

Endodontisk kirurgi

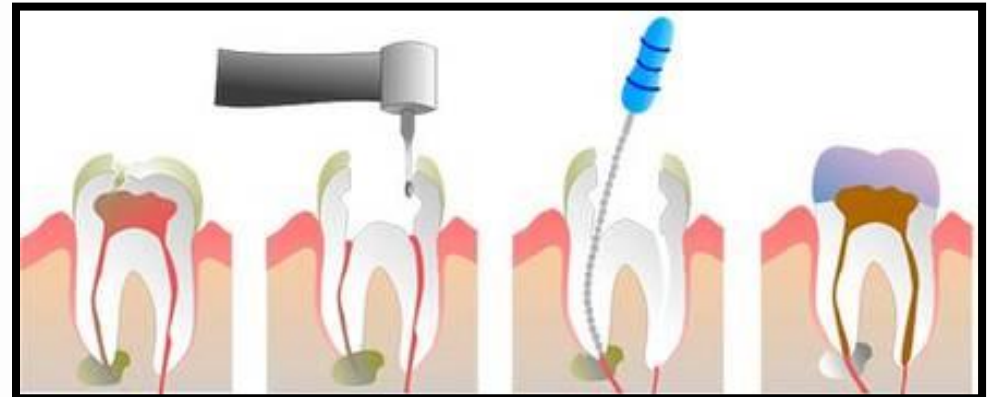
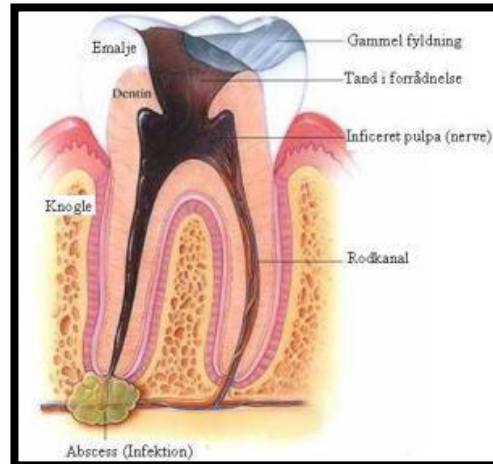
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Introduktion

- I de fleste tilfælde kan patologiske periapikale forhold behandles ved hjælp af konventionel endodonti
- Ortograd endodontisk behandling kan sikre reaktionsløse periapikale forhold i 85-95% af tilfældene
- Mangelfuld heling efter konventionel endodonti eller andre forhold kan nødvendiggøre anvendelse af kirurgisk teknik, hvor rodkanalen forsegles ved hjælp af en retrograd rodfyldning

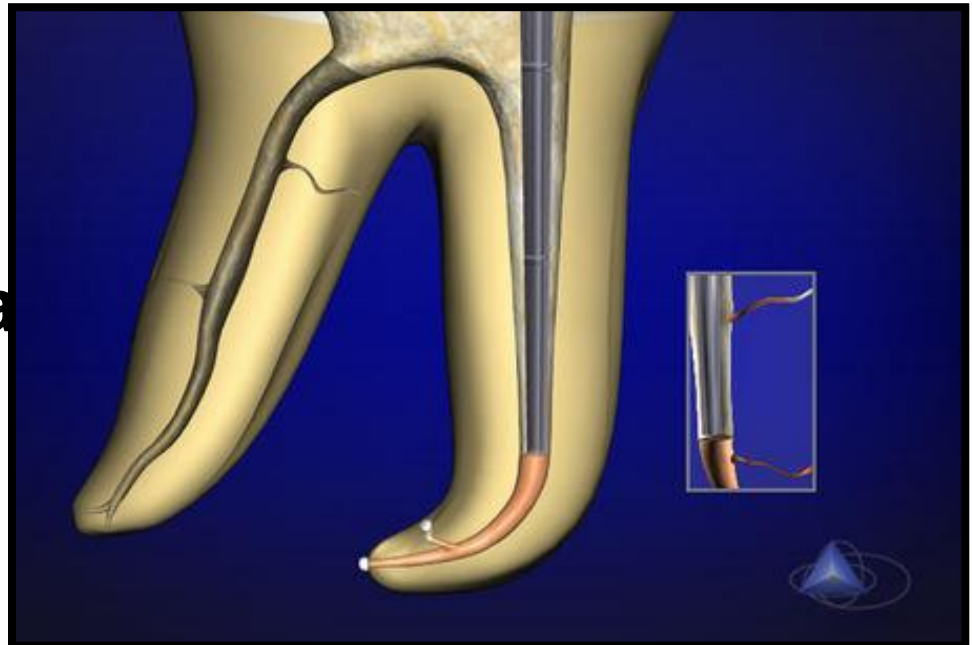


Introduktion

Ortograd rodfyldning

Hvorfor ses der mangelfuld heling af en periapikal patologisk proces efter en sufficient ortograd rodfyldning

- Apikal delta
- Bikanaler
- Reaktion på rodfyldningsmateriale
- Tandmorfologi
- Isthmus
- Patologi

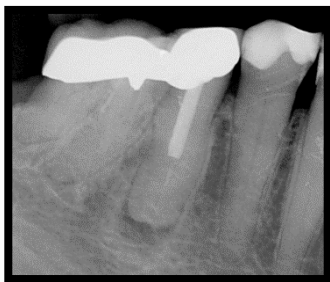


Indikation

Rodspidsamputation og retrograd rodfyldning

• Indikation:

- *Obliteration af rodkanalen med radiologiske eller kliniske symptomer*
- *Rodfyldningsoverskud med kliniske symptomer*
- *Mislykkede rodbehandling, hvor forsøg på revision er uhensigtsmæssig*



• Kontraindikation:

- *Anatomiske forhold*
- *Parodontale sygdomme*
- *Svært destrueret tand*
- *Manglende Kooperation*
- *Medicinsk kompromitterede patient*



Introduktion

• God prognose:

- *Ingen præoperative symptomer*
- *God rodfyldning*
- *<5mm periapikal opklaring*
- *Brug af operationsmikroskop*

• Dårlig prognose:

- *Symptomer*
- *Dårlig rodfyldning*
- *Molar > præmolar > fortænder*

Review Article

Prognostic Factors in Apical Surgery with Root-end Filling: A Meta-analysis

Thomas von Arx, DMD,^{1*} Miguel Peñarrocha, DDS, PhD,² and Storgård Jensen, DDS^{3†}

Abstract

Introduction: Apical surgery has seen continuous development with regard to equipment and surgical technique. However, there is still a shortage of evidence-based information regarding healing determinants. The objective of this meta-analysis was to review clinical articles on apical surgery with root-end filling in order to assess potential prognostic factors. **Methods:** An electronic search of PubMed and Cochrane databases was performed in 2008. Only studies with clearly defined healing criteria were included, and data for at least two categories per prognostic factor had to be reported. Prognostic factors were divided into patient-related, tooth-related, or treatment-related factors. The reported percentages of healed teeth ("the healed rate") were pooled per category. The statistical method of Mantel-Haenszel was applied to estimate the odds ratios and their 95% confidence intervals. **Results:** With regard to tooth-related factors, the following categories were significantly associated with higher healed rates: cases without preoperative pain or signs, cases with good density of root canal filling, and cases with absence or size ≤ 5 mm of periapical lesion. With regard to treatment-related factors, cases treated with the use of an endoscope tended to have higher healed rates than cases without the use of an endoscope. **Conclusions:** Although the clinician may be able to control treatment-related factors (by choosing a certain technique), patient- and tooth-related factors are usually beyond the surgeon's power. Nevertheless, patient- and tooth-related factors should be considered as important prognostic determinants when planning or weighing apical surgery against treatment alternatives. (*J Endod* 2010;36:957-973)

Key Words

Apical surgery, healing predictors, meta-analysis, prognostic factors, root-end filling

Apical surgery is often a last resort to maintain an endodontically treated tooth with a persistent periapical lesion. After the introduction of microsurgical principles and new materials for apical obturation in endodontic surgery in the early 1990s, healed rates of apical surgery with root-end filling have improved but remain around 80% to 90% (1).

In order to enhance the outcome of a surgical procedure, three different strategies may be considered: (i) improvement of technical equipment/instruments, (ii) changes in surgical technique, and (iii) appropriate case selection. The choice of treatment, however, is often based on individual experience and skill rather than on evidence-based prognostic factors. The latter would allow narrowing the indication for a certain treatment by weighing various predictors and thereby increasing the likelihood of a favorable outcome.

Limited information is available with regard to prognostic factors in apical surgery. Most clinical studies on apical surgery evaluate the outcome with respect to the root-end filling material. Only a few clinical studies have assessed potential prognostic factors in apical surgery, such as the age and sex of the patient, the type of treated tooth, or the presence of a radicular post. Studies evaluating multiple prognostic factors with regard to healing outcome of periapical surgery are sparse (2-6). The number of subjects within a single study may often be too small to find a statistically significant difference comparing two or more categories with regard to healing outcome. Systematic reviews and meta-analyses may provide additional and important information to the clinician in order to weigh apical surgery against treatment alternatives such as conventional endodontic (re-)treatment or tooth extraction and prosthetic replacement.

The first systematic review of endodontic surgery by Peterson and Gutmann (7) evaluated the outcome of resurgery cases. They reported that 35.7% of cases healed successfully after resurgery, 26.3% healed with uncertain results, and 38% did not heal at the 1-year follow-up. A systematic review of the in vivo performance of retrograde obturation materials was published by Niedermaier and Theodosopoulos (8). Most of the included studies compared amalgam with a competitor material. They reported a significant caveat because there were only two randomized clinical trials (RCTs) and only one controlled clinical trial for each material. Mead et al (9) performed an electronic and manual search to investigate the levels of evidence for the outcome of endodontic surgery. They wrote that the majority of frequently quoted "success and failure" studies were case series (level of evidence 4 according to the Centre for Evidence-based Medicine at Oxford). Del Fabbro et al (10) performed a systematic review comparing the outcome of surgical versus nonsurgical retreatment. The finding that healed rates, at least in the short-term, were higher for cases treated surgically as compared with those treated nonsurgically was based on two RCTs only. They also found in a single RCT that healed rates in the medium- to long-term were very similar

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0099-2399/10 - see front matter
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Behandlingsplanlægning

Anamnese

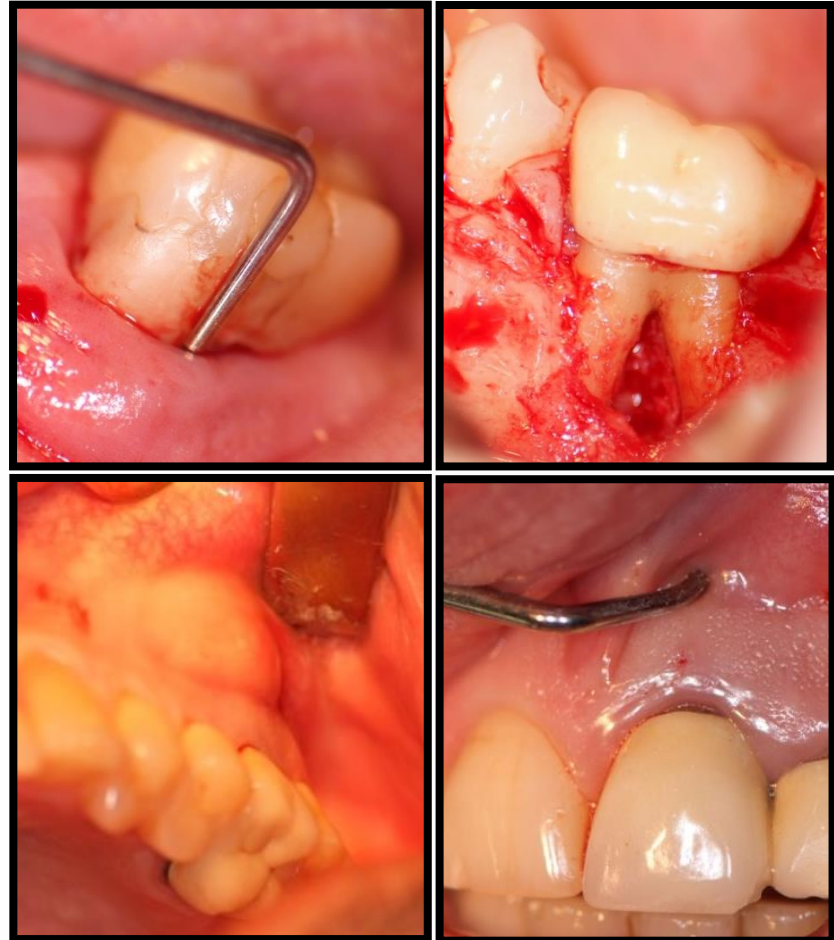
- **Anamnese:**
 - *Aktuelt problem:*
 - *Smerte*
 - *Hævelse*
 - *Fistel*
- **Nuværende medicinforbrug**
- **Allergier**
- **Tobak og alkohol**
- **Tidligere relevante indlæggelser på hospital**
- **Tidligere behandling af aktuelle tand**



Behandlingsplanlægning

Klinisk undersøgelse

- **Perkussionsømhed**
- **Hævelse**
- **Rødme**
- **Fistel**
- **Pus**
- **Pocher**
- **Mobilitet**
- **Retraktion af gingiva**



Behandlingsplanlægning

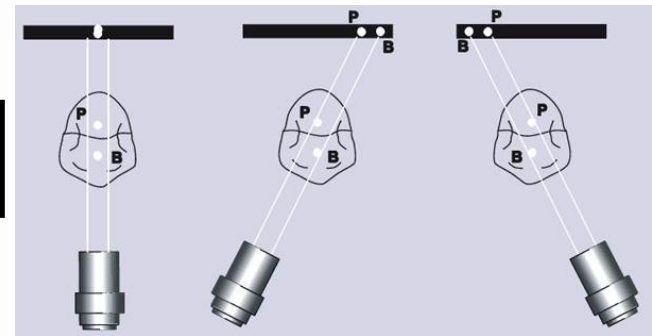
Radiologisk undersøgelse

Radiologisk undersøgelse er obligatorisk forud for endodontisk kirurgi

- Formål med den radiologiske undersøgelse:

Diagnose/Differential diagnoser

- *Skildre antal rodkanaler*
- *Skildre patologiske proces*
- *Skildre rodfyldningen*
- *Skildre rodstifter*
- *Vise relationen til nærliggende anatomiske strukturer*
- Enoral røntgen – Buccal Object Rule
- OTP
- CBCT-skanning



Kirurgisk procedure

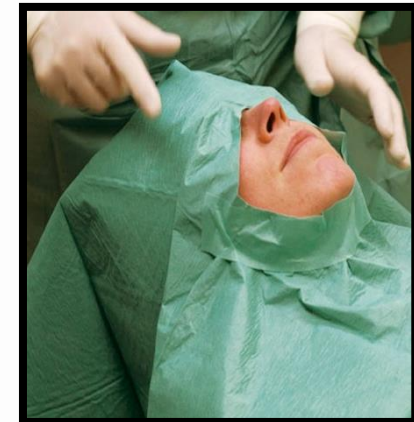
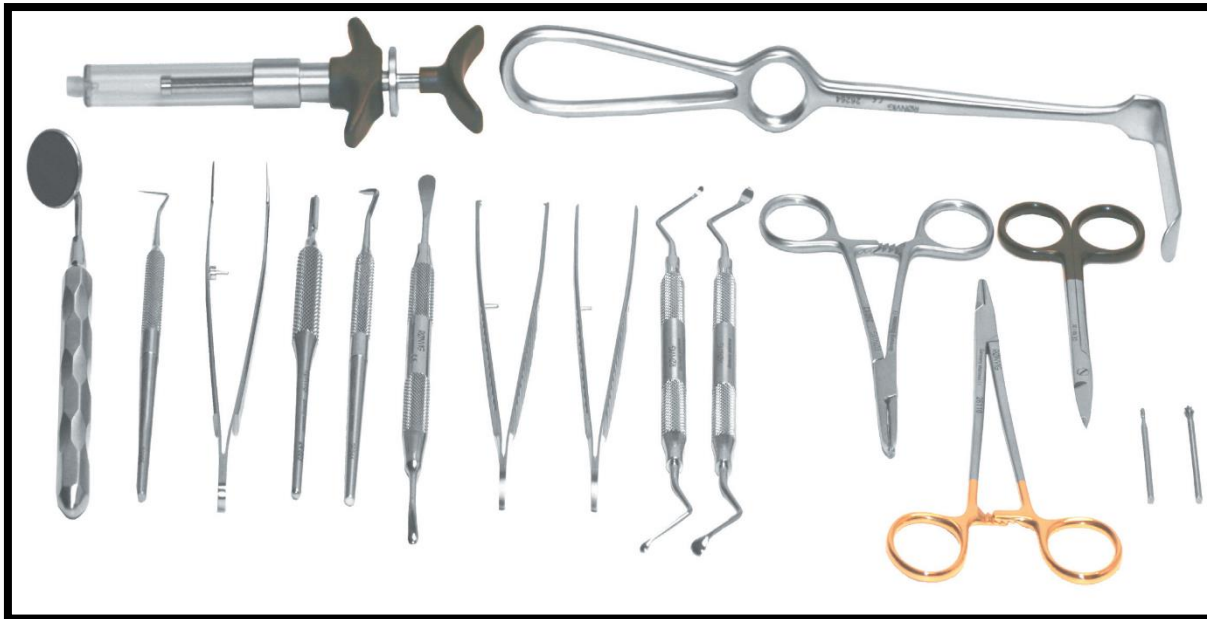
Kirurgiske instrumenter

- Operationslampe
- Pandelampe
- Lupbriller
- Boremaskine
- Opdækningsbord
- Ultralyd
- Rodfyldningsmateriale



Kirurgisk procedure

Kirurgiske instrumenter og opdækning

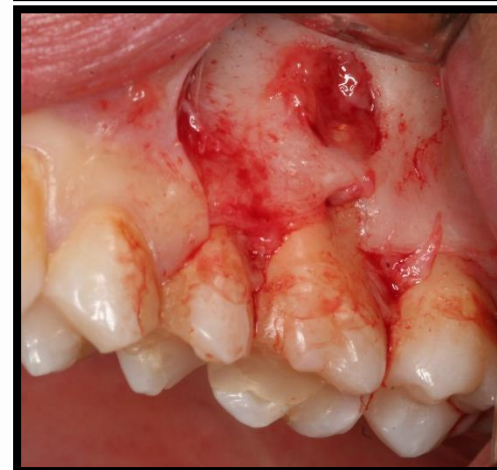


Kirurgisk procedure

Incision

Overvejelser omkring placeringen af incisionen

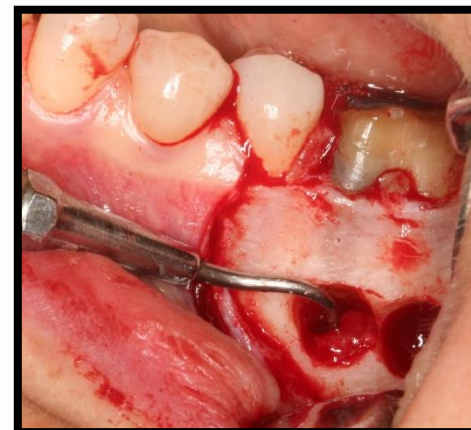
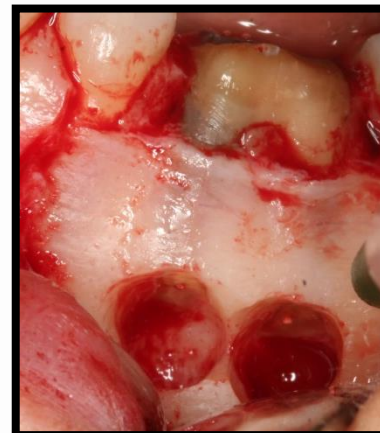
- Sikre blodforsyningen til lappen
- Mesial aflastningen, da blodforsyningen som hovedregel kommer posterior og apikalt
- Parodontal status, således at incisionen involverer fordybede parodontale pocher og medfører gingiva retraktioner
- Støbte restaureringer på den aktuelle tand, da marginal incision kan give gingiva retraktion
- Patientens smilielinie
- Marginal vs løstbundne slimhinde



Kirurgisk procedure

Knoglefjernelse og rodspidsamputation

- Rodspidsen lokaliseres efter knoglefjernelse med stort rosenbor
- Resektion af rodspidsen med stort rosenbor
- Resektionsfladen skal være vinkelret på rodaksen
- Resektion af rodspidsen: 2-4 mm
- Fjernelse af granulationsvæv

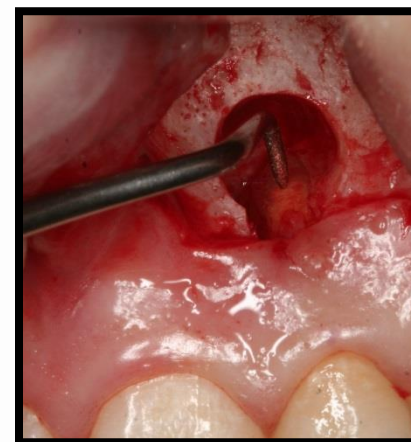
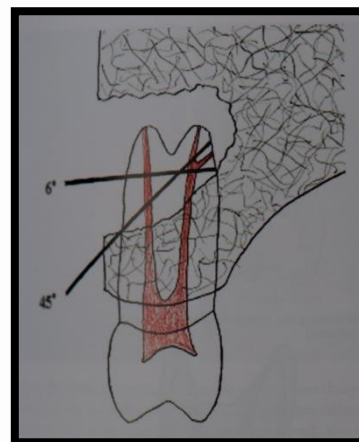


Kirurgisk procedure

Apikal kavitetspræparation

• Ultralyd:

- *Skånsom mod roden*
- *Arbejder i rodens akse*
- *Kan præparere ned i kanalen*
- *Præparation af isthmus*



• Bor:

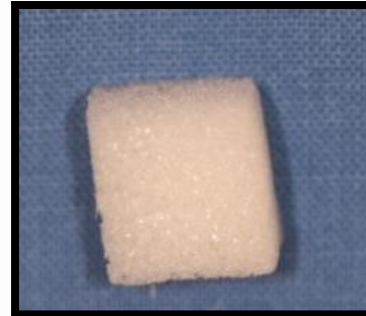
- *Besværlig håndtering*
- *Vanskelig ved vinkelret rodspidsamputation*
- *Fjerner meget rodsubstans*
- *Risiko for perforation*
- *Ikke muligt med dyb præparation*



Kirurgisk procedure

Hæmostasekontrol i knoglekaviteten

- Stryphnon gaze
- Spongostan
- Vatpellets fugtet med 1% adrenalin
- Elektrokoagulation
- Knoglevoks



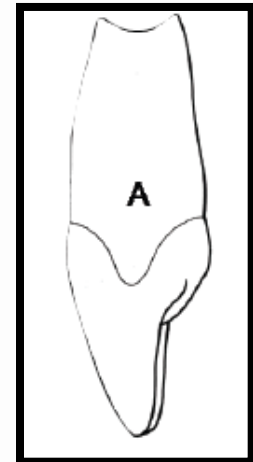
Formål

Retrograd rodfyldning

- Forhindre yderligere udsivning af bakterier og disses toksiner fra rodkanalen til det periapikale område
- Besidde gode forseglingsegenskaber, biokompatibelt og uopløseligt. Materialer med god radiopacitet, lille teknikfølsomhed og gode håndteringsegenskaber foretrækkes
- I Danmark blev anvendelsen af amalgam til retrograd rodfyldning forbudt af Miljøstyrelsen 15.oktober 1998

Fyldningsmateriale

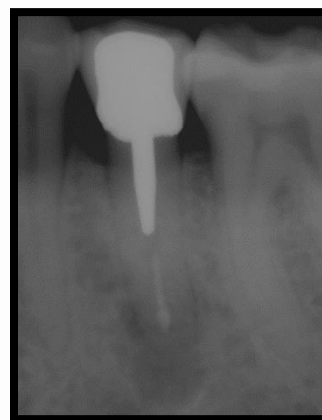
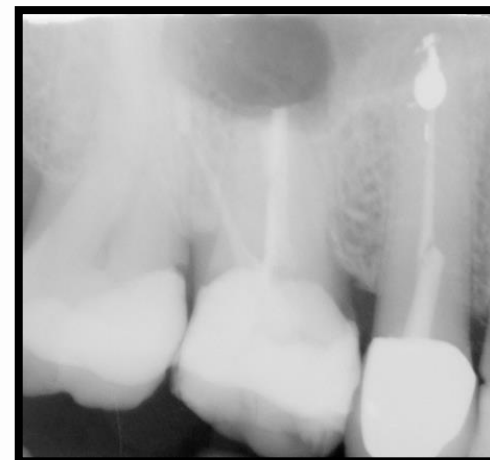
- **IRM**
- **Zinkilte-eugenol-cement (SuperEBA)**
- **Retroplast**
- **Glasionomercement**
- **Mineral Trioxide Aggregate (MTA)**



Kirurgisk procedure

Postoperativ røntgen

- **Altid postoperativ røntgenbillede**
- **Postoperativ røntgenkontrol af heling efter 6-12 måneder**



Postoperative komplikationer

Manglende heling

- **Persisterende røntgenologisk opklaring:**
- **Reoperation >< ekstraktion**
 - *Symptomer*
 - *Infektion*
 - *Hævelse*
 - *Pocher*
 - *Mobilitet*

