

## 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.

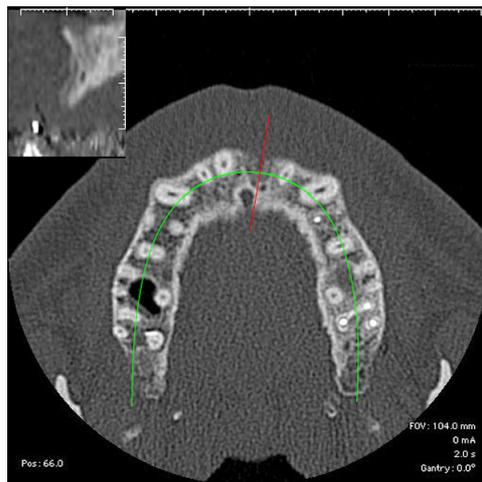


Fig 5: During entire treatment the patient is provided with a resin-bonded provisional bridge

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

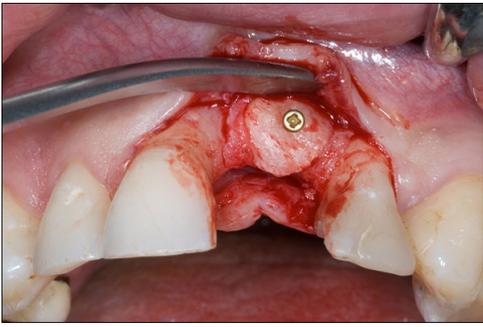


Fig 7: The trimmed graft is fixed with a screw to augment the bony defect

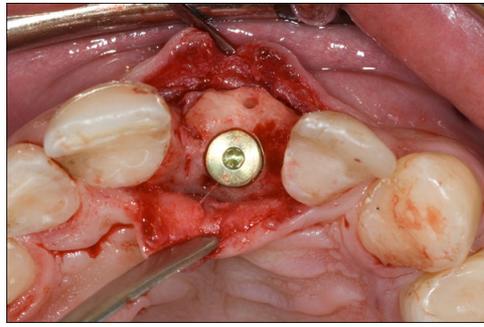


Fig 8a: An implant is placed in the augmented ridge in an ideal prosthetic position.



Fig 8b: Orthopantomogramm after implant insertion

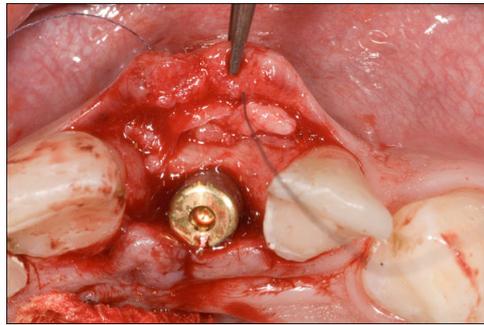


Fig 9: 4 months later the implant was uncovered and a connective tissue graft was placed buccally to implant and lateral incisor to improve the soft tissue conditions



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.

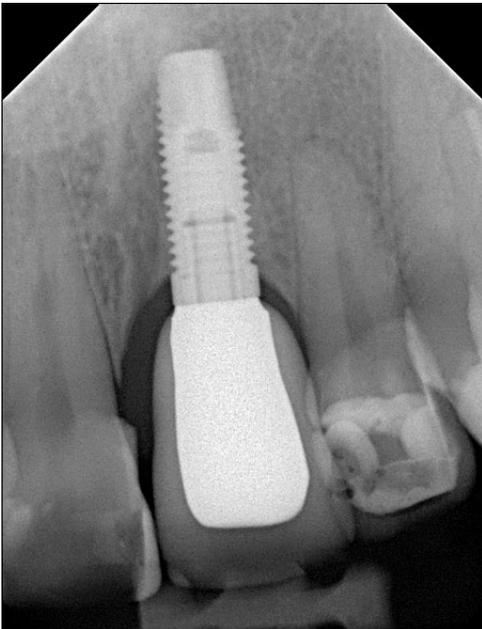


Fig 11b: Final a) clinical and b) radiological situation 6 month after uncovering the implant: The implant is restored with a cemented single tooth crown and the lateral incisor is provided with a veneer.

## 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

- 1.) Belser UC, Schmid B, Higginbottom F, Buser D. (2004) Outcome analysis of implant restorations located in the anterior maxilla: a review of the recent literature. *Int J Oral Maxillofac Implants* 19 Suppl: 30-42.
- 2.) Levin L, Sadet P, Grossmann Y. (2006) A retrospective evaluation of 1,387 single-tooth implants: a 6-year follow-up. *J Periodontol* 77: 2080-2083.
- 3.) Camargo PM, Melnick PR, Suleimanagich O, Carnio JG, Camargo LM. (2006) Replacement of a fractured upper central incisor with an implant-supported crown: a step-by-step approach to achieve acceptable esthetics. *Compend Contin Educ Den* 27:234-243.
- 4.) McCarthy C, Patel RR, Wragg PF, Brook IM. (2003) Dental implants and onlay bone grafts in the anterior maxilla: analysis of clinical outcome. *Int J Oral Maxillofac Implants* 18:238-241.
- 5.) Capelli M. (2003) Autogenous bone graft from the mandibular ramus: a technique for bone augmentation *Int J Periodontics Restorative Dent* 23:277-285.
- 6.) Shibli JA, d'Avila S. (2006) Restoration of the soft-tissue margin in single-tooth implant in the anterior maxilla *J Oral Implantol* 32:286-290.
- 7.) Kourtis S, Psarri C, Andritsakis P, Doukoudakis A. (2007) Provisional restorations for optimizing esthetics in anterior maxillary implants: a case report *J Esthet Restor Dent* 19:6-17.
- 8.) Mordohai N, Reshad M, Jivraj S, Chee W. (2007) Factors that affect individual tooth prognosis and choices in contemporary treatment planning *Br Dent J* 202:63-72.

*This Poster was submitted by Gerlinde Durstberger, MD, DMD.*

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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 established treatment option<sup>1-3</sup>. Tooth loss due to endodontic or periodontic reasons often result in an inadequate alveolar bone volume and soft tissue situation for later implant placement.<sup>4</sup> To achieve a functionally and aesthetically satisfying result in most cases hard and soft tissue augmentation is necessary. Mandibular block onlay grafts<sup>5-7</sup> and connective tissue grafts<sup>8</sup> 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<sup>9</sup>. 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 in-

volvement 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<sup>®</sup>) 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.

**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<sup>10</sup>.

1. Sailer H, Schmalz G, Engelbertsen J, Rupp T. (2005) Osseous analysis of implant restorations located in the anterior maxilla: a review of the literature. *J Oral Maxillofac Surg* 63: 1342-1347.
2. Jovanovic M, Sailer H, Schmalz G. (2005) A retrospective analysis of 17,307 single tooth implants: a 5-year follow-up. *J Oral Maxillofac Surg* 63: 1348-1352.
3. Jovanovic M, Sailer H, Schmalz G, Engelbertsen J, Rupp T. (2005) Replacement of a maxillary upper central incisor with an implant supported crown: an 18-year follow-up. *J Oral Maxillofac Surg* 63: 1353-1357.
4. Jovanovic M, Sailer H, Schmalz G, Engelbertsen J, Rupp T. (2005) Bone growth and bone loss in the anterior maxilla: a 5-year retrospective analysis of 17,307 single tooth implants. *J Oral Maxillofac Surg* 63: 1358-1362.
5. Jovanovic M, Sailer H, Schmalz G, Engelbertsen J, Rupp T. (2005) Bone growth and bone loss in the anterior maxilla: a 5-year retrospective analysis of 17,307 single tooth implants. *J Oral Maxillofac Surg* 63: 1363-1367.
6. Jovanovic M, Sailer H, Schmalz G, Engelbertsen J, Rupp T. (2005) Bone growth and bone loss in the anterior maxilla: a 5-year retrospective analysis of 17,307 single tooth implants. *J Oral Maxillofac Surg* 63: 1368-1372.
7. Jovanovic M, Sailer H, Schmalz G, Engelbertsen J, Rupp T. (2005) Bone growth and bone loss in the anterior maxilla: a 5-year retrospective analysis of 17,307 single tooth implants. *J Oral Maxillofac Surg* 63: 1373-1377.
8. Jovanovic M, Sailer H, Schmalz G, Engelbertsen J, Rupp T. (2005) Bone growth and bone loss in the anterior maxilla: a 5-year retrospective analysis of 17,307 single tooth implants. *J Oral Maxillofac Surg* 63: 1378-1382.
9. Jovanovic M, Sailer H, Schmalz G, Engelbertsen J, Rupp T. (2005) Bone growth and bone loss in the anterior maxilla: a 5-year retrospective analysis of 17,307 single tooth implants. *J Oral Maxillofac Surg* 63: 1383-1387.
10. Jovanovic M, Sailer H, Schmalz G, Engelbertsen J, Rupp T. (2005) Bone growth and bone loss in the anterior maxilla: a 5-year retrospective analysis of 17,307 single tooth implants. *J Oral Maxillofac Surg* 63: 1388-1392.

