Clinical outcomes with CONELOG SCREW LINE implants in the posterior mandible
- final 5-year results of a prospective two-center study –

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Background

The fundamental observation of Lazzara and Porter in 2006 that abutments with reduced diameter may have significant less marginal bone loss, led to an still ongoing scientific discussion if a specific implant design, especially the abutment connection (platform switch) may have potential influence on the functional outcome apart from the surgical procedure.[1]

Aim

We set out to investigate the bone level changes of the Camlog Conelog® implant system with platform switch and conical abutment as part of a prospective two center clinical trial.

Secondary clincal parameter were the survival rate of the implant system, the performance of the restorative components, satisfaction of the patient and the nature and frequency of adverse events.

Methods and Materials

Prospective observational cohort study over 60 months

Inclusion criteria were as follows:

- Two or more missing adjacent teeth in the posterior mandible (pos. 34 – 37 and 44 – 47).
- Single crown restorations.
- The opposition dentition must be natural teeth or an implant supported fixed restoration.
- Implants placement at least 6 weeks post-extraction.
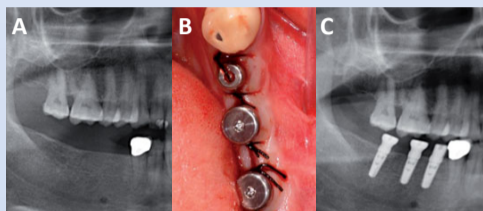- No bone augmentation was allowed.

Fig.1: (A) Orthopantomography as example of a case with three missing teeth at the posterior mandible. (B) The intraoperative aspect and the according postoperative x-ray (C).
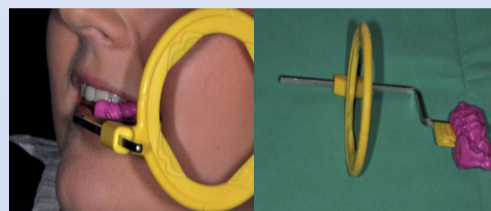

Fig.2: Silicion supported bite-trays in combination with a tube holder served for the orthoradial x-ray study .
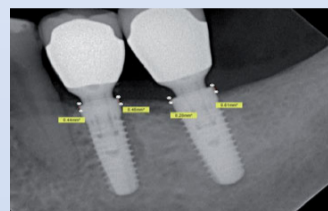

Fig.3: Example for the bone level meassurement at the mesial and distal aspect from implant shoulder to the first visible bone formation.
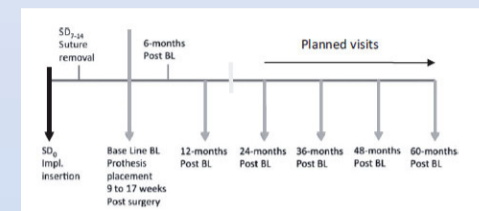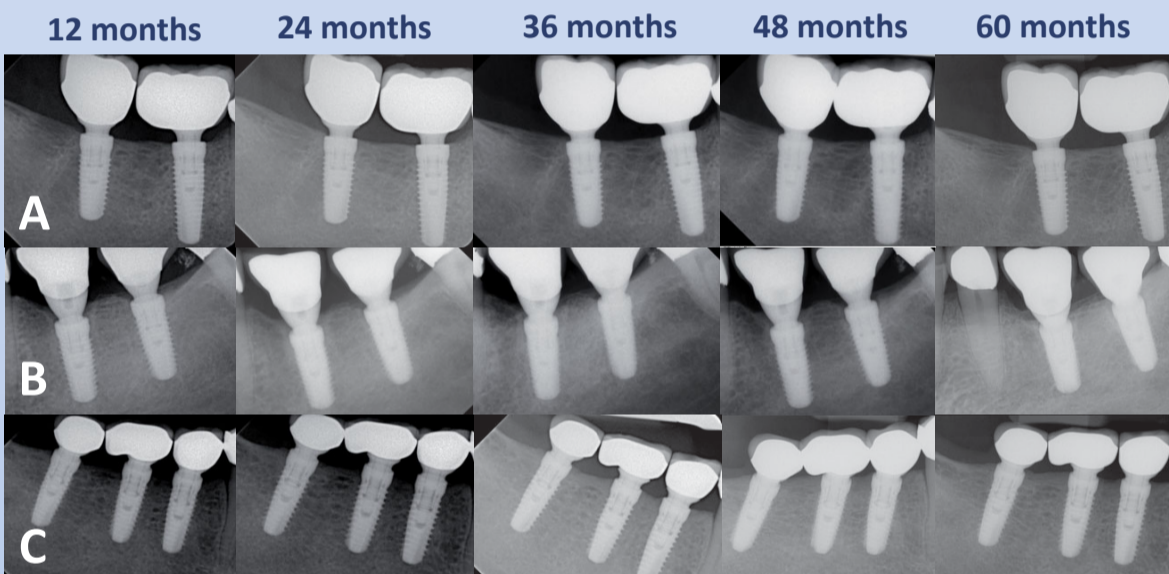

Fig.4: Study Flow Chart

Primary study objective

Change in bone level over time in mm (primary study objective)

12 months	24 months	36 months	48 months	60 months

Change		N	Min	Max	Mean	SD	95% CI-Interval Lower	Upper
surgery - loading*		50	-1.48	0.13	-0.50	0.40	-0.61	-0.38
loading – 6-month*		50	-0.77	1.10	0.12	0.36	0.02	0.22
loading – 12-month **		46	-1.20	1.10	0.12	0.42	-0.01	0.24
loading – 24-month ***		44	-0.93	1.43	0.20	0.46	0.06	0.34
loading – 36-month°		43	-0.97	1.43	0.20	0.45	0.06	0.34
loading – 48-month		36	-1.03	1.43	0.26	0.49	0.09	0.43
loading – 60-month		35	-0.87	1.43	0.27	0.47	0.11	0.43
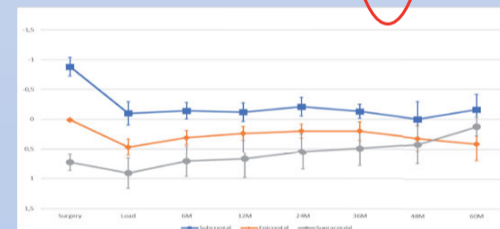
The x-rays examples (A-C) present stable bone levels at the implant shoulder over the study course. The mean change was a 0.3 mm gain of bone at the shoulder, that established after 48 months (see table).
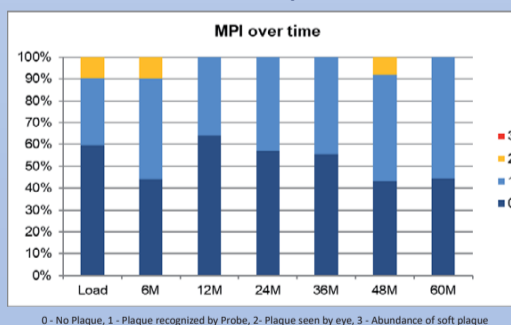
A full mixed effect model on slightly differing insertion depths showed no significant differences between the three groups (subcrestal, crestal and supracrestal insertion depths) after 60 months (D).
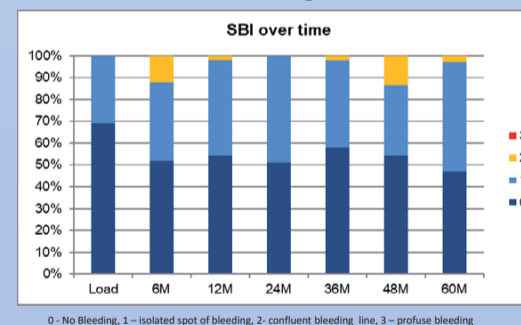
Secondary study objectives

The clinical photographies of the implant sites revealed healthy peri-implant soft tissues of the patient examples from above. Modified plaque Index (MPI) and Sulcus Bleeding Index (SBI) for all patients underline the soft tissue performance of the implant system after 60 months.

Modified Plaque Index

0 - No Plaque, 1 - Plaque recognized by Probe, 2- Plaque seen by eye, 3 - Abundance of soft plaque

Sulcus Bleeding Index

0 - No Bleeding, 1 – isolated spot of bleeding, 2- confluent bleeding line, 3 – profuse bleeding
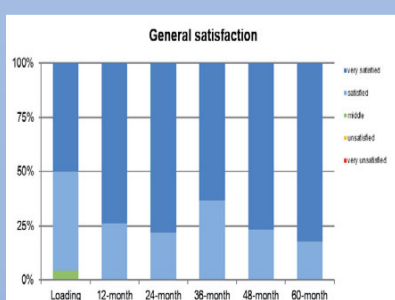
Survival and Clinical Success

The Overall Survival Rate was 95.4 % and the Clinical Success Rate as defined by Buser 1990 with absence of pain, foreign body sensation, dysaesthesia, peri-implant infection and suppuration or mobility was likewise high: 95.1%

Patients were asked about the performance of the prosthetic parts with a categorial questionaire about general satisfaction, comfort, appearance and ability to chew all with satisfied to very satisfied ratings in the majority of the patients.
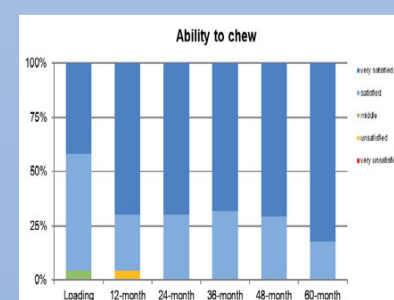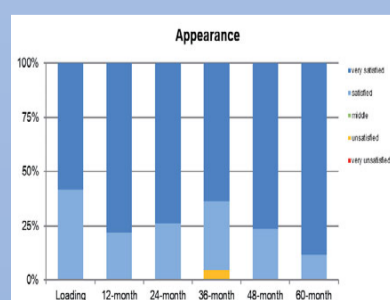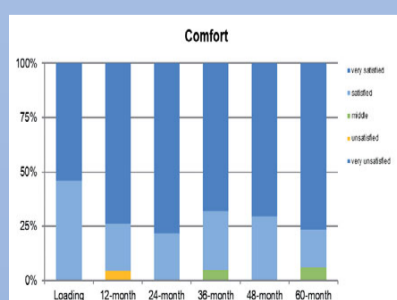
Conclusion

The CONELOG® SCREW-LINE implant presented with a good clinical performance regarding implant survival and functional outcome. The crestal bone remained stable at the implant shoulder within the observational period. These findings are congruent to crestal bone remodelling effects reported by the Camlog platform switch study presented by Guerra et al.[2] that likewise demonstrated a positive effect on the marginal bone, when compared to restaurations without a platform shift.

References

1. Lazzara, R. J., & Porter, S. S. (2006) Platform switching: A new concept in implant dentistry for controlling postrestorative crestal bone levels. Int J Periodontics Restorative Dent, 26
2. Guerra, F. (2014) Platform switching vs. platform match in the posterior mandible – 1 year results of a multicentre randomized clinical trial. J Clin Periodontol, May 2014, 41(5):521-9