

Successful restoration of the maxilla and mandible

Case report of a heavy smoker

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Introduction

Dental implants represent the most cost-effective and long-term solution for the replacement of missing teeth and have a high average life expectancy. Presently, the failure rate of implants is higher among smokers than in non-smokers. There seems to be a correlation between the implant failure rate and the number of cigarettes smoked daily—the higher the number of cigarettes smoked daily, the higher the implant failure rate. One of the authors of this article has extensive experience in treating smokers and has more than 30 years of experience in inserting dental implants with a low implant failure rate. To achieve a satisfactory result regarding implant survival, a variety of factors need to be taken into consideration, such as bone type and quality, bone density, placement and location of the implants, patient motivation, and the patient's financial situation.

On smoking

In general, smoking is considered to be one of the main risk factors for implant failure. Reports in the literature

show a lower survival rate of dental implants in smokers as opposed to non-smokers. One possible mechanism by which smoking may affect osseointegration is lowering of the blood flow rate owing to increased peripheral resistance and platelet aggregation. Tobacco smoke directly affects osteoblast function.

Materials and methods

Patient

The patient was male and aged 65. He was a heavy smoker, smoking 60 cigarettes a day. In addition, he suffered from severe periodontitis (Fig. 1).

Implants

The implantation was carried out with six implants in the maxilla and ten implants in the mandible (Figs. 2–5). The implants used were OKTAGON DENTAL RATIO implants (DRS International) of 4.1 mm in diameter and 13.0 mm in length. The implants had a tapered bone-level design. Before insertion, each implant was wetted with either hyaluronic acid or the autologous blood of the patient.

Preoperative medication

As for premedication measures, Augmentin was given for a duration of one week. After microbiological examination, an antibiotic (Clindamycin Aristo 600, Aristo Pharma) was prescribed (first one tablet three times a day and then one tablet twice a day until the day of surgery). In addition, the patient was instructed to rinse with Chlorhexamed (GlaxoSmithKline). Local anaesthesia was achieved with Ultracain D-S forte (Sanofi-Aventis Deutschland), and 40 mg Dexamethasone (Dexa-ratiopharm (ratiopharm)) was administered intramuscularly at the same time.

Augmentation

Augmentation was carried out using NanoBone granules (Artoss) and a Geistlich Bio-Gide membrane (Geistlich Biomaterials). NanoBone is a synthetic calcium phosphate. Its structure results in extremely quick bone formation.

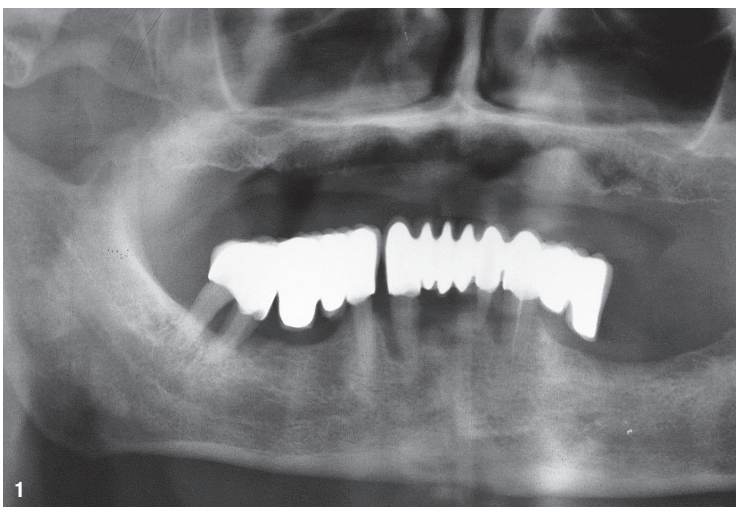


Fig. 1: Radiographic evaluation of the mandible of the male patient, who was a heavy smoker and suffered from severe periodontitis.

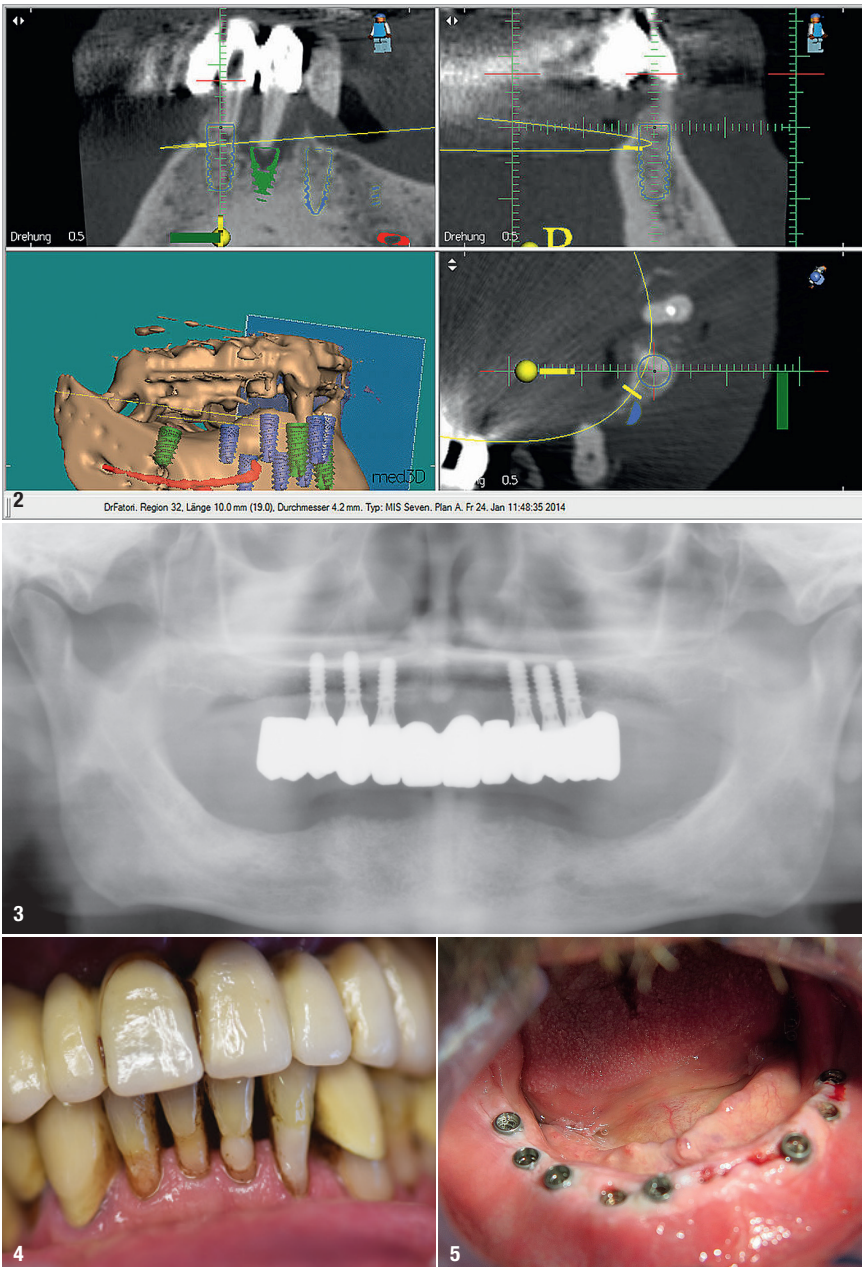


Fig. 2: Diagnostic procedures. **Fig. 3:** Radiograph of the maxilla showing the situation after the placement of six OKTAGON DENTAL RATIO implants. **Fig. 4:** Frontal view showing the restorative situation of the maxilla and the mandible prior to tooth extraction. **Fig. 5:** Situation after implantation of ten implants in the mandible. Guided bone regeneration was necessary (with NanoBone and Geistlich Bio-Gide).

Surgical technique

Implant placement was performed under local anaesthesia. The osteotomies were extended gradually, according to the intended implant diameter, with the sequential order of drills that is recommended by the implant manufacturer. Thereafter, the oral cavity was cleaned and necrotic or inflamed tissue was removed. The implants were then inserted

into the prepared sites to an insertion torque of 45 Ncm. Adequate primary stability was obtained. Resorbable 4/0 sutures were used for wound closure.

Postoperative treatment

Postoperative intra-oral periapical radiographs were taken, and these confirmed the accuracy of the implant placement. As for postoperative medication, an-



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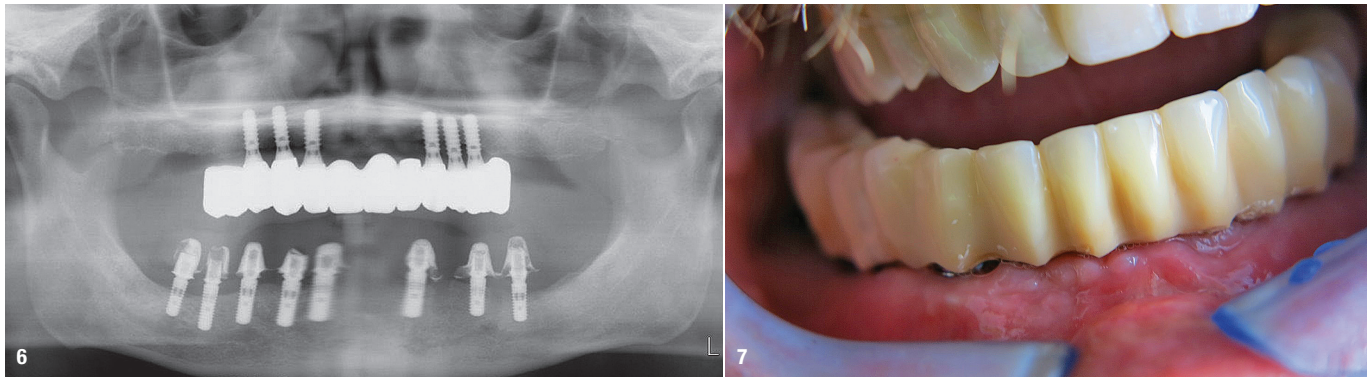


Fig. 6: Early loss of two implants in the mandible due to primary instability. **Fig. 7:** Provisional restoration of the mandible.

tibiotics were prescribed. In addition, 20mg prednisolone was prescribed (first one tablet three times a day, then half a tablet three times a day and finally a quarter tablet three times a day). Five arnica globules were also prescribed daily to minimise swelling. Radiographs were taken digitally at the time of surgery, after 24 hours and after one month in order to evaluate implant success (Fig. 6).

Follow-up examination

Follow-up examinations employed the criteria of Albrektsson et al. and Buser et al.^{1,2} These criteria for implant success are widely cited and generally accepted. According to these, implant success is defined by the absence of persistent subjective complaints, including pain, foreign-body sensation and/or dysesthesia; the absence of recurrent peri-implant infection with suppuration; the absence of mobility; continuous radiopacity around the implant; and the possibility of prosthetic restoration. Ahead of the definitive restoration, a provisional restoration of the mandible was fabricated and inserted (Fig. 7).

Results

Fourteen of the 16 inserted implants osseointegrated. During the healing phase, periosteal tests were performed (Periotest, Siemens), and the average values achieved ranged from 0.55 to 0.67 (on the plaque, gingival and papillary bleeding indices).

Discussion

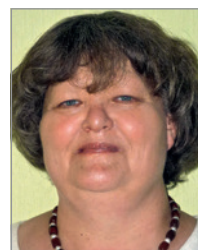
The healing process of the implants in the case described was good. Only two implants were lost. In conclusion, it can be argued that smoking tobacco is not a contra-indication for replacing missing teeth with dental implants. However, providing the smoker with detailed information about the smoking-related risk of implant failure is a rational consensus from the vantage point of both patient and dentist.

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about the authors



Dr Branislav Fatori has more than 41 years of experience in implantology and has placed more than 8,000 implants. He was trained at prominent clinics around the globe. Also, he has worked as a long-term training consultant for professional societies and implant manufacturers.



Dr Inge Schmitz has worked at the Institute of Pathology of the Ruhr-University Bochum in Germany since 1990. Her main interests are implantology, stents, electron microscopy and osteology. She studied biology at the same University and completed her PhD at the University of Essen in Germany in 1989.

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