implant placement using conventional surgical techniques (in a two-stage approach) is, in most cases, a rather invasive procedure. It involves the raising of a mucoperiosteal flap and implant placement into the osteotomy site (Adel, 1985). Examining this procedure from a general point of view, it has changed little over the years (Hööckl, 2011).

The advantages of good visibility of the site and the ability to correct peri-implant defects are countered by the major disadvantage of resultant bone loss. This is due to interruption of the blood supply to the periosteum (Kleinheinz, 2005).

Flapless procedures have been developed as an atraumatic approach, which allow good preservation of the existing hard and soft tissues (Kan, 2000, Lee, 2008). The limited surgical trauma is suggested to minimize bleeding at the time of the procedure and postoperative complications such as swelling and pain (Stoll, 2011).

This results in improved postoperative comfort and accelerated recuperation of the implant site. In addition, it minimizes the amount of resultant scar tissue, particularly if it is used with a transgingival approach.

Promises from the dental industry that sophisticated planning systems are the universal remedy to efficiency and the gateway to success with flapless procedures are elusive. The inherent blindness of the flapless technique demands sound surgical experience and profound planning, especially when using the soft tissue punch technique.

A traditional comprehensive surgical education is thus an essential advantage when starting flapless.

With a careful selection of cases, free-hand flapless implant placement is possible and leads to good results.

Case presentation
A 19-year-old female was referred in as a result of a horizontal fracture of the apical area of the root of the right central incisor. This was the result of a sporting accident (Figures 1 and 2). Extraction was planned together...
with delayed placement of the implant until the patient had completed her university examinations. The extraction was carried out carefully using periotomes, preserving as much of the hard and soft tissue architecture as possible (Figures 3 and 4).

The area was augmented with a xenograft material (Geistlich). It was then supported with a membrane, which was sutured in place (Sereline) (Figures 5 and 6). Healing was allowed to take place for 8 months, and a bonded temporary composite was placed (Figures 7 and 8). The temporary was designed so that its pontic carefully reached into the extraction socket. The apical end was constantly adapted to the remodeling process. Implant placement took place with a flapless procedure.

A CBCT scan was not used as the implant placement had been carefully planned from the time of extraction. The area had been carefully probed and measured during extraction surgery; models of the presurgical condition gave information about the clinical distances and axis, which were needed to consider.

A tissue punch was used to expose the implant site as a punch diameter that is
minimally smaller than the implant diameter has a positive effect on healing (Lee, 2008) (Figures 9 and 10). A predetermined drilling sequence took place using implant drills (Thommen Medical) (Figure 11).

Implant placement subsequently took place with a chairside conditioned superhydrophilic implant surface, which has been shown to enable improved homogeneous protein absorption to allow for a safer osseointegration (Vasak, 2013; Held, 2013; Calvo Guirado, 2010; Tugulu, 2009; 2010) (Figure 12). A healing abutment was placed to allow for transgingival healing (Figure 13). A composite chairside temporary was bonded to the adjoining central incisor (Figure 14).

Implant recovery took place after 10 weeks. A chairside temporary crown was then placed (Figure 15).

This procedure did not require a local anesthetic and demonstrated good gingival harmony. The temporary crown will be left in place for a period of time to encourage further papillary development (Figure 16). The temporary crown was carefully contoured so that the tissues were supported and to
provide space for any potential increase in height of the papilla.

Discussion

Flapless implant surgery gains high patient acceptance and popularity. It also offers important advantages for the elderly and medically compromised patients. In the early stages of the development of the flapless technique, it was recommended to inexperienced surgeons. It has, however, now become clear that it is a very technique-sensitive procedure, as false assessment may lead to bone perforation or incorrect implant positioning.

Careful planning seems to be the key element in the success of the flapless approach, and this aspect has not changed with the accessibility of planning systems. It is, therefore, only a technique that can be recommended to highly experienced implant surgeons who can do the appropriate case selection. The tissue punch technique should only be used with a sufficient amount of keratinized tissue around the defined implant placement area and when no bone augmentation is necessary. In areas of doubtful primary stability of the implant (posterior maxillary region), the mini-incision technique is a flapless alternative to the punch technique (Choi, 2010).

Flapless procedures carried out carefully with good planning can lead to very high success rates with less bleeding at the time of implant placement and fewer postoperative complications, together with an increasing demand from patients for less invasive procedures.

REFERENCES