The extraction of teeth is inevitably associated with distinctive changes in the surrounding hard and soft tissues. The aim of the following case report is to demonstrate that immediate implantation and provisionalisation, in combination with the experimental socket-shield technique, may result in a volume stability of the mucosa adherent to the inserted implant.

Hürzeler et al. have reported a novel approach to preserve the soft and hard tissues following tooth extraction without the use of biomaterials (Hürzeler, Zuhr et al. 2010, Baumer, Zuhr et al. 2015). The authors propose the retention of a buccal root segment during immediate implantation to prevent alveolar bone loss following tooth extraction.

In the following presentation a 40-year-old female patient was treated with a single tooth implant in the maxillary premolar region. The patient was a non-smoker and did not present relevant medical conditions. The primary indication for tooth extraction was an endodontic treatment failure.

Figures 1 and 2 show the tooth (14) before extraction and immediate implant placement.

Without lifting a mucoperiosteal flap or affecting the marginal gingiva, the tooth was carefully decoronated using a diamond bur. A 1–2mm thick tooth fragment in the buccal area of the extraction socket was separated from the rest of the tooth using rotating tungsten carbide instruments with sterile water irrigation. Particular attention was taken to avoid damage to the bone walls of the extraction socket. Following preparation of the implant bed in the lingual part of the root, all residual tooth fragments were completely removed. A careful curettage of the extraction socket was performed to remove granulation tissue. The buccal fragment of the root was preserved 1mm coronally to the buccal bone plate. Figure 3 shows the prepared socket-shield intra-operatively.

The implant was placed according to the manufacturer's recommendations in the lingual part of the extraction socket, without contact with the retained root fragment (Figure 4). The patient received a screw-retained one-piece provisional crown within the following two hours (Figure 5).

Special attention was paid to the emergence profile of the provisional implant crown. At the subgingival portion, a concavity was designed to avoid placing any pressure on the root fragment. To ensure ideal support of the soft tissue, the marginal portion corresponded exactly to the extracted tooth (or with a slight positive contour). Figure 6 shows the radiographic control after implant placement.

Follow-up examinations were performed seven days after surgery (Figures 7 and 8) and at the three-week (Figures 9 and 10) and twelve-week (Figure 11) follow-up intervals. The implant site showed uneventful healing. No socket-shield exposure was observed.

The final restoration – a screw-retained ceramic-to-metal implant single crown – was delivered four months after implant placement. It was fixed according to the manufacturer's recommendations with a torque-control device using a titanium screw. Functional capabilities were checked (Figure 12, 13). To support the marginal soft tissues, the submucosal emergence profile of the provisional implant crown was transferred into the final restoration identically. Figure 14 shows the radiographic control of the inserted final restoration.

Conclusion

This case illustrates an experimental technique for preserving a buccal root segment in conjunction with immediate implant placement and provisionalisation. The socket shield technique may be a valuable technique to minimise buccal contour changes after tooth extraction, leading to increased volume stability of the mucosa adjacent to the inserted implant. However, it is important to note that this technique should not be used in daily practice until long-term multicentre studies are available.
References
