

# LONG-TERM FOLLOW-UP OF IMPLANTS WITH REDUCED LENGTH

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## ABSTRACT

**INTRODUCTION:** The aim of this study was to assess the reduced length implants as an alternative of conventional length implants in combination with bone augmentation. The following criteria were observed: survival rate, marginal bone loss, bleeding on probing.

**MATERIAL AND METHODS:** This study included 186 Straumann Standard Plus implants with dimensions: length of 6 mm and diameter of 4.8 mm. The implants were loaded with non-removable crowns or bridges at least 10 weeks after the implant placement. Depending on the type of the prosthetic option the distribution of the implants was as follows: 83 implants were co-abutments to one more implant with conventional length (8-14 mm); 67 implants were co-abutments to more than one implant with conventional length, 33 implants were loaded with single crowns.

**RESULTS:** The mean period of observation was 5.59 years. The mean marginal bone resorption was 0,224mm. In 12.4% from the cases was registered BOP (bleeding on probing). A correlation was found between the BOP and mean marginal bone resorption. No correlation was found between the values of marginal bone resorption and the type of the prosthetics. The survival rate of the implants in the observation period was 99.5%.

**CONCLUSION:** Treatment by short implants is a reliable alternative to implants with conventional length with combination of bone grafting procedures. It is less invasive, cost effective and consumes less treatment time.

**Keywords:** *implants with reduced length, short implants*

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## INTRODUCTION

The aim of many studies was to evaluate the treatment with short implants as a reliable and less invasive alternative to placement of conventional length implants in combination with bone augmentation procedures.

Renouard and Nisand (1) defined as ‚short‘ implants those with intraosseal length of less than 8 mm. Many authors described both methods as al-

most equally reliable, predictable and with almost the same success rate (2,3). Thoma et al. (4) compared the survival rate of 70 implants placed in combination with sinus lift with a lateral access and 67 short implants placed in the distal area of the upper jaw, without bone augmentation. They monitored them for 18 months. The authors reported 100% survival rate for both groups. Similar results were reported by other authors: Gulje et al. (3), Pistilli and et al. (5, 6). The conclusion of many studies was that there was no significant difference between the survival rate of short implants with modification of the surface topography and conventional length implants (2, 7, 8). Hentschel et al. (9), in a study which included 649 implants, concluded that the implant length had no significant influence on the survival rate for a period of two years.

In a system literature review Thoma et al. (10)

implants with dimensions: length of 6 mm and diameter of 4.8 mm. The distribution of the implants according to area is shown in Fig. 1. After elevation of the muco-periosteal flap using one horizontal incision along the alveolar ridge and one or two paramedian vertical incisions, the osteotomy for the implant placement was performed in the following clinical protocol:

1. The position of the osteotomy was marked with 1.4 mm round bur.
2. The mark was expanded with 2.3 mm round bur.
3. Pilot osteotomy was done with a 2.2 mm pilot drill to the appropriate depth at a maximum speed of 800 rpm.
4. The osteotomy was enlarged to the desired diameter consecutively with increasing diameter twist drills - 2.8 mm, 3.5 mm and 4.2 mm.

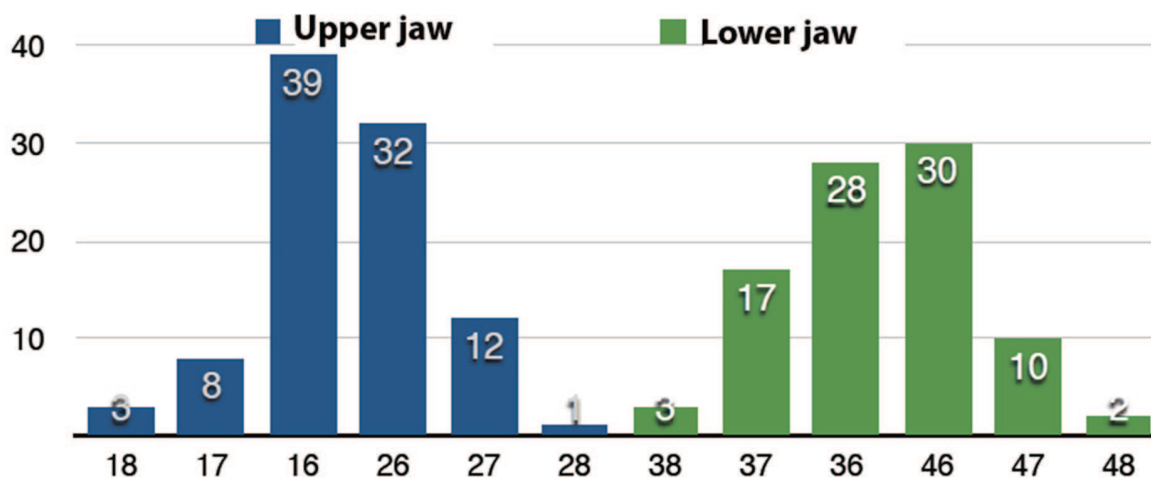


Figure 1. Distribution of the implants according to area

concluded that short implants placed in the distal areas of non augmented maxilla had similar survival rates compared to implants placed in combination with sinus lift. In connection with the typical for the augmentation of the maxillary sinus complications, the increased cost and extended treatment time, short implants were the preferred alternative.

## MATERIAL AND METHODS

The success rate of implants with reduced length was observed for a period of one to six years. This study included 186 Straumann Standard Plus

The osteotomy was performed with continuous cooling with sterile saline solution. The cases were done under local anesthesia using a 4% articaine solution with adrenaline 1/100 000 (Septanest - Septodont, France).

The flap was repositioned and sutured using 5/0 monofilament polyamide thread (Dafilon, B. Braun-Melsungen, Germany) with single interrupted sutures. Second stage surgery was performed 3 months after the implant placement. The implants were loaded with single crowns or bridges at least 10 weeks af-

ter the implant placement. Depending on the type of the prosthetic option the distribution of the implants was as follows: 83 implants were co-abutments to one more implant with conventional length (8-14 mm); 67 implants were co-abutments to more than one implant with conventional length, 33 implants were loaded with single crowns. During the control visit we registered: absence or presence of exudation, BOP (bleeding on probing) and marginal bone resorption visible on radiography, survival rate. Probing was performed with periodontal probe UNC-15. The level of the bone registered on radiography. The implant length was used as a reference. The appearance of marginal bone resorption was measured from the border between the treated (modified surface topography) and polished part of the implant.

## RESULTS

The cases were observed from 5 to 6 years, with a mean period of observation of 5.59 years. The mean age of the patients was 51.43 years. The survival rate of the implants for the period of the observation was 99.5%.

The mean marginal bone loss was 0.224 mm. BOP was registered in 12.4% of the cases. A correlation was found between BOP and mean marginal bone loss. In the cases without BOP, the mean marginal resorption was 0.13, and in the cases where there we registered BOP the mean marginal bone loss was 0.89. No correlation was found between the values of marginal bone resorption and the type of prosthetic option.

## DISCUSSION

The survival rate of the implants with reduced length according to our study was 99.5%. Srinivasan et al. (11), Thoma et al. (4), Gulje and et al. (3) and Pistilli et al. (5, 6) reported similar results. The mean marginal bone loss was 0.224. The implants with size 4.8/6 mm with SLA modification of the surface topography are reliable alternative to conventional length implant placement in a combination with bone augmentation in both - upper and lower jaw as they show similar survival rate and marginal bone loss. The short implants are not recommended in cases with increased esthetic risk where the restoration of bone volume and soft tissue esthetic is necessary.

## CONCLUSION

Treatment by short implants is a reliable alternative to implants with conventional length with combination of bone grafting procedures. It is less invasive, cost effective and consumes less treatment time with less perioperative complications.

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