



MARGINAL BONE LEVEL AND GINGIVAL ESTHETICS

A PROSPECTIVE OBSERVATIONAL STUDY



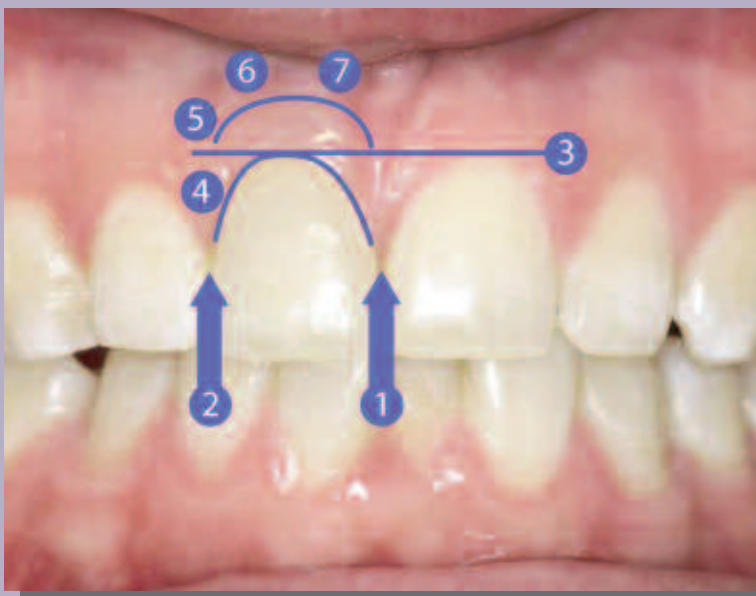
R. Nölken^{1,2}, T. Morbach², M. Kunkel², W. Wagner²

¹ Private Practice for Oral Surgery, Paradiesplatz 7-13, 88131 Lindau / Lake Constance, Germany,

² Department of Oral and Maxillofacial Surgery, University of Mainz, Augustusplatz 2, 55131 Mainz, Germany

Objective:

The aim of this retrospective study is to evaluate the relation of the marginal bone level and the esthetic outcome in scalloped Nobel Perfect™ implants [1], placed in a one stage procedure (immediate provisionalization and loading) in the esthetic zone.



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. 1: Pink Esthetic Score by Fürhauser and its criterias.

Materials and Methods :

From October 2003 to June 2005 immediate prosthetic restorations were placed on 31 Nobel Perfect™ implants with a 1.5 mm machined scalloped collar (Fig. 2) in the esthetic zone (maxilla 24, mandible 7) in 20 patients (range: 29 to 69 years). Implants were inserted immediately after tooth removal (n=21) or secondary to osseous consolidation of the extraction sockets (n=7) or alveolar ridge augmentation (n=3). The facial bony lamella was defect or totally lost in six sites. All temporary restorations were inserted at the day of implant placement and adjusted to clear all contacts during excentric movements. 29 implants were splinted to neighboring teeth or to each other. Two implants remained unsplinted. Primary outcome variables were implant success, marginal bone levels and the Pink Esthetic Scores by Fürhauser (PES) [2] (Fig. 1) assessed per implant.



Fig. 2: NobelPerfect™ implants

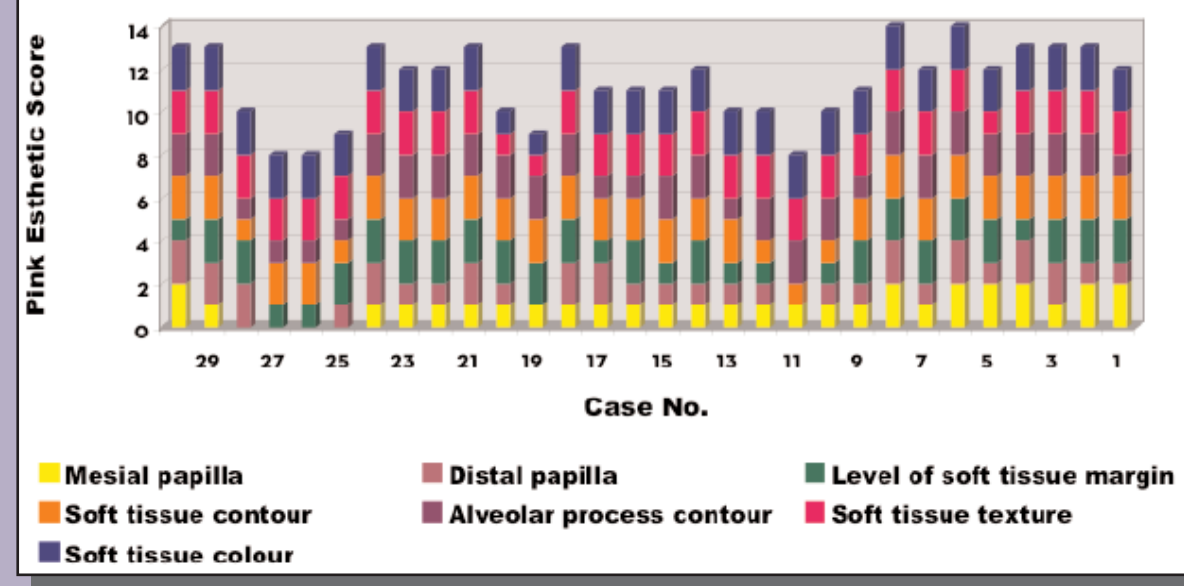


Fig. 3: Pink Esthetic Score of 30 evaluated NobelPerfect™ implants

Results :

In the follow up period (1.4-26.6 months, median: 12,9 months) one implant failed. This failure occurred in a non-splinted single tooth replacement case. Cumulative success rate according to the criteria specified by Smith and Zarb was 96.8 % (Fig. 4). Marginal bone levels averaged 1.7 mm above the first thread and remained stable within the observational period. Mean PES-ratings were 11.3 (range 8-14) (Fig. 3). The interproximal marginal bone level showed a significant association to the esthetic result ($r=0.531$; $p=0.0026$; Spearman's rank correlation coefficient) (Fig. 5). In 18 patients, preoperative and postoperative scores were available. Improvement of the PES was noticed in 5 patients. In 6 patients the esthetic status was unchanged while 7 patients sustained slight to moderate decrease on the esthetic rating scale (Fig. 6).

Conclusion :

The promising marginal bone levels suggest proof of principle for the preservation of the interproximal bone lamella by a scalloped implant design. Moreover our study confirmed the marginal bone level to be a crucial determinant of the esthetic outcome [3].

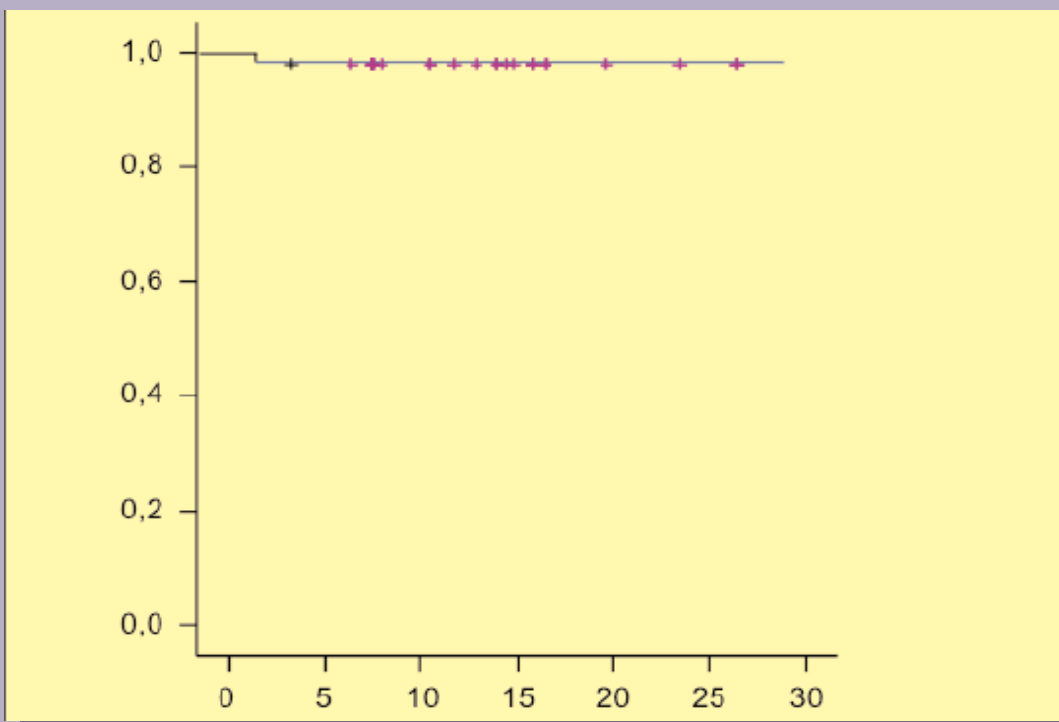


Fig. 4: The cumulative survival rate according to the criterias by Kaplan-Meier was 96.8% (median post-operative period 12.9 months, range 1.37 to 26.6 month).

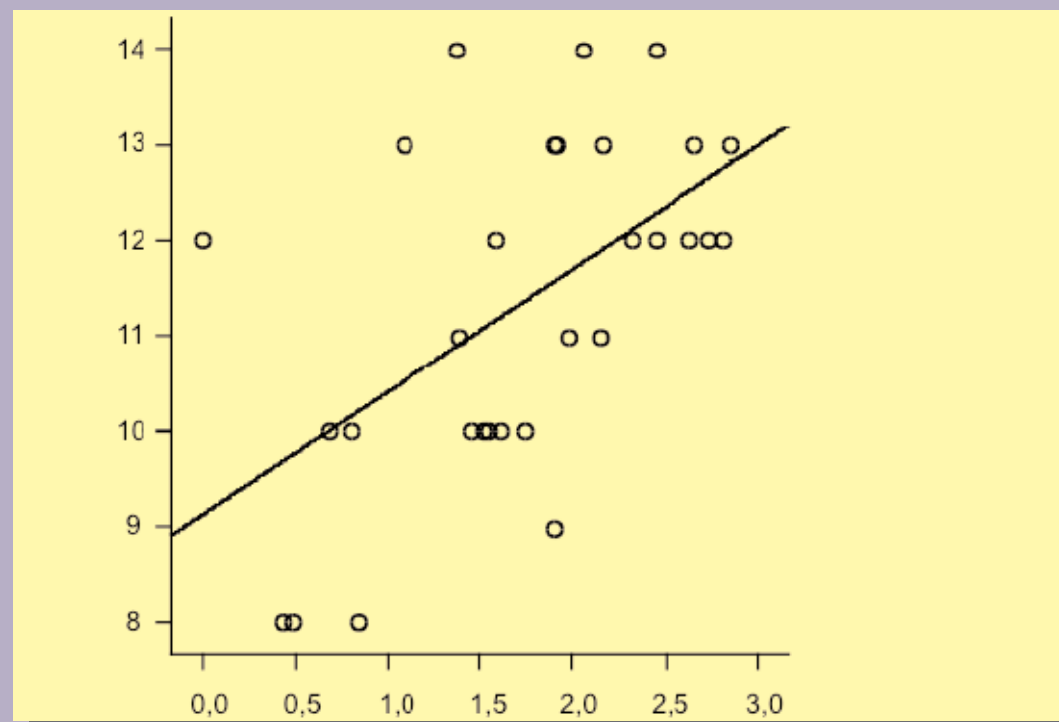


Fig. 5: Scatter plot of PES-ratings according to average marginal bone level. The data demonstrate a significant correlation ($r=0.531$; $p=0.0026$; Spearman's rank correlation coefficient).

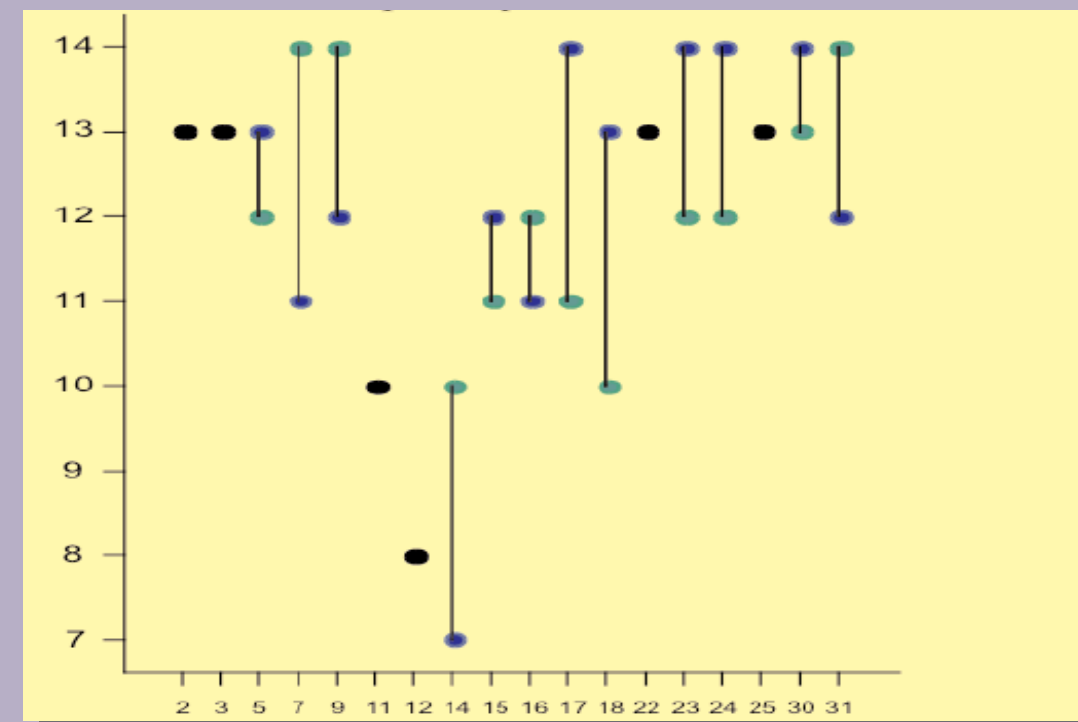


Fig. 6: Pre- and post-operative "Pink Esthetic Scores". In about 2/3 of the patients the esthetic status was improved or preserved compared with the initial situation.

Literature

1. Wöhrle PS. NobelPerfect™ esthetic scalloped implant: rationale for a new design. Clin Implant Dent Relat Res 2003; 5 (Suppl 1): 64-73
2. Fürhauser R, Florescu D, Benesch T, Haas R, Mailath G, Watzek G. Evaluation of soft tissue around single-tooth implant crowns - the Pink Esthetic Score. Clin Oral Implants Res 2005; 16: 639-644
3. Rocci A, Gottlow J. Esthetic outcome of immediately loaded scalloped implants placed in extraction sites using flapless surgery. A 6 month report of 4 cases. Appl Osseo Res 2004; 4: 55-62

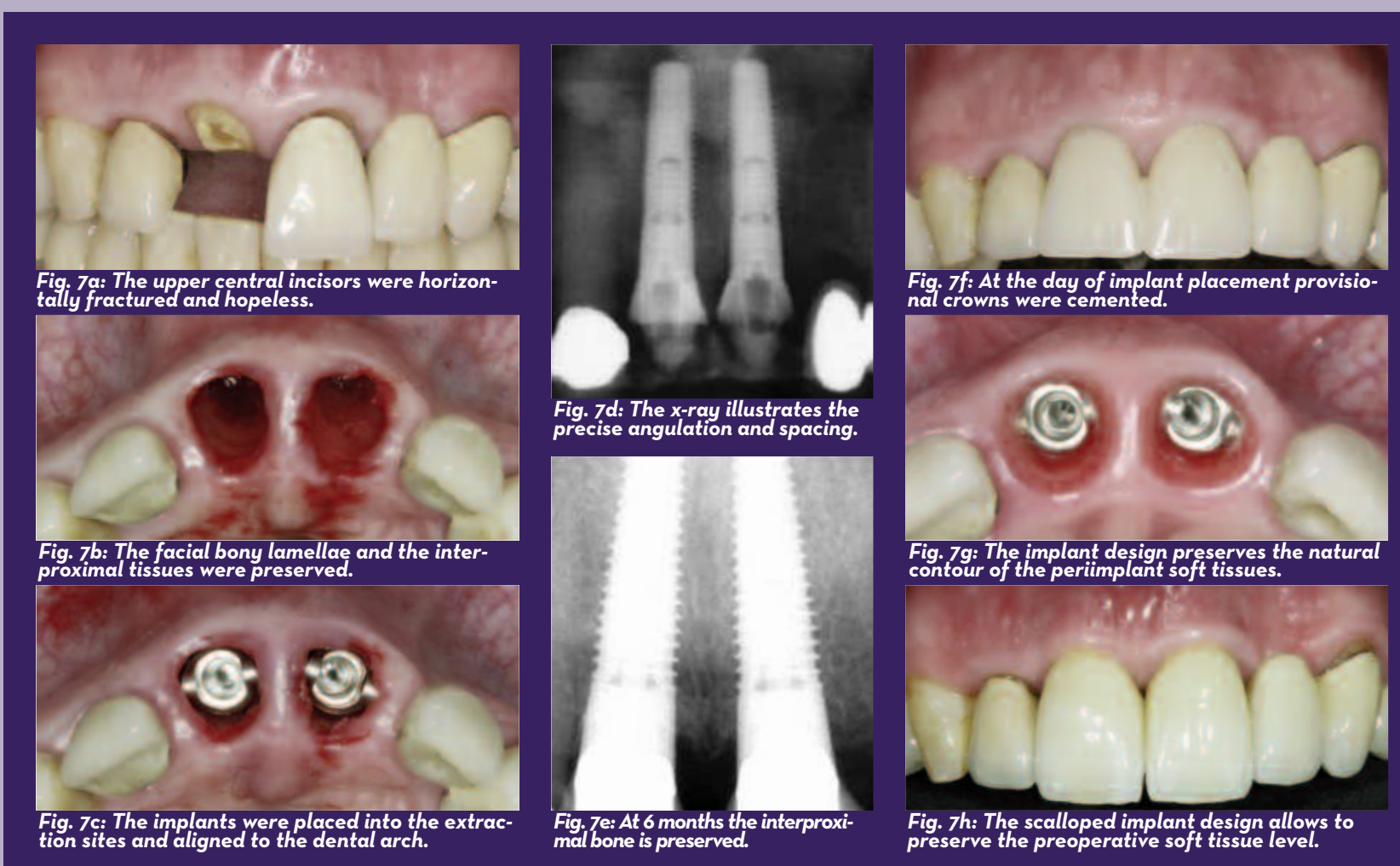


Fig. 7: Case no. 14 and 15 - teeth no. 8 and 9 - endodontic failure - facial bony lamellae intact - immediate implant placement - immediate provisionalization - splinting - final restoration at 6 months - high bone level - interimplant bony peak - Pink Esthetic Score in total 11 each.

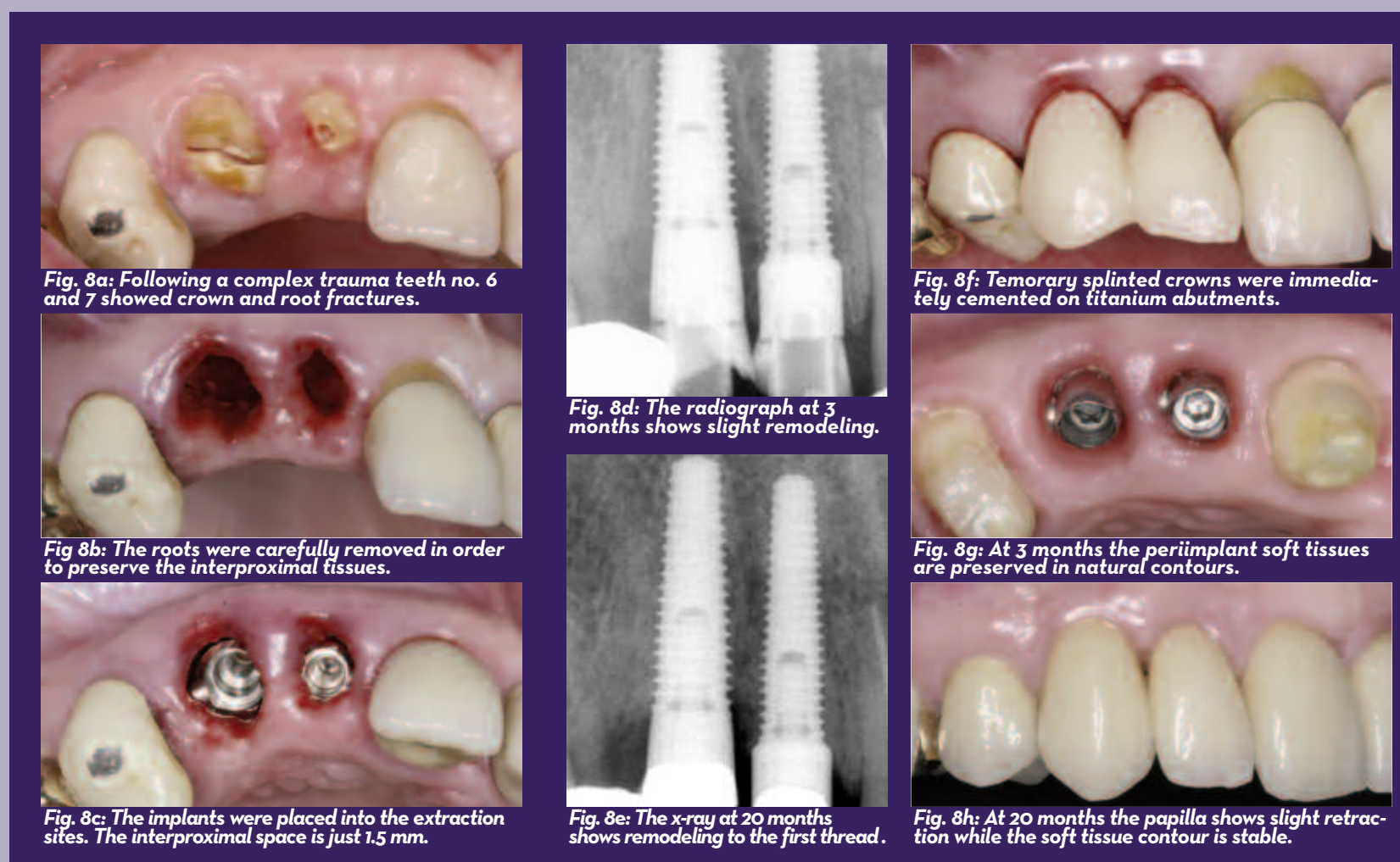


Fig. 8: Case No. 2 and 3 - teeth no. 6 and 7 - smoker - traumatic vertical and horizontal root fractures - facial bony lamellae intact - immediate implant placement - immediate provisionalization - splinting - final restoration at 3 months - slight remodeling interproximal - Pink Esthetic Score in total 13 each.

Contact information

Dr. Robert Nölken, Paradiesplatz 7-13, D-88131 Lindau / Lake Constance, Germany, praxis@dr-noelken.de