

The influence of implant-abutment junction on marginal bone level shown by the comparison of CAMLOG® and CONELOG® Implants

Clinical relevance

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Introduction

Prosthetic abutments with butt junctions regularly show vertical bone resorptions (dish defects) [1]. Abutments with reduced width in relation to the implant diameter (platform switch) seem to have the capability to reduce crestal bone loss [2, 3, 4]. The potential benefit of conical abutment junctions may be a build-in platform switch [5]. Higher mechanical stability as well as less microleakage due to lower microgaps are discussed as further possible advantages of conical junctions [6, 7, 8]. However, clinical conclusions for practice are difficult due to heterogeneous study designs in literature and varying implant characteristics.

Objective

The purpose of this retrospective clinical study was to determine differences in bone level changes by using butt and conical implant abutment junctions. The comparison of CAMLOG and CONELOG implants should allow comparable conditions concerning outer implant geometry.

Material and Methods

Inclusion criteria: All patients were treated by the same surgeon, the same prosthodontist, the same dental technician, and with single crown restorations. Mesial and distal distances from the crestal bone level to the implant shoulder were measured radiographically after surgery (panoramic radiographs) as well as after prosthetic rehabilitation (intraoral radiographs using parallel technique). Bone level changes were determined. Tukey's range test was used to find means that are significantly different from each other ($p < 0.05$).

Results

Thirty CAMLOG implants (without platform switch) in 17 patients and 30 CONELOG implants in 20 patients were investigated (Camlog, Winsheim, DE). Mean follow-up time after surgery was 25 months in the CAMLOG group and 18 months within the CONELOG group. The mean marginal bone level change for CAMLOG was significant from surgery to follow-up ($p < 0.002$; $p < 0.008$; fig. 1). CONELOG showed no significant difference ($p < 0.992$; $p < 0.999$; fig. 2). The comparison of CAMLOG and CONELOG revealed a significant difference between the groups ($p < 0.001$; fig. 3). Bone loss was noted for 67 % of the CAMLOG implants. Bone gain was noted for 47 % and no bone loss for further 30 % of the CONELOG implants (fig. 4).

Discussion

According to other studies conical connections seem to be beneficial to limit crestal resorption [9]. To prevent crestal bone loss around dental implants platform switching seems to be necessary when using butt joints [4]. Nevertheless, bone remodelling also depend on surgical technique, biological width formation, and periodontal diseases.

Conclusions

Within the limits of this study conical connections may prevent peri-implant bone loss and have a positive effect on marginal bone in comparison to butt connections (fig. 5, 6).

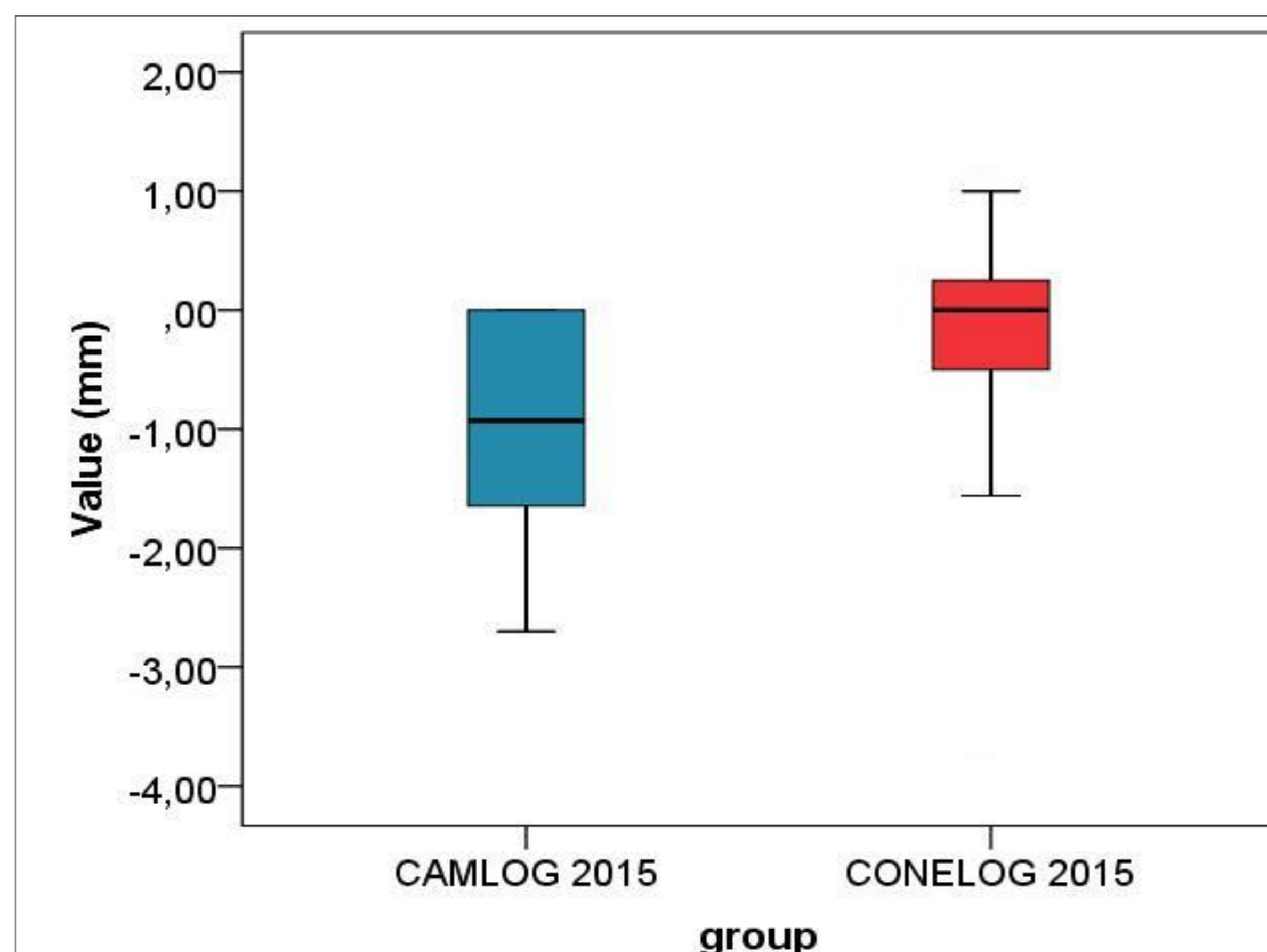
CAMLOG baseline			CAMLOG 2015			
SITE	N	MEAN ± SD	SITE	N	MEAN ± SD	p-value
Mesial	30	0.01 ± 0.41	Mesial	30	-0.91 ± 0.95	< 0.002
Distal	30	-0.11 ± 0.26	Distal	30	-1.01 ± 0.88	< 0.008

Fig. 1

CONELOG baseline			CONELOG 2015			
SITE	N	MEAN ± SD	SITE	N	MEAN ± SD	p-value
Mesial	30	-0.04 ± 0.59	Mesial	30	0.13 ± 0.65	< 0.992
Distal	30	-0.67 ± 1.05	Distal	30	-0.56 ± 1.12	< 0.999

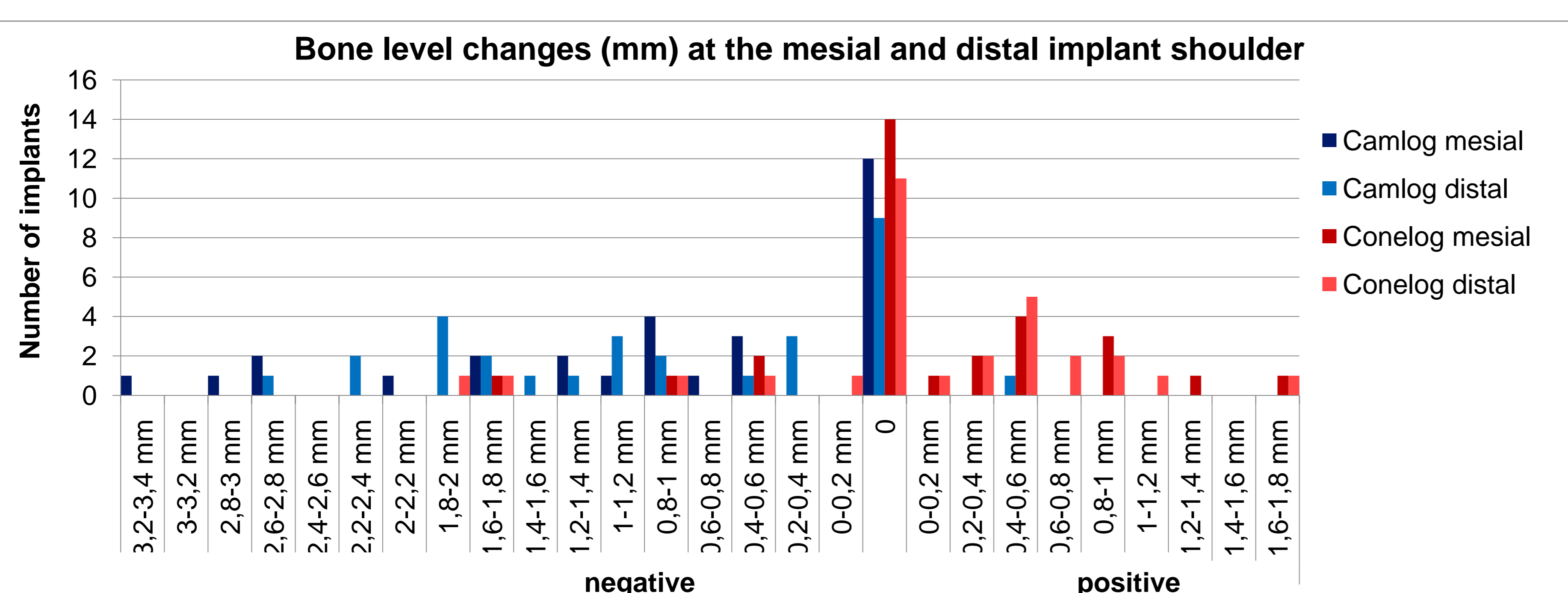
Fig. 2

Mean values in mm (MEAN), standard deviation (SD), and p-values for the groups after surgery and follow-up in 2015



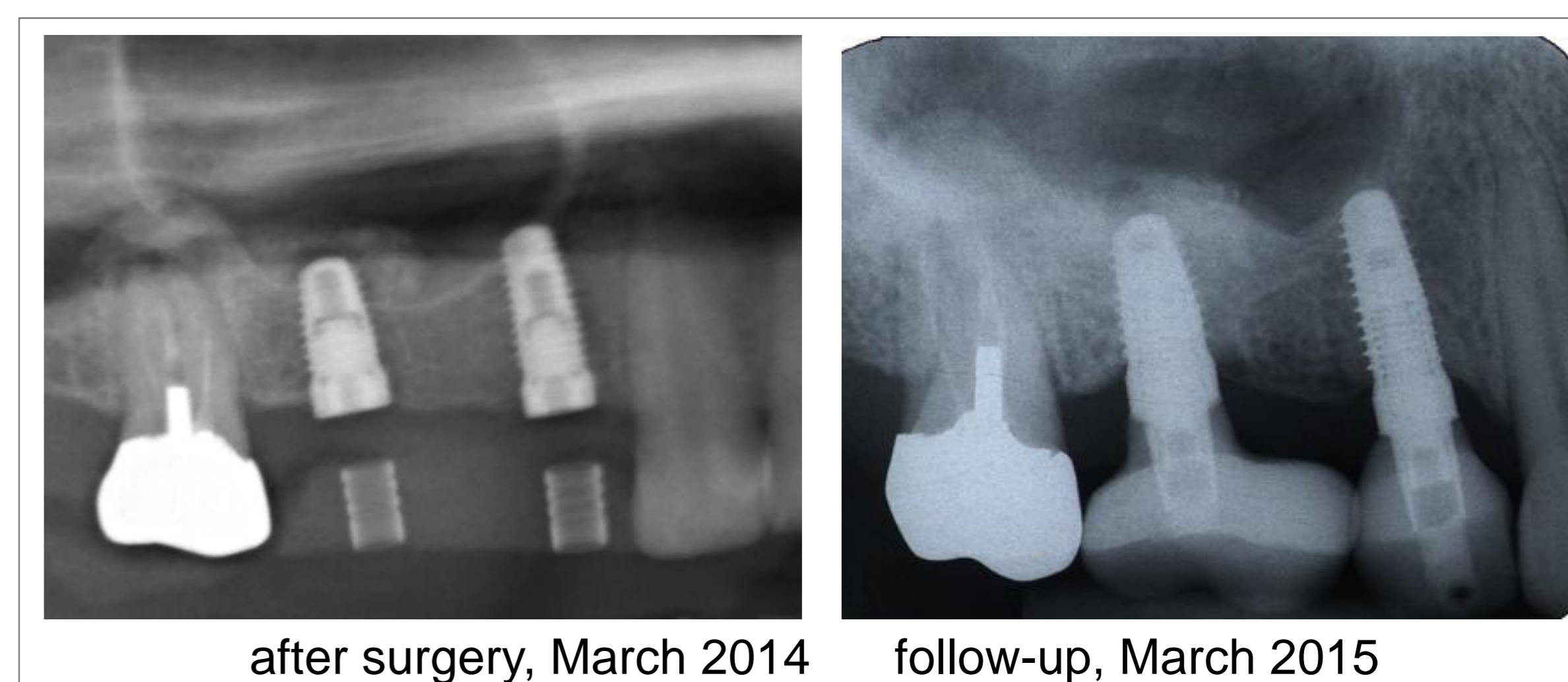
Mean distance from first bone to implant contact to implant shoulder for CAMLOG and CONELOG at follow-up determined a significant difference ($p < 0.001$)

Fig. 3



In 67 % of the CAMLOG implants bone loss was observed. Bone gain or no changes were noted in 77 % of the CONELOG implants.

Fig. 4



Exemplary typical dish defect of CAMLOG implants (without platform switch)

Fig. 5



Two examples of CONELOG implants approximately 3 years after loading: There is no bone loss to be seen rather bone gain can be noticed.

Fig. 6

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 [8] Canullo et al.: Microbiological assessment of the implant-abutment interface in different connections: cross-sectional study after 5 years of functional loading. *Clin Oral Implants Res* 2014, 26, S. 426-434.
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