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Case Report

Roy Samuelsson, DDS
Specialist in Prosthodontics
Dep. of Prosthodontics,
University of Oslo, Norway
Private practice:
Bjerke tannmedisin, Oslo
E-mail: rs-samue@online.no

Johan Caspar Wohlfahrt, DDS
Specialist in Periodontics
Dep. of Biomaterials,
University of Oslo, Norway
Private practice:
Bjerke tannmedisin, Oslo
E-mail: j.c.wohlfahrt@odont.uio.no

Svein Thorstensen, MDT
Dental Studio AS,
Oslo, Norway
E-mail: svein@dentalstudio.no

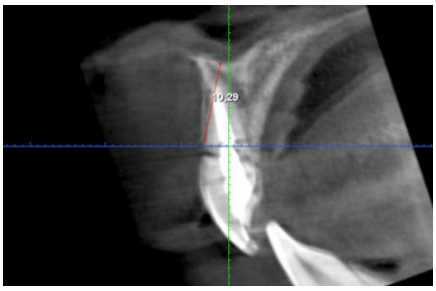
Replacing a failing tooth with an implant-supported crown – strategies for ensuring an esthetic treatment result

The restorative team will often be exposed to significant challenges in trying to replace a failing tooth in the esthetic zone. Different treatment alternatives exist but the least invasive method in regard to neighboring teeth would most certainly consist of the utilization of implant-supported prosthodontics. Implant site development, surgical approach, prosthodontic handling with utilization of appropriate components and materials are vital issues to consider in the therapy.

In this case report, a young individual presented with circumstances which may have resulted in a less appealing treatment result with a more conventional approach. Difficulties were anticipated and different approaches as well as expected results were discussed with the patient who decided to go with the following treatment.

1. View from initial consultation. The tooth 11 is mobile with a deep gingival pocket and exhibits a soft tissue swelling marginally.

2. X-ray reveals a root fracture and the buccally positioned gutta-percha point confirms communication with the fracture.



3. In the CBCT section (Planmeca Promax 3D Conebeam) one can see insufficient vertical height of the alveolar process. This could be further reduced after a surgical extraction of the apical part of the root which would lead to a hopeless situation.

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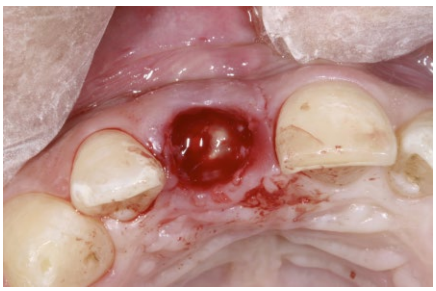
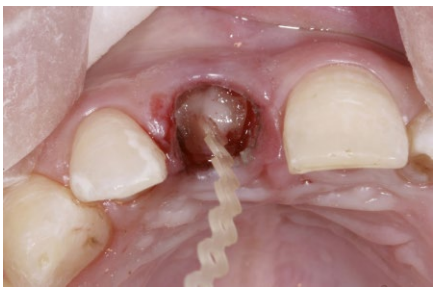


4. The coronal part of the tooth is removed. Upon inspection one can see that the buccal bone plate is resorbed to the inferior of the fracture line.

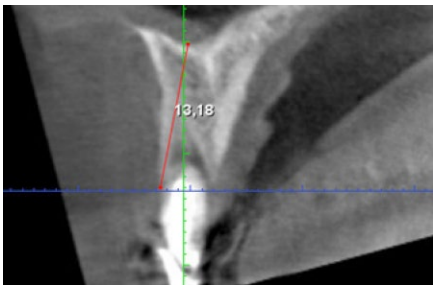


5. After achieving haemostasis, an orthodontic elastic is attached to the remaining root fragment.

6. A provisional tooth which has been bonded to neighboring teeth is hollowed out palatally and the elastic is attached to it and stretched in order to force the remaining root to erupt.

7. Four months later the root has erupted significantly and the supporting tissues have followed, resulting in a vertical augmentation of both soft and hard tissues.

8. X-ray indicates bone apposition even superior of the marginal ridge.



9. There seems to be enough space for an implant on the CBCT scan in respect to both vertical and horizontal dimensions.

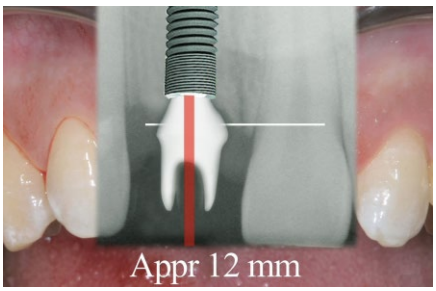
10. The remaining root tip is carefully extracted without lacerating the soft tissues using a periotome and appropriate forceps.

11. The cervical contour of tooth 21 is delineated on the X-ray.

12. The orthodontic extraction has resulted in a dense bone quality, a frequent finding. This will allow for an immediate flapless implant installation followed by immediate temporization aiming for maximum "pink" esthetics.

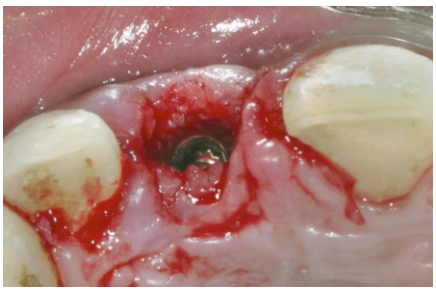
13. The preparation for the implant will have to be considered thoroughly since this is performed according to a "flapless" protocol.

14. The excess of soft tissues will have to be considered during implant installation and the soft tissue profile is here manipulated to a symmetric level.



15. In order to be able to manipulate soft tissues and allow enough space for the prosthodontic components, the implant has to be positioned 3 mm below gingival zenit and in this case it means below the marginal bone level to allow for symmetry.

16. An OsseoSpeed 4.0 S – 13 mm (ASTRA TECH Implant System) during insertion.



17. Implant in position, it resists a torque of 35 Ncm indicating good primary stability.

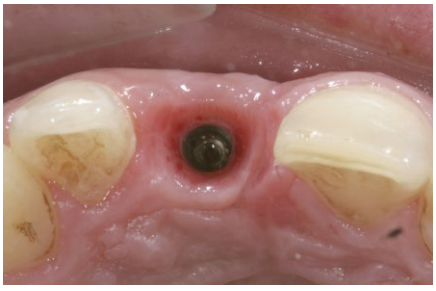
18. A TempDesign temporary abutment (ASTRA TECH Implant System) and a 3M ESPE Ion shell crown are used to fabricate an individually shaped temporary crown. The TempDesign component has to be cut for proper length.

19. Temporary crown finished and ready for seating.

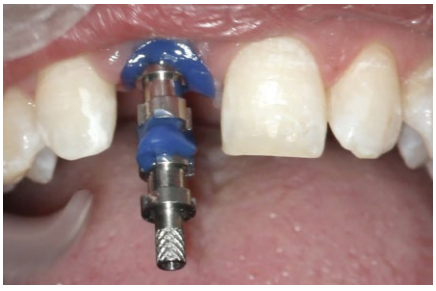
20. The situation clinically just after seating of the temporary crown. Mild, but not undue, ischemia can be noticed since it exerts some pressure towards the soft tissues. This is where the shaping of the "emergence profile" starts.

21. Three weeks after implant installation.

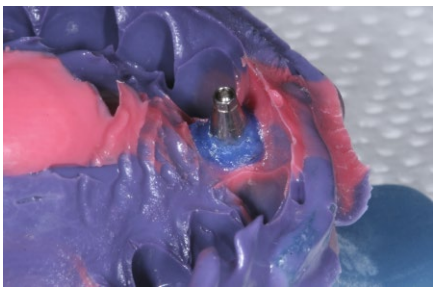
22. The temporary crown is trimmed a few months later to shape the soft tissues further and this is the situation after almost 6 months.



23. The soft tissues have matured and are now stable. Final prosthodontic treatment can be initiated.

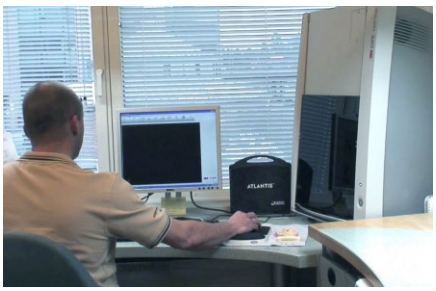


24. Impression coping on implant level is modified with a light cured acrylic (block-out resin e.g. Ultradent) to be able to replicate the soft tissue profile created.

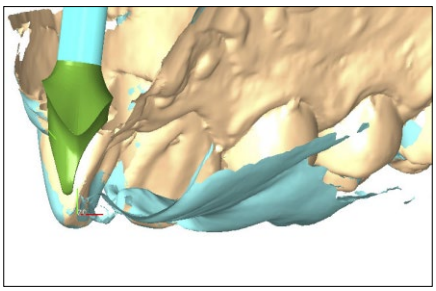


25. A customized impression tray is used for obtaining an impression together with Polyether material.

26. Working model with a detachable soft tissue mask and implant replica.



27. The model is scanned in the 3M ESPE Lava scanner and the files are sent to the DENTSPLY Implants ATLANTIS production unit where an individually designed abutment will be manufactured.



28. In the ATLANTIS VAD software, an abutment is designed according to the soft tissue profile and the shape of the final crown.

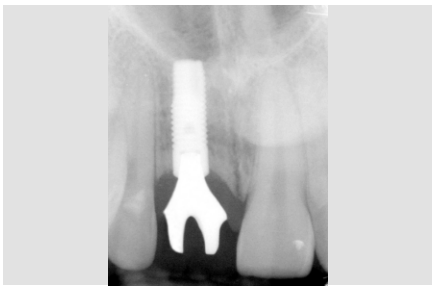
29. The finished ATLANTIS abutment, zirconia is delivered to the laboratory.

30. The abutment is tried in and checked clinically with light finger force of the abutment screw before proceeding with the construction of a crown restoration.

31. A 3M ESPE Lava zirconia coping is produced after scanning the ATLANTIS abutment.

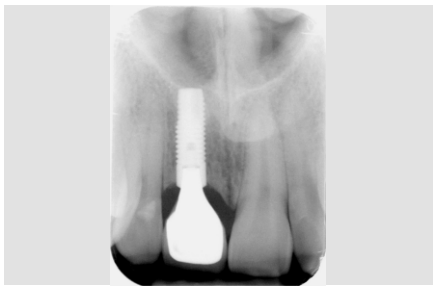
32. The finished ceramic crown and the abutment ready for delivery to the clinic.

33. A transfer index produced in the laboratory will facilitate seating of the abutment into proper position. Otherwise, excessive undue forces can be applied when the abutment screw is tightened.



34. An X-ray will verify positioning before tightening the abutment screw with appropriate torque.

35. The crown is cemented with 3M ESPE Rely X "Unicem". The excess material is "frozen" by a short exposure with the curing unit and can then be removed before chemical setting starts. Notice the translucency.



36. Seating and removal of excess cement is visualized in this X-ray at the 6 month recall.

37. Final result.

38. At the 6 months recall, the soft tissues have stabilized and the symmetry is even better. Note that a transition from smoking to snuff has resulted in gingival recessions on tooth 22 and 23.

39. The one year recall shows excellent soft tissue stability around the restoration. The patient also stopped using snuff after firm counseling.

This case report is published as an inspiration for you as a clinician and not necessarily as a recommendation from DENTSPLY Implants.

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