

Nasal Floor Membrane Lifting for Dental Implant Placement in an Atrophic Premaxilla: A Case Report

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Introduction: Augmentation of atrophic alveolar ridges is an important aspect of functional restoration in modern oral rehabilitation. Vertical bone resorption of the dentoalveolar ridges remains a serious challenge for successful dental implant placement. The premaxilla region is one of the most challenging areas for implant restoration. Nasal floor approximation in anterior maxilla in concomitant with atrophy made where sufficient amount of augmentation is not possible make nasal lifting as an alternative technique. **Report of a case:** In this report, we described a successful case of nasal floor lifting for dental implant placement in an atrophic premaxilla. **Conclusion:** It might be concluded that nasal floor membrane lifting may be a reliable technique for implant recipient site rehabilitation in severe vertically atrophied premaxilla. However, further clinical trials are needed to support its relevancy.

Keywords: Implant; Nasal floor elevation; Nasal lift; Premaxilla.

Introduction

Nowadays the increased quality of life, the high therapeutic expectations and tendency to receive the most efficient treatments have made the use of novel medical and dental techniques unavoidable (1, 2). The successful dental implant placement predominantly depends on the presence of adequate bone quantity and quality at the edentulous site (3). The volume of optimal osseous positively affects osseointegration, as well as the long-term stability and final esthetic and prosthetic outcomes of dental implants (1, 4). Vertical bone augmentation has been considered a great dilemma in advanced preprosthetic surgery (5).

Onlay bone grafting, sandwich techniques, guided bone regeneration (GBR), distraction osteogenesis, and anatomic repositioning in posterior maxilla (sinus lifting) are the most considered approaches to regenerate the recipient site bone. These techniques have been reported to be efficient in highly resorbed ridges to achieve optimal outcomes in horizontal and vertical dimensions (6). Anterior maxillary region is one of the most challenging areas in implant dentistry. Nasal floor approximation, gingival and dental smile line, and adjacent teeth

made three-dimensional osseous volume reconstruction very compromised (7). Nasal lifting could be considered as an alternative technique to crestal bone augmentation in anterior maxilla instead of using short implants (7).

Regarding the literature, nasal floor elevation is an effective and safe procedure that can be used for implant placement in an atrophic premaxilla with success rates that are comparable to those of implants placed following open sinus lifting (4, 8).

The present study aimed to introduce a successful case of nasal floor lifting for dental implant placement in an atrophic premaxilla in a 67-year-old female patient.

Report of the Case

A 67-year-old female with missing lateral tooth of the maxilla was referred to the oral and maxillofacial department of Mashhad dental school, Mashhad, Iran. Her upper left lateral tooth (tooth no 22) was extracted about 4 months ago. The patient had implant-based prosthesis for teeth no 11,12,21,23 and 24. Now she wished for a new dental implant in her upper left lateral site.

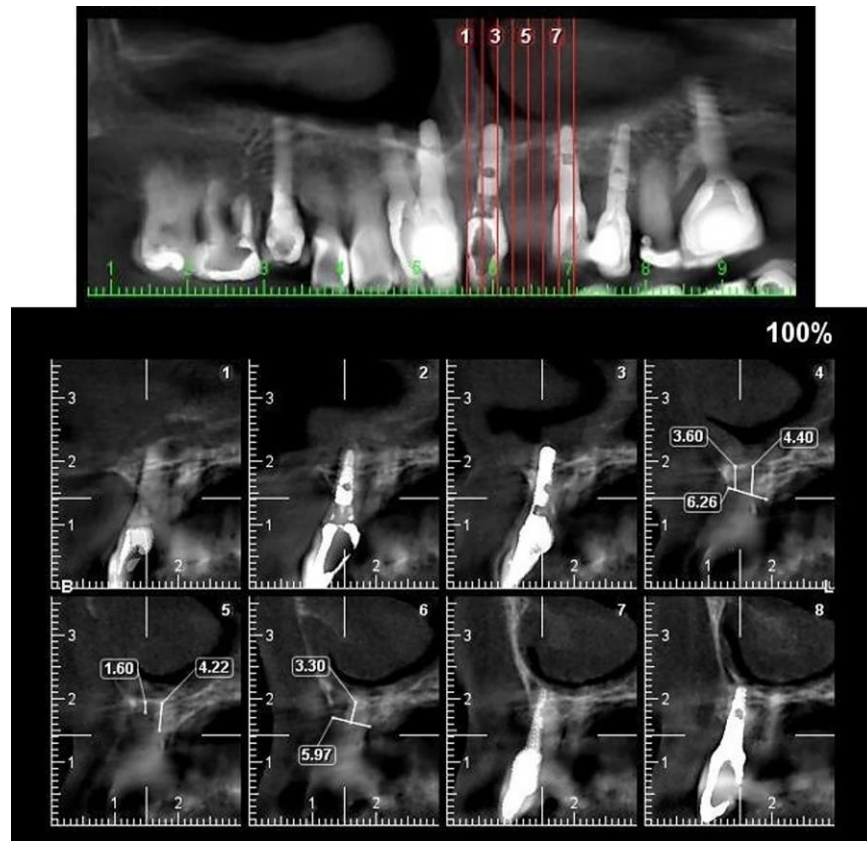


Figure 1. Pre-operative CBCT depicted a vertically atrophic ridge in the left upper lateral site

Periodontal evaluation of the area showed a thin keratinized gingiva and atrophic bony ridge. Over the last 3 years, the patient underwent various dental implant surgeries for her other upper teeth replacement. The oral hygiene was good and no medical problems has been reported. Cone-beam computed tomography (CBCT), showed an atrophic alveolar ridge in left lateral tooth region (Figure 1). The bone width and height (distance from nasal floor) in this region were 6.20 mm and 4.40 mm, respectively.

Nasal floor lifting has been done with simultaneous implant placement in site of 22. The neighboring dental implants that suffered from crestal bone loss has also been treated with the aid of bone substitute.

Surgical approach

The protocol was approved by the Institute of Human Research and Ethics Committee of Mashhad University of Medical Sciences (IR.MUMS.sd.1394.89). After the informed consent, the operation was performed under local

anesthesia (Lidocaine 2%, Epinephrine 1/80000, IranDaru, Iran). At first, a full-thickness flap on crestal ridge of the left upper lateral region with two releasing incision was created and dissected. The surgical procedure of nasal floor elevation was performed conservatively. The piriform rim and the anterior nasal spine were exposed through an intraoral approach. A Woodson elevator and open sinus lift currettts were used for nasal mucosa elevation while the soft tissue and nasal septum attachment to the anterior nasal spine were maintained (Figure 2A). The extent of posterior elevation was determined by the position of the most distal position of the implant. The nasal mucosa was then carefully elevated in the anterior part of the nasal floor to allow the placement of the bone graft material (Figure 2A).

For vertical augmentation, the nasal floor was grafted with a xenograft bone substitute mixed with autogenous bone particles. The bone graft material used for all procedures (horizontal and vertical alveolar ridge deficiency reconstruction) was natural bovine bone mineral (Cerabone®, Bottiss, Germany).

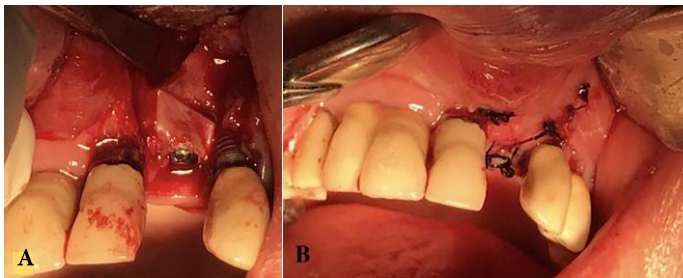


Figure 2. Clinical illustration of Nasal floor lifting procedure

Following the bone graft procedures, the implant was placed in the lateral region, using the standard drilling sequence. The implant type used was Implantium (Dentium, Seoul, South Korea). A bone-level implant with a diameter of 3.6 millimeters and a length of 10 mm was inserted into the drilled site with satisfactory primary stability.

The Implant was placed at the crest of the residual alveolar ridge and in line with adjacent implants. Guided bone regeneration around adjacent dental implants was performed. Moreover, a resorbable collagen barrier membrane (Jason® Membrane, Bottiss, Germany) with a size of 10 mm*15mm fixed on implant and the cover screw used to stabilize the membrane (Figure 2A). In order to advance the flap over the augmented ridge and to avoid tension on the flap, a horizontal incision of the periosteum was made in the base of labial side, and the flap was then been closed with a mattress suture (Vicryl, Johnson, and Johnson, UK) free of tension (Figure 2B). Antibiotics (co-amoxiclave [625 mg] every eight hours for seven days), analgesics (ibuprofen [400 mg] every six hours for four days), and antiseptic mouthwash (chlorhexidine [0.12%] every 12 hours for two weeks) were prescribed for the patient post operatively. Instructions were given to the patients to follow a soft diet and to avoid blowing their noses, coughing, or sneezing with the mouth open. After four months, radiographic and clinical examinations demonstrated successful osseointegration and proper bone healing (Figure 3). Neither the graft infection, nor the implant thread exposure was observed. The uncovering of the implants was performed to place the healing abutments. The patient was followed for 6 months with a successful result.

Discussion

The specific aim of the present study was to show that nasal lifting might be an effective and reliable alternative of short implants in vertically atrophic premaxilla cases.



Figure 3. Post-operative radiographic examination of the patient

Garcia-Denche *et al.*, in their study demonstrated that the nasal lifting is an effective and safe procedure that can be used for implant placement in atrophic premaxilla with success rates that are comparable to those of implants placed in the maxillary sinus following the open sinus lifting procedure (4).

To the best of our knowledge, the vertically atrophic premaxilla region is one of the most challenging areas for implant restoration (9). One way of dealing with this challenge is by using short implants in the case of vertical bone atrophy. However, short implants may lead to more complications. Therefore, alternative options are needed (4). Several techniques have been used to increase the bone height of the premaxilla region, such as onlay bone grafts, and guided bone regeneration, as well as Distraction osteogenesis and titanium mesh (10). However, the risk of failure with these techniques is still a major problem (4, 11). Another technique that can be used when there is an insufficient vertical bone for implant placement in the premaxilla is nasal floor lift or elevation, as described by Garg (12).

Endosseous dental implant placement in the posterior maxilla with augmentation of the floor of the maxillary sinus using is a generally accepted procedure with an acceptable success rate and few complications (13). In contrast, studies reporting the success rate of implants placed in augmented premaxilla site concomitant with nasal floor elevation are very limited (14). The study of Garcia-Denche *et al.*, in 2014 declared that the implant success rate was 89.2% following nasal lifting (4). Albeit, there is a lack of evidence regarding the success of implants placed in atrophic premaxilla using the nasal floor elevation technique (4, 8).

In this procedure, the nasal mucosa is carefully elevated to remain intact. Then, the elevated nasal cavity is filled with bone graft material to prepare the site for implant placement.

Perforating the nasal mucosa with dental implants may cause serious complications. It may lead to infection, epistaxis, sinusitis, and failure of the bone graft (15).

The protruding implants in perforated nasal mucosa will act as foreign bodies and give rise to inflammation and peri-implantitis. Therefore, nasal lifting is an advantageous technique to remain the nasal floor membrane intact, during the anterior maxilla implantation (16).

Although the implant in this study was placed immediately following nasal lifting and bone grafts, both delayed and immediately placed implants were successful, with a higher success rate in the immediately placed implants (4). The residual bone in our patient allowed immediate implant placement.

According to the present case report, the radiographic and clinical examinations demonstrated successful osseointegration and proper bone healing after nasal lifting. It might be concluded that nasal floor elevation is an effective and safe procedure that can be used for implant placement in a vertically atrophic premaxilla. However, further clinical trials with longer follow-ups about nasal floor elevation and the success of implants associated with this procedure are suggested to confirm our conclusion.

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