

USER REPORT

Introduction

Dental implant placement in the posterior maxilla can often be complicated by pneumatization of the sinus, alveolar ridge resorption and the presence of low-density bone.¹ The resulting lack of available bone for implant placement can be overcome by subantral augmentation (sinus lift) procedures.² A tapered, multi-threaded implant with a modified mid-section of highly porous tantalum material (Trabecular Metal Dental Implants, Zimmer Dental Inc., Carlsbad, CA) has been

developed to augment anchorage through osseointegration, a combination of conventional osseointegration and bone ingrowth and neovascularisation inside its network of interconnected pores.²

To evaluate the long-term clinical performance of TM implants, a five-year, multi-centre, Longitudinal Data Collection Program (LDCP) is currently being conducted in Europe. The study is ongoing in five countries across 22 sites including universities and private practices. The study complies with the Declaration

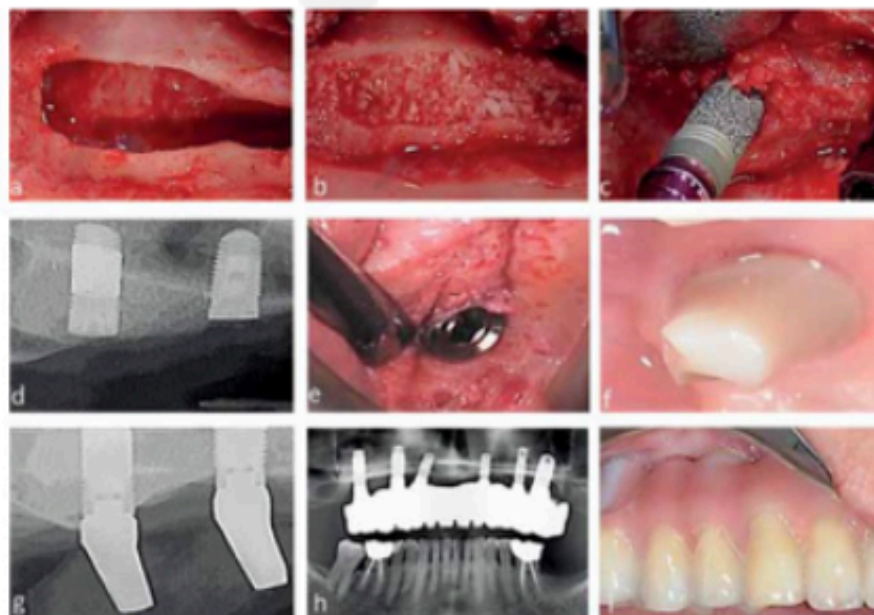
Placement of Porous Tantalum Trabecular Metal Implants in Sinuses Augmented with Mineralised Allografts: Interim Results from a Single Centre

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Figure 1¹: A 70-year-old female patient presented to the clinic with an extremely atrophic maxilla. The plan was to install six implants (one TM implant in relation to the maxillary right first molar and five non-study implants (Zimmer, Tapered Screw-Vent).

(a, b) A crestal window technique was used to perform the augmentation procedure (sinus lift). The sinus was augmented with a composite graft of 80 per cent cortical and 20 per cent allogenic bone chips (Puros®, Zimmer Dental Inc.). (c) Six months following the sinus lift, the TM implant was placed. (d) Radiographic view post implant placement. (e) The implant was uncovered after three months of healing and subjected to 25Ncm of counter torque to evaluate stability. A healing collar was placed over the implants and allowed to heal for an additional three months. (f) A zirconia abutment was then placed for provisional restoration.

(g) Radiographic view at the annual follow-up. (h, i) Radiographic and clinical views of the implant at the second annual follow-up. Implants were stable and without complications at this visit. The patient received a definitive full arch restoration at this visit.



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Patient Age (Years)	Average	57.11
	Minimum	38
	Maximum	71
Implant Design	Diameter (mm)	4.1 (n=4); 4.7 (n=17)
	Length (mm)	10 (n=2); 11.5 (n=19)
	Collar Surface Finish	Machined (n=1) Textured (n=20)

Table 1. Demographics and Implant Design Summary

of Helsinki and the ICH-GCP and is being conducted under the auspices of the local institutional review boards and ethics committees. Investigators were required to follow the implant's instructions for use (IFU) and their own professional judgment in patient selection and treatment. The study enrolled patients with concomitant health conditions and elevated risks for implant failure and/or bone loss. Implant placement in sinus grafts has been reported in the dental literature as a potential risk factor for implant failure; a single study centre in Italy placed TM implants in grafted sinuses of extremely atrophic maxillae. This poster reports on the current status of these cases.

Methods

Sixteen patients with extremely atrophic maxillae were enrolled in the study. The maxillary ridges were augmented with a composite graft of 80 per cent cortical and 20 per cent allogenic bone chips (Puros®, Zimmer Dental Inc.) and left to heal for six months.

Upon presentation with healed ridges, TM dental implants were placed in 21 sinuses of the 16 patients. Three months after implant placement, the sites were uncovered and the implants counter-torqued at 25Ncm to evaluate stability. The implants were restored if clinically stable.

Implant success and survival will be evaluated clinically and radiographically at annual follow-up for five years.

Results and discussion

Sixteen patients (six males, ten females) were treated with 21 implants after maxillary sinus augmentation. The average age of the patients in the study was 57.11 (ranging from 38 to 71) years.

Among the patients, 31.2 per cent (n = 5) had one or more concomitant risk factors that could affect the implant survival and/or bone maintenance around the implant (smokers = 3; history of systemic disease = 2; periodontal disease = 1).

All sites presented with a low density Type 4 bone (n = 21).

All implants tolerated the counter-torque of 25Ncm applied at implant uncovering at three months of implant healing. One patient with one implant was lost to follow-up at 15 months. Two patients with single implants reported resolved systemic disease (cancer) unrelated to the study at one-year follow-up. To date, the implants have been followed up between 21 and 33 months with no failures or peri-implant pathologies reported.

Hence, the implant survival is 100 per cent (n = 20/20). The average bone level change from implant placement to one-year follow-up is 0.65 ± 0.56 mm.

Conclusions

Within the limitations of this case series:

- Placing TM implants into grafted sinuses resulted in a high level of predictability.
- There appears to be no difference in implant survival between healthy and elevated risk patients within this sub-group. DA

References

1. Altintas NY, et al. Comparative radiological analyses of newly formed bone after maxillary sinus augmentation with and without bone grafting. *J Oral Maxillofac Surg* 2013; 71:1520-1530.
2. Schlee M, van der Schoor WP, van der Schoor ARM. Immediate loading of Trabecular Metal-enhanced titanium dental implants: Interim results from an international proof-of-principle study. *Clin Implant Dent Relat Res* 2013; Jul 30. doi: 10.1111/cid.12127. [Epub ahead of print].
3. Images courtesy of Dr. Carlo Maria Soardi, Brescia, Italy.

About the Authors

Dr. Carlo Maria Soardi graduated in Medicine and Surgery from Università degli Studi di Milano (Italy) in 1979. Since then, he has been practising at the Maxillofacial Surgery Department of Ospedali Civili di Brescia, where he has been performing minor oral surgeries, traumatology, orthopaedic and maxillofacial oncology surgeries.

Dr. Soardi took part in conventions and courses both in Italy and abroad, publishing scientific works on pathologies of the oromaxillofacial region. Since 1990, he has been dedicated exclusively to his private practice, focusing on oral surgery and implantology.

Dr. Shilpa Kotalgi worked as a Clinical Project Lead at the Clinical Affairs Department of Zimmer Dental. She holds a Bachelor of Dental Surgery degree from India and a Masters in Clinical Research from the University of California, San Diego (USA). She is also a certified clinical research associate (with CCRA certification). She currently works on sponsored clinical studies and investigator-initiated studies in USA and Europe with her main focus on Trabecular Metal Dental Implants.

Kim Bradbury, BS, CCRP received her Bachelor of Science degree in Biology from the University of Santa Clara (USA). She has over 20 years of research and development experience in the areas of cell biology, immunology and molecular biology. She is currently a Clinical Project Lead at the Clinical Affairs Department of Zimmer Dental.