A Multistage Procedure to Replace a Maxillary Central Incisor by an Implant-Supported Single Tooth Restoration: A Case Report

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Introduction

The use of dental implants to replace lost anterior teeth has become a well established treatment option. (1, 2) Tooth loss due to endodontic or periodontic reasons often result in an inadequate alveolar bone volume and soft tissue situation for later implant placement. (3) To achieve a functionally and aesthetically satisfying result in most cases hard and soft tissue augmentation is necessary. Mandibular block onlay grafts (4, 5) and connective tissue grafts (6) are predictable methods to restore the alveolar ridge prior to implant placement and the gingiva around the implant prior to the final prosthetic restoration. An adequate provisional restoration additionally contributes to the success. (7) This clinical report shows the successful replacement of a maxillary central incisor by an implant-supported single tooth restoration in a multistage procedure.

Case presentation

The left central incisor of a 30-year-old male was finally lost due to root fracture. During the previous five years, root canal treatment and apicectomy had been performed on the tooth. Furthermore, the situation was complicated by the atypical involvement of the adjacent lateral incisor which showed a fistula and bone loss with increased probing depth distally and a buccal recession (Fig 1a,b). During treatment, it was discovered that all of these pathological conditions were caused by the inflammatory process of the left central incisor (Fig 2) and healed up after a new root canal therapy and an apicectomy were done on the left central incisor (Fig 3). Three years later the left central incisor fractured and was removed as atraumatically as possible (Fig 4). The patient was provided with a resin-bonded provisional bridge for the healing period (Fig 5). The CT scan after 3 months showed that the vertical as well as buccolingual dimension of the alveolar bone was inadequate for placement of a dental implant. (Fig 6) In the next surgical step an autogenous block graft, harvested from the left mandibular ramus was used to augment the defect. The onlay graft was fixed with a screw but not covered by a membrane (Fig 7). Four months later, after healing of the bone, a dental implant (Replace Select Standard RP 4,3x13mm Nobel Biocare®) was inserted in an ideal prosthetic position determined from a wax-up (Fig 8). After another four months of submerged healing the implant was uncovered and provided with a healing abutment. A connective tissue graft from the palate was placed buccally to the implant and left lateral incisor to improve the soft tissue condition (Fig 9). Ten days later a provisional acrylic crown was inserted to condition the soft tissue (Fig 10). Finally the implant was restored with a cemented single tooth crown. To improve the aesthetics of the upper front teeth veneers were suggested to the patient as an additional procedure (Fig 11).
Fig 1: Clinical appearance at the first appointment. The left central incisor is discoloured because of root canal treatment, the left lateral incisor shows a fistula distally and a buccal recession which has been covered with pink resin.

Fig 2a: Initial radiographic situation. The left central incisor shows root canal treatment and a bony defect which extends to the region of the lateral incisor including the apex. Bone loss also can be seen distally of the lateral incisor.

Fig 2b: In the CT scan an extensive bony defect round the apices of the central and lateral incisor is presented. The lateral incisor is vital.

Fig 3a: Clinical appearance after removing the resin from the recession of the lateral incisor, after renewing the root canal therapy, bleaching and apicectomy of the central incisor. The fistula distal of the lateral incisor disappeared.

Fig 3b: The Scanora Orthopantomogram one year after apicectomy shows remineralisation of the bony defects round the both left incisors. For planned orthodontic treatment a bone screw was placed in the lower jaw.

Fig 4: Surgical removal of the fractured tooth. The buccal bone plate is almost totally resorbed. Methylene blue is used to disclose the fracture line.

Fig 5: During entire treatment the patient is provided with a resin-bonded provisional bridge

Fig 6: CT scans 6 months after the fractured tooth was removed. The vertical as well as buccolingual dimension of the alveolar bone is inadequate for placement of a dental implant
Fig 7: The trimmed graft is fixed with a screw to augment the bony defect.

Fig 8a: An implant is placed in the augmented ridge in an ideal prosthetic position.

Fig 8b: Orthopantomogram after implant insertion.

Fig 9: 4 months later the implant was uncovered and a connective tissue graft was placed buccally to implant and lateral incisor to improve the soft tissue conditions.

Fig 10: Soft tissue conditions 3 weeks after uncovering. The implant is provisionalized with an acrylic crown.

Fig 11a: Final a) clinical and b) radiological situation 6 month after uncovering the implant: The implant is restored with a cemented single tooth crown and the lateral incisor is provided with a veneer.
Conclusion

In this case it was possible to achieve a good functional and aesthetic result by a very complex, multidisciplinary approach. However, the question arises of how to avoid such extensive rehabilitation by choosing the right time to remove compromised teeth. (8)

Notes


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Implant-Supported Single Tooth Restoration: A Case Report

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Introduction:
The use of dental implants to replace lost anterior teeth has become a well-accepted and successful treatment option. However, due to esthetic or periodontal surgical reasons, many patients are reluctant to undergo the surgical procedure. To achieve a functional and aesthetic outcome in patients with anterior tooth loss, a single-tooth implant restoration may be indicated.

Case presentation:
The left lateral incisor of a 30-year-old male was lost due to tooth fracture. During the previous years, root canal treatment and crowns had been performed on the teeth. Furthermore, the situation was complicated by the adjacent incisor involvement, the adjacent lateral incisor which showed a tooth and bone loss with increased probing depth distally and a buccal erosion Fig. 1A,B. Despite treatment, it was decided to perform a root canal treatment and a provisional restoration to maintain the functional and esthetic appearance of the smile. The provisional restoration was made of acrylic resin and placed on the implant to reduce the height of the soft tissue. The provisional restoration was removed after 3 weeks, and the implant was covered with a healing cap. The implant was allowed to heal for 6 months. After healing, the implant was uncovered and provided with a healing abutment. A customized tissue graft from the palate was placed buccally to the implant and left lateral incisor to improve the soft tissue condition Fig. 5. Ten days after a provisional bridge was inserted to complete the soft tissue Fig. 9. Finally, the bridge was cemented with a customized tissue graft to improve the esthetics of the smile. The final restorations were supported by the bone in a single-tooth procedure Fig. 16.

Conclusions:
In this case, it was possible to achieve esthetic and functional results using a single-tooth implant, including incisor grafting. Nevertheless, the decision to use a bone graft is essential for the long-term success of the implant.

References: