Ideal resolution of advanced peri-implantitis using a bone-level implant, bone substitute and a collagen membrane

Alessandro Perucchi[1] and Jessica Dana[2]

Peri-implantitis is a pathological condition occurring in tissues around dental implants, characterized by inflammation in the peri-implant connective tissue and progressive loss of supporting bone[1].

Contemporary research estimates a prevalence of 22%[2]; and as the global number of patients treated with dental implants increases, peri-implantitis is considered to be a major challenge in dentistry. Thus, prevention and appropriate management of this condition are becoming increasingly important for the general dentist and specialist.

The appropriate treatment protocol depends on proper diagnosis and should be tailored to the severity of the lesion and the patient's risk factors. Depending on disease progression, the clinician needs to decide if the treatment goal is to arrest disease progression, regenerate the tissues or explant and replace the dental implant.

The following case report describes the treatment of a patient diagnosed with peri-implantitis in an upper premolar site, with advanced bone loss. The failed implant was removed with conservative techniques, avoiding damage to neighboring structures and preserving as much bone as possible. The implant was replaced with a Straumann® BLX Roxolid® SLActive® implant and the tissues were reconstructed using bone granules (maxgraft®, botiss, distributed by Straumann Biomaterials) in conjunction with a collagen membrane (Jason®, botiss, distributed by Straumann Biomaterials).

Initial situation

A non-smoker 75-year-old female patient presented to our clinic with the chief complaint of pain and discomfort in the upper right maxilla. A dental implant had been placed 3 years ago in position #14.

Her medical history revealed heart surgery 15 years ago, where a coronary stent was placed to avoid coronary artery obstruction. Following the cardiovascular surgery, her cardiologist prescribed acetylsalicylic acid (100 mg/day) and a drug based on the active ingredient ramipril (2.5 mg/day). She was also prescribed rosuvastatin (5 mg/day), a statin to treat hypercholesterolemia and prevent further cardiovascular complications, and was advised to eat a healthy diet and exercise.

[1] Alessandro Perucchi
DDS, Specialist in dental surgery, Mendrisio, Switzerland

[2] Jessica Dana
Freelance dentist, Switzerland and Spain.
jessica.dana@bluewin.ch

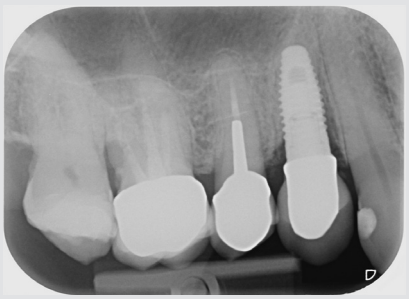


Figure 1

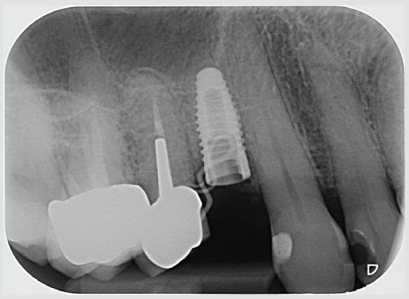


Figure 2

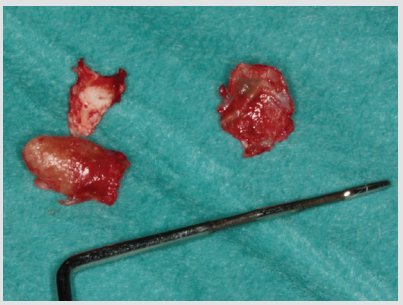


Figure 3

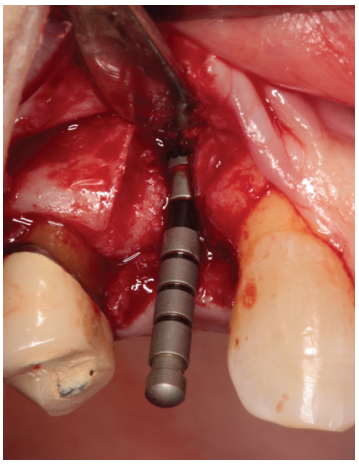


Figure 4

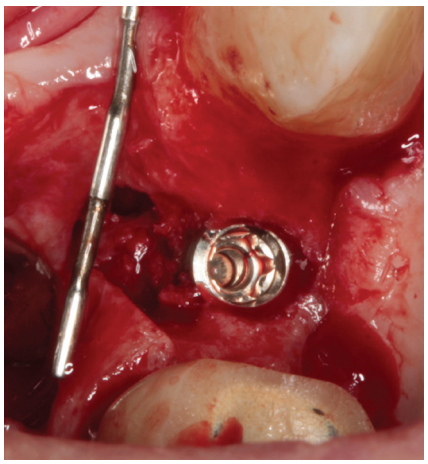


Figure 5

She also reports that she has been taking an anxiolytic (trazodone, 50 mg/day for the past 5 years since the death of her husband.

The intraoral examination revealed erythematous buccal mucosa, 9 mm probing pocket depth with bleeding on probing, and a vestibular abscess in the region of implant #14. Her oral hygiene was evaluated as good.

The radiographic evaluation showed moderate interproximal vertical and horizontal bone loss (Fig. 1).

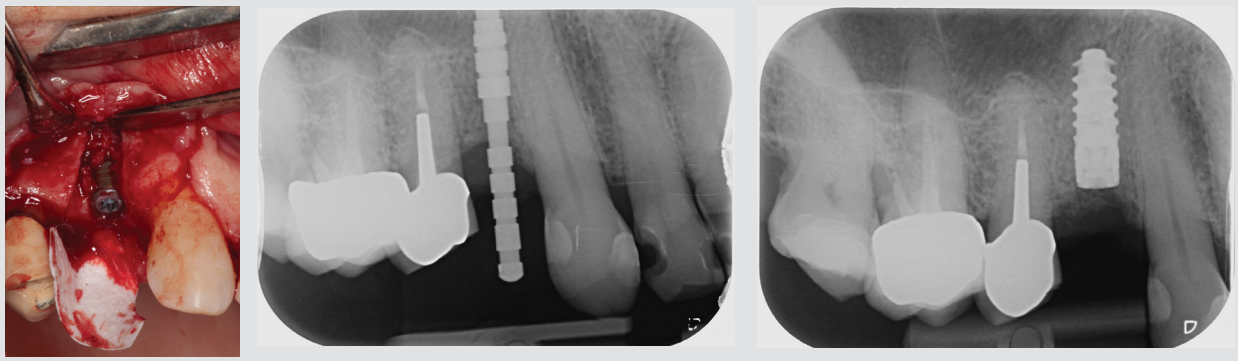
Treatment planning

Peri-implantitis on #14 was diagnosed on the basis of the clinical and radiographic findings. The treatment plan started with etiological treatment and included the elimination of the focus of infection. A small incision was made in the abscess area. The lesion was rinsed with povidone-iodine and chlorhexidine and covered with a gauze containing oxytetracycline and hydrocortisone. Then, the crown was unscrewed and gutta-percha inserted into the pocket. This was x-rayed to confirm the origin of the lesion. This assessment confirmed that the focus of infection was located on the buccal region and associated with implant #14. (Fig. 2)

The treatment options were discussed with the patient and the amount of bone loss and the esthetics were taken into consideration. Given the extent of the defect and location, it was decided to proceed with the explantation of the failed implant followed by the placement of a Straumann® BLX Roxolid® SLActive® implant and the simultaneous reconstruction of the tissues using a bone substitute (maxgraft® granules) in conjunction with a collagen membrane (Jason®).

Surgical procedure

After the multidisciplinary consultation with the patient's cardiologist, the acetylsalicylic acid (100 mg/day) was suspended 7 days before surgery. The patient underwent local infiltration anesthesia (lidocaine 2% with epinephrin 1:100,000), in the area corresponding to the apex of implant #14. Intrasulcular incisions were performed with a blade Nº15. The implant was carefully explanted with the corresponding kit. During surgery, a remanent of tooth #14 was detected in the buccal area, which could have been left intentionally for a socket shield technique or unintentionally (Fig. 3). Once the roots were extracted, a large bone defect was evident. (Figs. 4,5)



Figures 6 - 8

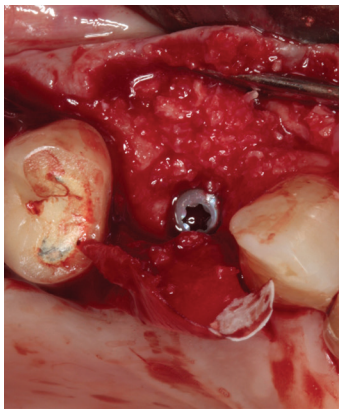


Figure 9

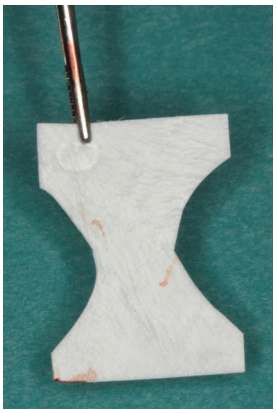


Figure 10

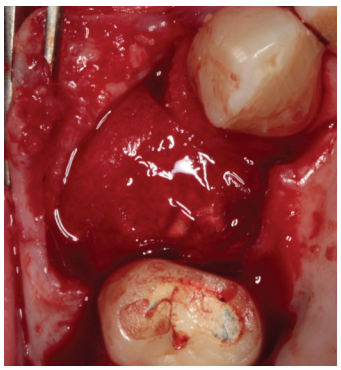


Figure 11

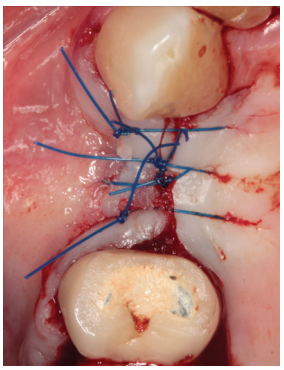


Figure 12

A Straumann® BLX 10 mm x 3.75 mm Roxolid® SLActive® implant was chosen because of its cut-condense-collect properties that redistribute native bone along the implant leading to high bone-to-implant contact. These features allow us to achieve ideal primary stability even in challenging clinical scenarios like this one (Figs. 6-8).

Following the implant placement, the bone granules (maxgraft®, botiss, distributed by Straumann Biomaterials) were placed in the defect creating an over-contour of the buccal plate (Fig. 9). To maintain the space, it was covered with a collagen membrane (Jason®, botiss, distributed by Straumann Biomaterials) (Figs. 10, 11). The osteoconductive properties of maxGraft® promote natural and controlled tissue remodeling and the Jason® membrane facilitates the manipulation of soft tissues, even in the more challenging thin biotypes.

The flap was sutured with interrupted 5-0 Vicryl sutures (Fig. 12).

After surgery, the patient received oral and written recommendations on medication, oral hygiene maintenance, and diet. She was prescribed mefenamic acid 500 mg/6 hours for 2 days, sulfamethoxazole (800 mg) and trimethoprim (160 mg)/12 hours for 5 days and rinse with chlorhexidine 0.05% for 7 days.

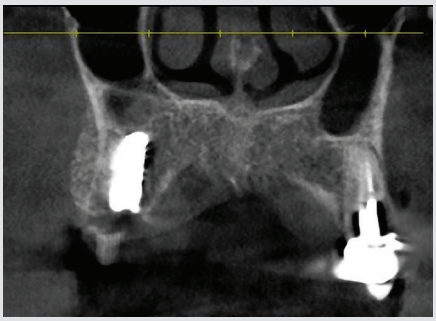
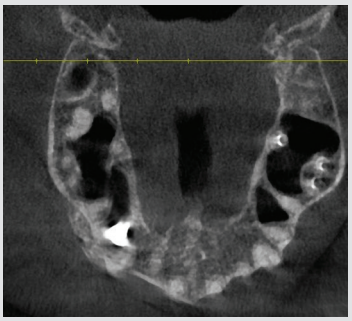
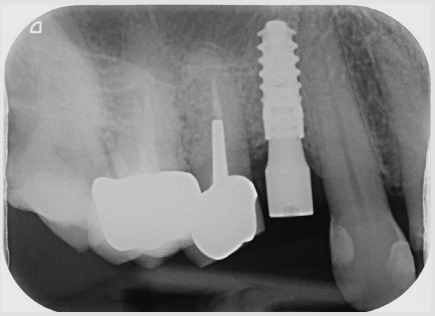
After 12 days, the patient attended for a follow-up visit and the sutures were removed. She reported no pain or complications and healing was uneventful.

A second phase surgery was performed 3 months later and a BLX RB Healing Abutment (GH 2.5 mm, AH 4 mm) was placed.

Prosthetic procedure

At the 6-month follow-up visit, a digital volume tomography (DVT) and a periapical X-ray were taken. An adequate bone volume, bone density, and 3D position were observed. (Figs. 13-15)

The oral hygiene was assessed as good with optimal peri-implant soft tissues. The healing abutment was removed, and

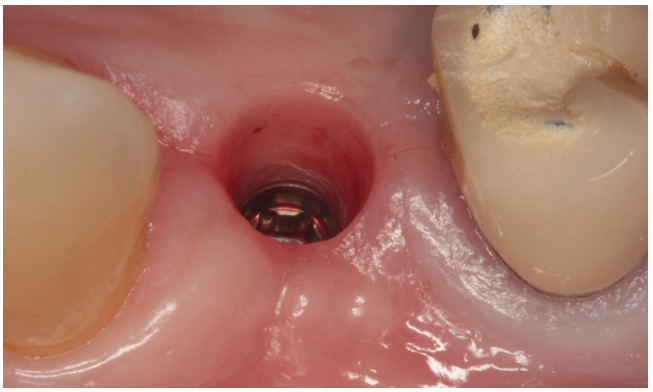
Figures 13 - 15

an ideal emergence profile was observed (Figs. 16, 17).

Conventional impressions were taken with an open-tray technique (Figs. 18, 19)

The crown was made of monolithic Zirconia (zerion® UTML) and an RB Variobase® for Crown (∅ 3.8 mm, GH 2.5 mm, AH 5.5 mm) was used. Following the placement of the final prosthesis, the occlusion and the interproximal spaces were verified.

Finally, a periapical X-ray was taken, and the correct placement of the restoration was verified (Fig. 20).



Figures 16

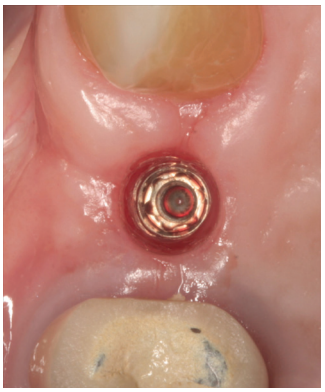


Figure 17

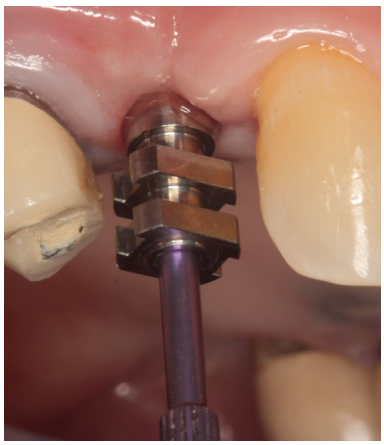


Figure 18

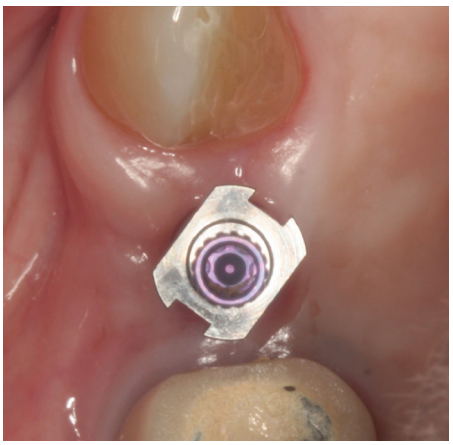


Figure 19

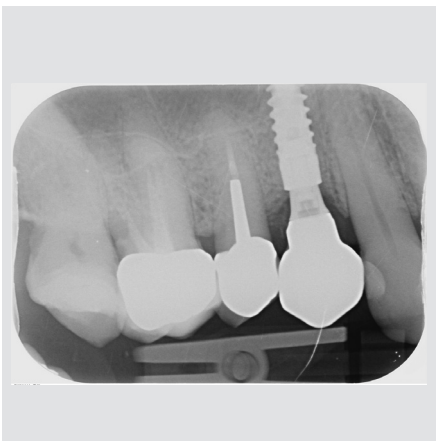
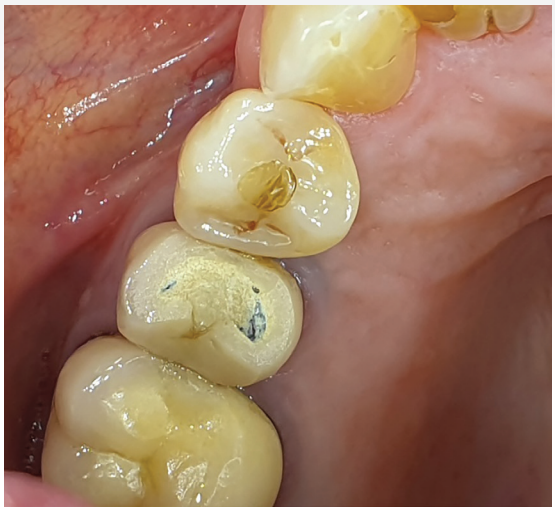
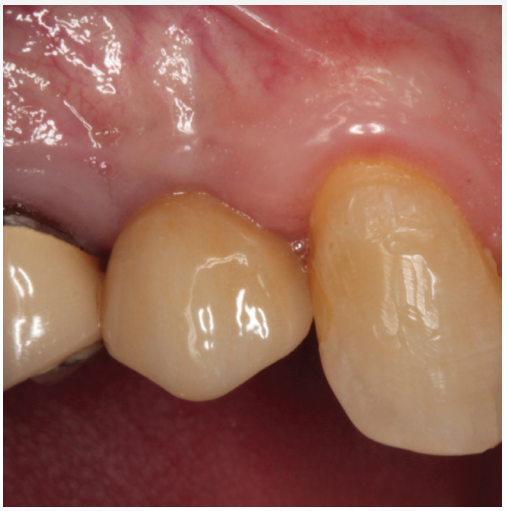
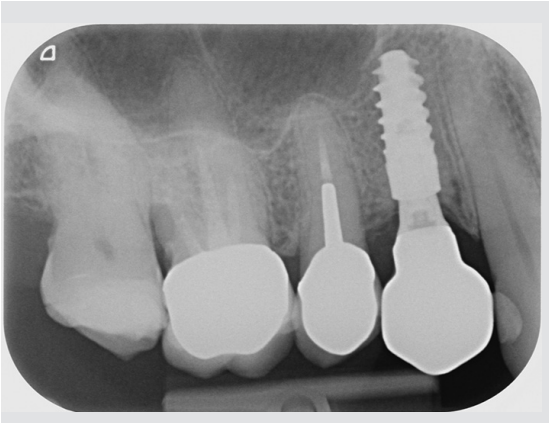


Figure 20







Figures 21 - 23

Treatment outcomes

The success of the treatment was confirmed by the intraoral images and the two-year follow-up X-ray after the insertion of the Straumann® BLX Roxolid® SLActive® implant and the simultaneous bone augmentation procedure (Figs. 21-23).

The patient's condition could not have been resolved without a correct diagnosis and an effective treatment plan. Additionally, the use of the bone substitute (maxgraft®, botiss, distributed by Straumann Biomaterials) and the collagen membrane (Jason®, botiss, distributed by Straumann Biomaterials) in combination with a Straumann® BLX Roxolid® SLActive® implant contributed to the success of the treatment.

References

1. Schwarz F, Derks J, Monje A, Wang H-L. Peri-implantitis. J Clin Periodontol.2018;45(Suppl 20): 246–P266

2. Derks J, Tomasi C. Peri-implant health and disease. A systematic review of current epidemiology. J Clin Periodontol. 2015 Apr;42 Suppl 16: 158-71

Reprinted with permission by youTooth, June 2021