

Immediately loaded implants in severely resorbed edentulous maxillae, 3-year results

Andreas Thor DDS, PhD¹, Joseph A. Toljanic DDS^{2,4}, Russell A. Baer DDS², Karl Ekstrand DDS, PhD^{1,3}

¹University of Uppsala, Sweden ; ²University of Chicago, USA; ³University of Oslo, Norway; ⁴Midwestern University, Chicago, USA

BACKGROUND

Immediate loading of implants in the edentulous maxilla has previously been successfully performed and reported. Severe resorption of the maxillary alveolar crest presents a more demanding situation for the restorative team. The benefit for patients of this treatment modality is also of interest to further evaluate.

AIM

To prospectively investigate the long-term results of dental implants, placed in atrophic maxillae without previous bone augmentation, and immediately loaded with provisionally fixed prostheses.

OBJECTIVES

The primary objectives are to investigate the clinical efficacy of a micro-threaded implant treated with a HF acid etching (OsseoSpeed™, Astra Tech AB, Mölndal, Sweden) by evaluating:

- Implant stability, by means of manual assessment and resonance frequency analysis
- Marginal bone adaptation, by radiological assessments
- Implant survival, by the number of implants successfully osseointegrated and not removed

MATERIAL AND METHODS

Two centers enrolled a total of 51 patients with severely resorbed edentulous maxillae (Lekholm & Zarb quality 3 or 4 and quantity C, D or E), in which 306 implants were placed (OsseoSpeed™, Astra Tech AB) (Fig. 1). The six implants in each patient were restored with screw-retained fixed provisional prostheses within 24 hours after implant placement (IP). Impressions were taken for definitive restorations installed 20 to 24 weeks after implant surgery. Radiographs were taken to analyze marginal bone level changes yearly throughout the study. The patients will be followed annually for 5 years and a subject satisfaction survey, Oral Health Impact Profile (OHIP), will be repeatedly completed by the patients (Fig. 2).

Fig. 1 Demography

AGE	Mean	65.8	GENDER	Males	47%	SMOKER	Non-smoker	47%
	Range	47-83		Females	53%		Ex-smoker	53%

Fig. 2 Study flow chart



RESULTS

Sixty-two percent of the implants were placed in bone quantity C and quality 3 or 4, and 38% of the implants in quantity D, type 3 or 4¹. Forty-five patients (267 implants) have attended the 3-year follow-up visit, successfully wearing their permanent prostheses.

REFERENCES

1. Toljanic JA, Baer RA, Ekstrand K, Thor A. Implant rehabilitation of the atrophic edentulous maxilla including immediate fixed provisional restoration without the use of bone grafting: A review of 1-year outcome data from a long-term prospective clinical trial. *Int J Oral Maxillofac Implants.* 2009;24:518-526.
2. Erikapers M, Ekstrand K, Baer RA, Toljanic JA, Thor A. Patient satisfaction after receiving dental implant treatment with immediate loading in the edentulous atrophic maxilla. *Int J Oral Maxillofac Implants.* 2011 Mar-Apr;26(2):356-64.

Thirteen implants in 6 patients have been lost resulting in a cumulative survival rate of 96% after three years (Fig. 3).

Fig. 3 Implant Survival Rate [Kaplan-Meier]

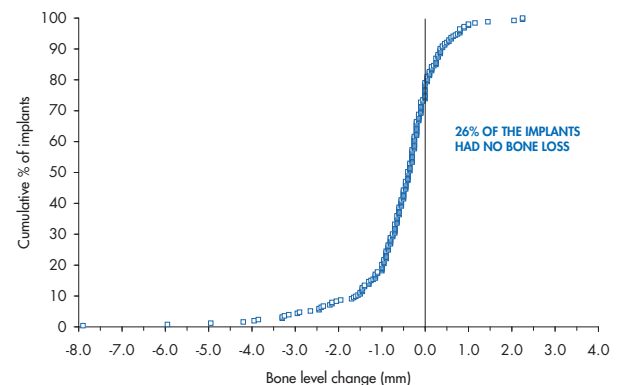
INTERVAL	NO AT RISK	FAILURES	CENSORED*	INTERVAL SURVIVAL PROBABILITY	SURVIVAL PROPORTION
Implant Placement (IP, Visit 2)	306	0	0	1.00	1.00
IP to Visit 3 (IP+ 2 weeks)	306	8	0	0.97	0.97
Visit 3 to Visit 4 (IP+ 4 weeks)	298	4	0	0.99	0.96
Visit 4 to Visit 5 (IP+ 12 weeks)	294	0	14	1.00	0.96
Visit 5 to Visit 6 (IP+ 20-24 weeks)	280	0	0	1.00	0.96
Visit 6 to Visit 7 (IP+ 26 weeks)	280	0	0	1.00	0.96
Visit 7 to Visit 8 (IP+ 1 year)	280	0	6	1.00	0.96
Visit 8 to Visit 9 (IP+ 2 years)	274	1	6	0.99	0.96
Visit 9 to Visit 10 (IP+ 3 years)	267	0	0	1.00	0.96
*Here equal to lost to follow-up				13	26
					0.96

The mean marginal bone level change over the first year was -0.4 mm (SD 0.8, n=255) and from implant placement to 3 year;-0.6 mm (SD 1.1, n=253) (Fig. 4 and Fig. 5).

Fig. 4 Mean marginal bone level change from implant placement to 1, 2 and 3 years respectively.

	IP - 1 YEAR	IP - 2 YEARS	IP - 3 YEARS
Average	-0.4	-0.4	-0.6
SD	0.8	0.8	1.1
n	255	258	253
Max	2.6	2.6	2.3
Min	-3.8	-4.6	-7.9
Median	-0.4	-0.3	-0.4

Fig. 5 Cumulative distribution of the implants according to mean marginal bone level change between implant placement and 3 years. Each square represents one implant. Negative is loss. Positive is gain. n=253



The 1-year OHIP result from this study indicates a rising satisfaction level in all domains tested (functional limitation, physiological discomfort, physical disability, psychological disability, social disability and handicap) among patients with maxillary fixed prostheses². The 3-year result is yet to be evaluated.

CONCLUSION

A careful selection and planning by the restorative team enables successful treatment outcomes when using an immediate loading protocol of patients presenting with severely resorbed edentulous maxillae. Data from the first three years of this long-term study reveals good clinical outcome with a cumulative survival rate of 96% and stable marginal bone levels.

THIS STUDY IS SPONSORED BY ASTRA TECH AB, SWEDEN.
THIS POSTER WAS PRESENTED AT THE 19TH ANNUAL SCIENTIFIC MEETING OF THE EUROPEAN ASSOCIATION OF OSSEOINTEGRATION - 6-9 OCTOBER 2010, GLASGOW.

Presented at the 3rd Astra Tech World Congress in Gothenburg, Sweden, May 9-12, 2012

