Restoring chewing function, comfort and self-confidence

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Initial situation

Our patient was a 55-year-old female who wanted her impaired chewing function to be restored. Four years before she came to my clinic, the teeth in her mandible were extracted and replaced with a full prosthesis due to advancing periodontitis (Fig. 1). The teeth in the maxilla also fell victim to periodontitis (Fig. 2) and had to be removed. The patient was otherwise in good health.

In addition to restoring chewing function, she wanted in particular to overcome the social handicap associated with the removable prosthesis.
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Approach

Treatment planning and surgical procedure

The patient's desire to replace the teeth with permanent reconstructions was to be met by implants in the maxilla and mandible as well as fixed restorations. The bone volume and quality in the mandible were sufficient for successful implant therapy (Fig. 3). Four implants (Straumann Bone Level Ø 4.1 mm, length 8 mm, position 36 and 46; Straumann Bone Level Ø 3.3 mm, length 12 mm, position 33 and 43) (Figs. 4 and 5) were placed.

Prosthetic approach

The dental impression (Fig. 6) was mounted with implant analogues and prepared with a gingival mask made of scannable material (Fig. 7). The master cast was then made from class IV plaster (Fig. 8). For the purpose of bite registration and verification of the implant position, temporary abutments were blocked with composite on the cast (Fig. 9). This ensured that the position of the implants and the jaw-to-jaw relation could be checked in one work step. Care was taken to ensure that the composite did not hamper checking of the position—particularly for the emergence profile. After mounting the cast, the initial tooth set-up was carried out, using the composite bar as a framework. An artificial gingiva was not used in the mandible in favour of better oral hygiene.

The initial esthetic intraoral try-on was performed. Tooth position, emergence profile, relation of tooth length and occlusal plane, color, and of course the esthetics were checked. After checking all of these factors and the patient's feedback, the process moved to CAD software for planning of the bar.

The work was digitised using the Straumann CS2 scanner (Figs. 10–12). The restoration was then designed in the Straumann CARES 9.0 software. We opted for the Straumann CARES Advanced Fixed Bar with basal polished metal surface. This has lower plaque accumulation compared with acrylic veneering.

It was possible to edit the bar (Fig. 13), individual segments, and bar copings directly in edit mode. The different tools were very easy and intuitive to use, e.g. an eye was kept on the necessary cross-section thickness using the 2-D cross-section window (Fig. 14). Using the mock-up scan (Fig. 14), the full shape of the bar was adapted to the set-up. The bar geometry was simple to edit in the segment editing and the interdental spaces were adjusted to...
the mock-up. The shape and height of the individual bar copings were defined to avoid space problems.

After designing, the bar data were sent directly to the Straumann milling center in Leipzig, Germany. The cast was forwarded by courier to ensure a perfect fit. The sandblasted bar was returned after three to five days, ready for further processing (Figs. 15–17). The bar was then treated with silane (for adhesion). The opaque coating was then ap-
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plied and set. The veneers were degreased, sand-
blasted, and repositioned in the previously made
transparent index. The index was secured to the
cast over the bar; the luting composite was injected
and cured with light. crea.lign, a light-curing com-
posite that achieves a homogeneous, dense surface
and thus inhibits plaque formation, was used to
finish the CARES Advanced Fixed Bar (Fig. 18).
From experience, use of this material reduces the
risk of the veneers flaking in the long term. After
curing, the occlusion was ground and the bridge
was finished and highly polished as usual.

Conclusion

After completion of treatment, the patient
confirmed that her wishes had been met in full.
Chewing function, comfort, and self-confidence
had been fully restored. From a financial point of
view, this reconstruction did not cost more than
manufacturing a conventional removable pros-
thesis with bar construction. By contrast, the fol-
low-up costs were reduced to a minimum. A fixed
reconstruction has had a psychological benefit
for this patient, which would not be possible with
a removable solution. We therefore firmly believe
that this solution is a valid therapeutic option
for the treatment of edentulous jaws. Now-
adays, patients want solutions for an unrestricted
quality of life, combining lasting functionality
with attractive smiles. Implant-borne restorations
(Figs. 19–21) can offer patients precisely this, as
this case demonstrates._

The authors would like to thank the ESTETIKER laboratory
in Lugano, Switzerland, for its collaboration.

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