A PERIO-PROSTHETIC TREATMENT with the use of ZX2 BIO-GLASS Attractive Glass Abutment System ABUTMENT SYSTEM

DR. **Mirko Paoli** (DDS)
DT. **Roberto Fabris**

The implant therapy in dentistry has allowed the modification of prosthetic rehabilitation treatment plans towards fixed solutions, absolutely not reachable at a pre-implant time. Today, however, the recovery of natural dental elements represents an absolute priority in the layout of a treatment plan based on modern concepts, even if there are partial compromises over carious or periodontal pathology (1). It should also be considered that the implant procedures may not be universally practicable in all patients' cases due to anatomical limitations that even nowadays make it impossible to place implants in situations of severe bone atrophy, or due to psychological aversion that still exists in some of our patients.

In some of these cases, however, if it is the patient's request to get an entirely fixed prosthetic rehabilitation, a technique of fixed prosthesis can be applied on natural teeth associated with the use of ZX-27 bio-glass abutments.

This technique allows sharing the functional loads between the natural abutment teeth and the edentule ridges. This is achieved by means of abutments made through a thermo individual moulding process in a glassy material highly biocompatible and well accepted by the hard and soft tissues of the residual ridges. Here we report a case of perio-prosthesis treated with this system.

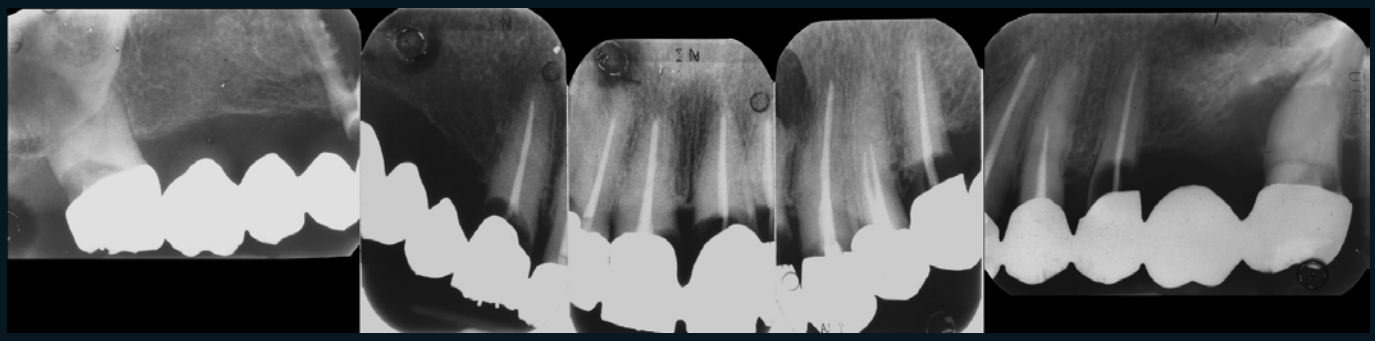
1–3

The case we present is related to a woman aged 63, in good general health, who complains of the mobility of the upper full-arch bridge as well as soreness in the left posterior area.

The clinical examination, whose images are illustrated in Figures 1-3, highlights a bridge in metal-resins with evident signs of incongruity, a marginal infiltration of many dental elements and a vertical mobility of almost a millimeter of the bridge. Thanks to the panoramic radiograph, as well as the intraoral X-ray status (**Figs 4 and 5**), it is clearly possible to understand the seriousness of the case highlighting destructive decays against almost all the prosthetic abutments in particular 17, 13, 21, 22, 23, 25, 27. The caries appear deep, very close to the bone crests, with poor dentin structure of the residual dental elements, as well as the probable violation of the biological width according to the classical concepts of periodontal health proposed by Gargiulo (**Figs 2 and 3**). There are not infra-bony parodontal defects except for the 27 element, which has a deep mesial bony defect with loss of 70% of the periodontal attachment in that area.

The laboratory is requested to make an emergency resin reinforced temporary in the area comprised between 17 and 25 (**Figs 6 and 7**), after diagnosing 27 a non-recoverable element, which is considered to be the only tooth to support the bridge, therefore in trauma and symptomatic.

In the following session, the old bridge of the patient was removed and the 27 was extracted and all decayed tissue was removed by all abutments. At this stage, it was recognized that the 17 had penetrating caries that required an emergency pulpectomy, but also that the abutment had an excellent stability and a good periodontal health. It was also noticed that 25 had subgingival caries that reached the bone crest. For this reason, we judged the tooth unrecoverable in this session, and therefore it was extracted. Teeth 23, 22, 21 and 13 also had subgingival caries but, by means of para-crestali finishing end preparations we were able to recover healthy dentin and, thanks to the aid of provisional endodontic posts, to reline with acrylic resin and anchor the shelled provisional from 17 to 25 (25 in distal extension).

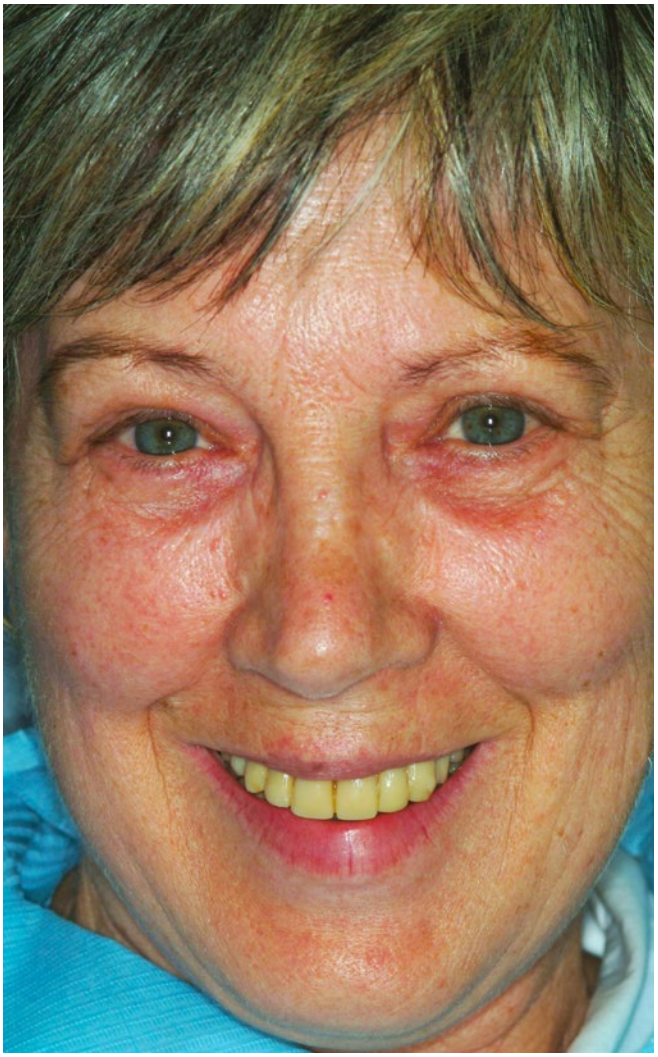


4–5

In the two weeks after check-up, the situation of facial and smile aesthetics was revalued and it was evaluated that the smile line of the upper lip appeared low, without exposing the soft tissues gum, as well as the length of the incisal margins may be somewhat shortened, especially on the left side (**Fig 8**). This evaluation together with the revaluation of the amount of residual periodontal attachment of the teeth, (judged sufficient for a long-term maintenance) has led us to the choice of a treatment plan that aims at recovering all residue teeth after periodontal surgery with ostectomy and clinical crowns lengthening in order to recover at least 1–2 mm coronal dentin useful to make metal-ceramic crowns with an adequate ferrule effect on residual dentin and prosthetic margins that do not violate the biologic width.

The periodontal surgery was performed in two steps: the first was made in the front area of between 13 and 24, the second two months after the first in the area of 17. In this way, we have given the front area more time for the post-operative healing, which is helpful for the stabilization of marginal periodontal tissues and aesthetics and this is in agreement with the modern management protocols of complex perio-prosthetic cases (**Figs 4, 5**).

6-7

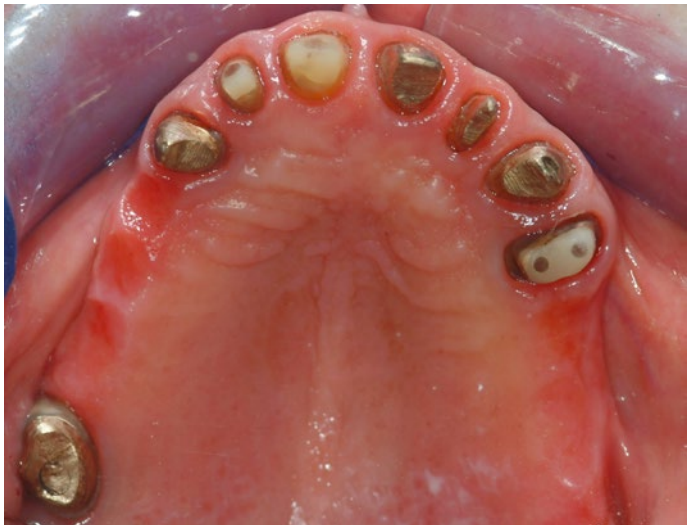


8

Figure 9 shows the checkup six months after the surgery with periodontal tissues now healed, even if not yet completely mature, after the relining of the same temporary bridge. While waiting for another two-three months, endodontic treatment of all teeth already devitalized and the post-endodontic reconstructions were performed; direct glass-fiber composite posts were put on elements 24, 11 and 12, where there was a greater amount of residual dentin, while we placed individual gold melted posts on elements 23, 22, 21, 13 and 17, where the residual dentin was in smaller amounts.

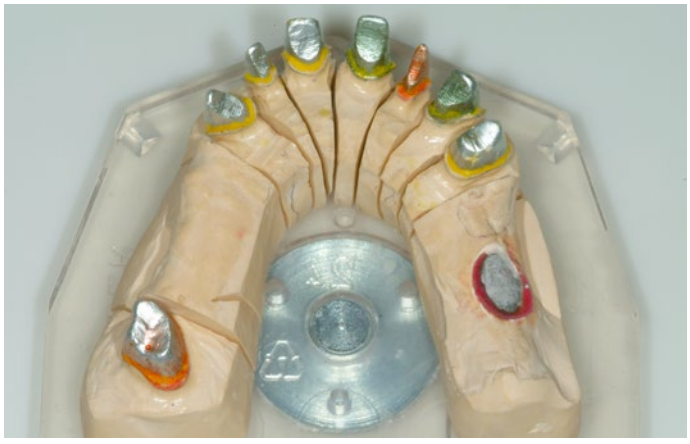
9

10

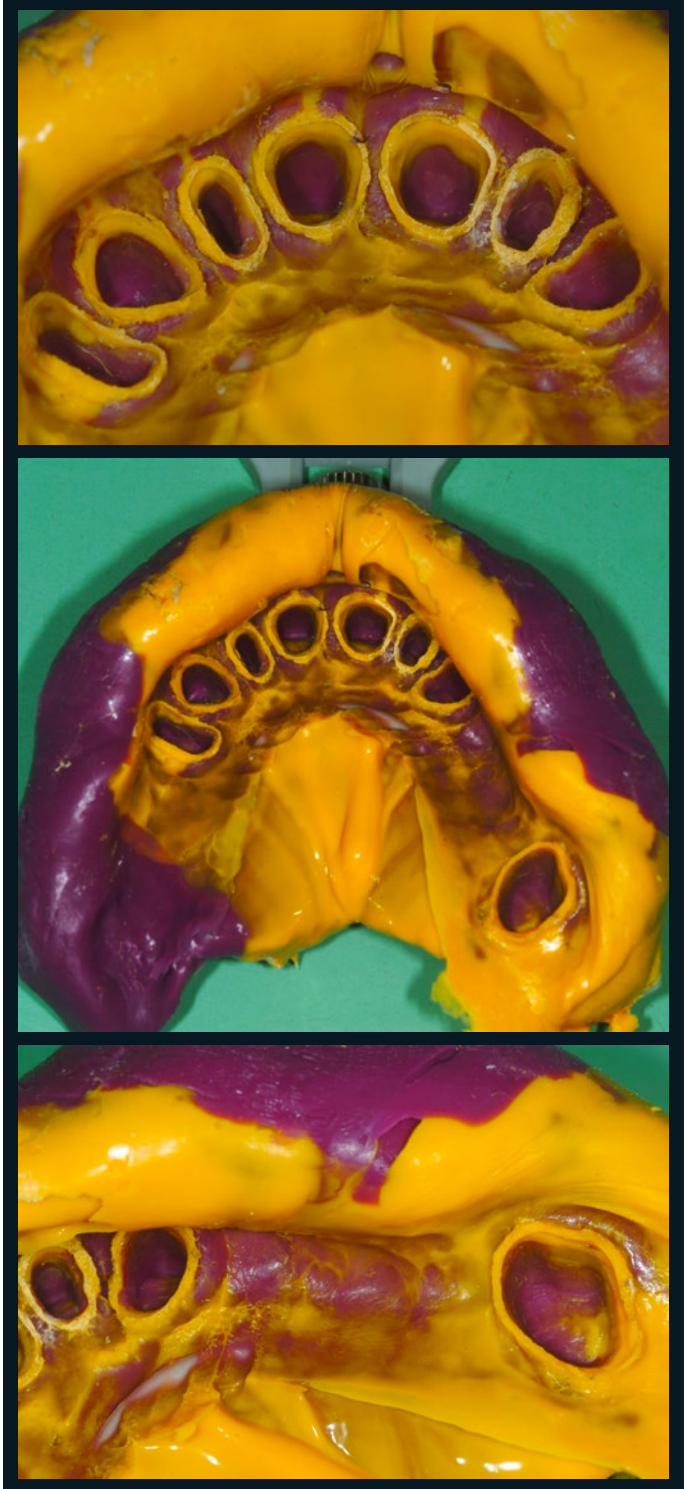


11

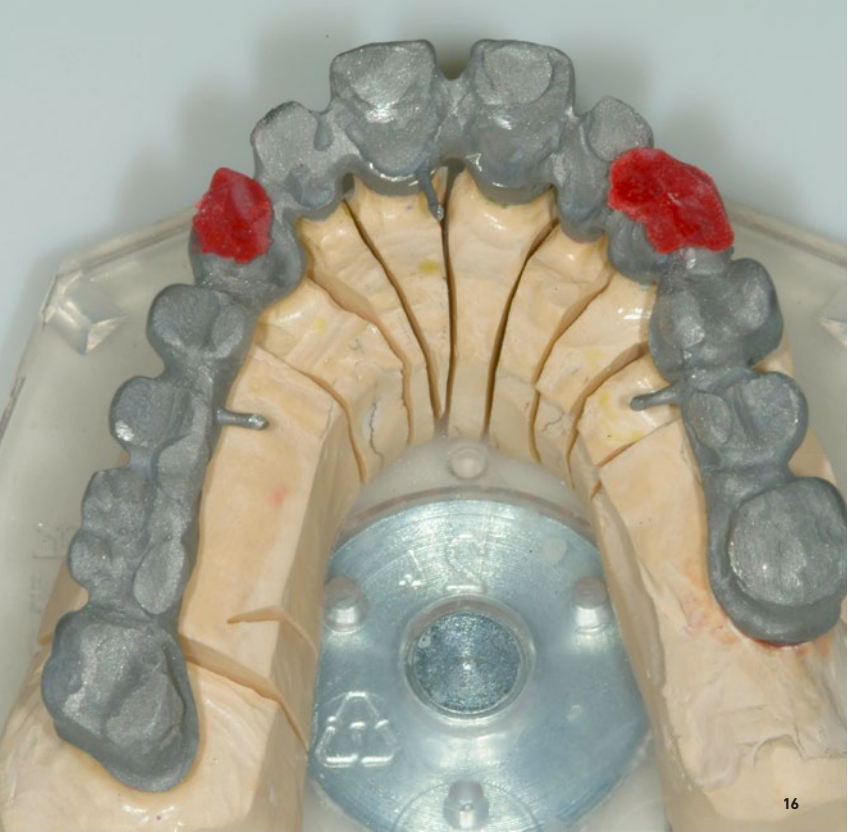
Figures 10 and 11 show the situation nine months after the first periodontal intervention, with the periodontal tissues by now mature, the abutments reconstructed, prepared and finished, ready for the final impressions. The patient's psychological aversion towards implantology and the excellent frontal group periodontal recovery, together with the possibility of creating a prosthetic structure cross-arch across the upper arch, prompted us to make an entirely fixed metal-ceramic bridge from 17 to 26. This was possible thanks to a ZX-27 bio-glass abutment made in area 26 as it can be seen in **Figure 12**, where the master model recognizes the imprint of thermoforming area. **Figures 13 to 15** show the images of the impression performed with a poly-vinylsiloxane material.



12



13–15



16

17

Figures 16 and 17 illustrate the design of the metal framework performed in palladium alloy, where we highlight the very robust sections and thicknesses of connectors, thanks to the construction of palatal metal garlands fundamental to achieve high rigidity of the structure.
In **Figures 18 and 19** we can see the framework from the internal side and with particulars of the ZX 27 bio-glass abutment.

18

19

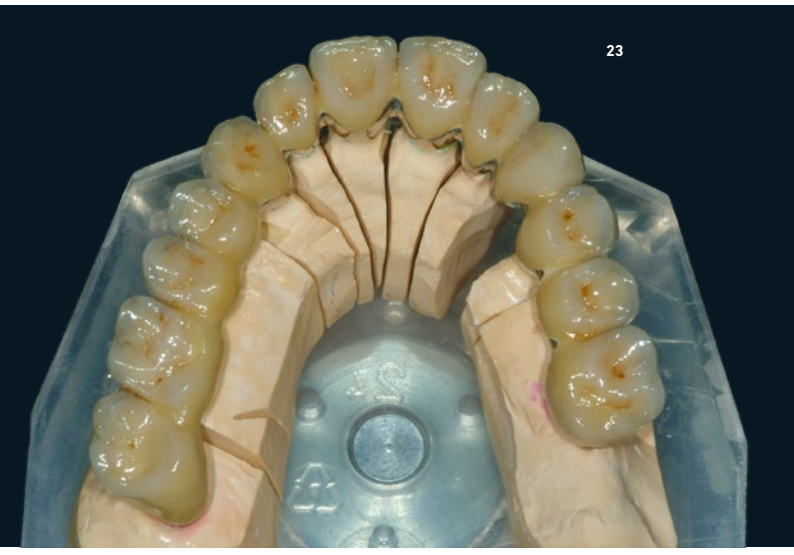
Figures 20 and 21 show the adaptation check of the framework as well as the fit-checker test of the ZX-27 abutment, in accordance with the protocols recommended by the guideline.

Figures 22 and 23 are pictures of the finished bridge ended after the ceramization.

Figures 24 and 25 are the intra-oral overview from a buccal and occlusal aspect;

Figures 26, 27 and 28 are some close-up images.

Figures 29 and 30 show details of 26 area, positioning site of the ZX-27 bio-glass abutment.



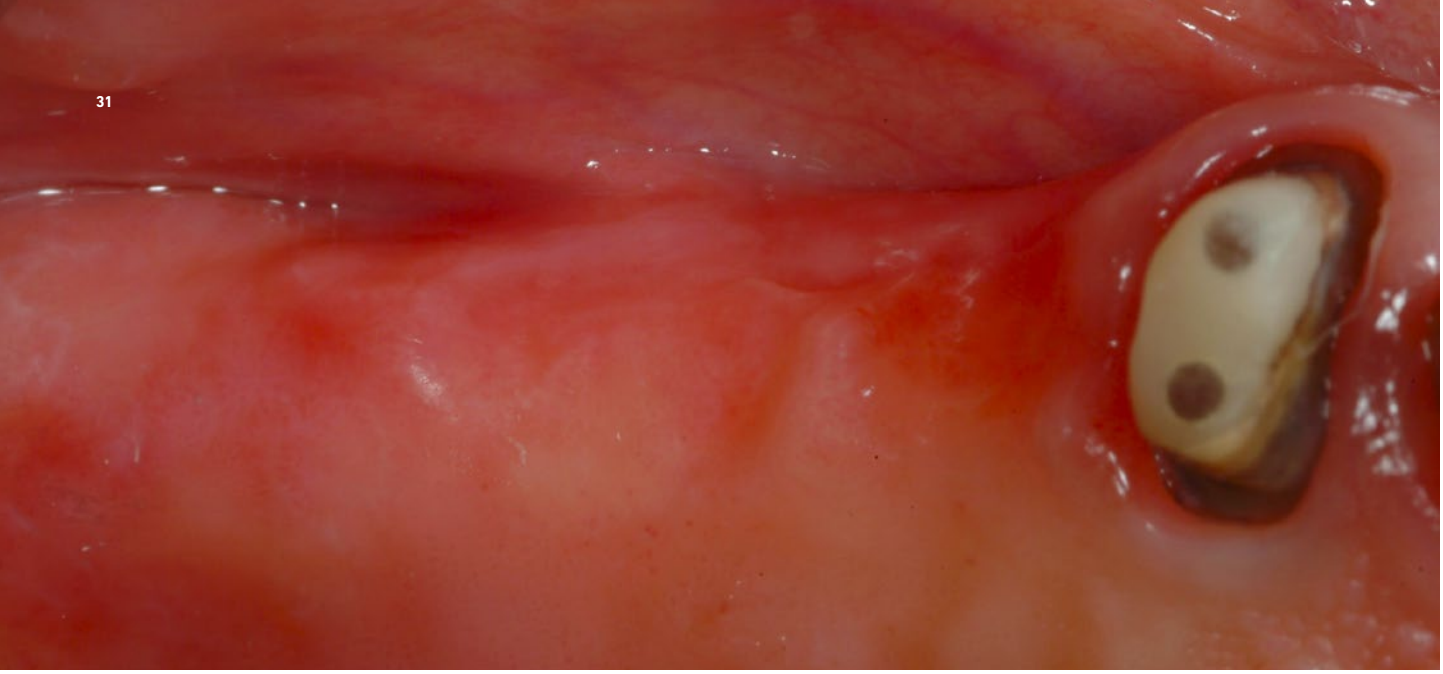

26


27


28


29


30


31


32


33


34


35


36

37

38

Figure 31 is the edentulous area of 26 two weeks after positioning the temporarily cemented finished bridge, in which the perfect health of the mucosa subjected to functional load through the ZX-27 bio-glass abutment is highlighted.

Figures 32 to 36 illustrate some stages of the definitive cementation of the prosthesis realized with reinforced glass ionomer cement in which we highlight the following steps:

- Insertion of the cement in the framework in area 26 only **(Fig 32)**
- Positioning of the ZX-27 bio-glass abutment in the proper position on framework **(Fig 33)**
- Positioning of the bridge on the master model to place the ZX-27 bio-glass abutment perfectly in its headquarters **(Fig 34)**
- Insertion of the cement in the framework in the other natural abutments area **(Fig 35)**
- Positioning of the bridge with the ZX-27 bio-glass abutment in the mouth with control of the field using cotton rolls and aspirator **(Fig 36)**.

In **Figures 37 and 38** the final aesthetic result obtained and the satisfied smile of the patient can be seen.

CONCLUSION

In cases of partial edentulism, when there are contraindications to the use of implants for reasons related to the site (poor anatomy) or to the patient (psychological aversion), after the good recovery of an adequate number of natural abutments, it is possible to perform an entirely fixed prosthetic rehabilitation through the use of one or more ZX-27 bio-glass abutments that allow to extend the number of prosthetic elements even up to the complete arch eliminating the use of removable dentures, shortened arch bridges or the needs of long cantilevers dangerous for the long term maintenance of the natural residues abutments

DR. **MIRKO PAOLI**

Dr. Mirko Paoli graduated in Dental Technology in 1982. He then graduated in Dentistry from the University of Padua in 1987.

He was Adjunct Professor for the Degree Course in Dentistry in the Department of Prosthodontics at the University of Padua from 1993 to 2000.

He is currently Professor for the Postgraduate Course in "craniomandibular and posture disorders" and for the "Master's in Osseointegrated Implantology" at the University of Padua.

A speaker at national and international congresses, as well as further education courses for colleagues.

Author of numerous publications on the subject of prosthodontics and clinical gnathology.

His practice focuses on aesthetics, dental prostheses on natural teeth and on implants, as well as the treatment of problems of the temporomandibular joint.

ODT. **ROBERTO FABRIS**

A Graduate in Dental Technology, he has run a Dental Lab in Padua (Italy) since 1990. Specialises in aesthetic prosthesis on implants in cooperation with Dentsply Implants.

Devotes much of his time to staff training courses and lectures in Italy and abroad, a speaker in numerous courses and conferences.

Collaborates with GC as a speaker in courses on the INITIAL ceramic and Gradia composite.

In 2005 he began to deal with prosthetic cases through the use of ZX-27 bioglass abutment; he is an Italian national referee in training courses and qualifications requiring the use of this system.