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Case Report

Indirect Sinus lift: a simplified approach for implant placement in posterior maxilla

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ABSTRACT

Implant has become an excellent modality for tooth replacement ever since its inception into the modern era of dentistry. An essential condition for successful implant placement is the presence of adequate quantity and quality of bone. This problem is mostly encountered in posterior region of maxilla were ridge resorption and sinus pneumatization are often seen after loss of the tooth. The purpose of the case report is to present a less invasive and less complicated simple approach of sinus lift which prevents sinus lining perforation during implant placement in posterior maxilla region.

Introduction

The success of implant therapy is directly related to the available quality and quantity of bone in the maxilla or mandible.[1] The posterior maxilla presents unique challenges for implant placement compared with other regions of the mouth. Most important among this is the presence of the maxillary sinus.[2] It is common to find sinus floor close to the alveolar ridge which is related to two phenomenon i) enlargement of sinus at the expense of alveolar bone after tooth extraction.[3] ii) increased pneumatization of the sinus because of increase in positive intra antral pressure.[4] The most widely used approach for sinus lift are 1) the direct sinus lift given first by Boyne & James in 1980.[5] 2) The indirect approach which is a less invasive alveolar crestal approach. Summers (1994) proposed the osteotomy technique for indirect sinus lift.[6] Since then the osteotomy technique has underwent various modification. The case report describes indirect sinus lift with immediate implant placement.

Case History:

A 42 year male patient reported to Saraswati Dhanwantri Dental College parbhani with chief complaint of difficulty in chewing from the left side. On oral examination it was found that his first maxillary molar was missing (Fig-1). Pre-operative evaluation of the patient was done which included

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Fig 1: Preoprative Photograph

Fig 2 : IOPA showing proximity to maxillary sinus

Fig 3 – Reflection of flap

Fig 4 – Pilot drill 1 mm away from the sinus lining

- Gingival health
- Presence of sufficient inter-occlusal space
- Bone tomography was evaluated with ridge mapping technique
- Presurgical measurement of the alveolar bone height to the sinus floor was measured using standard IOPA & CBCT scan. (Fig – 2)

Alveolar bone height was found to be 6.2mm from the sinus lining. After completing through oral and radiographic evaluation two stage surgery was planned with indirect sinus lift through alveolar crestal approach. A self threaded tapering acid etch implant with 10mm length and 4.2 mm diameter was selected. Prior to the surgery a surgical template of clear acrylic was fabricated on the patients cast. Parallism was checked and a hole was made in the surgical template corresponding to the location of implant placement. This surgical template was then used during surgery for making the pilot drill.

Surgical Steps:

- Posterior superior alveolar and greater palatine never blocks were given along with local infiltration with 2% lignocaine with 1:80000 adrenaline concentration.
- A mid crestal full thickness incision was given on the palatal side of the crest with two releasing incision.
- A full thickness mucoperosteal flap was reflected and retracted (Fig – 3).
- After reflection surgical stent was placed over the site and round bur was used for marking implant position on the bone using 1:20 reduction gear hand piece at 1000rpm and 35 ncm torque along with copious irrigation of normal saline to prevent thermal injury to the bone.
- Pilot drill of 2.0mm diameter with stopper at 5mm was used to prepare the implant site 1mm short of the sinus lining. An IOPA was taken to

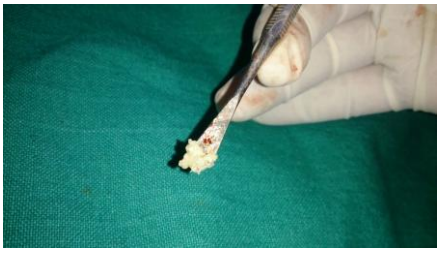

Fig 5 – Bone Graft material

Fig 6 – Implant Placement

Fig – 7 post operative IOPA

Fig 8 – Suture Placed

confirm the proximity of sinus to the drill (Fig – 4).

- Consecutive drill of 2.8mm with stopper was then used up to same length to increase the width of the site.
- Small amount of bone graft was then mixed with patients' blood and placed in the implant osteotomy site using graft carrier (Fig - 5).
- The sinus floor was then fractured with ostetome of 2.7mm diameter with gentle tapping using mallet.
- The implant osteotomy site then prepared to the full dimensions by osteotomes of consecutive increasing diameter. This technique helps in compacting bone laterally and apically around the implant osteotomy site.
- The implant was placed gently into the prepared site and tightened with the help of torque ratchet at 40 nm torque. The implant placement will further help to push the bone graft material upward leading to lifting of sinus lining 2mm ahead (Fig - 6).
- After checking the primary stability of the implant a titanium cover screw provided with the implant was placed. Post placement IOPA was taken to confirm the position of the implant (Fig - 7).
- The mucoperiosteal flap was then repositioned and sutures with the help of 3.0 black silk (Fig - 8).
- The patient was prescribed antibiotics and post-operative instructions were given. Suture removal was done after seven days.
- Post 4 months of implant placement after evaluation of the Osseo integration of the implant a metal ceramic crown was fabricated and cemented onto the abutment placed on the implant.

Discussion:

Implant supported prosthesis has become an emerging modality of treatment in the field of dentistry. Implant placement is rather easy when adequate amount of height, width and bone density is present. Implant

placement in the maxillary posterior region is still a concern due to the bone morphology and proximity of the maxillary sinus. In such a situation it becomes essential to modify or lift the sinus lining for placing the implants.

In this case report indirect sinus lift through alveolar crestal approach was performed as it is less complex and invasive compared to the direct sinus lift procedure. The radiograph reveled the sinus proximity at 6.2mm from the alveolar ridge. A self threaded tapering implant of 8mm length and 4.2 mm diameter was placed. Around 4mm rise of sinus lining was seen with around 2mm graft material between the implant and the sinus lining. This technique gives us the advantage of being less invasive with a shorter waiting and healing time.

Conclusion :

Many advance surgical techniques in the recent years have evolved which make it possible now for implant placement even in compromised situation. The technique of indirect sinus lift provides a conservative surgical entry more localized augmentation of the sinus with less degree of post-operative morbidity and early loading of implant compared to the conventional cad weel luc direct sinus augmentation procedure. The osteotome techniques also helps in condensing the maxillary bone laterally thereby helping in achieving better initial implant stability. The application of the clinician's knowledge with good patient evaluation thereby exploring all the solutions and choosing the suitable treatment modality forms the basis of successful implant placement.

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