The fitting of five implants in the maxillary anterior sextant, using an immediate loading protocol

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General Anamnesis

The patient is a 50-year old Caucasian woman, non-smoker and in a good general state of health. She had suffered breast cancer with infiltrating ductal carcinoma of the right breast, which required the breast to be removed, chemotherapy, radiotherapy as well as subsequent anti-estrogen therapy.[1] She is still undergoing anti-hormonal treatment up to the present day.

Oral and Dental Anamnesis

The patient underwent orthodontic treatment as an adolescent. She has silver amalgam fillings in some teeth and wears a Maryland adhesive bridge for positions 12 and 14 with supports on teeth 11, 13 and 15, and a zirconium structure cemented to the lower maxilla (Figs. 1 – 3). The patient exhibited progressive adult periodontitis. She reported that inflammation caused by the periodontitis has become significantly worse in recent years.

Clinical Examination

The x-ray exam revealed a destructive loss of bone contact in the teeth of the maxillary anterior sextant and the presence of periodontal pockets in the posterior sector. Moderate to severe periodontal disease was found in the upper maxillary. Tooth mobility was diagnosed in teeth 11, 13, 21 and 22. There was no mobility in the teeth in the posterior sector (Fig. 4).

Treatment Planning

More conservative treatment using scaling and root planning was considered for the posterior sectors of the upper maxillary; in the anterior sextant, extraction of teeth 11, 13, 21 and 22 and subsequent treatment with dental implants. We assessed the possibility of an immediate loading protocol in the event of sufficient primary stability of the implants that were fitted. We used the CBCT scanner to assess morphology and the quantity of residual bone in the area to undergo treated. The decision was

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made to treat the patient with Straumann® Roxolid bone level implants, Ø 3.3 mm, NC, Slactive 12 mm. A total of 5 implants were to be fitted, three of which in post-extraction alveolar sockets 11, 21 and 22 and two more in positions 12 and 14.

Surgical Procedure

The extractions were performed followed by curettage of the alveolar sockets. The mucoperiosteal flap was elevated in order to inspect the entire length of the bone crest and to assess any possible dehiscence which may have occurred during the surgical procedure. The implant bed of the post-extraction area was prepared, and two new alveolar sockets were created for the insertion of our five implants (Figs. 6, 7). A dental splint made of resin with lateral wings, which was supported by the remaining teeth aided us in performing the surgical procedure. These wings prevented the splint from moving while the surgery was performed (Fig. 5). All of the implants exhibited good primary stability and were considered suitable for immediate loading. At the same time as the implant surgery, a maxillary torus was removed from tooth 15. No biomaterial or biocompatible membrane of any kind was required, as no dehiscence was observed during the surgery. However, the bony material harvested from the torus that was removed was used for the regeneration of the extraction zone around tooth 13, where the most damage was found. After fitting the implants, an NC open tray impression post with a short 16.5 mm guide screw was inserted into each one. Suturing was performed using tension-free sutures (Fig. 8).

Immediate Prosthetic Procedure

We then proceeded to take a direct impression of the implants using an individually fenestrated tray, which had been sterilized during preparation (Fig. 9). We used a heavy fluid elastomeric material and single-impression technique. After taking the impression, the end caps were fitted onto the implants (Fig. 10). The impressions were quickly sent to the dental laboratory which then made an immediate temporary prosthesis (Figs. 15, 16).

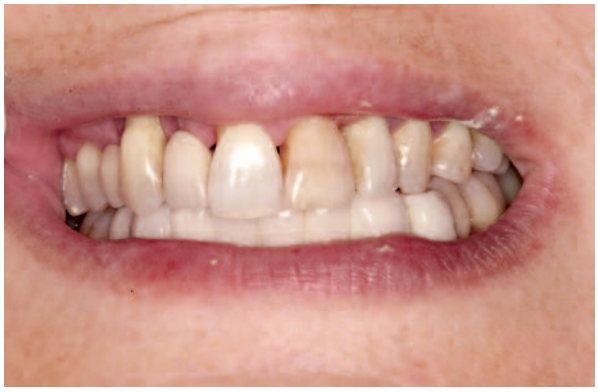


Figure 1

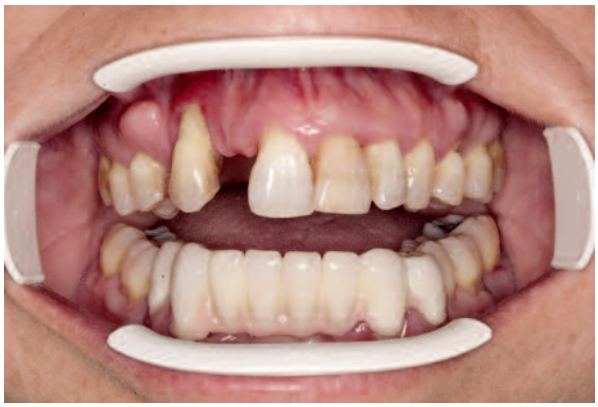


Figure 2

Figure 3

Laboratory Procedure

The implant analogs matching the impression posts were modified and the type-1 plaster impressions were removed

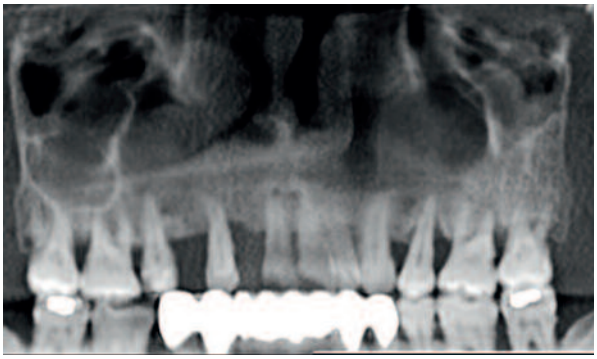


Figure 4

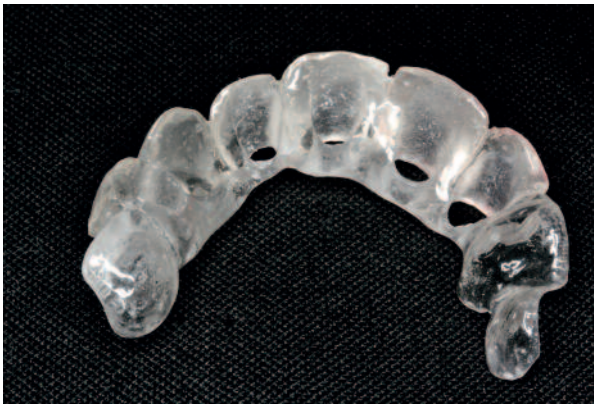


Figure 5

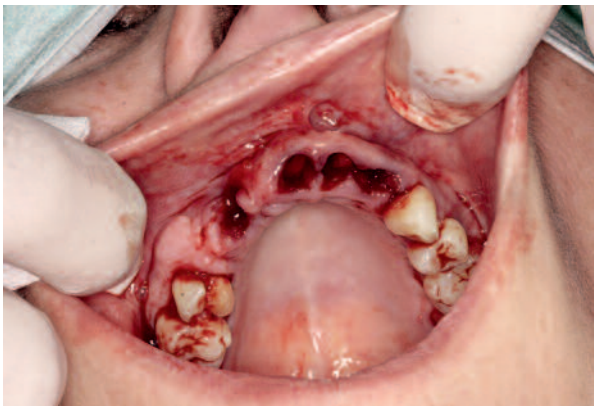


Figure 6

from their moulds. We used Straumann® NC temporary abutments (Figs. 11, 12). For making the immediate temporary prosthesis. The temporary abutments were created by the dental laboratory technician. Next, the structure used for the temporary restoration was polished.

Five hours later, the temporary abutments which had been made were sent back to the clinic along with the temporary prosthesis (Figs. 13 – 15).

Fitting the Temporary Structures

The prosthesis and abutments were sterilized and mounted onto the fitted implants. Next, we cemented our temporary prosthesis into place, achieving a tailor-made restoration with the best possible appearance. We were able to restore our patient's smile in just 5 hours (Fig. 16). We avoided contact with the opposing dental arch. The patient was recommended to eat only soft foods for the first few weeks, and she was prescribed antibiotics and instructed to rinse with a chlorhexidine mouthwash as a precaution. The stitches were removed ten days after the surgical procedure (Fig. 17).

Final Restoration

After a 12-week waiting period to allow osseointegration, the temporary restoration was removed and the progress of implant integration was assessed. All of the implants exhibited a solid degree of osseointegration. The healing of the soft tissue was favorable (Fig. 18), allowing us to proceed with the final restoration. Temporary resin crowns had been made for teeth 15, 24 and 25. We then proceeded to create these teeth. The NC open tray impression posts were once again fitted onto the implants, a final impression was made and the temporary restoration was cemented into place, including the temporary crowns for teeth 15, 24 and 25 (Figs. 19, 20). Implant analogs were fitted, plaster casts were made and the models were mounted onto the articulator to assess the inter-maxillary relationship. Using the Straumann® planning Kit, we selected permanent abutments, specifically Straumann® multi-base abutments, angled at 25° (four type a, one type b). Two zirconium structures were made, one for teeth 11, 12 and 13 and the other for teeth 21, 22 and 23, plus three independent crowns, also made of zirconium, for teeth 14, 15 and 24 (Fig. 21). The final outcome of the restoration is shown in fig. 22. Six months later, a follow-up x-ray showed no sign of peri-implantitis and that all the implants were stable.

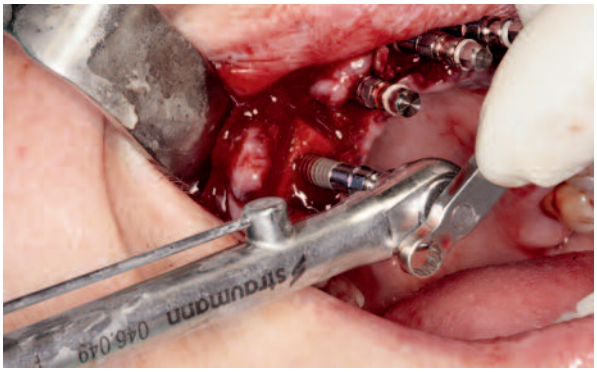


Figure 7

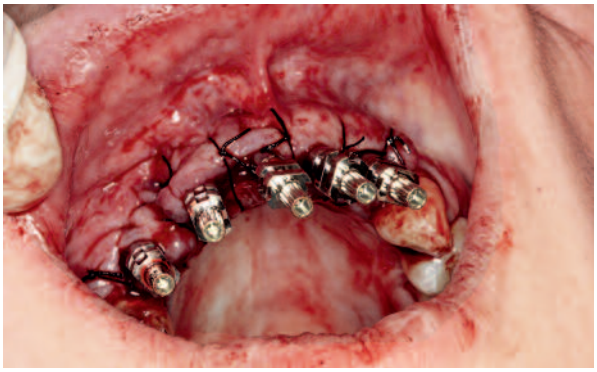
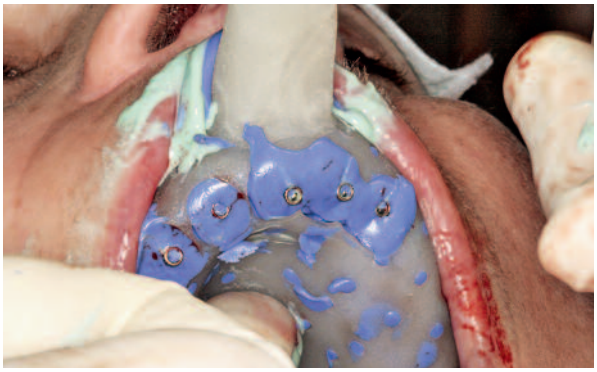


Figure 8

Figure 9



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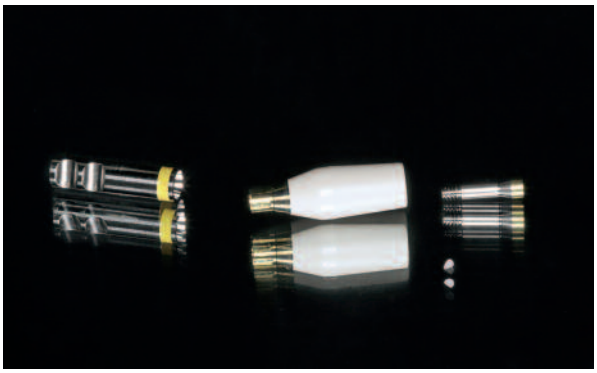


Figure 11

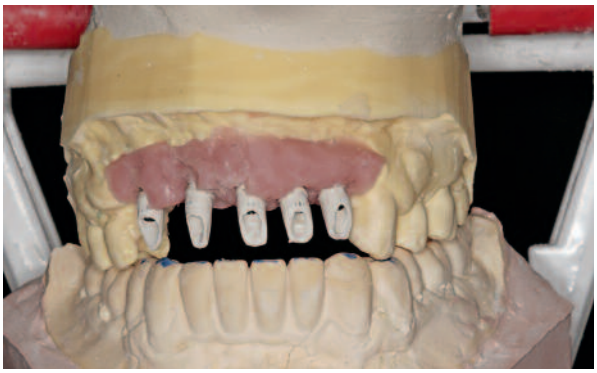


Figure 12

Conclusions

Narrow diameter implants have always suffered from the disadvantage that they fracture under excessive loading. Today, this problem can be avoided by using Ø 3.3 mm Straumann® Roxolid bone level implants. Both Roxolid® (the material) and Slactive® (the hydrophilic surface) facilitate excellent osseointegration and flexible treatment with narrow diameter implants. They offer a greater variety of treatment options for situations where bone preservation and blood supply are crucial and represent a practicable solution in certain clinical situations, inspiring greater confidence in both patients and professionals. In

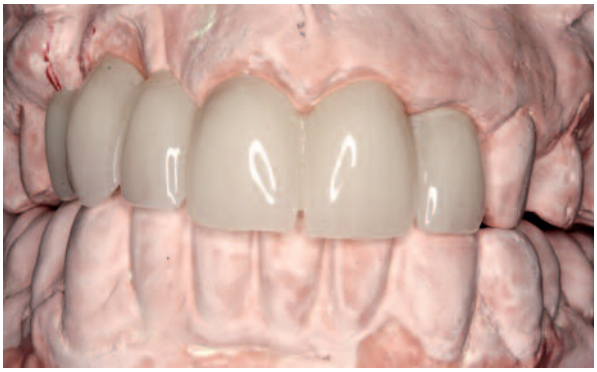


Figure 13

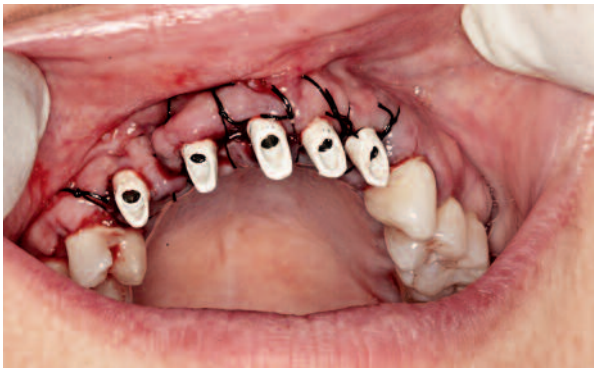
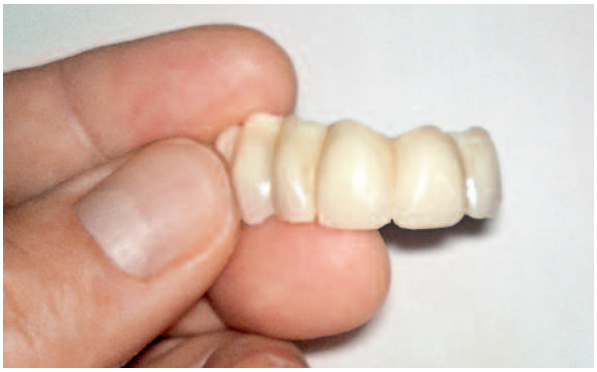


Figure 14



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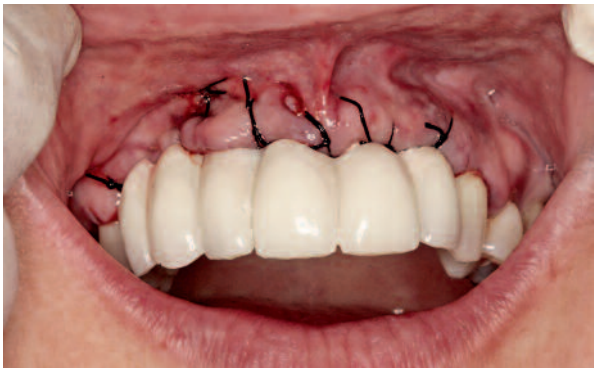
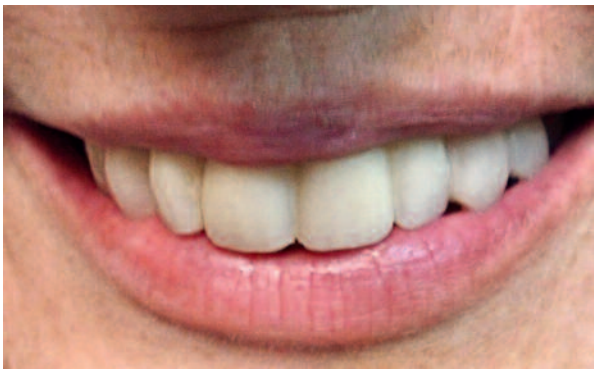


Figure 16



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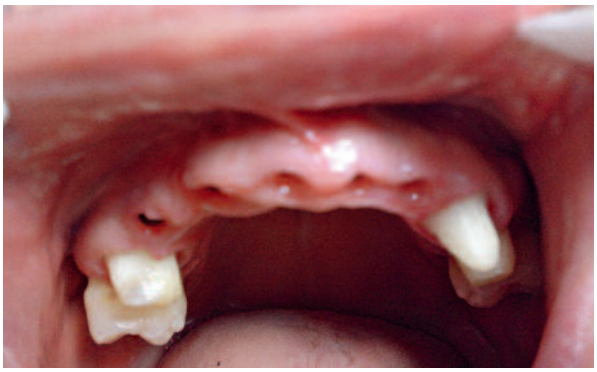
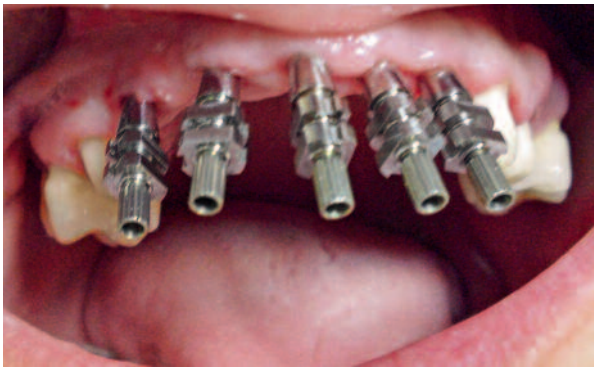


Figure 18

my opinion, it is the best implant for cases with narrow bone crests and bone damage requiring bone augmentation for the fitting of larger diameter implants, which also involves the attendant stress of surgery. We therefore see Roxolid® implants as an excellent alternative for cases requiring more complicated surgery where the problem of an insufficiently wide bone crest could potentially endanger the feasibility of the reconstruction, while at the same time avoiding greater surgical stress for the patient.



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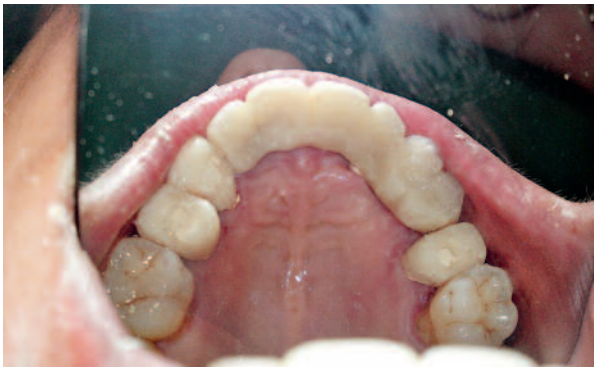

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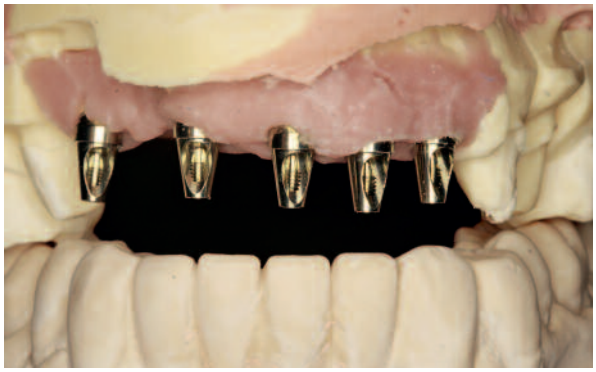

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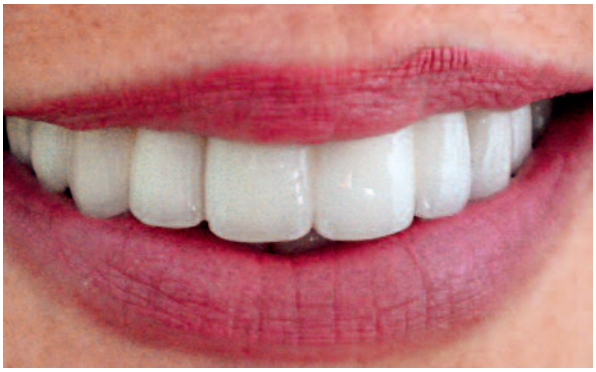

Figure 22

Reference

1. The carcinoma was removed on March 2007, solely treating the patient's breast tissue. The implant therapy was thus carried out in compliance with the indicated waiting period of 2 years between cancer treatment and implant surgery. As an alternative treatment, the patient was given Anastrozole (trade name Arimidex by AstraZeneca), which is a potent non-steroidal aromatase inhibitor. It is a highly selective and potent drug from the fourth generation of this pharmaceutical class. Unlike aminoglutethimide – an aromatase inhibitor from the earlier generation – Anastrozole does not inhibit the synthesis of adrenal steroids. Patients treated with Anastrozole do not require glucocorticoid or mineralocorticoid replacement therapy and therefore have no contraindication for dental implant treatment in such cases.

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