

Placement of a ceramic implant after uprighting the canine with aligner therapy due to tooth agenesis

Julia Plattner¹, Vasilios Alevizakos² and Constantin von See³

This case report describes the explantation of an insufficiently osseointegrated implant, followed by placement of the Straumann® PURE Ceramic Implant Monotype using the minimally invasive guided surgery system. The dental implant and temporary restoration provided the patient with immediate comfort, good esthetics and, most importantly, preservation of tissues.

Initial situation

A 37-year old patient presented complaining about his loose implant in region 13. The patient suffers from ankylosing spondylitis, for which he takes 50 mg of golimumab every 4-8 weeks. According to the patient's report, due to hypodontia the tooth in region 13 had been replaced with an implant 12 years ago. A panoramic x-ray showed four implants (13, 15, 23 and 25). Both of the mesially erupted canines had been crowned and substituted for the lateral incisors. Tooth region 13 was restored by an implant supported bridge crown linked to the upper lateral incisor (Fig. 1). After the crowns were separated, the implant in region 13 was easily removed with forceps (Fig. 2). All other implants were firmly anchored in bone.

Treatment planning

A cone beam CT scan (CBCT) was recorded, followed by digital implant planning (coDiagnostiX™, Dental Wings, Montreal, Canada) (Fig. 3). Insufficient space was available apically for the re-implantation (Fig. 4). The minimum required distance from the implant to the adjacent tooth is 1.5 mm. In this case, the circumferential space of 1.5 mm was only present in the coronal area, but not in the apical area. To straighten up the root (tip the root mesially) of tooth 13, an aligner treatment was performed prior to implant placement. The treatment required three attachments on teeth 12, 14 and

¹ Julia Plattner
2011-2017 Danube Private University,
Krems, Austria. Postgraduate program
Master of Science, Orthodontics,
Bonn, Germany. Private practice,
Bressanone, Italy.

² Vasilios Alevizakos. Dr.med.dent.
Danube Private University, Krems,
Austria. His field of special interest is
bone grafting and digital dentistry.

³ Constantin von See. Prof.Dr.
Director of the Center for CAD/CAM
and Digital Technologies in Dentistry,
Danube Private University, Krems,
Austria. Head of the Master's Program
for esthetic reconstructive dental
medicine at PUSH GmbH.



Figure 1



Figure 2

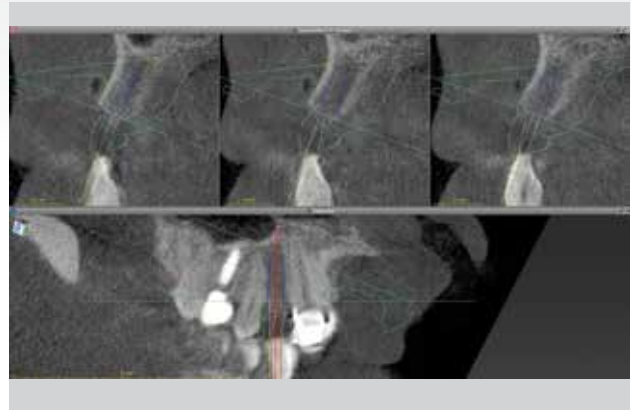


Figure 3



Figure 4



Figure 5



Figure 5a



Figure 5b



Figure 6a

22, and a total number of eight aligners had to be worn for about 23 hours a day. The patient's compliance was very good, and space was easily created. After 10 months of healing time for guided surgery, an impression was taken, and the plaster model scanned. Both the exported CBCT data and the STL files for the scanned plaster model were imported into the planning software (coDiagnostiX™, Dental Wings, Montreal, Canada), and a surgical guide was

developed and printed. Figure 4 shows the preoperative intraoral situation.

Surgery

Under local anesthesia, a soft tissue punch was performed using the drill guide (Fig. 5). Next, the implant bed was prepared using guided drills and bone condensing instruments (Fig. 6). The Straumann® PURE Ceramic Implant



Figure 6b



Figure 6c



Figure 7a



Figure 7b



Figure 7c



Figure 8



Figure 9

Monotype (Straumann, Basel, Switzerland), with a diameter of 3.3 mm, a length of 10 mm and an abutment height of 4 mm, was then placed with a maximum torque of 35 Ncm (Fig. 7). The occlusal plane with the patient's deep bite, but with sufficient distance between the implant abutment

and antagonist, was clinically checked postoperatively (Fig. 8). A postoperative x-ray was performed to check that the adjacent teeth were not injured. The implant was initially restored with a temporary denture, which was designed to maintain the group alignment of the posterior teeth. During



the retention phase of the aligner treatment, the temporary crown was blocked out in the retainer (Fig. 9).

Prosthetic restoration

After 6 months of healing time the temporary crown was removed and the Straumann® PURE Ceramic Implant Monotype showed all the signs of osseointegration. The x-ray did not show any pathological findings (Fig. 10). A precision impression of the upper jaw and a regular impression of the opposite jaw with additional bite registration was taken to instigate the production of the implant crown. After two weeks the implant crown was successfully placed with

FujiCEM 2.

Final result

Both the dentist and the patient were satisfied with the functional and esthetic outcome of the restoration (Fig. 11). As shown in this case report, the use of a ceramic implant in the anterior region of the upper jaw offers an esthetic solution for replacing the missing incisor. Prior treatment using the aligner technique to improve the implant bed site may be mandatory.

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