Title: Narrow diameter implant placement at molar region in patient with horizontal bone loss with deficient bucco-lingual bone.

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Abstract: The purpose of implant rehabilitation is to provide initial stability and long term sustained functional rehabilitation.in molar region wider diameter implant were treatment of choice due to increase BIC and greater distribution of load. Narrow diameter implants are generally avoided in posterior region. However, resorbed mandibular region and reduced buccolingual volume poses a threat. Longer narrow diameter implant can be used to increase the bic and share the masticatory load. In the present paper. A successful attempt was shown in present study with 3.5 * 13 mm implant and accesses 7 yrs. post loading clinico-radiographically.

Introduction

The implants placed in mandibular molar area should have adequate surface area and bone contact to support masticatory load. Studies show that wider diameter implant shows better result at mandibular molar area (1). Implant placement and tooth rehabilitations in the posterior jaw is affected by many factors such as the location and placement of adjacent and opposite arch teeth, quality of masticatory forces in the region, the quality and type of the bone present, postoperative maintenance of oral and prosthetic hygiene by patient, the bone height present from nerve or sinus, the period since edentulous, . The recommended standard is to place a large diameter implant (>4.00mm) or a regular one to replace missing molar (2). But sometimes, due to horizontal bone resorption, this option is not possible without additional bone grafting and augmentation procedures. (3) In this case a longer implant was used to compensate the width of relatively narrow diameter implant then preferred diameter of 4.00 mm and above at 1st molar region of mandible (4).

Case report

Patient age 26 yrs old male presented with missing teeth in right lower back region. Patient had dental extraction due to dental caries about 10 years back. Patient wanted restoration of tooth with dental implant. A thorough medical & dental history, and investigations were done, to rule out systemic, as well as local contraindications. On measuring the bucco-lingual space with caliper it was found at 5mm at mid crestal region and around 16 mm of bone height from infra alveolar nerve. Owing to less bucco-lingual space option of bone grafting followed by implant was offered to the patient. Following discussion with patient it was decided to go ahead with implant size 3.5 by 13 mm and simultaneous bone grafting with hydroxyapatite and autologous bone from drilling site. Antibiotics were started one day before the surgery (amoxicillin 500 mg tid for 5 days), analgesics, and anti-inflammatory medication (ibuprofen 600 mg tid for five days) and chlorhexidine mouth rinse (TID for seven days. surgery was done in strict sterile protocol. Local anesthesia (lignocaine hydrochloride 2% with adrenaline 1:80000) was provided. Full thickness flap designs/surgical protocols were released. Osteotomy was done using 2mm pilot drill at 1200 rpm at 35 n torque owing to hardness of bone. Drilling sequence with 2.8mm twist drill and 3.2 twist drill was done at low rpm of 600 and bone chips from osteotomy was collected for grafting. Root form implant 3.5 by 13mm was used and torqued at 35 N. buccal plate was grafted with mixture of hydroxyapatite bone graft mixed with autologous graft collected during drilling. Implant was placed according to manufacturers' recommendations, hemostasis was achieved immediately after

Figure 1- PRE-OP

Fig-2 Flap reflection

Surgery and postoperative instructions were given to patient. sutures were placed (mersilk 4-0) which were removed after 2 weeks. After 3 months waiting period close tray impression coping

was placed and Addition silicone impression was taken. Porcelain fused with metal (PFM) crown was planned and luted with the help of Resin based glass ionomer cement. Excess cement was eliminated during cementation to prohibit any damage due to excess cement flowing into gingival tissue.

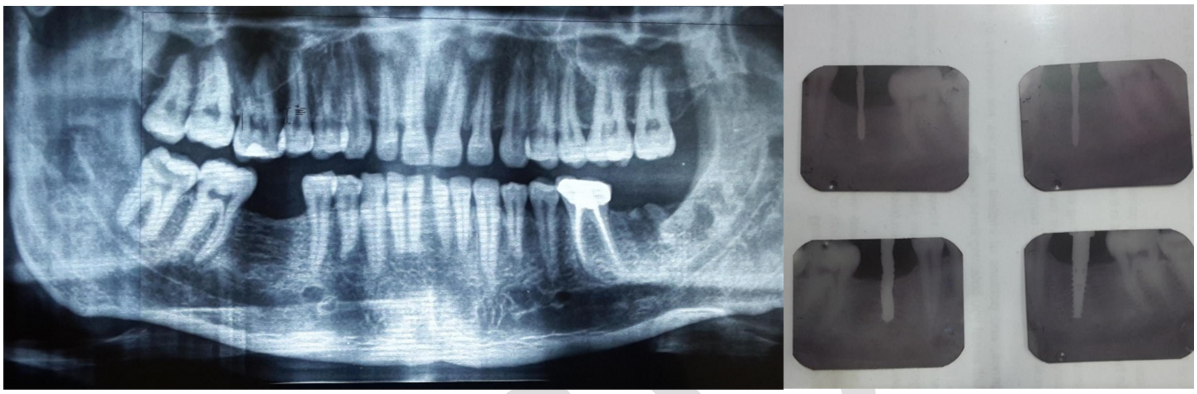

Figure 3-Preop OPG and IOPA X -Ray during implant placement

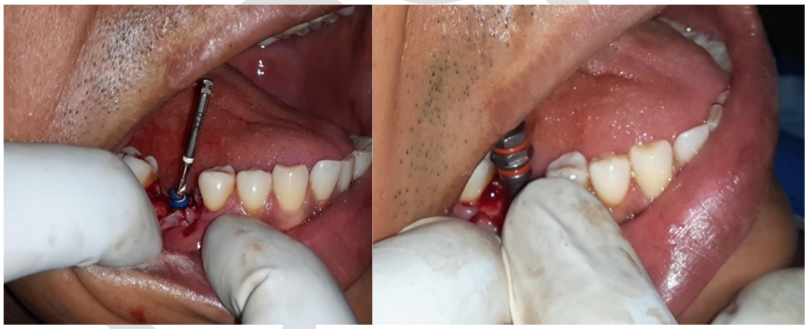

Figure 4- Pilot drill with stopper and implant

Figure 5-Abutment placement and Crown with access hole.

Figure 6-Crown hole sealed with composite and Postop pic in occlusion.

Patient was recalled at 3 months, 6 months and then every one year. Patient just had His 7 year follow up last month. Patient showed excellent bone levels and aesthetics with no loss in soft tissue or hard tissue. Implant success was assessed and determined based on the criteria defined by Dr Buser . [5]. The implant is considered successful if the following parameters were met: (1) the absence of recurring peri-implant infection with suppuration; (2) the absence of persistent subjective complaints such as pain, the foreign body sensation, or dysesthesia; (3) the absence of a continuous radiolucency around the implant; and (4) the absence of any detectable implant mobility. These guidelines have proven to be an effective tool in measuring the success of an implant system and evaluating long term results in clinical trials. By considering these outcome measures, the implant case used in our paper was judged according to their ability and outcome to satisfy the cited criteria, with an observed success rate of nearly 100%.

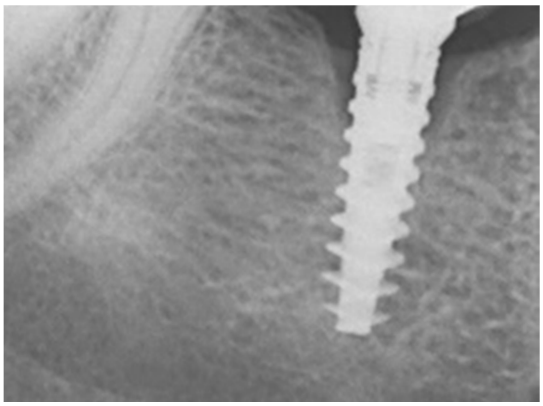

Figure 7 – A 7 years follow up IOPA-Xray

Discussion

After teeth extraction many people leave the treatment incomplete and leave the missing teeth unrestored. The alveolar bone is there to support the teeth and periodontium structure. once tooth is extracted the alveolar bone starts to resorb with time. When extracted tooth is not restored for a longer period of time, the alveolar resorption directly proportional to it. Sometimes the bone resorption is so much that the residual bone is inadequate to support implant there. in this area, the tooth was lost long ago leading to marked bone loss (6). This situation makes placing of regular diameter implant more challenging and complicated and poor prognosis for survival of implant under masticatory forces. The recent study and systematic review of Dr Assaf showed that narrow diameter implant can be used in the posterior jaw under certain conditions. They proposed some prosthetic and surgical guidelines for successful outcome in their paper (7). The success of narrow diameter implant can be accessed only after evaluating it for long term.in another scientific paper Dr Javed and Dr Romanos [8] have shown that the role of implant diameter in long term survival of dental implants is secondary. In fact, primary stability achieved during placement and maintenance of oral hygiene by patient are more important factor for the success of implant (9). Moreover, when implants are restored, they are submitted to higher levels of stress than when they would be in the anterior sites, giving a more critical role to biomechanical considerations.

In this case the available bone height was good at 16 mm from inferior alveolar nerve but the horizontal bone width was at 5.5 mm only. owing to 2mm sound bone structure principal (Carl

Mish) at lingual as well as buccal side (10) a wider implant was not possible without prior grafting procedures (11). A narrow implant which was placed here, worked well in this situation. A 7 year successful follow up shows that it can be placed in such situations.

Conclusion

After dental extraction, extracted tooth should be replaced as soon as possible. Immediate implant placement has favorable results for hard tissue around implants and helps in preserving bone width and height (12). Treatment planning should be aimed considering aesthetic requirements of the patient whenever possible. Narrow implants can be used in compromised bone structures with promising results. Clinical trials and studies on Narrow implants are going in the right promising direction. Many more long-term ones need to follow with large sample sizes.

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