

University of Pennsylvania
TEC2 Next Level
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Case study: broken instrument

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DentoDoc

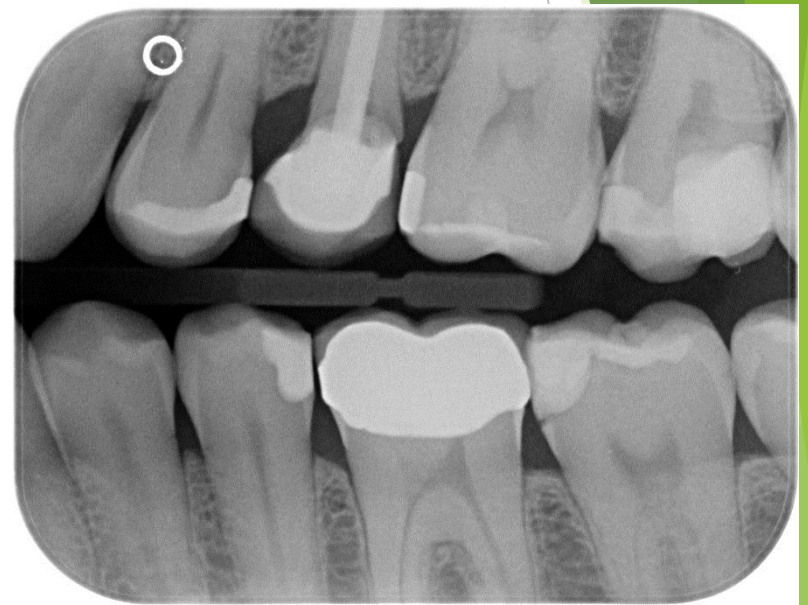
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Starting point



Starting point

- ▶ 43 year old patient with acute pain in 2. quadrant
- ▶ OPG area 26 to 27:
 - ▶ Tooth 27: occlusal distal shows filling next to pulp as well as occlusal mesial another filling with other material, which seem to be mesially insufficient
- ▶ X-ray: periradicular as well as apikal with no clinical report
- ▶ Filling at 27 occlusal -distal: was exchanged 3 days ago due to acute pain of the patient



Examination

- ▶ 1. percussion: :
 - ▶ 24,25,26,34,35,36,37 negative
 - ▶ 27 definitely positive
- ▶ 2. pulp test with dichlorofluoromethane (cold spray):
 - ▶ 27 hypersensitive
- ▶ 4. parodontal screening 25-27 PSI Gard 2
- ▶ 5. palpation in area 27:
 - ▶ No pain apical



Diagnosis

Irreversible Pulpitis with suspicion at apical parodontitis tooth 27

Treatment recommendation:

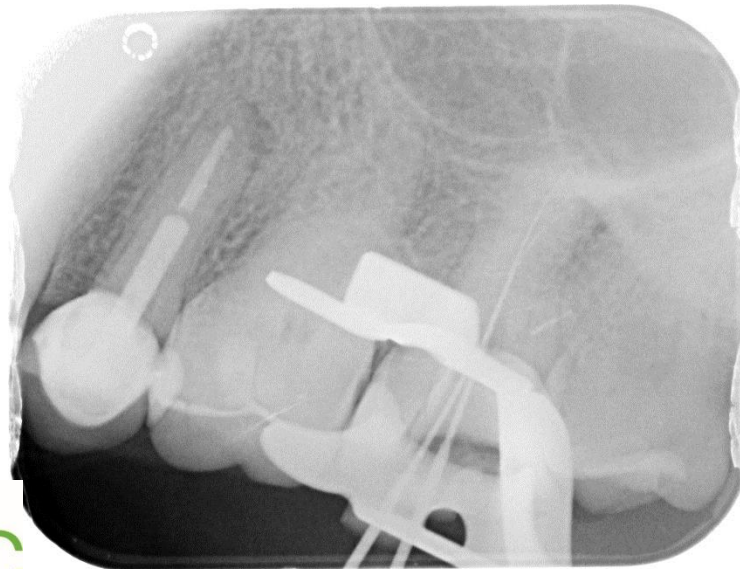
- ▶ Endodontic treatment at tooth 27 with surgical microscope
- ▶ Removal of old filling with Composite,
- ▶ Removal of caries prior to opening of pulpa
- ▶ Trepanation
- ▶ Treatment of root channels down to apical constriction
- ▶ Desinfektion
- ▶ Opturation und occlusal closure with Composite
- ▶ Prothetic suply of tooth 27 with gold or ceramic crown
- ▶



X-ray upon endometric legth measurement

Distal Chanel: remarkably curved to distal

During straight approach towards the channel, the BRO file of Biorace cracked in the middle third of the distal channel



X-ray upon endometric legth measurement

X-ray mesial eccentric

Mb1: 19mm (Iso10 R)

Pal: 19mm (Iso 20 R)

Db: Fracture BRO File



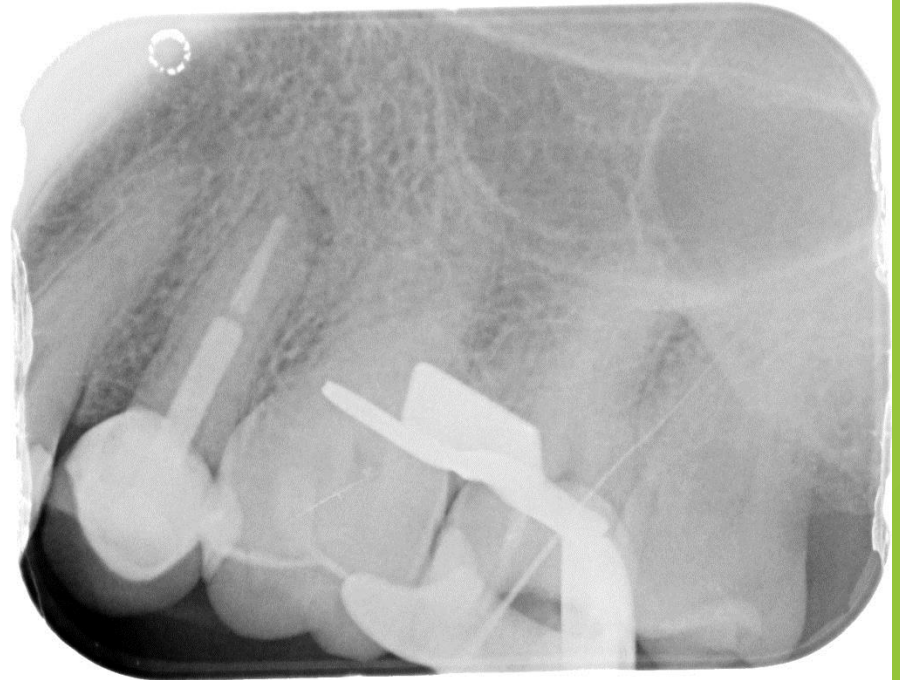
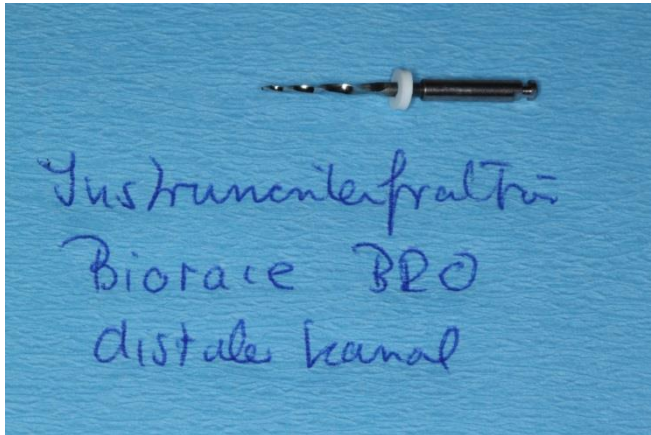
Removal of fragment via surgical microscope via ultrasonic technique

- ▶ Broadening and straightening of coronal entry with cut Gates-Glidden 2 → coronal part of fragment is visible
- ▶ circular vibrating of fragment via Endo- Chuck Needle
- ▶ Irrigation with EDTA 17 %



Cracked BR-0 Instrument removed and X-ray Disto-buccal

► Db: 19mm (Iso 15)



Apical Sizing

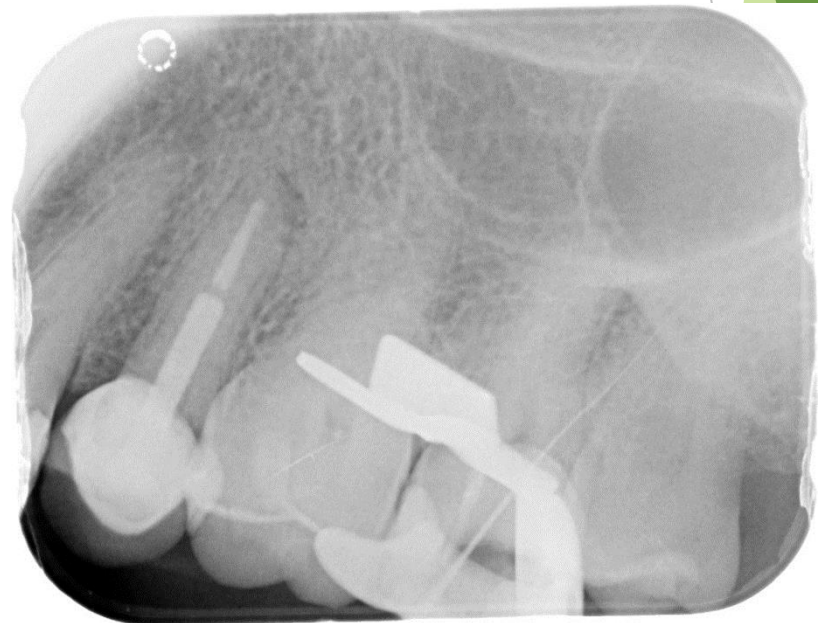
- ▶ Initial rotary File
- ▶ Mb1: Iso 10
- ▶ Db: Iso 15
- ▶ P: Iso 20

final apiakal Size

MB1: Iso 35

Db: Iso 35

P: Iso 40



Treatment and Disinfection

BioRaCe

Preparation of path 010,015, under humid conditions, rubberdam and DOM

Reamer 010,015, manually

BR0 coronal opening of channel entry

Verification of path with file

Reamer 015,020

BR1, BR2, BR3 shaping coronal and middle channel third

BR4, BR5 shaping apical channel third

irrigation protocol

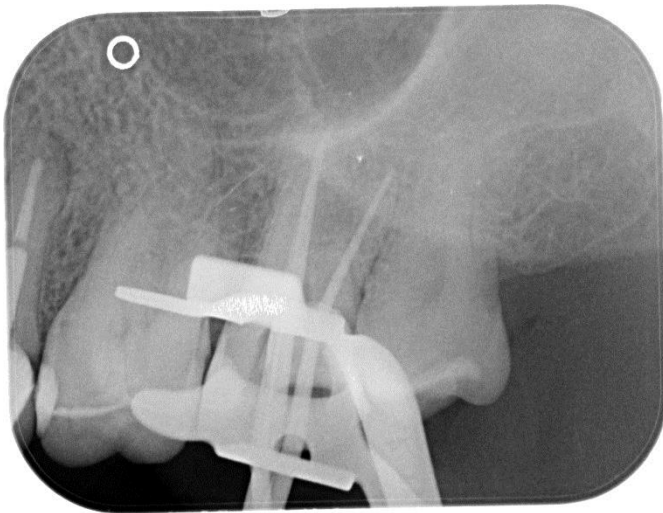
- **1. treatment:** changing lavage 3,5% NaOCl, 17% EDTA, processing at humid conditions
- Ultrasonication of lavage solutions
- sustained injection of CaOH into the root channel
- **2. treatment:** analog 1. treatment without ultrasonication
- Drying and obturation of channels



Opturation

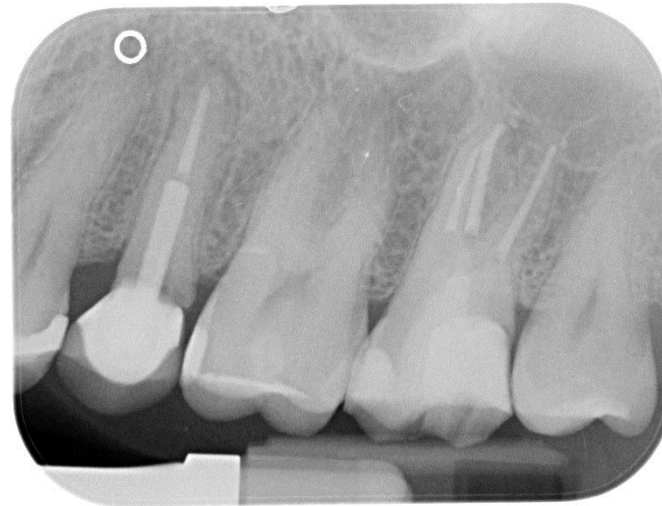
Single Cone Opturation Technique Guttapercha und TOTAL Fill

► Masterpoint



posttreatment radiograph

- Opturation and cover the floor of the pulp chamber with a line of bonded material after removal of excess gutta-percha to the canal orifice



Epicrisis

- ▶ During the preparation of the access cavity, a crack of the instrument (BR0 file, BioRaCe Systems) at the distal root occurred
- ▶ The top of the file of the rotary instrument got stuck within the lower middle channel third. This was caused by a pronounced root curvature of the distal channel as well as the insufficient straightening of the entry cavity before insertion of the rotary instrument
- ▶ The instrument fracture was due to exceeding torsion forces of the NiTi file with the channel lumen. The patient was informed immediately upon the accident and a X ray was recorded to investigate the location of the instrument within the channel
- ▶ As the instrument was located at the middle channel third and was clearly visible with the dental microscope, the risk of infection of the non-accessible part of the root channel might be increased, we decided to try to remove the instrument
- ▶ Prior to the removal, the patient was thoroughly informed about the procedure



Epicrisis

- ▶ The instrument could be removed successfully via the dental microscope and ultrasonication

The channels of tooth 27 could be treated thoroughly and filled completely

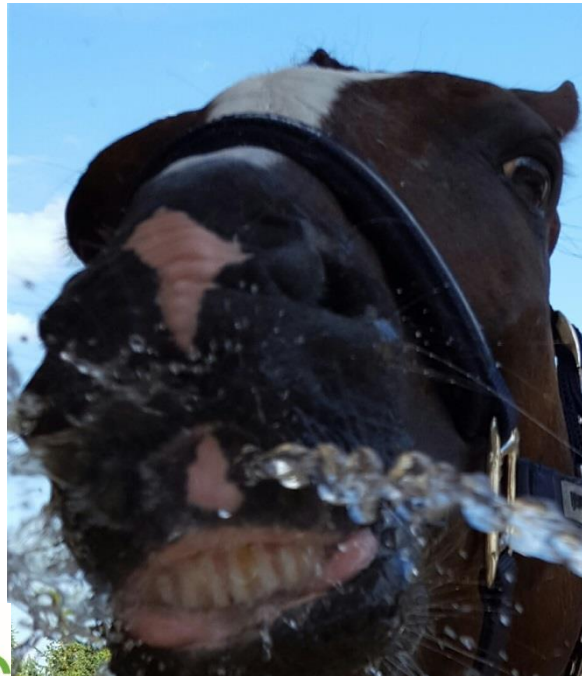
The prognosis for tooth 27 seems to be promising based on study results, especially because of the lack of a apical parodontitis at the distal root prior to the treatment*

- ▶ * Zitat: DZZ 62(08)2007(S.534/535)



Thanks for your attention

Questions?



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