Immediate implant placement with the Saturn implant

Aesthetic rehabilitation using a special implant design

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Immediate implant placement in fresh extraction sockets and immediate loading is now considered to have the same prognosis as the conventional two-step technique. Most issues encountered are due to recession of the alveolar ridge following bone resorption during the first postoperative months. With the exception of problems related to surgical error or infection, the incidence of problems can be reduced by providing good initial stability for the implant within the socket. Saturn implants yield better results and give implantologists more confidence in the aesthetic zone. A description of the technique used, along with two clinical cases, illustrate the use of this specially designed implant.

Objective

As the tooth is extracted, the physiological stimulus it previously exerted on the adjacent tissues disappears. Depending on the patient’s periodontal status, bone resorption will set on and can destroy up to 20 to 40 per cent of the anterior ridge in the six first months, and 40 to 60 per cent in the two first years [1,2].

The approach of immediately placing implants in fresh extraction sockets is popular because of shortened treatment times, less patient anxiety and discomfort, high patient acceptance, better function and very good aesthetic results [8,10,11,13]. Initially, it was thought that immediate loading after extraction was the way to maintain bone levels [5]. But recent studies [2,3,14] seem to indicate the inexorability of the process in the three first months due to a combination of general and local factors. Bone absorption can seriously interfere with the aesthetic result.

Factors that can improve results include primary stability, as a prerequisite of osseointegration, physiological stimulation and, importantly, reduced cervical

Fig. 1
The Saturn implant.

Fig. 2
Minimum displacement and stress with Saturn.
bone crater formation due to a more favourable force distribution [3-5,12]. This is implemented by way of two oversized cutting threads in the cervical region of the Saturn implant (Fig. 1). Better distribution of axial forces as well as 20° lateral forces result in dramatically improved implant stability within the bone in the cervical region, where bone loss and craterization typically occur.

Stress distribution at cortical crest level

An oblique load of 200 N at an inclination of 20° to the implant axis creates asymmetrical stress on the bone-implant interface. Implants with partial rings (3 wings) and full rings result in lower stress than with a classical cylindrical implant. Implants with a full ring have a lower stress distribution at all axial angles [4,7] (Fig. 2).

Clinical cases

The minimally invasive technique dispenses with raising a flap. It is important to utilize the residual apical/palatal tissue to ensure that the implant is placed in fresh bone. Undersizing the implant bed results in a higher insertion torque and more primary implant stability.

Case 1

A 65-year-old man with a buccal periodontal abscess at tooth 12 presented for emergency treatment prior to a planned trip abroad (Figs. 3 and 4). The tooth was highly mobile, and extraction was easy. Socket curettage was performed and the site disinfected with a 10-minute betadine rinse (Fig. 5). Drilling started 2 mm from the apical zone on the palatal wall of the socket and was continued at least 3 to 4 mm beyond this point in the bone where possible (Fig. 6). The last drilling step was of reduced length (by 2 mm) to provide an undersized bed for better stability (Fig. 7).
The Saturn implant was manually inserted with an implant driver with a straight handle for better control of the final axial inclination (Fig. 8). If necessary, an angled abutment can be used (Fig. 9).

A PEEK Cortex direct provisional abutment was made in neutral occlusion (Fig. 10). Healing was excellent on day 21 (Fig. 11), which was confirmed radiographically (Fig. 12).

This is sometimes not considered immediate loading [15], as temporary crowns are not in full occlusion. We prefer to talk about partial loading consisting of stimulation by the tongue and lips and, to a certain extent, by food.

Case 2
A 50-year-old man with a mobile crown due to a buccally fractured root (Fig. 13) wanted to be more secure with his smile. As this was no emergency situation, we performed a CT scan (Fig. 14). The 90° root-to-crown ratio highlighted showed a favourable axial position of the available bone. Drilling started 2 mm from the apical zone on the palatal wall and was continued 3 to 4 mm beyond this point in the bone (Fig. 15). Socket curettage was performed to provide good healing conditions (Fig. 16).

As in Case 1, the classical drilling sequence was used for the first few steps: round bur, pilot drill 2.8 mm. From that point we undersized the bed length by 2 mm, with the final drill determined by the implant (Fig. 17). Saturn wings provide good primary stability because an additional 1.5 mm diameter is available cervically for engaging the bone.

The implant was inserted with a straight handle to control the final axial inclination (Fig. 18). The insertion torque must exceed 50 Ncm. It may be necessary to use a ratchet to complete the insertion. The implant level must be lower than the crestal bone level to prevent bone loss. As we know that the void around the implant will be filled with the blood clot, we do not usually apply biomaterials for augmentation. But if indicated, it is recommended to place the material beneath the wings of the Saturn implant for more stability and protection. A Cortex zirconia abutment (Fig. 19) was definitively connected (30 Ncm) at this time for better aesthetic results (Figs. 20 to 22).

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Fig. 13 Bacally tooth fracture.

Fig. 14 CT scan showing deviating tooth axis and available bone.

Fig. 15 Starting point and drilling axis.

Fig. 16 A good coagulate is required.

Fig. 17 Final drilling.

Fig. 18 Straight handle.

Fig. 19 Cortex zirconia abutment.

Fig. 20 Resin provisional at 15 days.

Fig. 21 At twelve months.

Fig. 22 At twelve months, with zirconia abutment and crown.