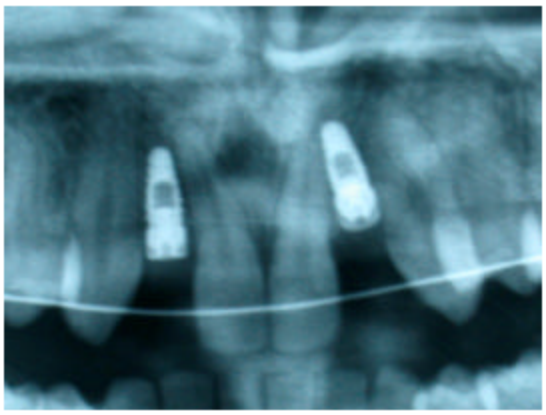

Fig. 5: The panoramic tomography showed normal radiological features at the follow up

Fig. 6: Cemented crowns restored the aesthetic and functional disability

with mild antiinflammatory effect (ibuprofen 500 mg, bd, 5/7) given for controlling expected signs and symptoms of such a surgical procedure. A chlorhexidine mouthwash suggested 2 times daily until sutures removal for antisepsis of the surgical site and plaque control of the adjacent teeth.

At the initial follow up, one week later the patient was pain free without pathological signs. The sutures removed and a soft periodontal brush given for brushing the teeth according to the instructions given on dental chair. Three months later the panoramic tomography showed normal features (Fig. 5).

The prosthetic treatment based on internal connection Certain MicroMiniplant UCLA Gold (Hexed) Abutment Cylinder 3.4 mm (D). The aesthetic requirements covered by cement retained metalloceramic restoration (Fig. 6).

DISCUSSION

Developmental disorders of teeth may be found due to abnormalities of morphodifferentiation caused by dental lamina or tooth germ (Soames and Southam, 1999). Evaluation of congenital partial edentulism is essential for designing the treatment plan. The most important factors may be the horizontal and vertical free space which is available for conventional crown or bridge restoration. Another factor which applied in implant restoration should be the anatomical root variation of the adjacent teeth. In our case, we overcame this negative factor using short implants.

According to the evidence, the prognosis of the surgery depended on the clinician and on the patient exogenous or endogenous aspects. The short implants in general had poorest prognosis if compared to those with long osseointegrative surface (Hobkirk *et al*., 2003). In cases were the patient is young, fit and healthy the short implants may be inserted for upper lateral incisors without any postsurgical complications. It is therefore a clinical decision based on the willingness of the surgeon to perform implant restoration.

The anatomical distal inclination of the central incisors roots may be easily classified into first degree of difficulty when the distance between the more inclined part of the root and the proximal part of the adjacent tooth is less than 3 mm. This radiological appearance is not ideal for implant placement when the ideal vertical bone dimension is less than 8 mm. Therefore, limited space guides the clinician toward selection of an implant of reduced diameter to avoid adjacent roots injury. According to the classification, the anterior upper maxilla is composed mainly of spongous bony tissue with thin cortex (Blahout *et al*., 2007). This is another negative issue for placing short implants in the anterior maxilla. The important factor which is mostly required in the western countries before any surgical procedure was the written consent form (Layton and Korsen, 1994). It is ethical to explain the patient about the surgery and any possible complication including the implant failure and to allow the patient to ask any question in verbal form. Further inclusion of written consent form should be available in all surgical practices indicating that the patient was informed about the procedure without any unsolved item.

This case report described a challenging case with uneventful outcome. We suggested that, the patient is free from systemic or local pathological conditions and non smoker may be considered as good candidate for short implants restoration when the space is limited.

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