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Case Report

Short implant in posterior maxilla with 2 years follow- up: A case report

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ABSTRACT

Placement of the dental implants in posterior maxilla requires maxillary sinus floor elevation. However, this is avoided by placing short implant, these implants are increasingly being seen as an alternative to more extensive bone augmentation procedures. Long term follows up revealed survival of the implants. This case report describes extraction of teeth, followed by immediate placement of implantswiss short implant in posterior maxilla using jig trial in the prepared socket with two-year follow-up.

1. Introduction

Dental implants have been an ideal treatment solution for patients who require permanent replacement of their missing teeth. Dental implants can be placed successfully in most cases, however, certain clinical situations, such as reduced bone dimension, may pose a significant challenge. This situation is frequently encountered in posterior maxillary bone, where, following tooth extraction, sinus pneumatization often results in inadequate vertical bone height for implant placement. Sinus floor elevation using lateral window and bone grafting before implant placement has been the gold standard with highly predictable results.[1]

However, sinus floor elevation should be avoided as much as possible due to systemic problems and associated delayed healing. In such situations, a less invasive surgery such as the use of short implant is more suitable.

An alternative method for treatment of atrophic bone in posterior maxilla involves the use of short dental implants. The use of short dental implants may limit the needs for bone augmentation. The predictability of short implants has been assessed in a recent survey of randomized clinical trials of implants placed in augmented sinus.[2] Short (length ≤ 8 mm) implants have presented a predictable survival rate and have resulted in three times lower intraoperative complications compared to long implants.[3]

Short implants placed in a posterior partial edentulous region have presented a high initial survival rate, which is similar to long implants. As mentioned above, shorter dental implants may represent the preferred treatment alternative in atrophic alveolar bone since they have been associated with lower biological complications, decreased morbidity, costs and surgical time.[4]

Immediate implants are widely accepted despite controversial beginning. Available literature consistently cites a high success rate ranging from 94 -100% on

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average. Immediate implants provide various benefits including a) reduction of morbidity b) reduction of alveolar bone resorption (clinical studies were conducted which demonstrate 4.4 mm of horizontal and 1.2 mm of vertical bone resorption on an average after 6 months of extraction), c) gingival tissue preservation d) papilla preservation in the esthetic zone, e) reduction in treatment time and cost.[5,6]

This case report aims to provide information on the successful treatment involving the use of short dental implants in posterior maxilla. In the present case we have immediately loaded implantswiss short implant at the time of extraction; verification jig technique is used in present case for implant supported prosthesis with 2 years follow up.

2. Case Report

A 62-year-old female reported to clinic with history of root stump in upper left back region (Figure 1).

Fig. 1: Retained root stumps in left maxillary arch.

Patient's general and medical history was taken which was non-significant. Patient was examined clinically and OPG was taken. (Figure 2)

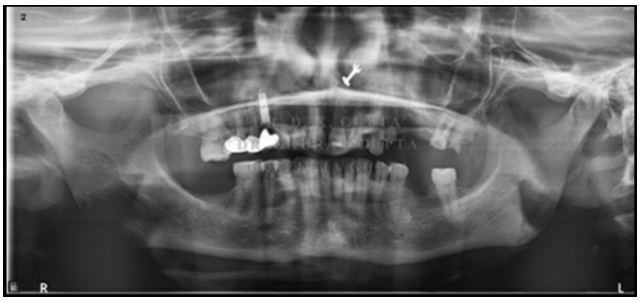

Fig. 2: Pre-operative

After thorough analysis clinically and radiographically it was evaluated that there is no underlying pathology and tooth root could not be restored but was surrounded by healthy bone. It was there and then decided to do extraction of 24, 27 & 28 followed by immediate placement of short dental implants to avoid elevation of sinus as sinus was in close proximity. Implants avail the benefits like preservation of bone and emergence of profile and so were desired by the patient.

Treatment plan was explained to the patient. As preservation of alveolar bone is key to success for immediate implants, extraction of root stumps and decayed teeth i.e 24,27 and 28 was done under local anesthesia. (Figure 3).

Fig. 3: Extracted teeth

The sockets were debrided with curettes and free hand placement of one implantswiss short implant and 3 implantswiss bone level implant was done. Implantswiss short implant was chosen to avoid sinus elevation in posterior of maxilla. Very good primary stability was achieved with insertion torque of more than 40 NCM. ISQ measurements was in range of 80-82, thereafter healing abutment was placed. (Figure 4).

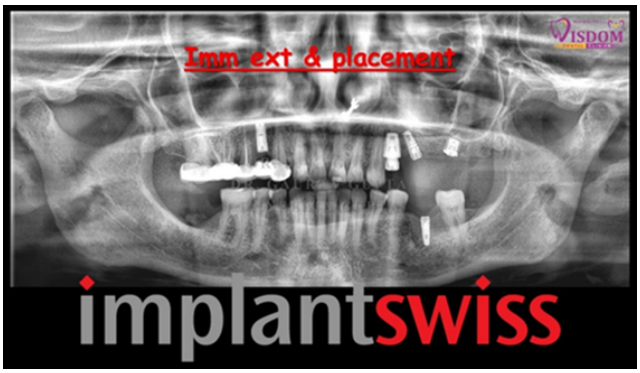

Fig. 4: post-operative OPG depicting implant positioning

The cover screw was placed. Post operative instructions were given to the patient, and was asked to report after 1 week. The sutures were removed after 1week.

The patient was recalled after 4 months for the prosthetic procedures. ISQ test done again, which showed excellent biological stability with reading measuring in between

84-87. Thereby, showing excellent secondary stability or osseointegration.

Impression was made with the impression post attached to the implant using the open tray impression technique. Shade selection was also done during this appointment. Healing abutment/ gingival former was replaced till the prosthesis in lab was manufactured.

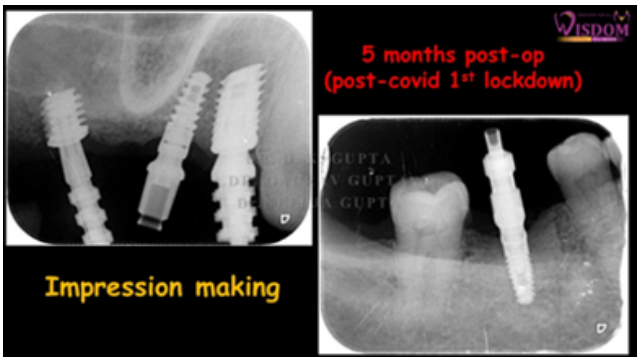

Fig. 5: Radiograph depicting closed tray impression making.

The jig trial was done to ascertain the accuracy of the impression. Jigs of both the arches were tightened in the patient's mouth and a radiograph was obtained to ensure a complete and passive seating (Figure 6).

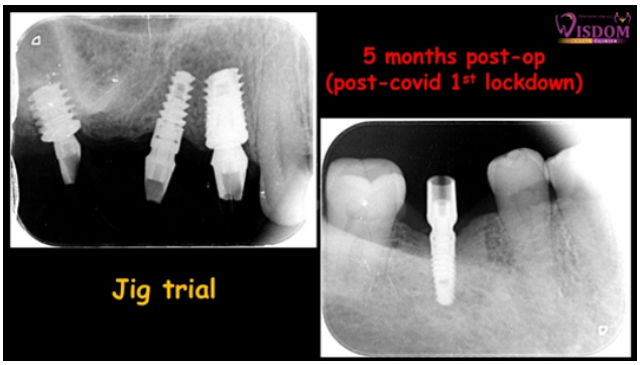

Fig. 6: Jig trial done in patient mouth

After approx. 4-7 days, the healing abutments were removed and replaced with final abutment. The PFM crown was checked for its passive fitting to abutment and non-interference with adjacent teeth. Crown was then cemented with translucent cement. (Figure 7)

Occlusion was checked. Patient was given post -operative and oral hygiene instructions. Patient was recalled for prophylaxis and follow up every year. (Figure 8)

The clinical and radiographic appearance after 2 years of periodic follow up showed good esthetics, osseointegration and maintenance of bone around the implant. (Figure 9)

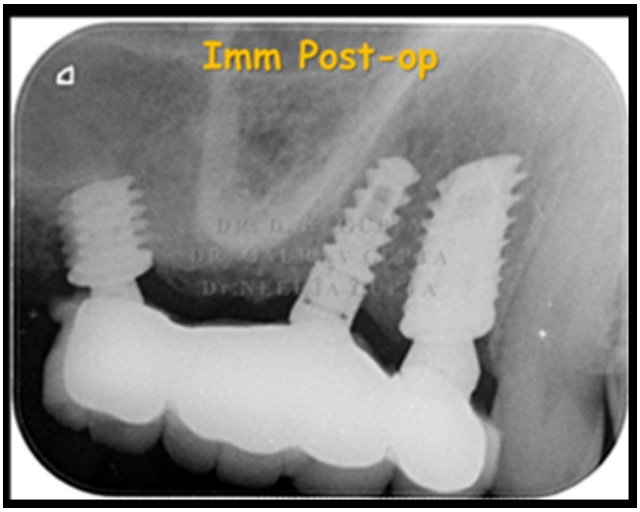

Fig. 7: X- ray showing successful placement of screw retained crown

Fig. 8: Occlusion was checked

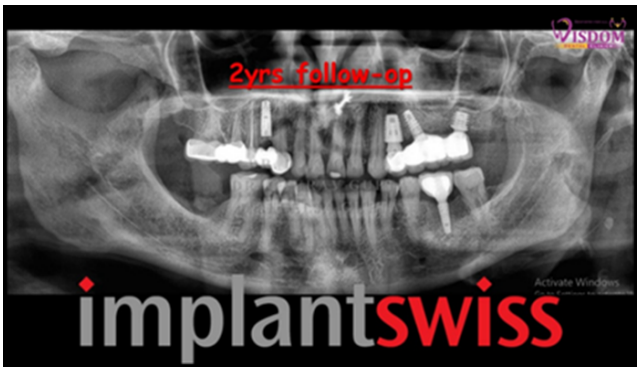

Fig. 9: 2 year follow up

3. Discussion

Short dental implants have been proposed as an alternative treatment to simplify implant placement procedures in severely defective alveolar ridge, to avoid vital structures, minimize surgical trauma and the risk of complications associated with invasive surgical procedures. With this in mind, short dental implants would be more suitable in present case.[7]

Many factors such as implant surface, implant primary stability, bone density and quantity, surgical preparation techniques used, management of the soft tissue and prosthodontic design have been related to implant survival rates.[8]

Biologically, a good primary implant stability is important, which can be achieved by under-prepared osteotomy site with the drilling stopped at diameter below the implant diameter. When using short dental implants, one should be aware of some risk factors that may increase stress such as a higher crown-implant length ratio, high bone density in the region, and higher bite force. Some methods are, therefore, required to decrease stress by minimizing the size of the crown in the bucco-palatal dimension to decrease the lateral force on the restoration, avoiding cantilever as much as possible, and splinting multiple implants together with splinted crowns.[8]

Implant therapy must fulfill both functional and esthetic requirements to be considered a primary treatment modality. Aiming to reduce the process of alveolar bone resorption and treatment time, the immediate placement of endosseous implants into extraction sockets is known to achieve a high success rate of between 94 and 100 %, compared to the delayed placement.[9]

A verification jig allows you to verify the accuracy of the model and ensure an accurate final frame every time. The jig consists of temporary cylinders luted together with a rigid resin material and sometimes thick wire or rods. The purpose of the verification jig is to mimic the final frame in fit.[10]

In present case, short dental implants were immediately placed in the posterior maxilla using jig trial method. The case was clinically and radiologically followed up after a mean loading period of 2 years. The clinical and radiological results demonstrate successful midterm results regarding implant survival and peri-implant hard and soft tissue health. Low levels of bleeding on probing and the probing pocket depths indicate the absence of acute or chronical peri-implantitis.

4. Conclusion

Dental implant treatment with short implant is suitable for patients as it is considered minimally invasive surgery which can reduce the risks of surgical complications and compromised post-operative healing. The sinus augmentation procedure could be avoided by placement of small dental implants in posterior maxilla. To achieve long term short implant survival, many factors such as good surgical technique, primary implant stability and prosthetic modifications to allow for stress reduction during mastication, should be considered.

5. Conflict of Interest

The authors declare no relevant conflicts of interest.

6. Source of Funding

None.

References

1. Papaspyridakos P, De'Souza A, Vazouras K, Gholami H, Pagni S, Weber HP, et al. Survival rates of short dental implants (≤6mm) compared with implants longer than 6mm in posterior jaw areas: A meta-analysis. *Clin Oral Implants Res*. 2018;29(6):8–20. doi:10.1111/clr.13289.
2. Thoma DS, Zeltner M, Husler J, Hammerle CH, Jung RE. EAO Supplement Working Group 4 - EAO CC 2015 Short implants versus sinus lifting with longer implants to restore the posterior maxilla: a systematic review. *Clin Oral Implants Res*. 2015;26(11):154–69. doi:10.1111/clr.12615.
3. Lang NP, Pun L, Lau KY, Li KY, Wong MC. A systematic review on survival and success rates of implants placed immediately into fresh extraction sockets after at least 1 year. *Clin Oral Implants Res*. 2012;23(5):39–66. doi:10.1111/j.1600-0501.2011.02372.x.
4. Norton MR. The influence of insertion torque on the survival of immediately placed and restored single-tooth implants. *Int J Oral Maxillofac Implants*. 2011;26(6):1333–43.
5. Howe MS, Keys W, Richards D, et al. Long-term (10-year) dental implant survival: a systematic review and sensitivity meta-analysis. *J Dent*. 2019;84:9–21. doi:10.1016/j.jdent.2019.03.008.
6. Al-Johany S. Survival rates of short dental implants (≤ 6.5 mm) placed in posterior edentulous ridges and factors affecting their survival after a 12-month follow-up period: a systematic review. *Int J Oral Maxillofac Implants*. 2019;34(3):605–21.
7. Mokcheh A, Jegham H, Turki S. Short implants as an alternative to sinus lift for the rehabilitation of posterior maxillary atrophies : Systematic review and meta-analysis. *J Stomatol Oral Maxillofac Surg*. 2019;120(1):28–37.
8. Srinivasan M, Vazquez L, Rieder P, Moraguez O, Bernard JP, Belser UC, et al. Survival rates of short (6 mm) micro-rough surface implants: a review of literature and meta-analysis. *Clin Oral Implants Res*. 2014;25(5):539–45.
9. Sekar AC, Praveen M, Saxena A, Gautam A. Immediate Implant Placement: A Case Report. *J Indian Prosthodont Soc*. 2012;12(2):120–2. doi:10.1007/s13191-012-0120-2.
10. Available from: https://www.perioimplantadvisory.com/restorative-dentistry/article/16412265/how-to-use-a-dental-implant-verification-jig-to-ensure-an-accurate-final-framework-every-time.

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