Introduction

3D-planning and –printing can provide insight in the complexity of the root canal anatomy\(^1\). Treatment time can be reduced and predictability can be increased using 3D-planning based on Cone-Beam Computed Tomography (CBCT).

Case presentation

A 37-year-old female presented with pain on tooth 37. Clinically the tooth was sensitive for percussion and non-responsive for carbon dioxide. The gingiva was swollen and contained a fistula. Radiographic images revealed a C-shaped morphology\(^2\). A 3D-model was printed using the 3D printer Object Connex 350 (Stratasys, Eden Prairie, United States) to predictably treat this tooth. The tooth was treated endodontically and restored coronally. Follow-up using CBCT revealed a satisfactory healing.

Case documentation

![Clinical images showing the initial restoration and a fistula on the gingiva.](https://example.com/image1)

a-d. Clinical images showing the initial restoration and a fistula on the gingiva.

![Fistulography showing an apical radiolucency and convergent root pattern.](https://example.com/image2)

a. Fistulography showing an apical radiolucency and convergent root pattern. b-c. CBCT images revealing an endo-perio problem around element 37. d-g. Cross-sectional CBCT images showing a C-shaped morphology, disruption of the cortical bone plate and extent of the apical radiolucency.

![3D-model based on CBCT images. Mimics- and 3-matic software were used to visualize the internal anatomy.](https://example.com/image3)

a-b. 3D-model based on CBCT images. Mimics- and 3-matic software were used to visualize the internal anatomy. c. Object Connex 350 printer. d. Printed 3D-model. Different colours were used to visualize the internal anatomy.

![Removal of the restoration, access cavity preparation, desinfection with sodiumhypochlorite and application of calciumhydroxide.](https://example.com/image4)

a. Removal of the restoration, access cavity preparation, desinfection with sodiumhypochlorite and application of calciumhydroxide. b. After one month, the fistula had completely dissapeared. c. Root canal morphology viewed through the access cavity. d. C-shaped root canal filled with gutta percha. e. Additional lingual root canal filled with gutta percha. f. Periapical radiograph immediately after finishing of the endodontic treatment.

![Periapical radiograph seven months after endodontic treatment. Reduction of apical radiolucency.](https://example.com/image5)


Conclusion

3D-models help to visualize the root canal system and can be helpful for clinicians. Treatment time can be reduced and predictability can be improved when a good planning is conducted. Follow-up can be done in a standardized way using 3D imaging.

References
