Patient history.
A 24-year-old non-smoking patient was treated for chronic apical periodontitis at tooth #21 (Fig. 1) with following old trauma. The tooth had a tissue-building defect at the apex and a voluminous radiolucent lesion (7.28 mm in the vestibular-palatal direction and 5.28 mm in the apical-coronal direction) was identified on the cone beam exam and the panoramic x-rays (Figs. 2, 3). The radiographic examination showed significant reduction of vestibular bone plate which after exodontia of tooth 21 could be completely unsuitable for an implant-borne restoration in an esthetic area. The X-rays and cone beam examination found an opportunity for a right retromolar harvest. The calculated dimensions of the cortical-cancellous graft were 15 mm long, 9 mm wide, and 4 mm thick (Fig. 4). Retromolar harvest is the preferred choice over chin bone harvest due to much lower incidence of neurological complications, which, depending on the study, are 0–5% for the retromolar versus 10–50% for the chin bone.

Treatment plan.
1. Identification of the onlay bone graft donor site
2. Periodontal support treatment
3. Creation of an immediate removable prosthesis to replace #21
4. Periodontal surgery for cyst removal, and removal of #21
5. Screw-type bone onlay graft using a crosshead mini-screw
6. Six months of healing
7. Implant placement
8. Implant loading after 1 month of

**Surgical protocol: the retromolar harvest technique and implant placement**

Periodontal extraction of # 21 (Fig. 5) reveals the fragile vestibular bone ridge which would undergo complete resorption. After exodontia, the apical lesion is carefully curetted with a view to achieving debridement of a circumference of bone around the lesion. At this stage, it is important to obtain primary closure with quality gingiva with regard to any future bone graft (Fig. 6). The retromolar harvest was performed using thin diamond disks with an 8mm diameter and 1mm thickness. A mucoperiosteal flap was made in a trapezoid shape, then raised to expose the periosteal-stripped bone in the oblique line of the mandible over a length of 3 to 4 cm and a height of 2 cm. Three osteotomy lines were made, two vertical (made with the handpiece) and one horizontal (made with the contra-angle), parallel to the mandibular basal edge located preferably above the mandibular canal to minimize the risk of damaging the inferior alveolar nerve (Fig. 4, NAI). The final osteotomy is made horizontally 2 mm away from the crown between the two vertical lines with a 1 mm diameter drill inserted parallel to the vestibular cortical bone by drilling about 3 mm deep at regular intervals. The graft, 2 cm long and 0.8 cm wide, was collected by splitting the...
underlying bone tissue using a bone chisel (Fig. 7). The donor site was not filled with any material. The harvested fragment was split into two parts. A box was created with one of the parts and fixed using a crosshead mini-screw (Straumann® Bone Block Fixation) on the previously exposed recipient site to form a vestibular vertical wall, while the other horizontal part formed an occlusal wall (Fig. 8). A second graft of buried connective tissue sutured under the flap was part of mucosa management in an anterior esthetic area (Fig. 9). After grafting procedures, a change in the size of the ridge can be seen (Fig. 10). The temporary removable partial prosthesis of # 21 was corrected to avoid any interference with the augmented site (Figs. 11, 12). Six months after the graft, clinical and radiographic evaluations found that placement of a Straumann® Bone Level Implant (RC Ø 4.1, 10 mm SLActive®) was possible (Figs. 13, 14). Patients are followed up until osseointegration of implants, which was the starting point for the prosthetic procedure.

**Prosthetic protocol**

The implant was osseointegrated after 1 month (Figs. 15–17). Then soft tissue conditioning was started, which is a prerequisite for dental esthetics. RC temporary abutment with provisional crown was placed to shape the soft tissues (Figs. 18, 19). The final ceramic-metal crown was sealed on a titanium RC anatomic abutment after 3 months. At this stage, the intraoral photo shows relationships of the white and the pink esthetics and thus sets an initial reference (Fig. 20).
Conclusion
To obtain optimal bone maintenance, especially in the esthetic zone, dental professionals should select an appropriate implant that is supported by clinical data. The esthetic and functional results obtained through this clinical case are a good demonstration of the efficiency of the restoration with Straumann® Bone Level Implant in the esthetic zone. The patient expressed his satisfaction with his new smile.

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References: The complete list of references to this article can be viewed on www.straumann.com/stargetref.pdf

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