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Maintenance of Marginal Hard and Soft Tissue Support at Immediately Provisionalized OsseoSpeed™ Profile Implants - 1-Year Results

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Introduction

To overcome the disadvantages of staged implant surgery and treatment, immediate loading concepts as well as flapless surgery approaches have been introduced in recent years. Specifically, promising results in terms of high success rates and remarkable esthetic outcomes have been reported for implants placed in extraction sockets and immediately loaded via provisional crowns and prostheses. In the anterior maxilla the extraction socket anatomy is sloped in a lingual to buccal direction and the placement of a regular implant is not optimal. A dental implant with a sloped marginal contour, OsseoSpeed™ Profile (Astra Tech AB, Mölndal, Sweden), has been developed to optimize implant placement in such situations.

The study examined the clinical performance of OsseoSpeed™ Profile implants and the transgingival components in a one-stage procedure with immediate insertion and provisionalization in the anterior maxilla.

Materials and Methods

22 OsseoSpeed™ Profile implants were inserted in 17 patients. All implants were placed immediately into extraction sockets. Facial bony defects (2 total, 8 partial losses of the facial lamella) were reconstructed immediately with autogenous bone chips without raising a flap. All patients received immediate provisional restorations. Primary outcome variables were implant survival, marginal bone levels and Pink Esthetic Score.

Results

Mean primary stability at time of implant insertion was 23 Ncm; 3 further implants had to be excluded because of insufficient primary stability for immediate provisionalization (below 15 Ncm). Mean follow-up was 16.8 months (range 8.1 to 21.6 months). There was one implant loss. Cumulative survival rate according to Kaplan-Meier was 95.7%. Marginal bone level remained stable from the time of implant insertion to the final follow-up. In 73 % of the implant sites it was possible to keep the gingival esthetics stable or even to improve it from the pre-operative examination (mean 10.6, SD 2.3) to the final follow-up (mean 11.5, SD 1.4).

Conclusions

Results of survival rate, marginal bone stability and esthetic improvement suggest proof of principle for immediate provisionalization of Astra OsseoSpeed™ Profile implants.

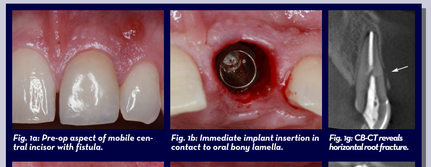


Fig. 1a: Pre-op aspect of mobile central incisor with fistula.

Fig. 1b: Immediate implant insertion in contact to oral bony lamella.

Fig. 1g: CB-CT reveals horizontal root fracture.

Fig. 1c: Immediate implant insertion and flapless bone reconstruction.

Fig. 1d: Immediate chairside non-functional provisionalization.

Fig. 1h: Facial bone reconstruction at 12 months.

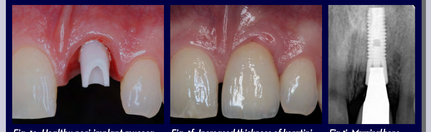


Fig. 1e: Healthy peri-implant mucosa at delivery of zirconia abutment.

Fig. 1f: Increased thickness of keratinized periimplant mucosa at 12 months.

Fig. 1i: Marginal bone maintained at 12 months.

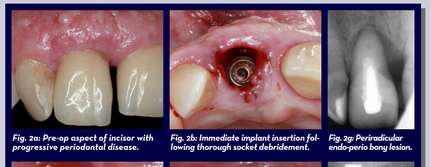


Fig. 2a: Pre-op aspect of incisor with progressive periodontal disease.

Fig. 2b: Immediate implant insertion following thorough socket debridement.

Fig. 2g: Periradicular endo-perio bony lesion.

Fig. 2c: Immediate implant insertion, perimplant flapless bone grafting.

Fig. 2d: Immediate non-functional chairside provisionalization.

Fig. 2h: Interproximal bone regeneration.

Fig. 2e: Final delivery of zirconia abutment at 5 months.

Fig. 2f: Favourable periimplant tissues without bleeding on probing at 18 months.

Fig. 2i: Periimplant bone reconstruction.

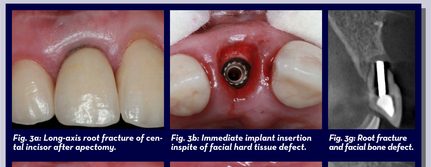


Fig. 3a: Long-axis root fracture of central incisor after apectomy.

Fig. 3b: Immediate implant insertion inspite of facial hard tissue defect.

Fig. 3g: Root fracture and facial bone defect.

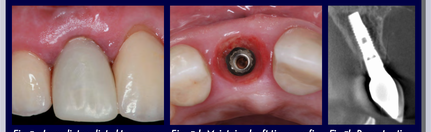


Fig. 3c: Immediate splinted temporary restoration on TiDesign abutment.

Fig. 3d: Maintained soft tissue profile at prosthesis delivery.

Fig. 3h: Reconstruction of facial bone defect.

Fig. 3e: Final delivery of zirconia abutment 4 months post-op.

Fig. 3f: Facial soft tissue regeneration & improved esthetics at 12 months.

Fig. 3i: Favourable bone level at 12 months.

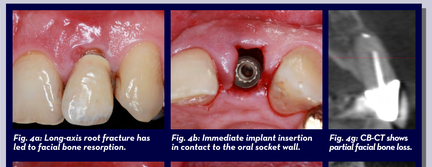


Fig. 4a: Long-axis root fracture has led to facial bone resorption.

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

Fig. 4g: CB-CT shows partial facial bone loss.

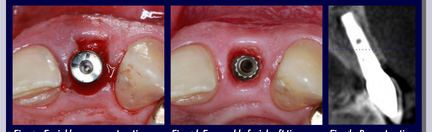


Fig. 4c: Facial bone reconstruction with autogenous bone chips.

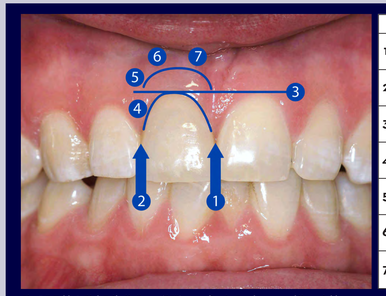
Fig. 4d: Favourable facial soft tissue contour after remission of swelling.

Fig. 4h: Reconstruction of facial bony lamella.

Fig. 4e: Delivery of individualized, final zirconia abutment at 4 months.

Fig. 4f: Improved esthetics & facial soft tissue contour at 18 months.

Fig. 4i: Maintained marginal bone at 18 months.



	Variables		0 points	1 point	2 points
1	mesial papilla	shape vs. reference tooth	absent	incomplete	complete
2	distal papilla	shape vs. reference tooth	absent	incomplete	complete
3	level of soft tissue margin	level vs. reference tooth	major discrepancy more than 2 mm	minor discrepancy between 1 and 2 mm	no discrepancy or smaller than 1 mm
4	soft tissue contour	naturality, matching reference tooth	unnatural	fairly natural	natural
5	alveolar process contour	alveolar process deficiency	obvious	slight	none
6	soft tissue texture	texture vs. reference tooth	obvious difference	moderate difference	no difference
7	soft tissue colour	colour vs. reference tooth	obvious difference	moderate difference	no difference

Fig. 5 & Table 1: Pink Esthetic Score (PES) according to Fuerhauser and its variables.

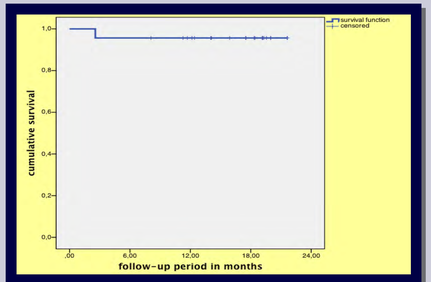


Fig. 6: Overall cumulative survival rate was 95.7% within a time range up to 21.6 months.

Fig. 7: Astra Tech OsseoSpeed™ Profile implant dimensions in this study were 4.5, 5.0 and 5.05 mm with implant lengths of 13 and 15 mm. A MicroThread™ characterizes the coronal part of the implant.

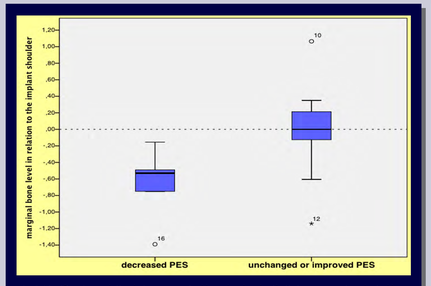


Fig. 8: Significant correlation between marginal bone level and esthetic improvement evaluated by the PES ($p = 0.008$; Spearman rank correlation coefficient).

Fig. 9: Observation of pre- and post-operative PES scores revealed stable or improved PES ratings in 73 % of the implant sites.

Literature

Noelken R, Donati M, Fiorellini J, Gellrich N-C, Parker W, Berglundh T. Maintenance of marginal bone support at OsseoSpeed Profile implants. **Poster EAO #201, Glasgow 2010**

De Santis E, Botticelli D, Pantani F, Pereira FP, Beolchini M, Lang NP. Bone regeneration at implants placed into extraction sockets of maxillary incisors in dogs. **Clin Oral Impl Res 2011; 22: 430–7**

De Kok IJ, Chang SS, Moriarty JD, Cooper LF. A retrospective analysis of peri-implant tissue responses at immediate load/provisionalized microthreaded implants. **Int J Oral Maxillofac Implants 2006; 21: 405-12**

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