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DIRECT SINUS LIFT WITH IMMEDIATE IMPLANT PLACEMENT:A Case Report

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ABSTRACT

Numerous studies have shown that placement of implants in the maxillary region with resultant successful osseointegration can be achieved by the use of sinus lift procedures using piezosurgical technique. In this case report a 32 year old patient had come to the outpatient department of DY Patil School of Dentistry, Navi Mumbai with a chief complaint of missing upper right posterior molar. Since the radiographic showed only 4 mm bone below the sinus floor and 3.6mm width of the bone in #16 region, direct sinus lift procedure was done for placement of a dental implant. Piezosurgery unit was used, as it reduces the risk of damaging vital soft tissues such as nerves, dura matter and blood vessels. To stabilize the implant in the maxillary sinus region and also to stimulate bone regeneration, xenograft was used. Bone formation in the maxillary antrum was seen clearly in the intra oral periapical radiograph.

KEYWORDS: Xenograft, Bone augmentation, Endosseous implant, Sinus lift, Peizosurgery

CASE REPORT

A 32-year-old female patient came to the outpatient Department of DY Patil school of Dentistry, Navi Mumbai in 2022, with a chief complaint of missing right upper back teeth. On examination, tooth no #16 was missing. Detailed case history of the patient revealed that both the teeth were extracted due to extensive caries and persistent pain. The patient had no relevant extraoral or intraoral abnormalities. Blood investigations were done which revealed

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no systemic abnormalities. The CBCT taken revealed that the bone height and bone width in 16 region and the maxillary antrum was insufficient (height: 4.0mm) for implant placement. (figure 1) Alveolar bone was homogenous in nature and bone mapping revealed the crestal width of bone in relation to #16 was 3.6 mm. According to Misch's classification [1], bone density showed D3 type of bone. An informed consent was taken from the patient prior to the surgery. Alternatives to the treatment were explained and he was also informed about the benefits and risks of each treatment option. Patient did not want to get removable prosthesis done, so he opted for implant.

Pre-Surgical Evaluation

Blood investigations were done, and informed consent was taken after discussing the treatment plan with the patient. Alginate impression was recorded, and presurgical diagnostic casts were prepared. In the cast, the interocclusal distance was measured, and the treatment plan was discussed with the patient and the bystander.

SURGICAL PHASE

Before the surgical procedure, preparation of the patient was done. The maxillary posterior segment was anesthetized with buccal and palatal infiltration using local anaesthesia of 2% lignocaine with 1:80,000 adrenaline. Once the patient was anesthetized, an incision was made using #15 surgical blade and extending from the mesial surface of #15 to the mid buccal of 18. A vertical incision was extended until the end of the buccal vestibule at #15. A full thickness buccal flap was raised, and a bony window was then traced. (figure 2) Piezoelectric surgical unit with ultrasonic tip BS#5 was used for window preparation. This was followed by the deepening of the mark using SL1 tip. The bone tracing was made until a very thin plate of buccal bone remained over the sinus lining, and then, the fractured section of the bone was taken carefully and kept aside in a sterile bowl. The osteotomy wall was fractured, removed and kept in saline. This was followed by the SL3 tip to raise the lining in the vicinity of the bony window. The partially raised lining was then lifted to a greater extent using the BS4 & BS5 tips. Complete membrane elevation was done manually by use of appropriate elevators. (figure 3)

Once complete membrane elevation was done, we tested its integrity by observing mobility during respiratory acts. Valsalva manoeuvre was performed to diagnose the integrity of the membrane, in case of perforation of Schneiderian membrane. It was deemed unnecessary in the other cases as it was quickly ascertained that the membrane had remained intact because the sinus membrane was moving with the respiratory rhythm (bellows effect).

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This included detailed case history, clinical examination, blood investigations, photographs and radiographic analysis. Radiological analysis used was a combination of intra-oral periapical radiograph (IOPAR)/Orthopantomogram and C.B.C.T. scan of the maxilla.

Then a collagen membrane was used to protect the roof of created sinus cavity. The sinus membrane elevation was grafted using large particle size Bio-Oss (xenograft). An osteotomy was done using Densahosseodensification burs in reverse cutting motion to improve the bone quality, protecting the raised sinus lining from any damage with the drills. Bredent SKY Implant (4mmx8mm) was placed at the site and the initial stability was confirmed clinically. The grafted site was closed with the bony window plate which was harvested at the time of window preparation. Immediate radiograph was taken to confirm correct positioning of implant and graft material. Medicines and post- operative instructions were given to the patients. (figure 4 & 5)

DISCUSSION

With the advancement in the field of dentistry, implant-supported prosthesis is no more a big challenge. The rate of tooth loss in the maxillary molar area is high due to its important role in mastication and caries or periodontal diseases caused by inferior oral hygiene practices. In addition, because bone quality of the maxilla is poorer than that of the mandible, atrophy of the alveolar ridge can be more severe in cases maxillary tooth loss. In addition, maxillary pneumatization may hinder implant placement. (1,2)

To overcome these problems, maxillary sinus lift with an accompanying bone graft serves as a simple, widely used procedure. (3)A sinus lift for implant placement is considered one of the most predictable procedures for augmenting bone in the maxilla. (4,5)Several approaches have been developed and are currently used. The lateral approach using a Caldwell-Luc osteotomy is historically the first main technique, where the maxillary sinus floor is grafted to provide a sufficient quantity of bone for the placement of endosteal dental implants. (2,6,7)Sinus floor elevation with bone augmentation of the maxillary sinus is now well-accepted procedures which are used to increase bone volume in the posterior maxilla.

In this present case, on radiographic examination, the available bone height in the right molar region was found to be only 4.0 mm from the maxillary sinus lining. Since the patient had a missing right molarfor couple of years, there was atrophy of the edentulous area. This could have caused continuous loss of bone height and density and an increase in antral pneumatization. (8)Hence, direct sinus lift using piezosurgical approach following immediate

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implant placement was planned. (9)This technique prevents perforation of the "Schneiderian Membrane" and cause minimal postoperative complications.

To stabilize the implant in the maxillary sinus region and also to stimulate bone regeneration, large particle size xenograft was used. (10)

The outcome of sinus augmentation procedure for implant placement has been presented from a single centre. It appears from the case report that case selection, graft placement and the type of implant used plays an important role in determining outcome of the procedure.

CONCLUSION

The present study identified that with lesser amount of bone height in maxillary posterior region, implant can be placed safely with direct sinus lift procedure. The goal of any dental implant surgeon is to use a cost-effective, short duration, less risky, simple, and highly predictable outcome procedure. Advanced and extensive surgical techniques often increase treatment duration and costs with no absolute prediction of result. Use of minimally invasive technique such as direct sinus lift provides cost affordable, less risky, and predictable results as compared to invasive procedures. The techniqueemployed in this manuscript has facilitated implant placement in areas of limited bone height, improved primary stability, high implant success in posterior maxilla, simple, and minimally invasive surgery with increased success and case acceptance.

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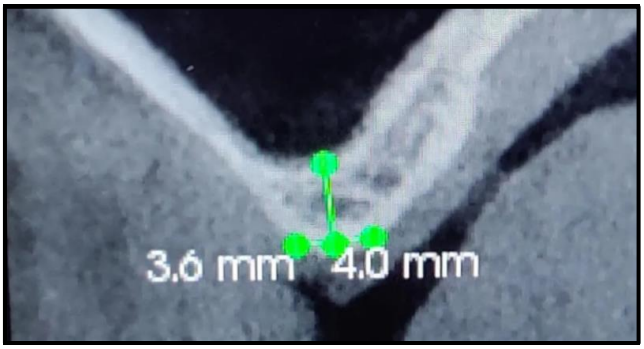

Figure 1

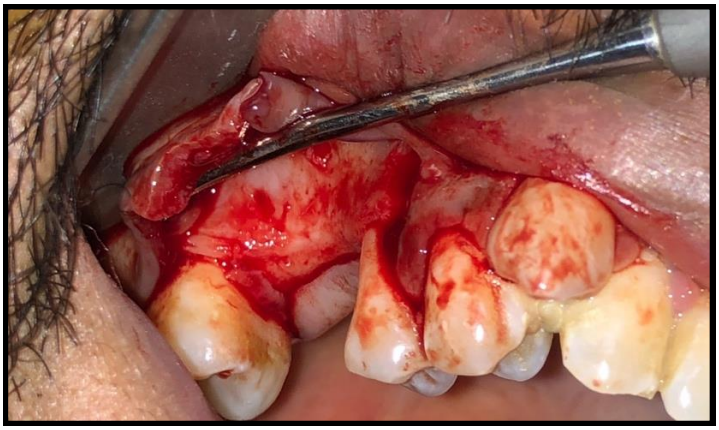

Figure 2

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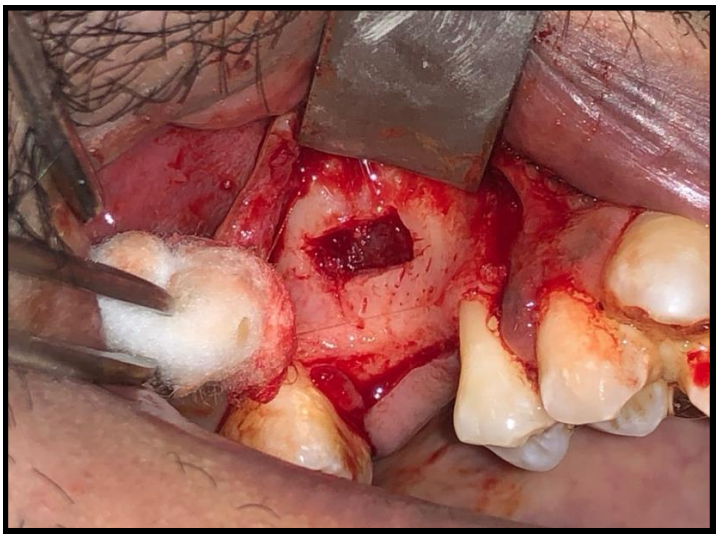

Figure 3

Figure 4

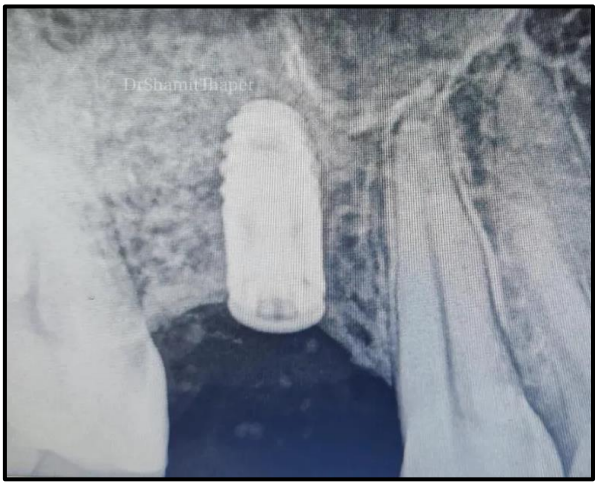

Figure 5