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Hard and Soft Tissue Maintenance at Immediately Provisionalized OsseoSpeed Implants Placed into Extraction Sites: 2-year Results

Noelken R[1, 3], Kunkel M[2], Wagner W[3]
[1] Private Practice, Lindau / Lake Constance, Germany, [2] University Hospital, Bochum, Germany, [3] University Hospital, Mainz, Germany

Topic: Implant therapy outcomes, surgical aspects

Background and Aim

The main objective in modern implantology is to maintain and support peri-implant osseous and soft tissue structures to combine long-term osseointegration with an esthetic and natural peri-implant mucosa. The major advantages of immediate implant insertion in comparison to delayed implant placement protocols are a reduced treatment time, less number of sessions and the minimally invasive procedure. The aim of this study examined the clinical performance of OsseoSpeed implants placed into extraction sockets with immediate provisionalization in the anterior maxilla with a two-year follow-up.

Methods and Materials

Twenty patients received a total of 37 OsseoSpeed implants which were immediately inserted into extraction sockets with and without facial bone deficiencies of various dimensions. A flapless procedure was applied and the implants were immediately provisionalized with a temporary crown without occlusal contacts. Facial gaps between implant surface and facial soft or bone tissue were grafted with autogenous bone chips. Implants in diameters 3.5, 4.0, 4.5 and 5.0 with lengths of 11 to 17 mm were used in the study. During the course of the study, implant success rates, marginal bone levels and the Pink Esthetic Score (PES) were assessed per implant.

Results

One patient with 3 implants did not continue the study after prosthesis delivery, the remaining 34 implants were still in function at the final follow-up (survival rate: 100%). The mean follow-up period was 27 months (range, 12 to 40 months). The mean interproximal bone level (as measured against the implant shoulder) changed from 0.82 ± 1.00 mm at implant insertion, to 0.24 ± 0.58 mm at prosthesis delivery, and further to 0.14 ± 0.57 mm at the 1-year follow-up. Finally, at the 2-year follow-up -0.07 ± 0.58 mm was recorded (Figure 1). The thickness of the facial bony lamellae were measured at 1 mm, at 3 mm and at 6 mm apical to reference level and showed increased thickness of the facial bone dimension (Figure 2).The mean PES ratings were 11.4 ± 1.8 (range, 6 to 14) in the final follow-up. In 78% of the patients the PES was completely preserved or even improved.

Conclusions

Survival rates, marginal bone levels, and esthetic results suggest proof of principle for the preservation of marginal bone level at immediately placed and provisionalized OsseoSpeed implants after a two-year follow-up. Implant sites with facial bony deficiencies can be predictably treated with a favorable esthetic outcome using the immediate implant insertion, immediate reconstruction and immediate provisionalization technique.

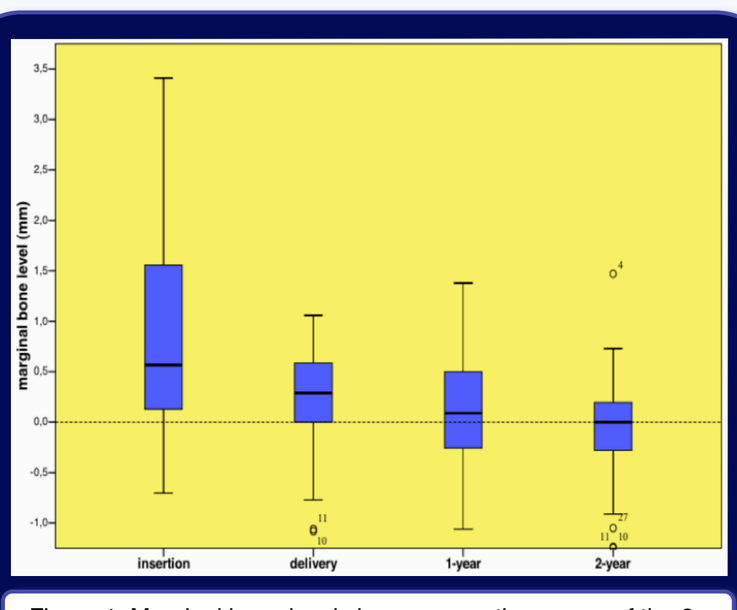


Figure 1: Marginal bone level changes over the course of the 2-year follow-up in relation to reference level (implant shoulder).

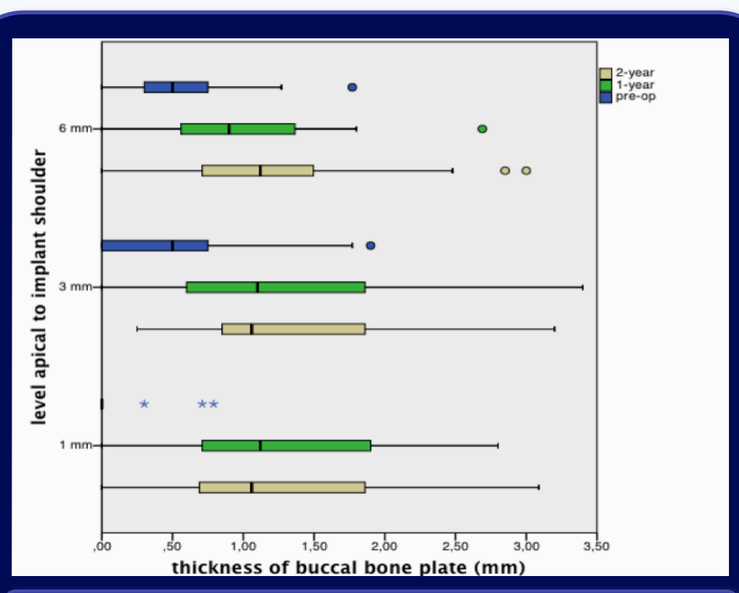


Figure 2: Changes of the thickness of the buccal bone plate 1, 3 and 6 mm apical to reference level.

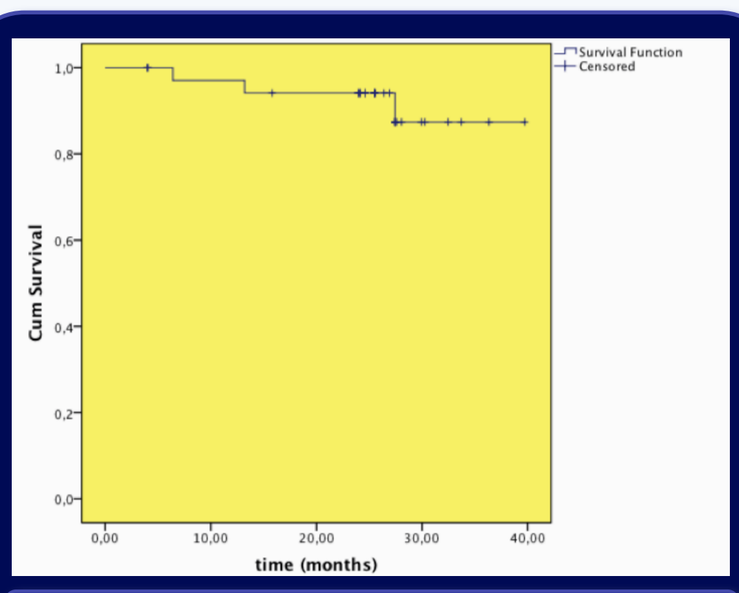


Figure 3: Success function according to Kaplan-Meier including criteria of Buser and bone loss smaller or equal than 1 mm.

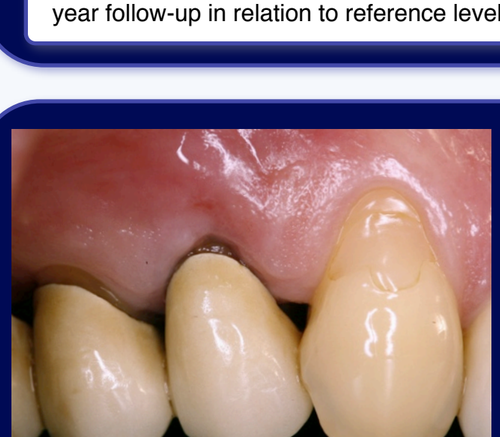


Fig. 4a: Initial situation with swelling and loss of attached gingiva.

Fig. 4b: Extraction of premolar with vertical root fracture.

Fig. 4c: Immediate implant insertion and reconstruction.

Fig. 4d: Temporary crown allows creeping attachment.

Fig. 4e & f: Vertical root fracture causes facial bone loss.

Fig. 4g: Delivery of zirconia abutment at 4 months.

Fig. 4h: Delivery of zirconia crown on zirconia abutment.

Fig. 4i: Thick facial tissues at 1-year follow-up.

Fig. 4j: Interproximal tissue regeneration at 2-year follow-up.

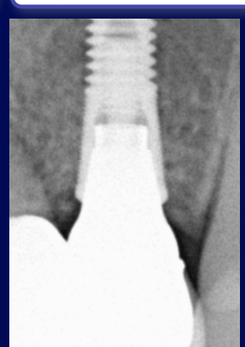


Fig. 4k & l: Regeneration of facial bone wall at 1-year.

Fig. 4m: Extraction socket with facial bone defect.

Fig. 4n: Immediate implant insertion in contact to the oral wall.

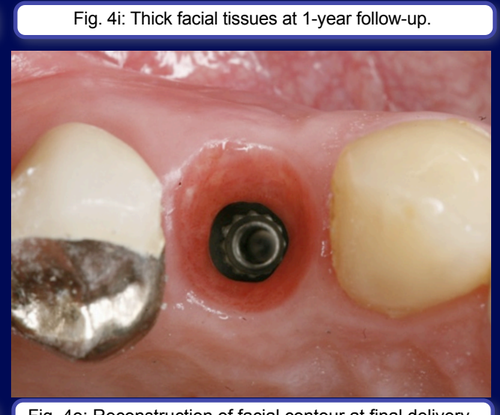
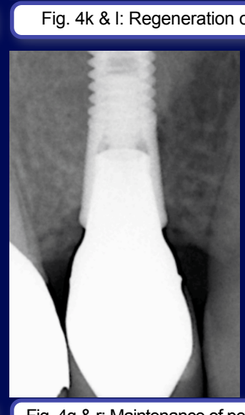


Fig. 4o: Reconstruction of facial contour at final delivery.

Fig. 4p: Maintenance of facial contour at 2-year follow-up.



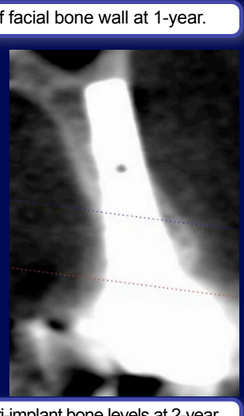


Fig. 4q & r: Maintenance of peri-implant bone levels at 2-year.

References

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Contact

Dr. Robert Noelken, private practice for oral surgery, Paradiesplatz 7 - 13,
D - 88131 Lindau / Lake Constance, Germany, e-mail rnoelken@me.com

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