

GrandTEC®

For securely fixed teeth after extraction and during osseointegration following implantation

Increasing numbers of patients are expressing the desire for fixed restorations using implants. Understandably, many demanding patients find removable interim prostheses after extraction and placement of the implant difficult to tolerate. Even for this manageable period of time, the adhesive glass fibre technique with GrandTEC® from VOCO provides a convenient option for fixed restorations of a tooth gap.

Glass fibre technology

GrandTEC consists of a large number of tightly packed parallel glass fibres, impregnated with a special, light-curing methacrylate resin, which are compatible with light-curing composites and flowables when using a conventional polymerisation light device (Fig. 1). Due to its malleability prior to polymerisation, this glass fibre strip can be ideally applied in dental adhesive techniques and is minimally invasive in the reinforcement of non-metallic

restorations. GrandTEC's resin impregnation eliminates the need for application of a bonding on the fibres. The chemically stable link is created by polymerisation of the glass fibres and a flowable as an initial layer on GrandTEC. This stable link enables the masticatory forces to be evenly spread in the restoration, the flexural strength is significantly improved and, finally, the fracture resistance is markedly increased. This enables a broad range of application.



Fig. 1: GrandTEC



Fig. 2: Preparation on the model



Fig. 3: Length transfer for shortening the glass fibre strip



Fig. 4: Implant in region 22



Fig. 5: Clinical situation after suture closure



Fig. 6: Fixation of the prosthetic tooth



Fig. 7: Splinting from the palatal



Fig. 8: Clinical image of the GrandTEC treatment 1 week after surgery

Range of indications

GrandTEC is a reliable solution for splinting teeth after orthodontic or periodontal therapy. The VOCO resin fibre strip can equally be used to fix loosened teeth and for fragment fixation after tooth fracture. In prosthetic treatments, composite-based temporary crowns and bridges can be reinforced with GrandTEC. The new VOCO glass fibre strips provide ease of use, while ensuring stability in the temporary or semi-permanent restoration of a tooth gap, using an extracted natural tooth or an artificial tooth. The latter is indicated during osseointegration after setting an implant and is the subject of the following case study.

Case study

In this female patient, an Astra OsseoSpeed 3.5 S implant is to be placed in region 22. Even before planning the treatment, the patient expressed the desire for a “fixed” restoration of the gap in the teeth during the period of osseointegration. It was possible to reassure her that, thanks to the use of GrandTEC directly after implantation, she would not leave the practice without a tooth and would even have a “firm bite”.

To this end, the plaster was etched on region 22 of a duplicate model of the maxilla before surgery, and a prosthetic artificial tooth of the appropriate shade was adjusted to the gap (Fig. 2). In order to assure a mechanical bond to the prosthetic tooth it was mesially and distally drilled through with a round burr, whereby this “tunnel” forms an oval aperture, so that later the glass fibre is mechanically securely fixed to the tooth with Grandio® Flow and protected from rotation. The ideal position and length of GrandTEC is determined using Wedjet®. Alternatively, the position and length of the glass fibre strip can be determined using a fine wax wire.

An exact determination of the fibre length is practical, in order to avoid needlessly having to shorten unwanted fibre ends remaining in the patient’s mouth. Every GrandTEC glass fibre strip is 55 millimetres long and 2 mm wide and is sealed, protected from light, in a blister pack. Before surgery, the strip is shortened to the required length using the Wedjet rubber (Fig. 3) and immediately stored away from light under a cover. Forceps with smooth blades facilitate the handling.

Figures 4 and 5 show the clinical situation after primarily stable implantation and suture closure. The approximal enamel surfaces of tooth 21 and 23, towards the gap 22, are conditioned using the acid-etch technique, and the bonding is applied and polymerised. The wound area is protected by a thin layer of a CHX gel. The management of rinsing and suction is arranged according to the situation of the fresh wound. The tailored glass fibre strip is fed through the hole in the tooth and the remaining cavity is filled with the flowable composite Grandio Flow. Because of the occlusal situation, determined by means of the model analysis, the

tooth and glass fibre strip are now held from the palatal and the fibres are adapted on the palatal surfaces of teeth 21 and 23 with a composite instrument. The tooth is now gently positioned with a finger and can initially be fixed, from the vestibular, in the interdental spaces using the flowable (Fig. 6) – initially with two small dots. The polymerisation lamp is only used at this point.

The palatal glass fibre ends are then completely covered with the flow (Fig. 7), the remaining approximal area is formed on the vestibular using composite, with optimisation of the interdental spaces, and both areas are polymerised for a sufficient period (at least 30 seconds per surface with a halogen lamp at 1100 mW/cm²). The use of Grandio Flow is especially advantageous here, both thanks to its outstanding properties for a flow, such as minimal shrinkage and high flexural strength, as well as the possibility of precise application without dripping, due to the non-dripping technology (NDT®) of the flow syringe.

Alternatively, the tooth could also be positioned using a transfer key made on the model and using, for example, a composite. In this case, the precise prior planning and uncomplicated occlusal circumstances make the described free fixation simple and successful. This is finally followed by checking the occlusion, finishing and polishing. Due to the preparatory work on the model, this type of temporary restoration takes less than 5 minutes for the patient, enables the user to carry it out in few steps directly after surgery and is, for the patient, the minimally invasive option for a “fixed” temporary restoration. Figure 8 shows the situation 1 week later, directly after suture removal. GrandTEC has enabled the achievement of a mechanically stable and visually appealing result.

Conclusions

When creating a prosthesis carried by an implant, GrandTEC and Grandio Flow offer a minimally invasive method of quickly and securely closing the gap between the teeth. The adhesive procedure is easy for the dentist and can be carried out directly after surgery. Patients are glad not to have to wait for the definitive restoration before being able to chew without fear. GrandTEC restorations, which are equally aesthetic as they are stable, enable a powerful bite, even immediately after implant surgery. **DA**

About the author



Ludwig Hermeler was born in 1964; has the license to practise medicine and doctorate gained in 1988 at the Westfälische Wilhelms Universität Münster; established own practice in Rheine in 1991; publications on the subject of aesthetic dentistry, bleaching, implantology and endodontics. Currently he is a member of the DGOI (German Association for Oral Implantology). E-Mail: zahnarzt.dr.hermeler@telemed.de