The Un-Nerving Truth Vital Pulp Therapy in Permanent Teeth

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- DDS
  - University of Iowa
- Certificate in Pediatric Dentistry
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- Board Certified
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- EZPedo University (SprigU) Graduate

- **TEXT arctic to 31996**


Gravitas
Ventures™

Disclosures

- Honorarium provided by *Sprig Oral Health Technologies*

Muscatine, Iowa


Heinz


GPC
KENT
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BAYER


CARVER PUMP™


musco
Lighting


HON


Stanley Consultants

SmartMTA

Smart MTA

- Calcium Carbonate
- Silicon Dioxide
- Zirconium oxide
- Calcium Zirconia Complex

Comparison

ProRoot MTA

Chemical Name	Content (wt%)
Tricalcium Silicate	66.1
Dicalcium Silicate	8.4
Tricalcium Aluminate	2
Tetracalciumaluminoferrite	-
Calcium Sulphate	-
Bisthmuth Oxide	14
Calcium Oxide	8
Silicon Oxide	0.5
Aluminum Oxide	1

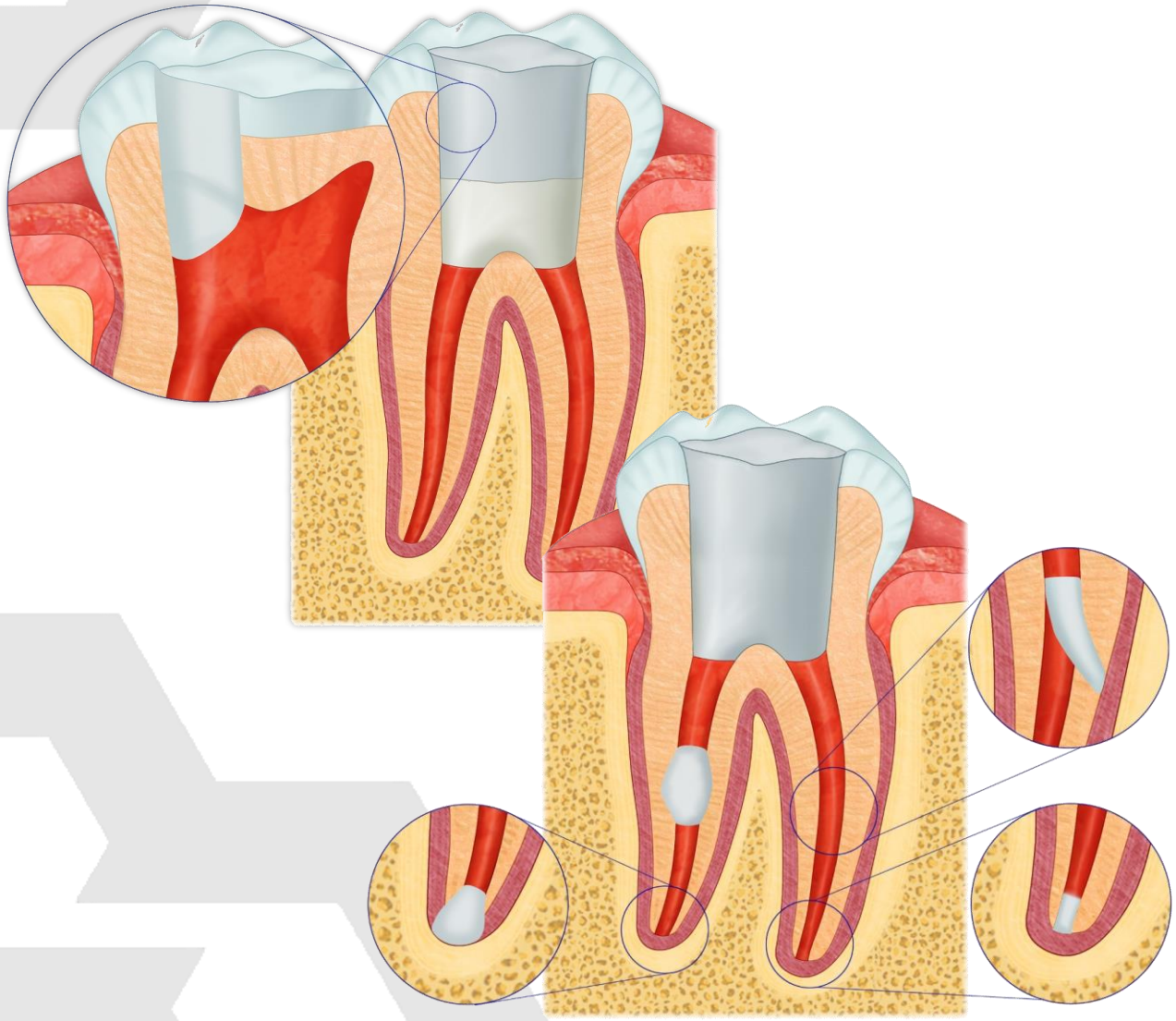
SmartMTA

Chemical Name	Content (wt%)
Calcium Carbonate ($CaCO_3$)	60-80
Silicon Dioxide (SiO_2)	5-15
Aluminum Oxide	5-10
Calcium Zirconia Complex	20-30
Total	100

SmartMTA Uses

- Indirect Pulp Cap
- Direct Pulp Cap
- Pulpotomy (Full/Partial)

- Regenerative Endodontics
- Obturation
- Apexification
- Perforation Repair^
- Apicoectomy^



Properties of SmartMTA

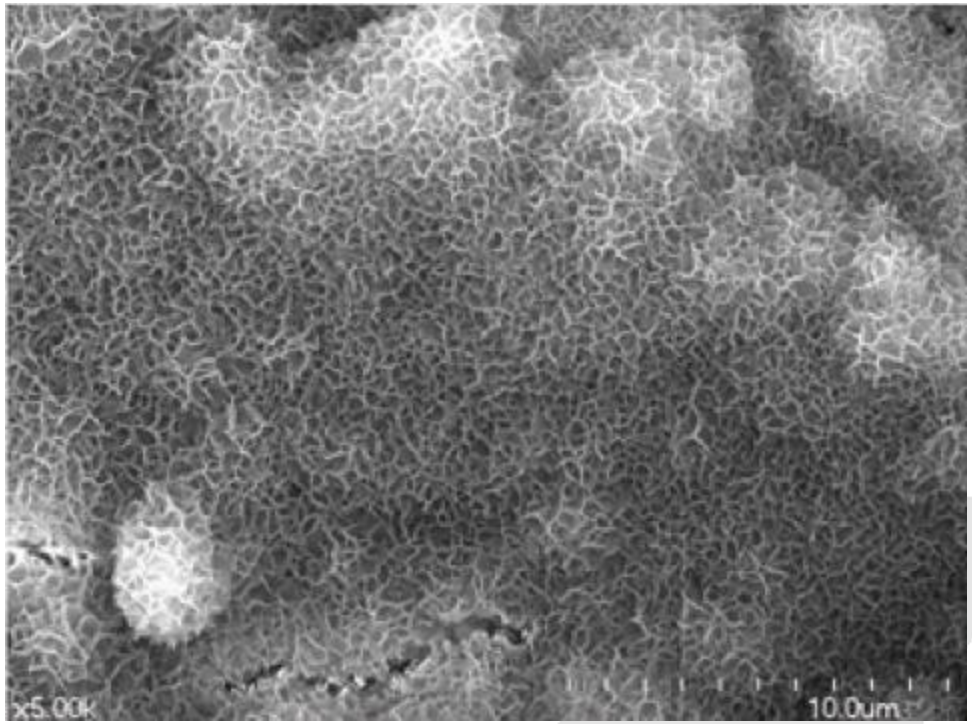
Advantages

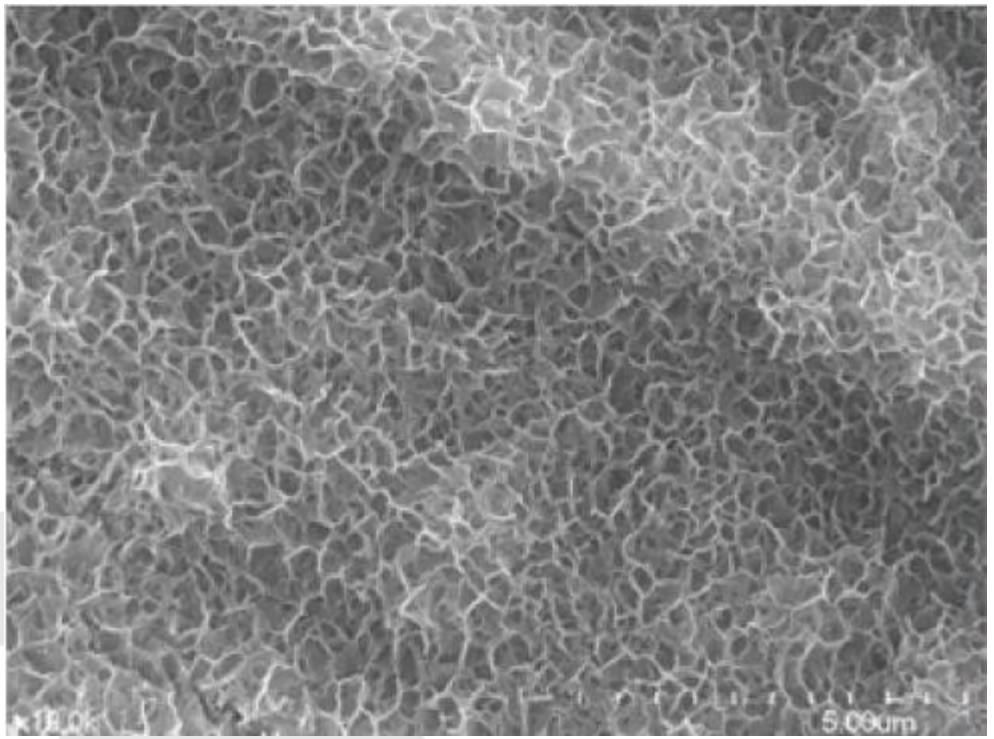
- Faster Bridging than Calcium Hydroxide
- Bioactive, Mineral Tags Form
- Biocompatible (Non-Toxic)
- Antibacterial (basic pH)
- Rapid Setting Time
- Easier Handling
- No Staining
- No Heavy Metals (Cr, As, Ni, Bi, Fe, Cd)
- Economical

Disadvantages

- Hand Mixed*

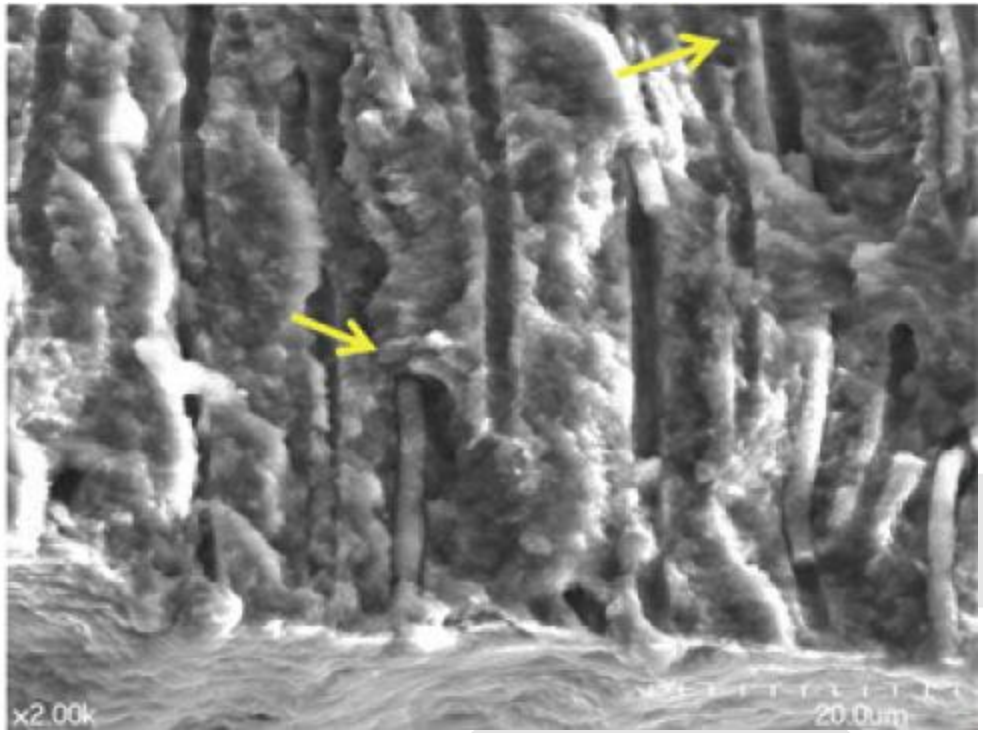
Faster Bridging

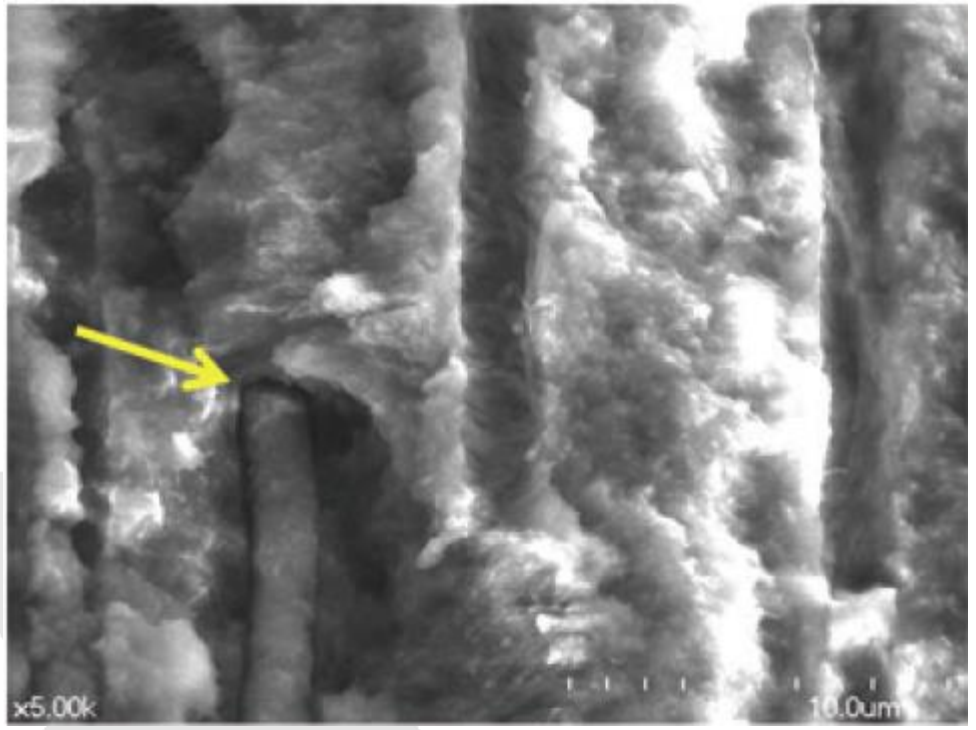




Manufacturer Data

BIOACTIVE



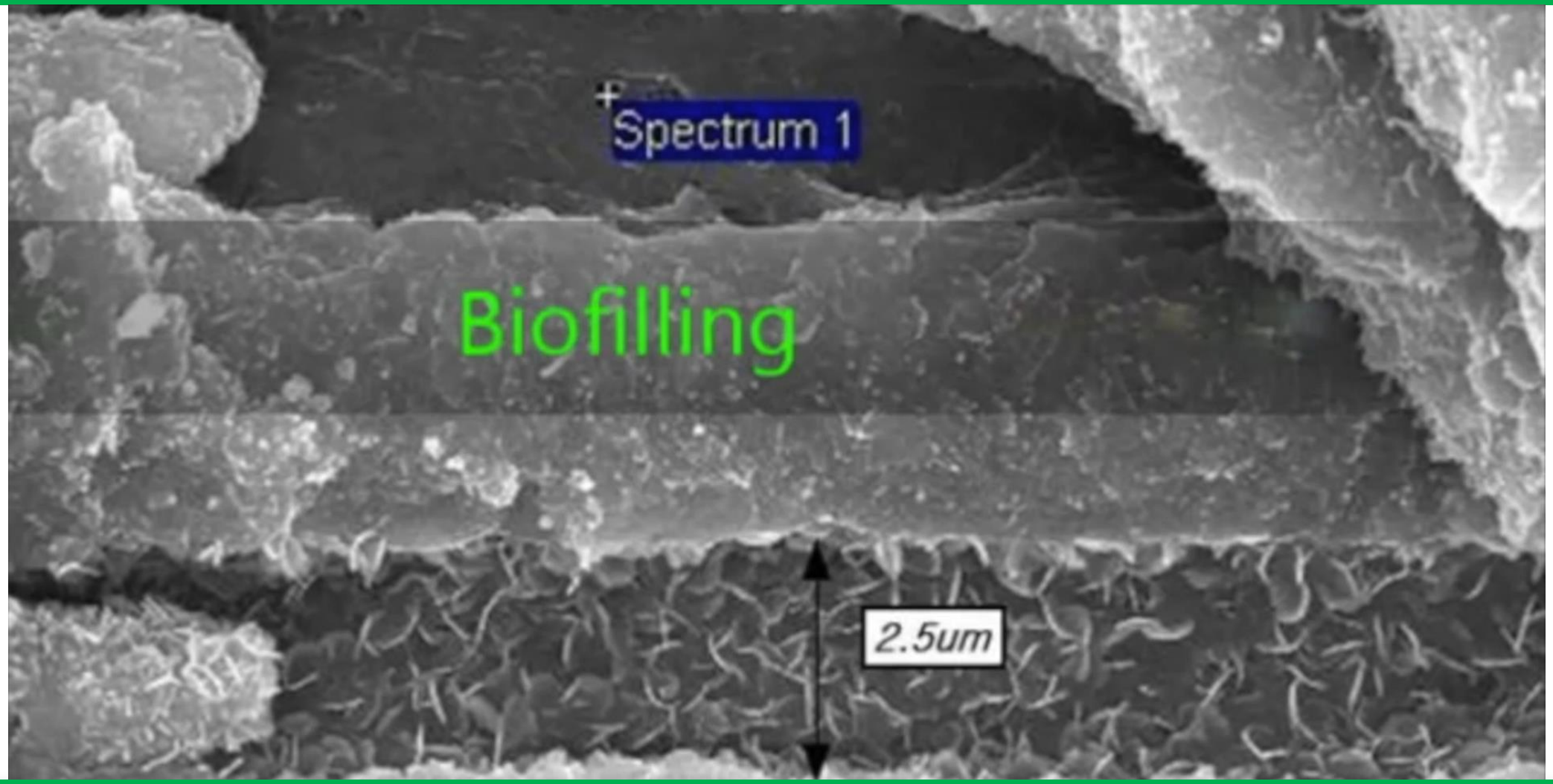


Manufacturer Data

Int J Oral Sci. 2014 Dec;6(4):227-32.

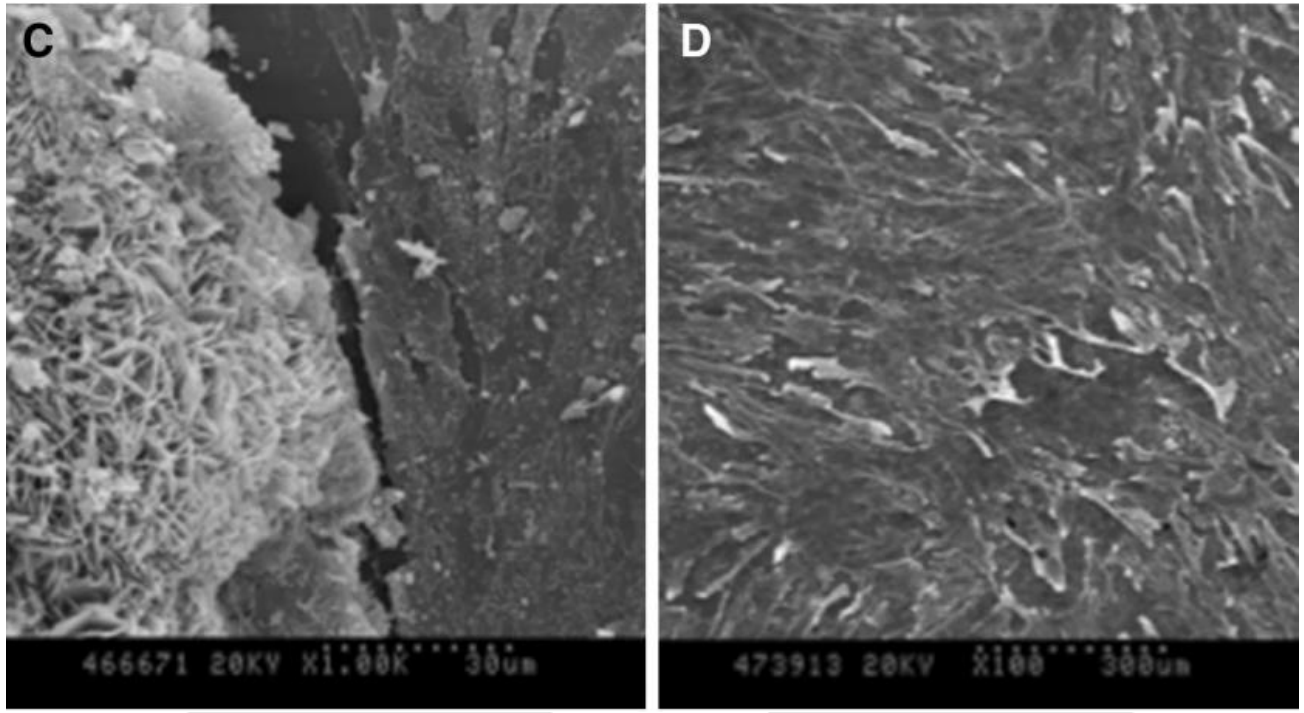
Bacterial entombment by intratubular mineralization following orthograde mineral trioxide aggregate obtuation: a scanning electron microscopy study.

Yoo JS, Chang SW, Oh SR, et al



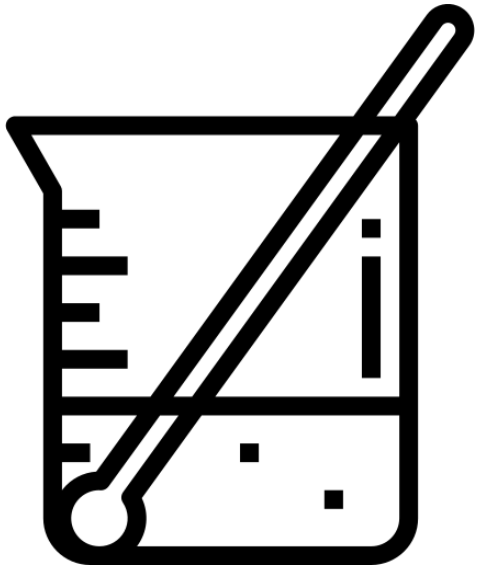
Courtesy Dr. Kee-Yeon Kum, Dr. George Bogen

Biocompatible

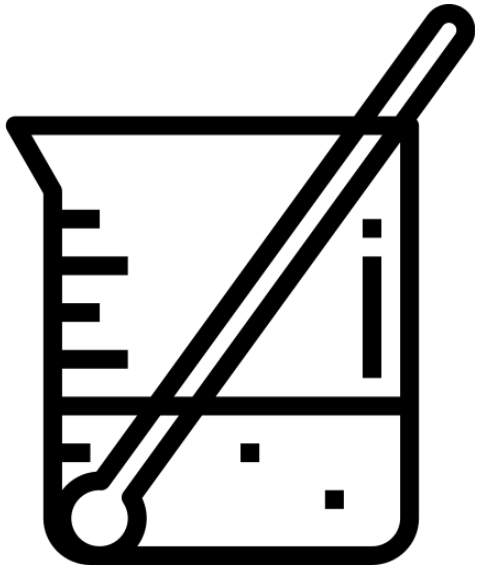


Manufacturer Data

Basic pH

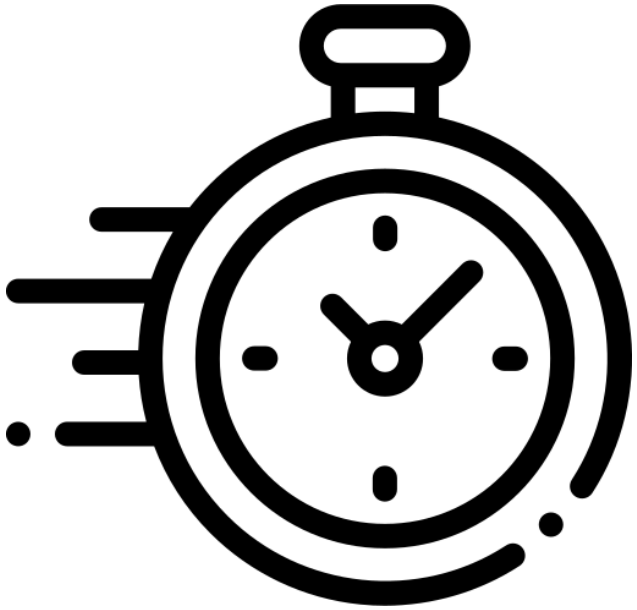


12.5
Initial pH

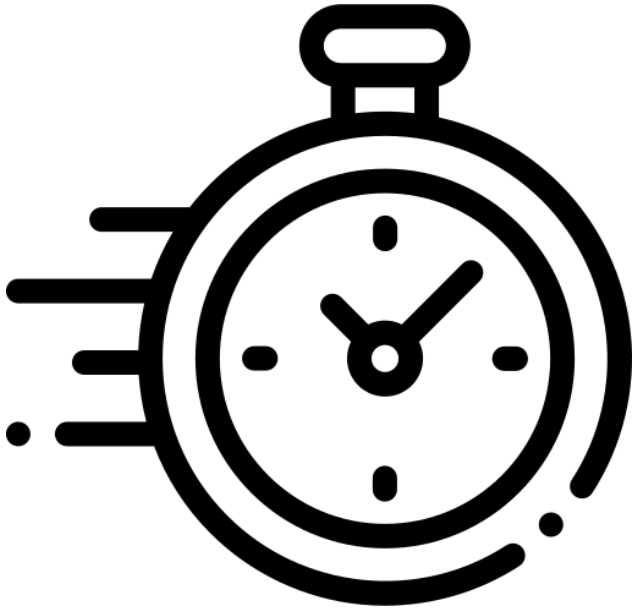


7.8-8.0
Final pH (4 weeks)

Rapid Setting Time



Initial
150 Seconds



Final
360 Minutes

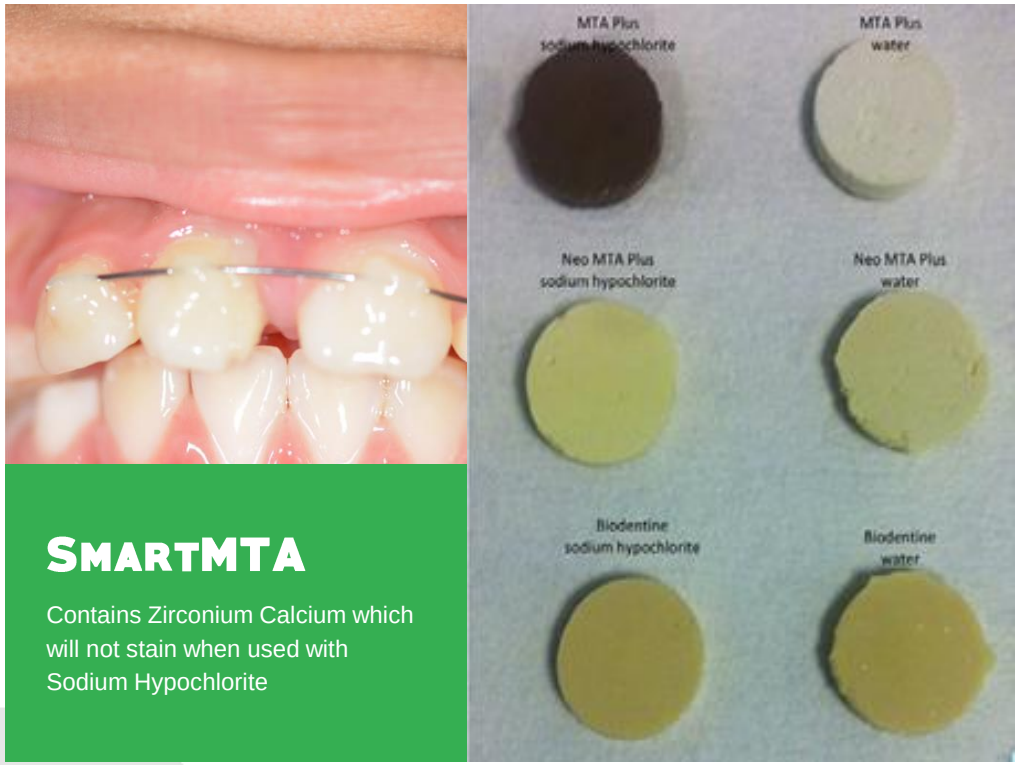
Easy Handling


No Discoloration

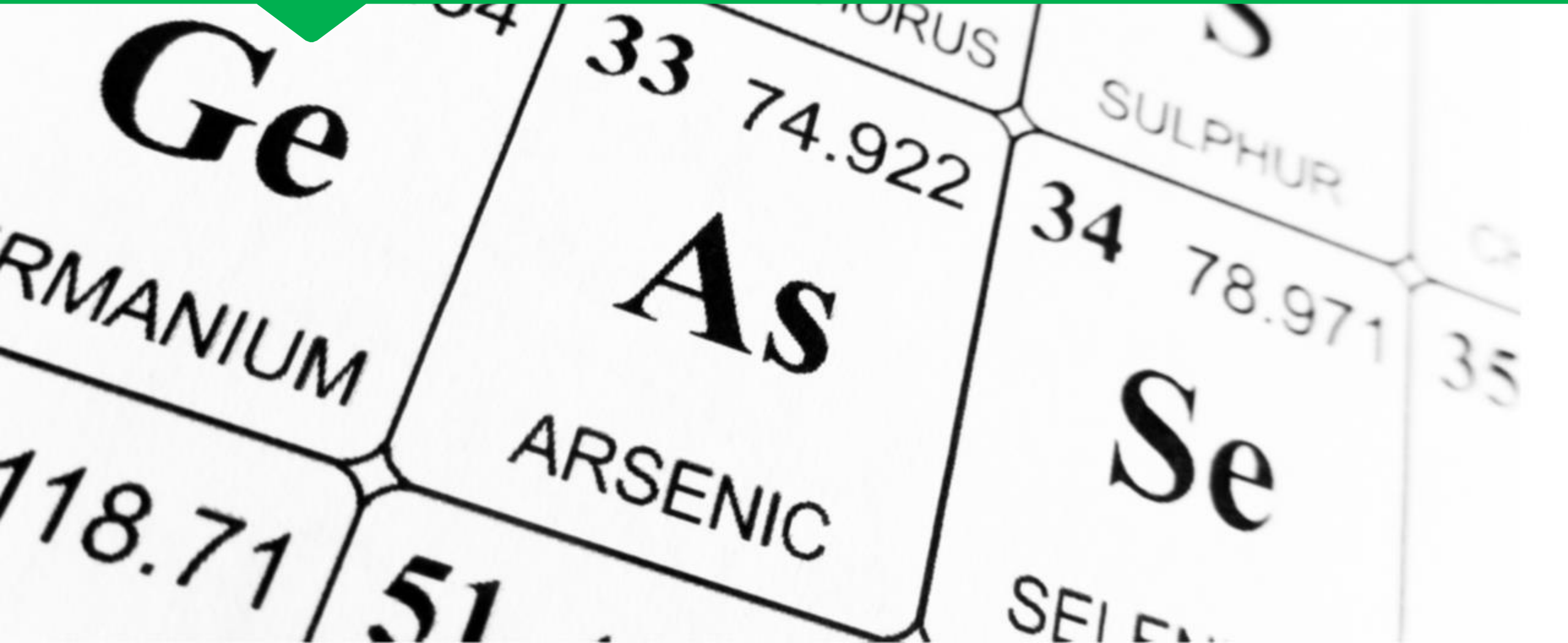

ProRoot MTA Discoloration

J Endod. 2015 Jul;41(7):1139-45.
Staining Potential of Neo MTA Plus, MTA Plus, and Biodentine Used for Pulpotomy Procedures.
Camilleri J

- Radiopaquers
  - Bisthmus Oxide
    - Stains when combined with NaOCl
  - Zirconium Oxide
    - Biodentine
  - Tantalum oxide
    - NeoMTA Plus



No Heavy Metals



Economical

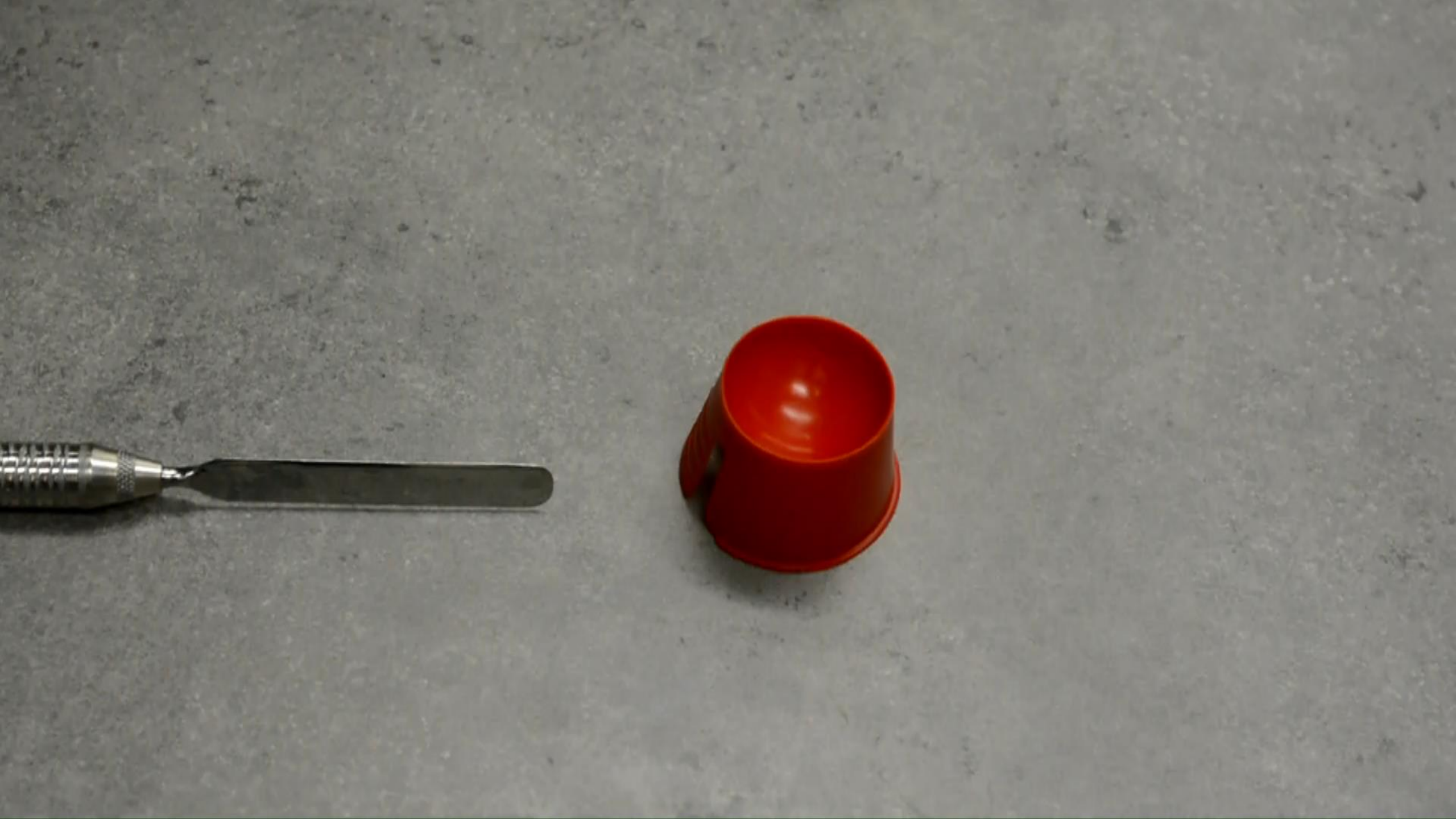
As low as

$5

per dose

SmartMTA Wetting

1. Open the SmartMTA
2. Place powder on a mixing pad or glass slab
3. Use 2 free flowing drops of liquid
4. Wet it gently for 40 seconds (Do Not Mix)
5. Wait until the shine disappears
6. Load into an amalgam carrier



Too Wet

- Apply a dry cotton pellet for 120 seconds

Too Dry

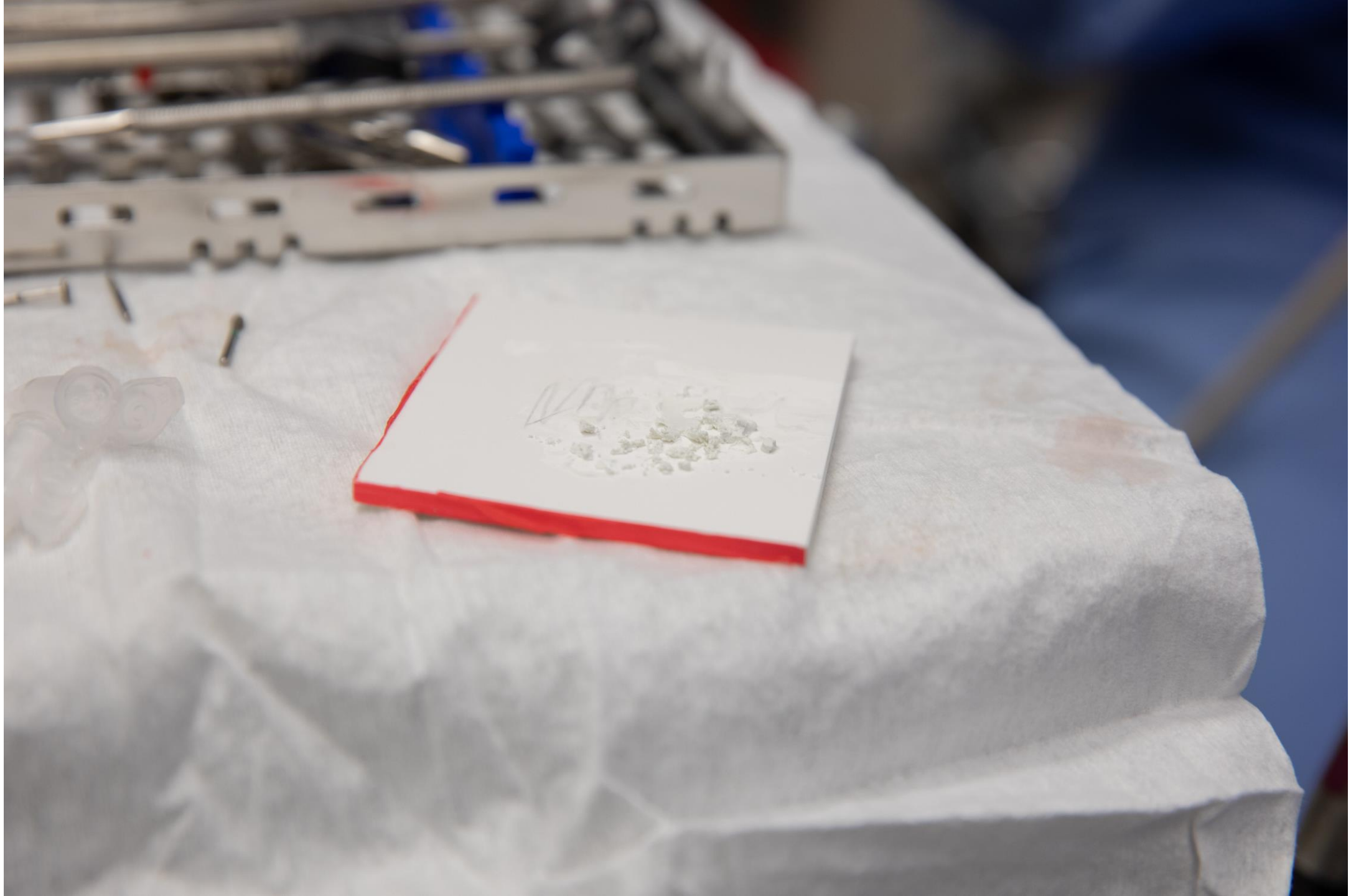
- Apply wet cotton pellet for 120 seconds

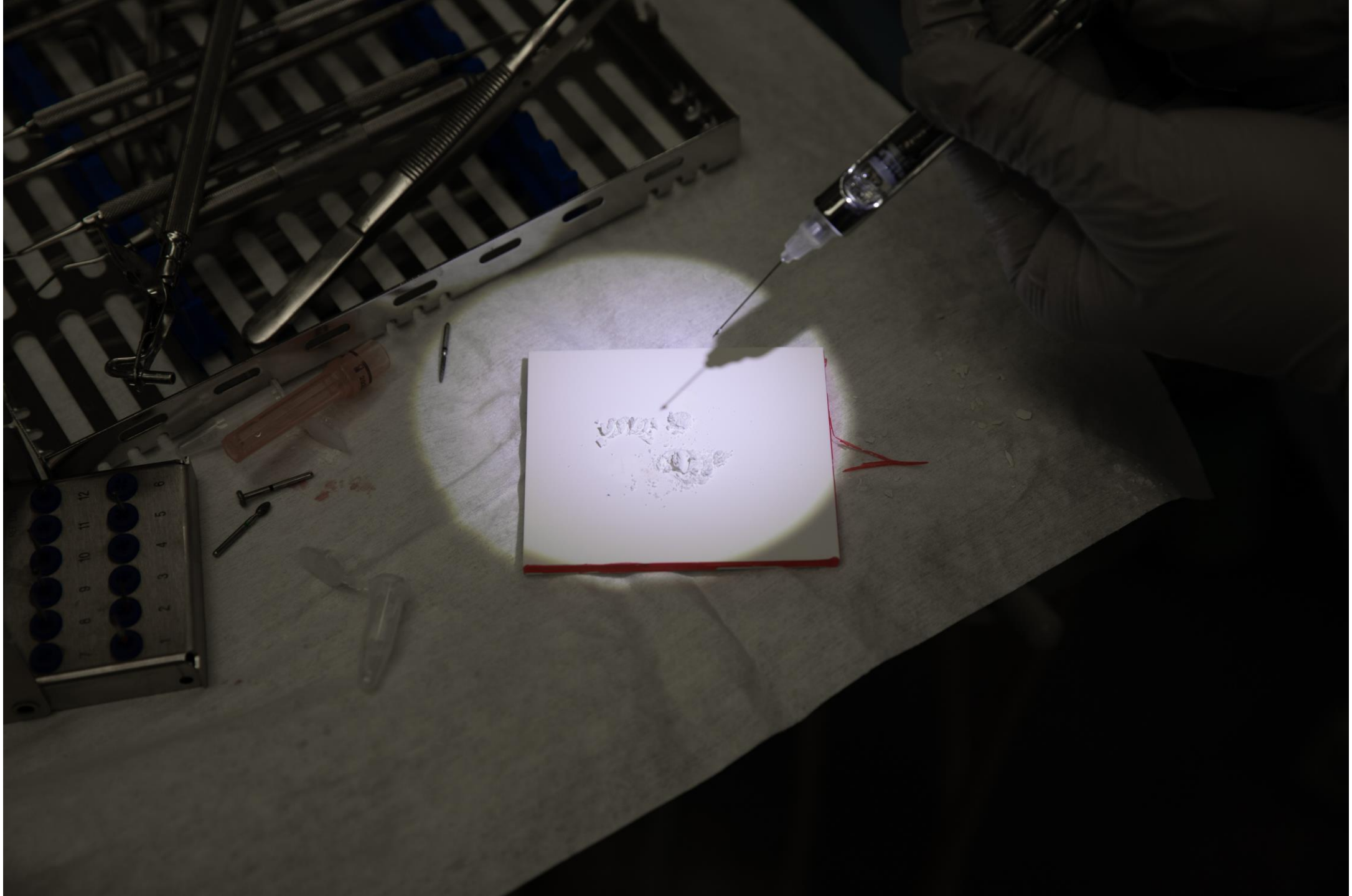
Off Label Wetting

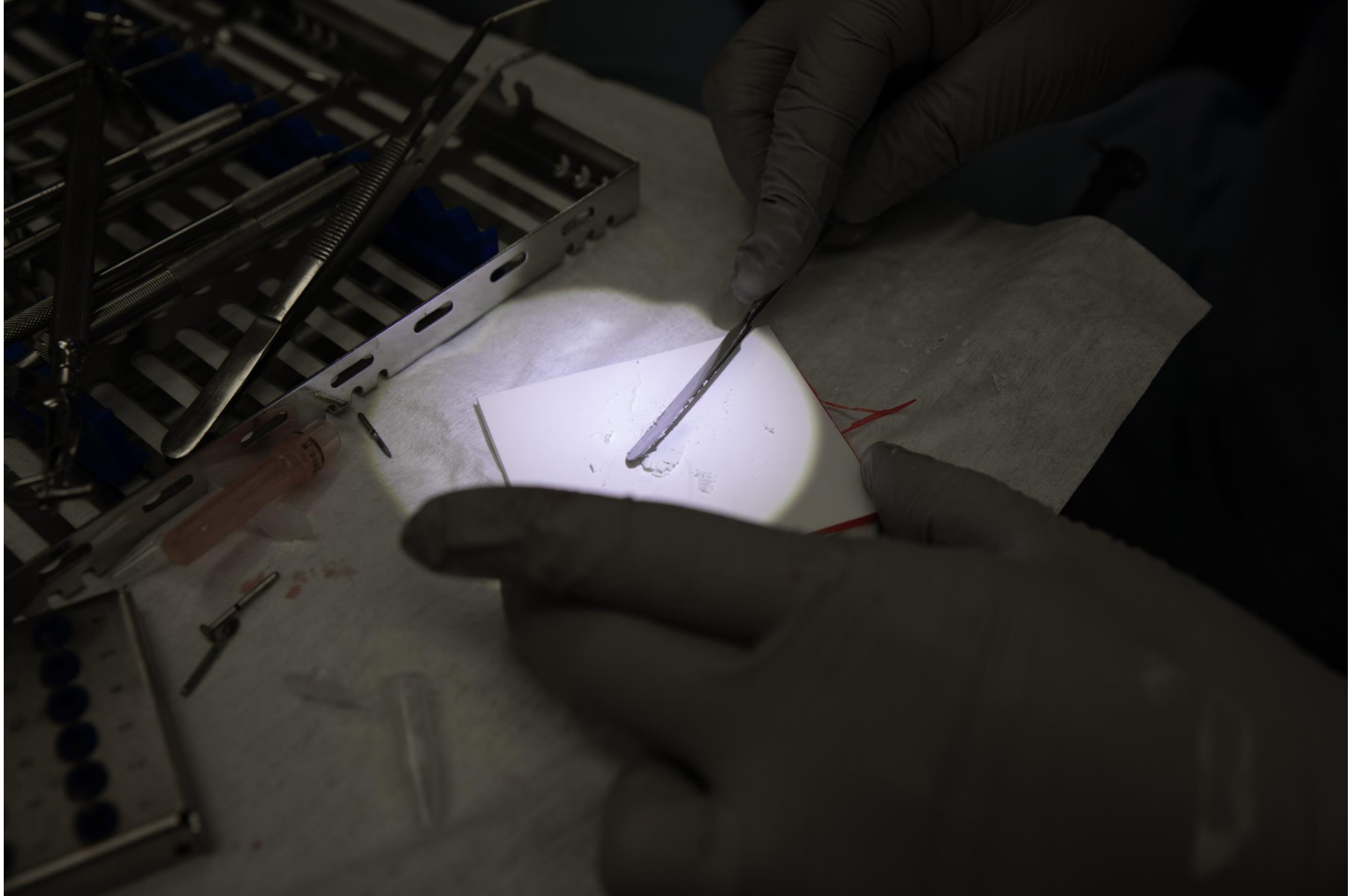
1. Open the SmartMTA
2. Place powder on a mixing pad or glass slab
3. Use 10-15 drops of local anesthetic
4. Wet it gently for 40 seconds (**Do Not Mix**)
5. Wait until the shine disappears
6. Load into an amalgam carrier

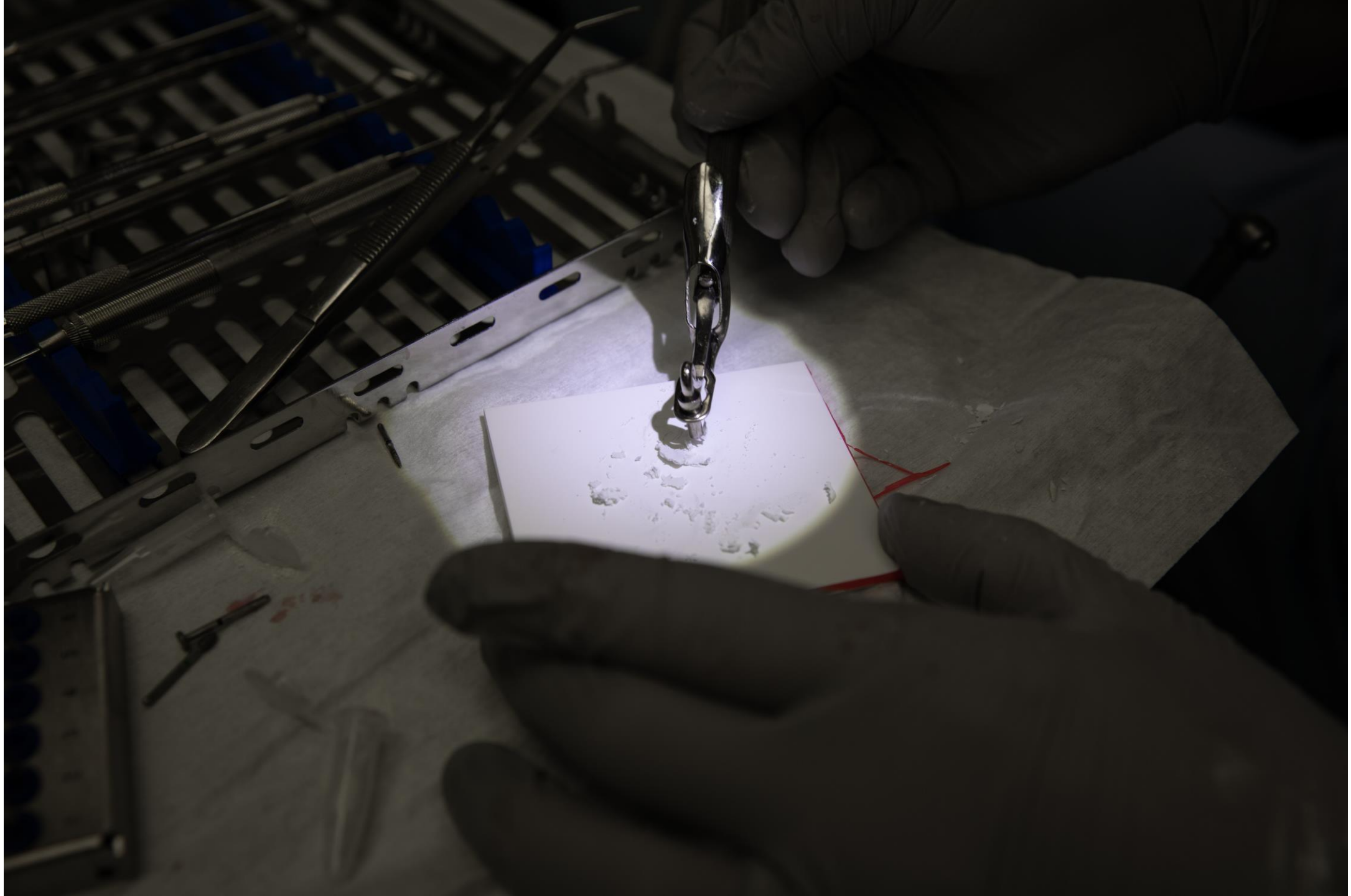
Speedy Mixing

- Faster
- Alters Setting Time (Increases)
- Requires RMGI/GI Top Coat





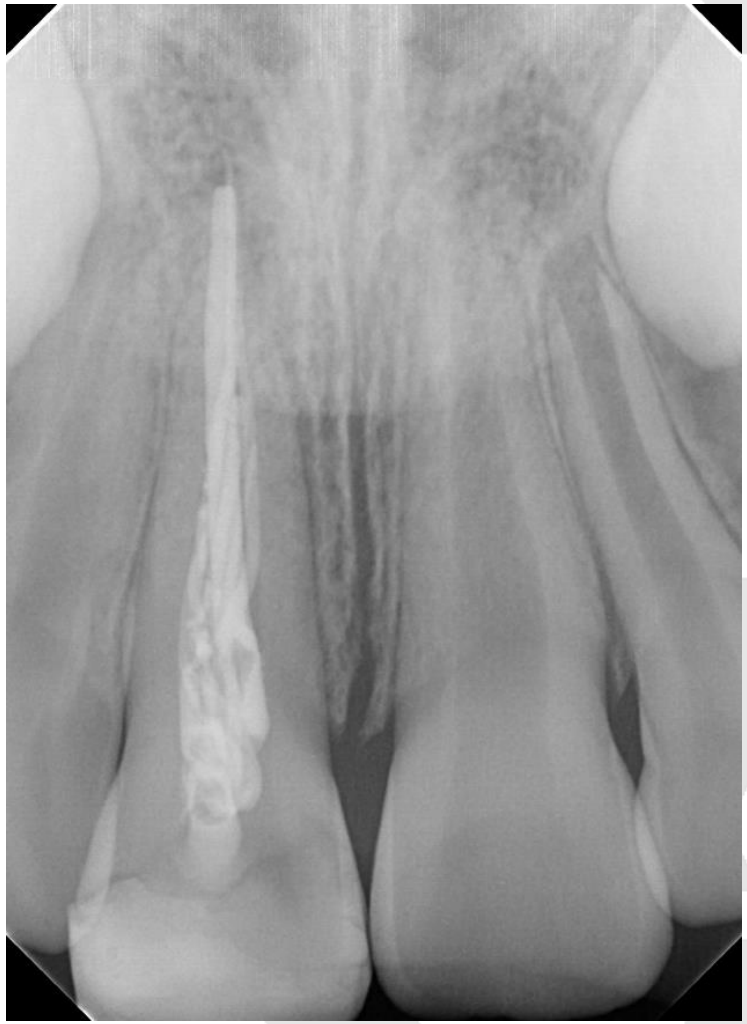


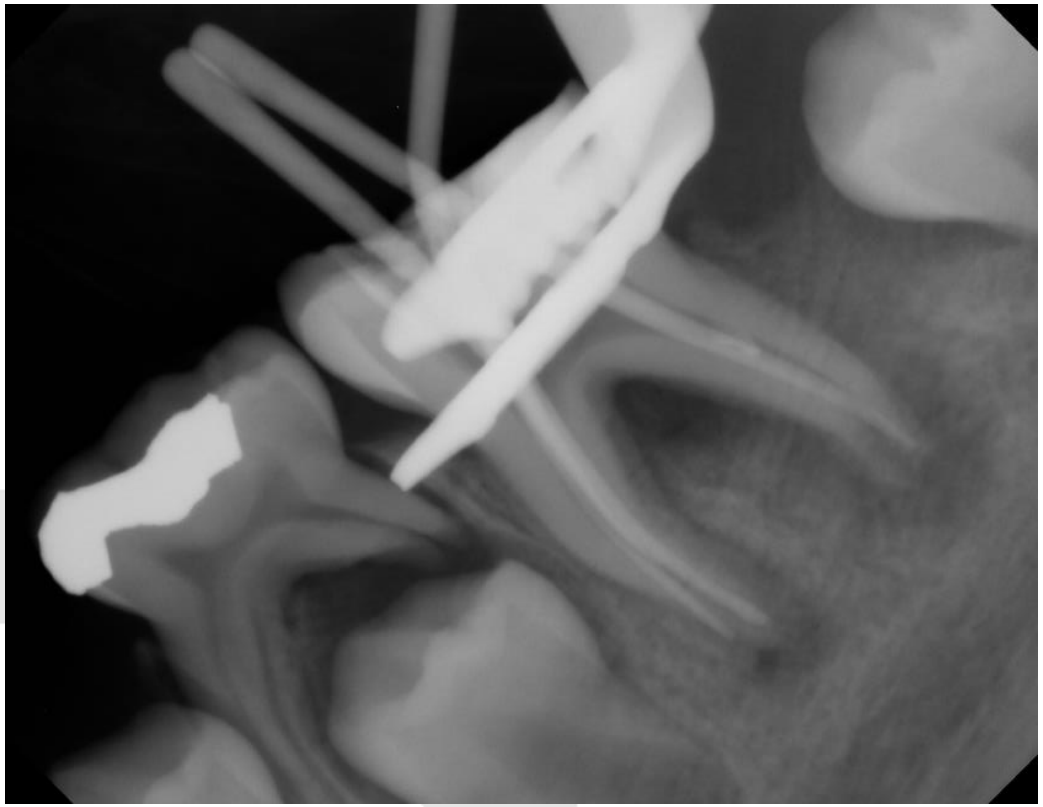


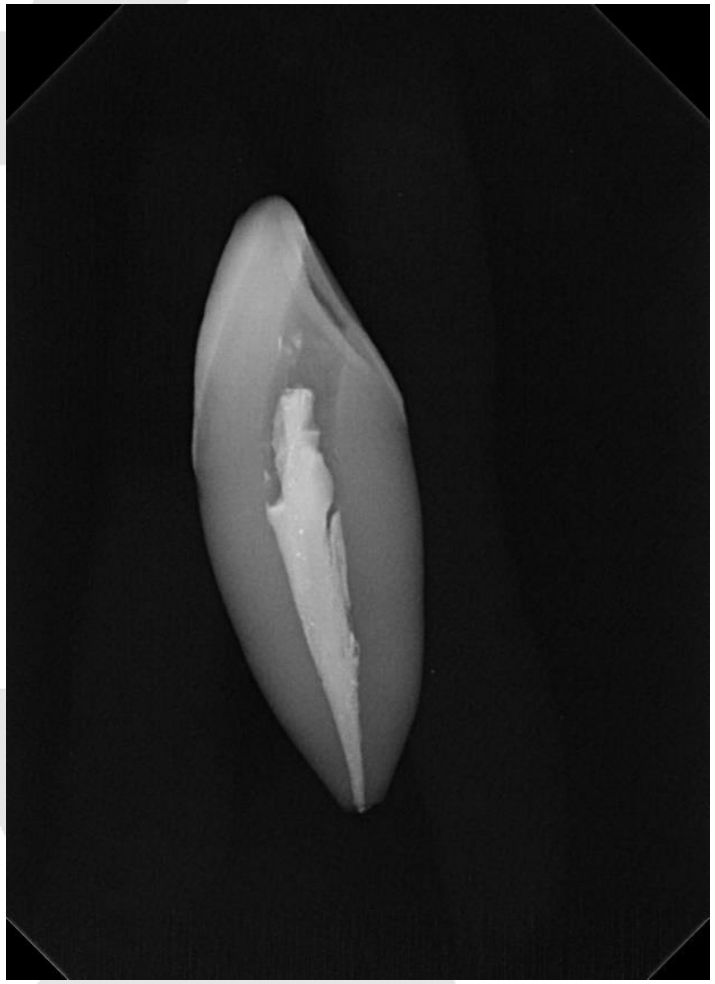
Diagnosis

Terminology

- Apexogeneisis
  - Histological term used to describe continued physiological development and formation of the root's apex
- Apexifiation (Apical Barrier)
  - Method of inducing root end closure of incompletely formed permanent tooth by removing the coronal and non-vital radicular tissue short of the root end







Clinical Tip

Use permanent teeth that should have the same developmental stage for comparison or root development for sensibility testing.

Pulpal Diagnosis

Diagnosis	Findings
Normal	Asymptomatic, normal response
Reversible Pulpitis	Inflammation is capable of healing
Asymptomatic Irreversible Pulpitis	Inflammation is incapable of healing; no clinical symptoms
Symptomatic Irreversible Pulpitis	Inflammation is incapable of healing; with clinical symptoms
Pulp Necrosis	Pulpal death; non-responsive to testing
Previously Treated	Endodontically treated tooth
Previously Initiated Therapy	Partial endodontic therapy has been started (pulpotomy/pulpectomy)

Periapical Diagnosis

Diagnosis	Findings
Normal Apical Tissues	Normal response to percussion and palpation, lamina dura intact and normal PDL
Asymptomatic Apical Periodontitis	Apical radiolucency without symptoms
Symptomatic Apical Periodontitis	Symptomatic to percussion and palpation, may or may not have apical radiolucency
Acute Apical Abscess	Symptomatic, swelling of tissues present
Chronic Apical Abscess	Minimal symptoms, sinus tract present
Condensing Osteitis	Diffuse radiopaque lesion around apex

Normal Pulp or Reversible Pulpitis

- Carious Lesion or Trauma
- No Swelling/Sinus Tract
- No Spontaneous Pain
- No Mobility
- Positive to Vitality Testing
- No Apical Pathology*
  - Apical Lesion
  - Widened PDL
- No Calcifications?
- Adequate Remaining Dentin Thickness (RDT)^, for IPT

Deep Carious Lesion/Trauma

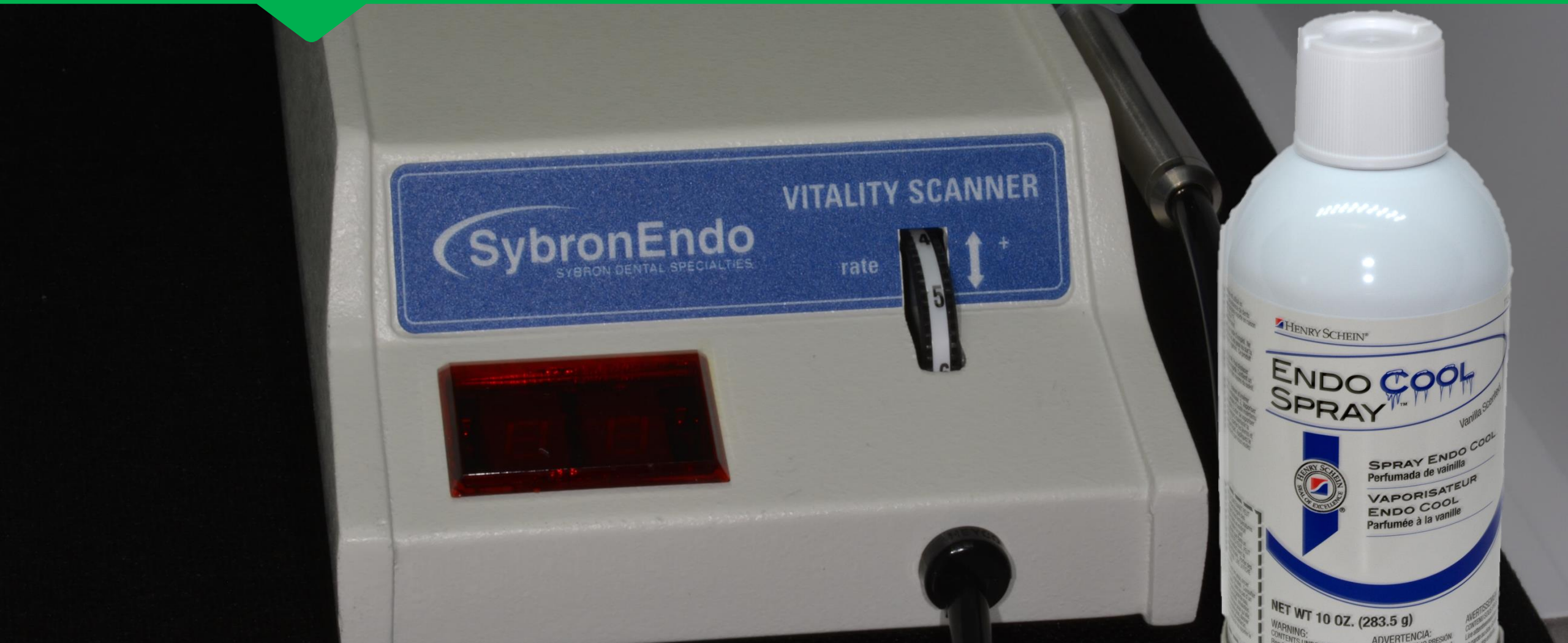
No Swelling

No Sinus Tract

No Spontaneous Pain, or History

No Mobility

Positive to Vitality Testing



Diagnostic Tests

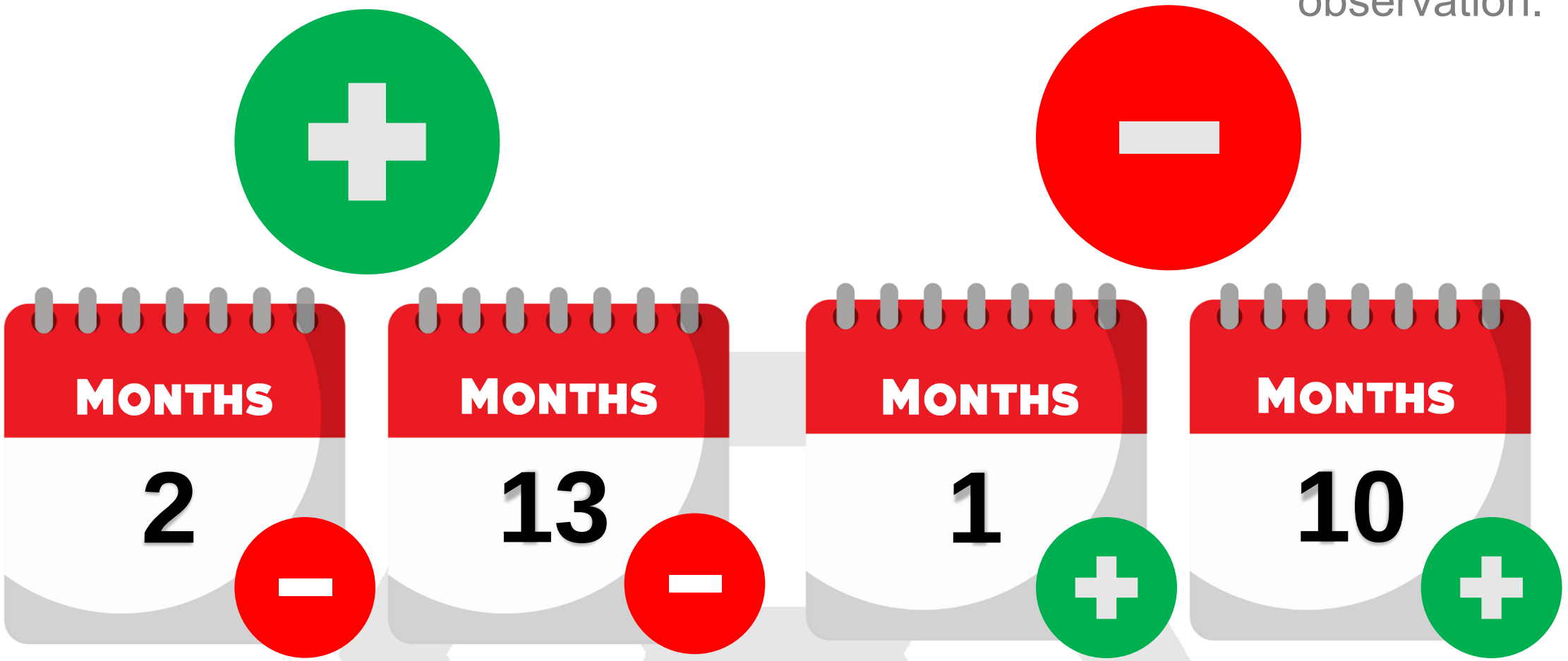
- Cold
- EPT
- Percussion
- Palpation

Clinical Tip

Cold is the more reliable diagnostic pulp test for immature permanent teeth.

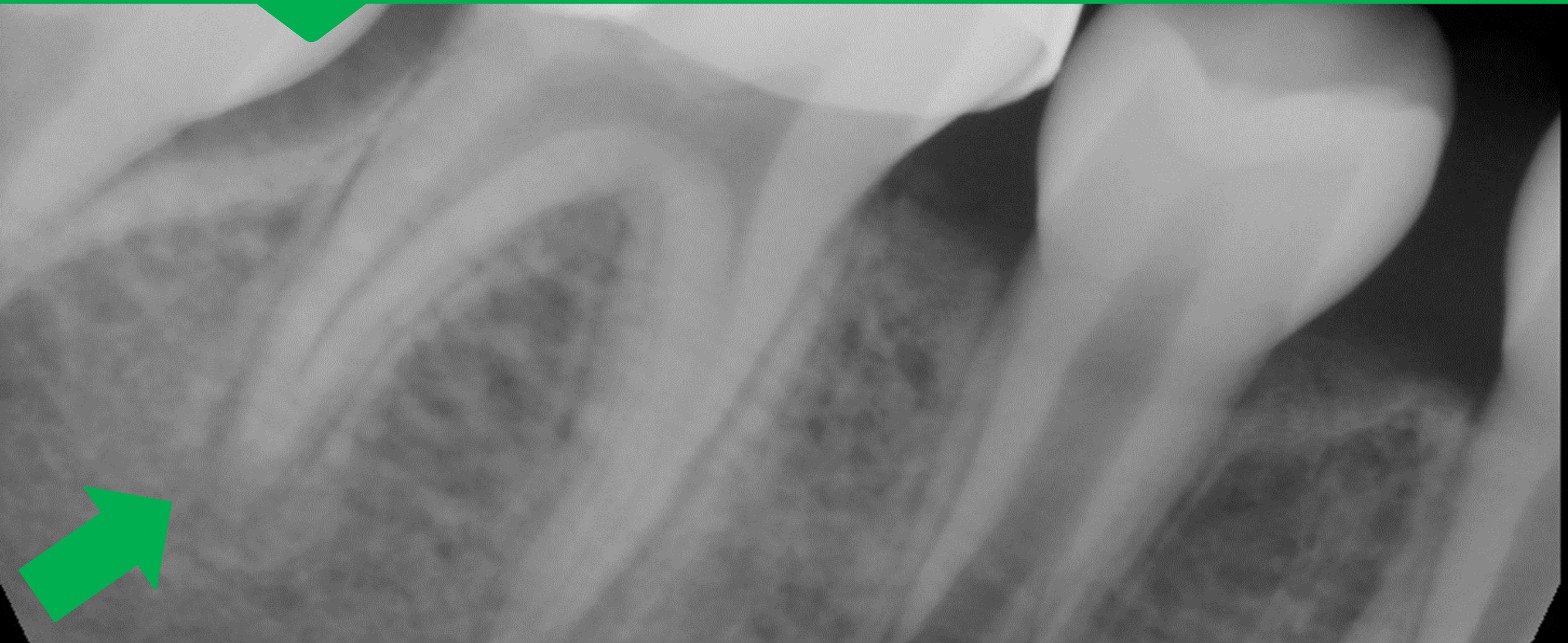
Post Trauma Testing

"Root canal therapy should not be performed in young individuals before pulp vitality has proved absent during a considerable period of observation."



No Apical Pathosis (Furcal/Apical Lesion)

No Apical Pathosis (Widened PDL)



No Calcifications

Adequate Remaining Dentin Thickness (RDT)

Indirect Pulp Therapy (IPT)

Oral Surgery, Oral Medicine, Oral Pathology. 1963;20(3):340-349.
The effects of surgical exposures of dental pulps in germ-free and conventional laboratory rats.
Kakehashi S, Stanley R, Fitzgerald RJ.

Canon

noun

the body of rules, principles, or standards accepted as axiomatic and universally binding in a field of study or art:

- The major determinant in pulpal healing is the presence or absence of a microbial flora.

09/06/2013

09/30/2013
2 Weeks

11/25/2013
2 Months

01/28/2014
4 Months

09/06/2013

09/16/2013
CaOH Placment

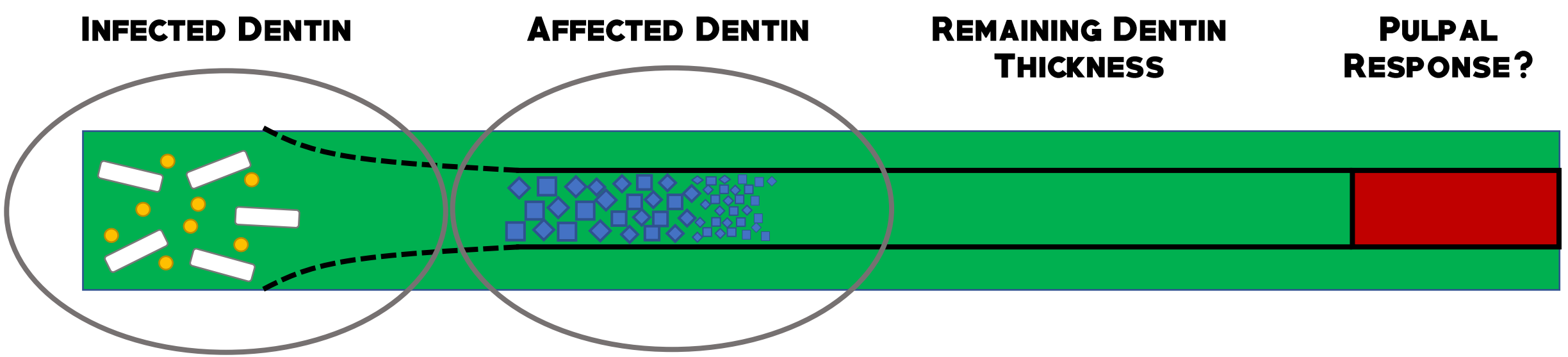
09/30/2013
2 Weeks

11/25/2013
2 Months

01/28/2014
4 Months

02/03/2014
4 Months

Preservation and Restoration of Tooth Structure. 2nd ed: Knowledge Books and Software; 2005.
Mount G, Hume W.



Oral Surg. 1977;43(6):929-947.
The affected and infected pulp.
Massler M, Pawlak J.

9 Lesions

Superficial Active Lesions

(< ¼ dentin thickness)

- Changes in the Odontoblast Layer
- Pulp Appeared Unaltered

11 Lesions

Moderately Deep Active Lesions

(¼ to ½ dentin thickness)

- Reduced Odontoblast Layer
- Engorged capillaries, arterioles and venules

14 Lesions

Active Deep Lesions

(>¾ dentin thickness)

- Reparative Dentin
- Inflammation
- Loss of Cell Free Zone
- Radicular Pulp Appeared Normal or Less Involved

Oral Surg Oral Med Oral Pathol. 1966 Jul;22(1):59-65.
The relationship of bacterial penetration and pulpal pathosis in carious teeth.
Reeves R, Stanley HR.

The relationship of bacterial penetration and pulpal pathosis in carious teeth.

- > 1.1 mm
  - No pathologic changes
- < 0.5 mm
  - Pathologic pulpal changes

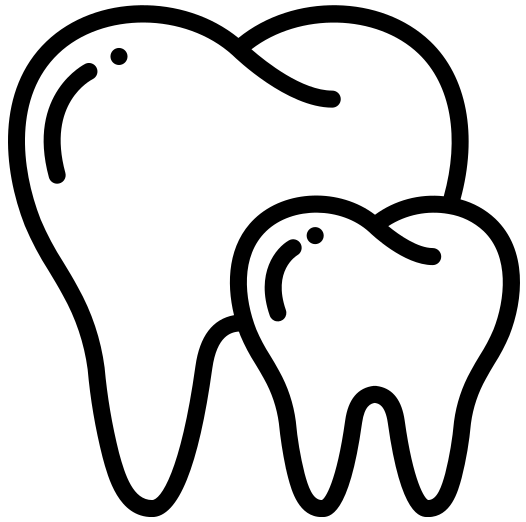
Indirect Pulp Therapy

- Incomplete Caries Removal
- Avoid Pulpal Exposure
- Seal Bacteria from Substrate
- Dentin Changes
- Tertiary Dentin, Dentin Sclerosis, Remineralization
- Types
  - No Re-entry (1 Visit)
  - Re-entry (2 Visit, Stepwise Caries Excavation)

J Dent Child. 1966 May;33(3):164-6.

Indirect Pulp Capping Success Verified

A Aponte, J Hartsook, M Crowley



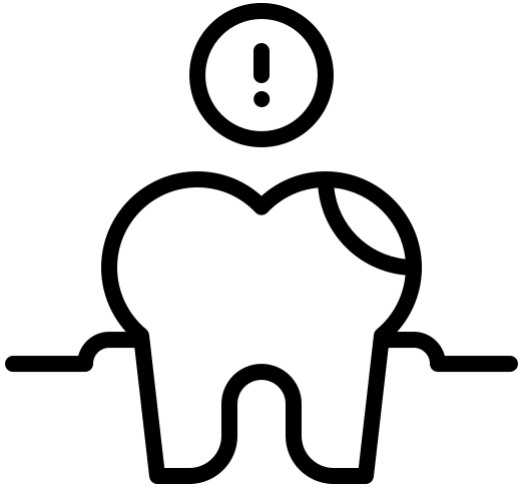
30

Primary Teeth

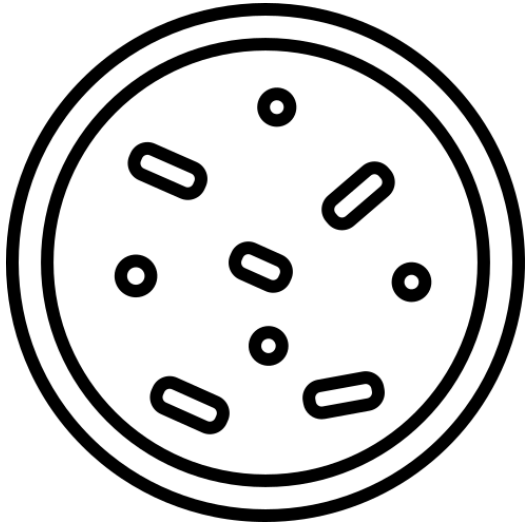
Bacteria Free

Dentin Bridges

J Amer Dent Assoc. April 1980;100:547-552.
Effect of Improved Dycal and IRM on bacteria in deep carious lesions.
Fairbourn D, Charbeneau G, Loesche W.



40
Primary Teeth

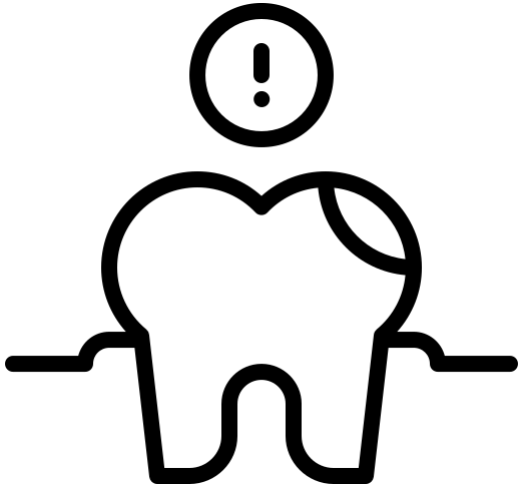


- Reduction in CFU/mg in both groups
- No difference between IRM and Dycal
- Re-entry may be unnecessary provided coronal seal is intact

Clin Oral Invest. 2009;13:465-471.

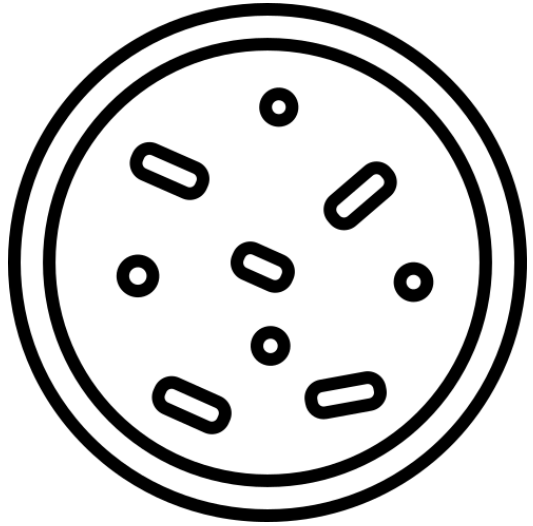
Clinical and microbiologic performance of resin-modified glass-ionomer liners after incomplete dentine caries removal.

Duque C, Negrini T, Sanco N, Spolidorio D, Alberto de Souza Costa C, Hebling J.



27

Primary Teeth

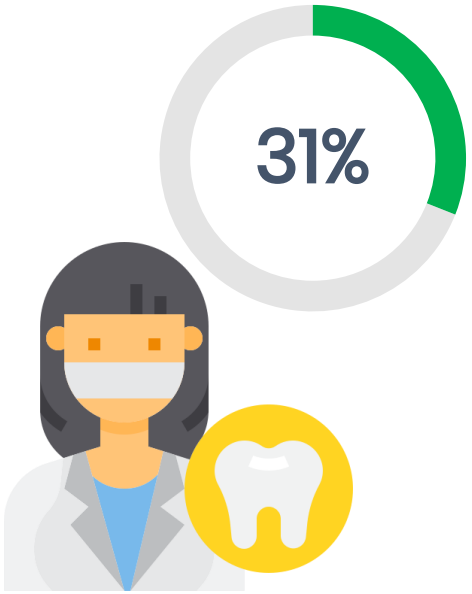


- Reduction in CFU counts all groups
  - $p<0.05$
- No difference in final CFU between the groups

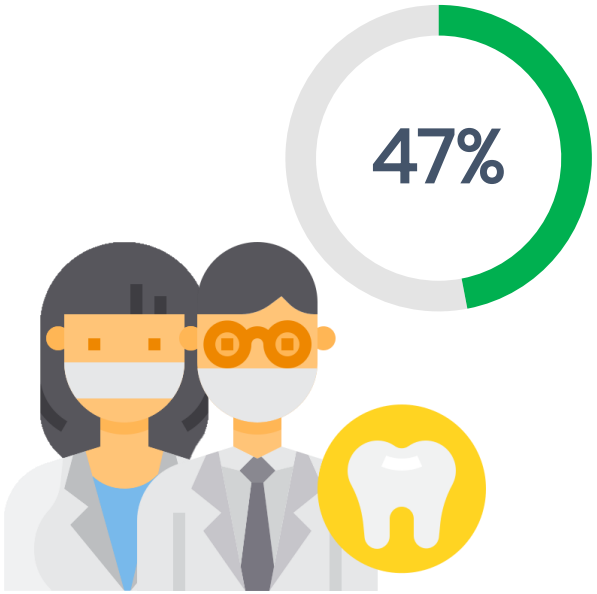
J Am Dent Assoc. 2017 Feb;148(2):64-74

General dentists', pediatric dentists', and endodontists' diagnostic assessment and treatment strategies for deep carious lesions: A comparative analysis.

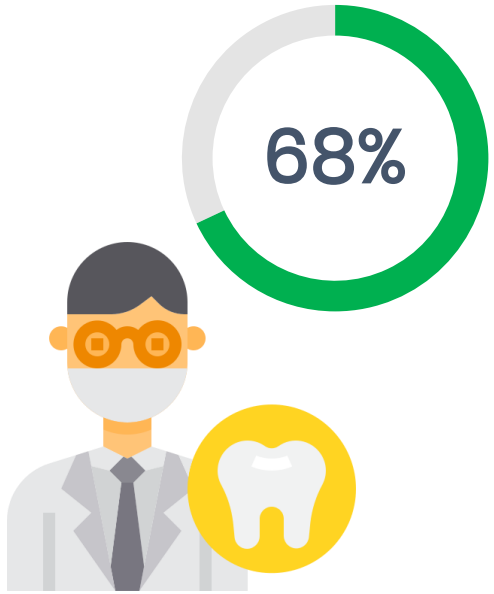
Koopaeei MM, Inglehart MR, McDonald N, Fontana M.



PEDIATRIC DENTISTS



GENERAL DENTISTS

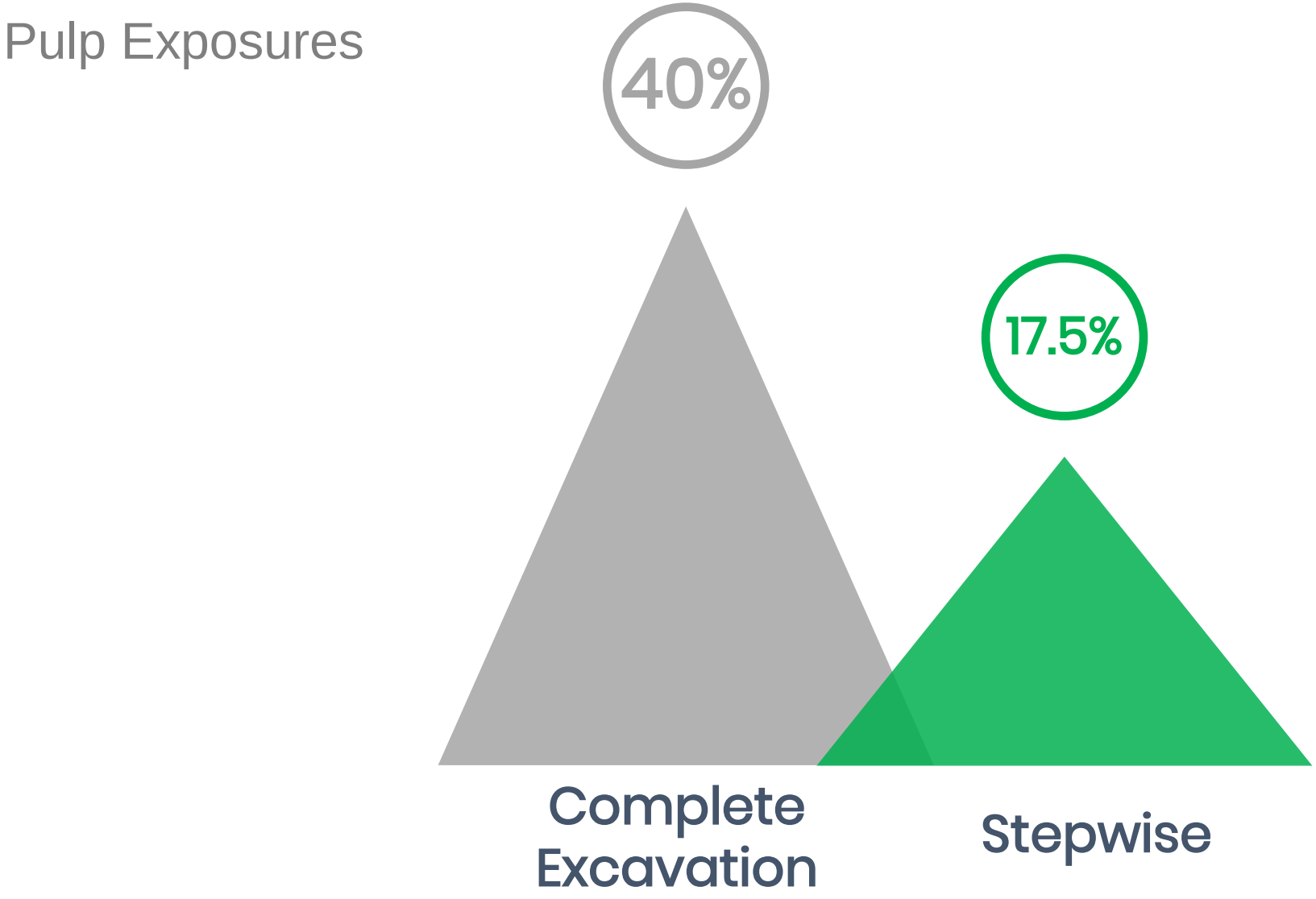


ENDODONTISTS

Endod Dent Traumatol. 1996;12:192-196.

Pulp exposure after stepwise versus direct complete excavation of deep carious lesions in young posterior permanent teeth.

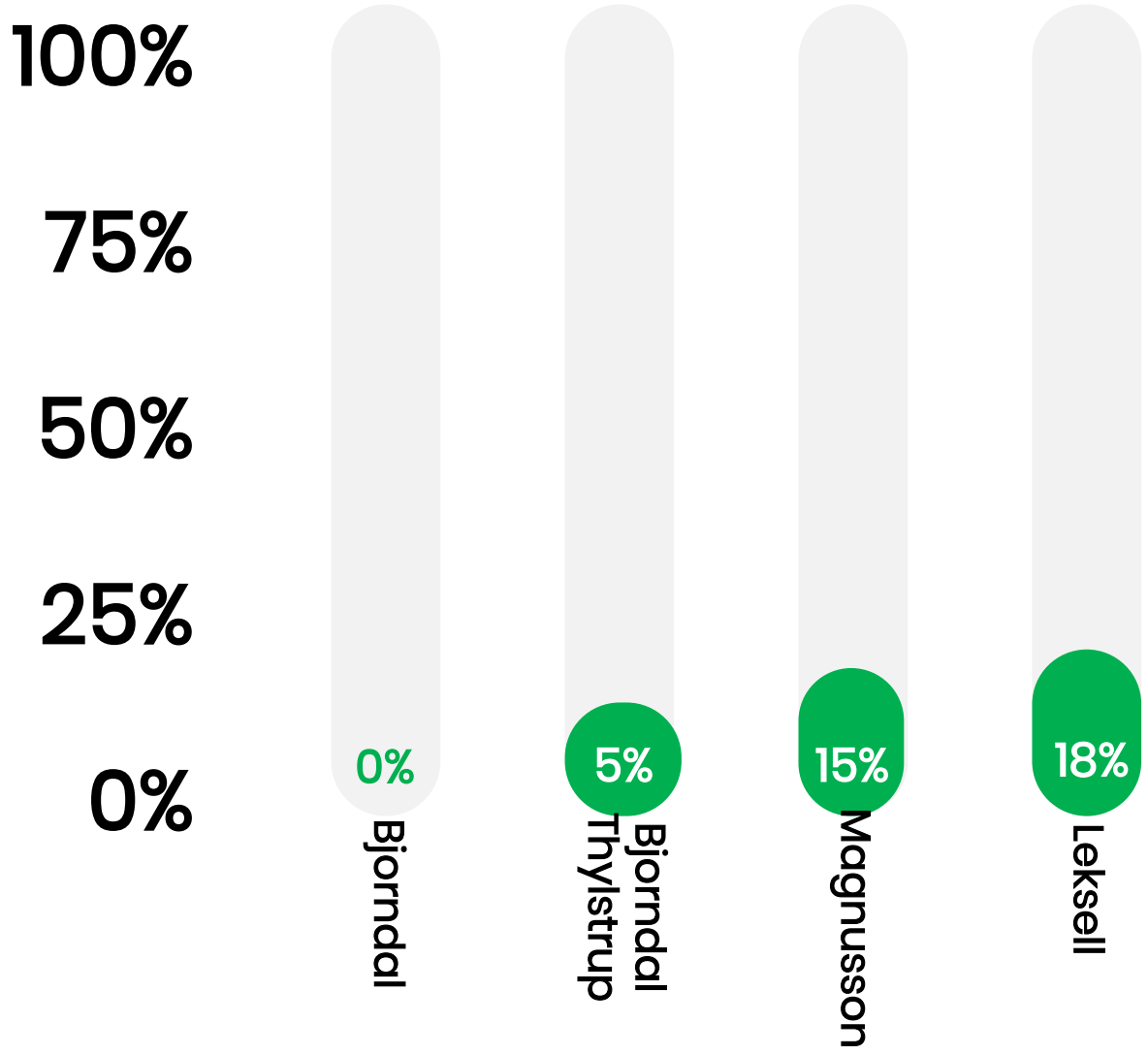
Leksell E, Ridell K, Cvek M, Mejare I.



Pediatr Dent. July/Aug 2010;32(4):347-355.

Pulp Exposure Occurrence and Outcomes after 1- or 2-visit Indirect Pulp Therapy Vs Complete Caries Removal in Primary and Permanent Molars.

Orhan A, Oz F, Orhan K.

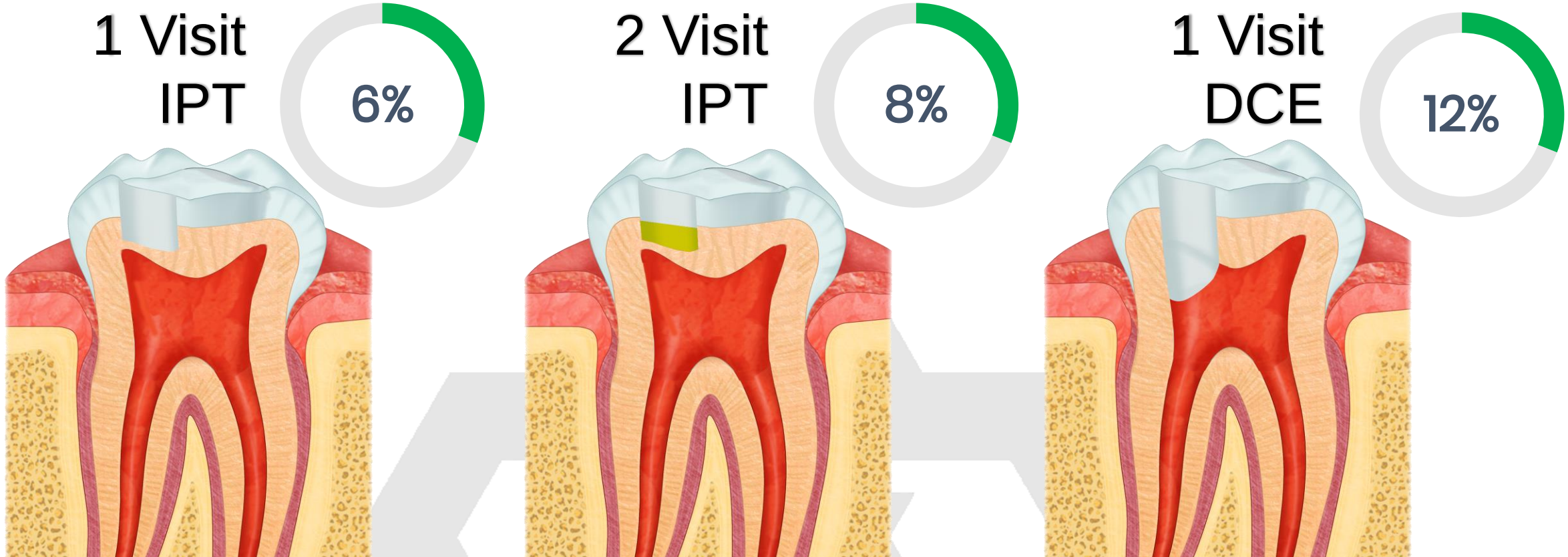


Pediatr Dent. July/Aug 2010;32(4):347-355.

Pulp Exposure Occurrence and Outcomes after 1- or 2-visit Indrect Pulp Therapy Vs Complete Caries Removal in Primary and Permanent Molars.

Orhan A, Oz F, Orhan K.

- Pulp Exposures (p=0.008)
- No difference in outcome at one year.



Clinical Tip

If there is a possibility of a pulp exposure use rubber dam isolation.
The rubber dam is the standard of care when performing vital pulp therapy.

Rubber Dam

- "**The use of rubber dam is universally accepted as a gold standard for pulp therapies.** […] it is critical **to use the rubber dam in order to maintain the highest standard of care** and to ensure patient safety."

AMERICA'S PEDIATRIC DENTISTS®

Rubber Dam Isolation

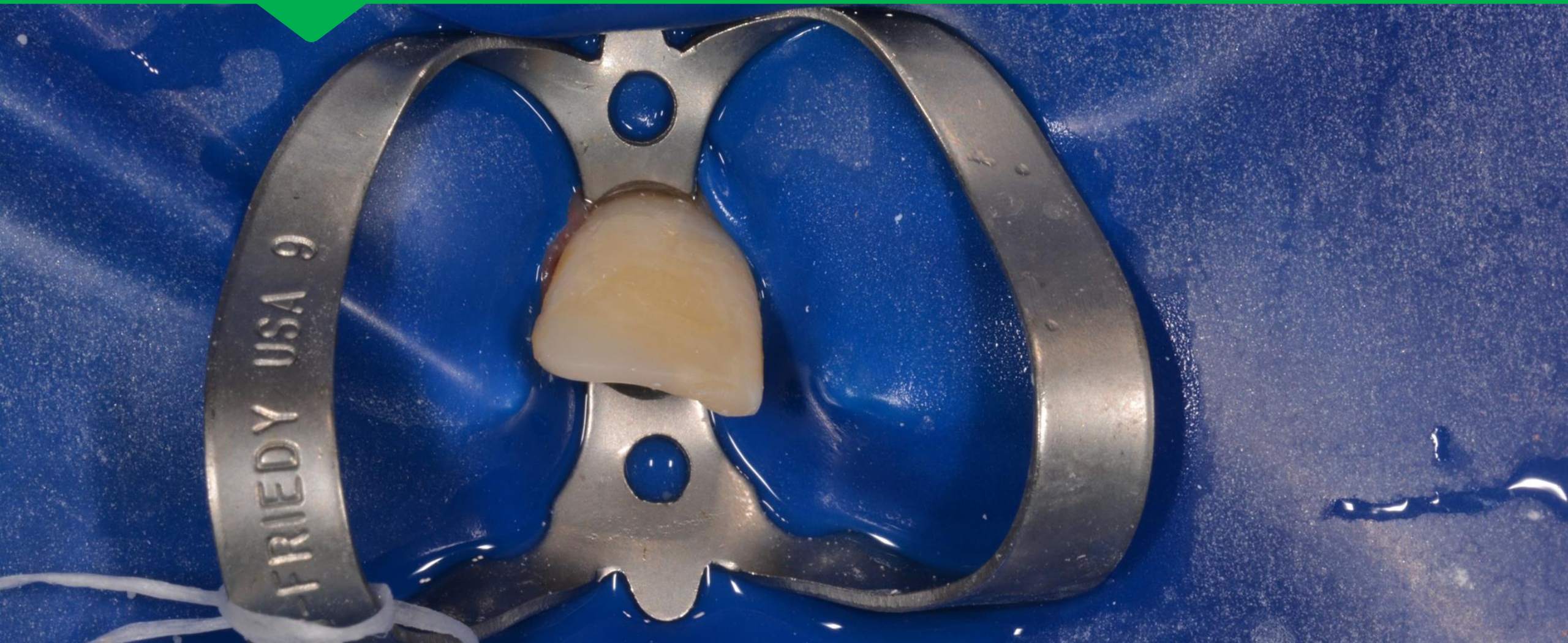
Advantages

- Isolation
- Visualization
- Retraction
- Material Properties
- Airway Protection
- Behavior Management
- Potentiates Sedatives (N2O/O2)

Disadvantages

- Claustrophobia
- Possible Airway Restriction
  - Obligate Nose Breather
  - Nasal Congestion
- Gag Reflex

Isolation

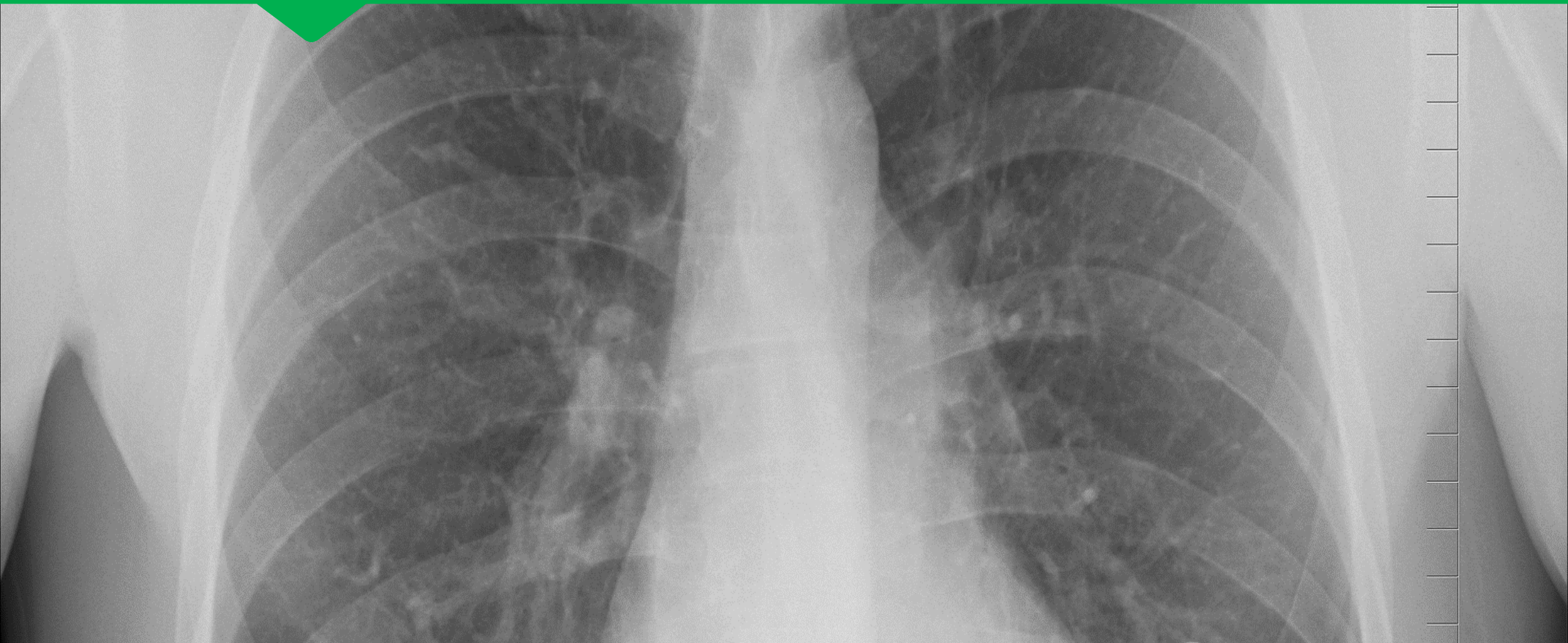


Visualization

Retraction

Material Properties

Airway Protection



Behavior Management

Potentiates Sedation (N_2O/O_2)

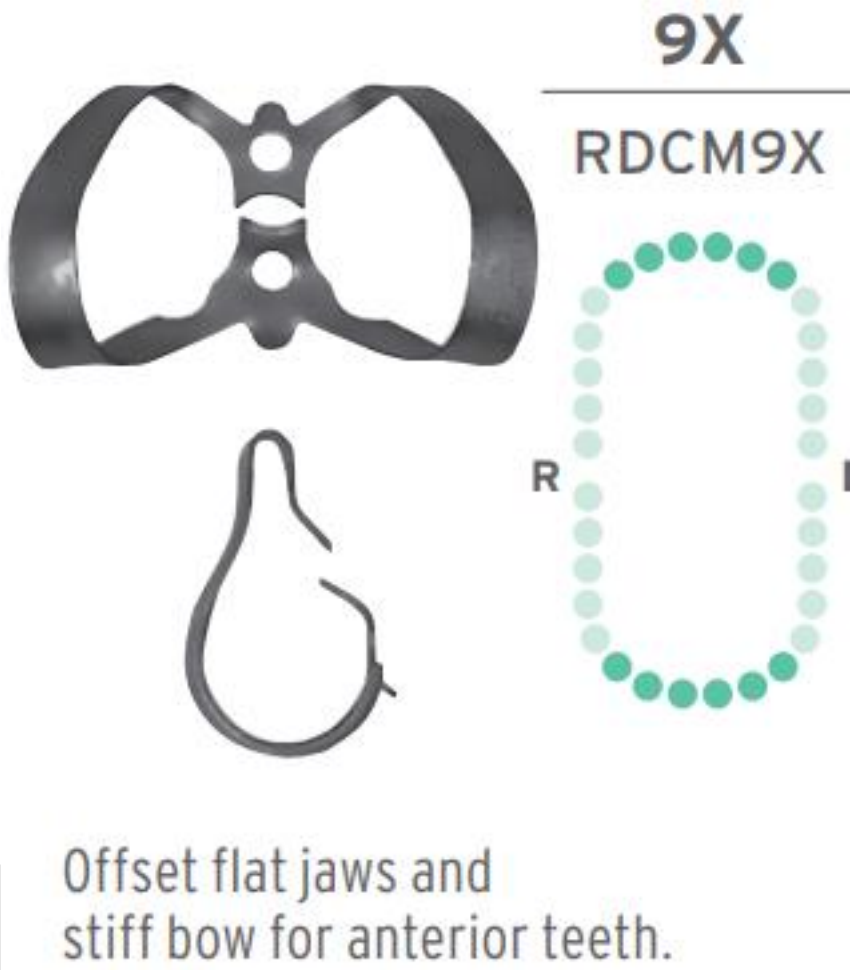
Claustrophobia

Possible Airway Restriction

Gag Reflex

Permanent Teeth

- Molars
  - 26, 3, 7, 200
- Premolars
  - W2A
- Anterior
  - 9

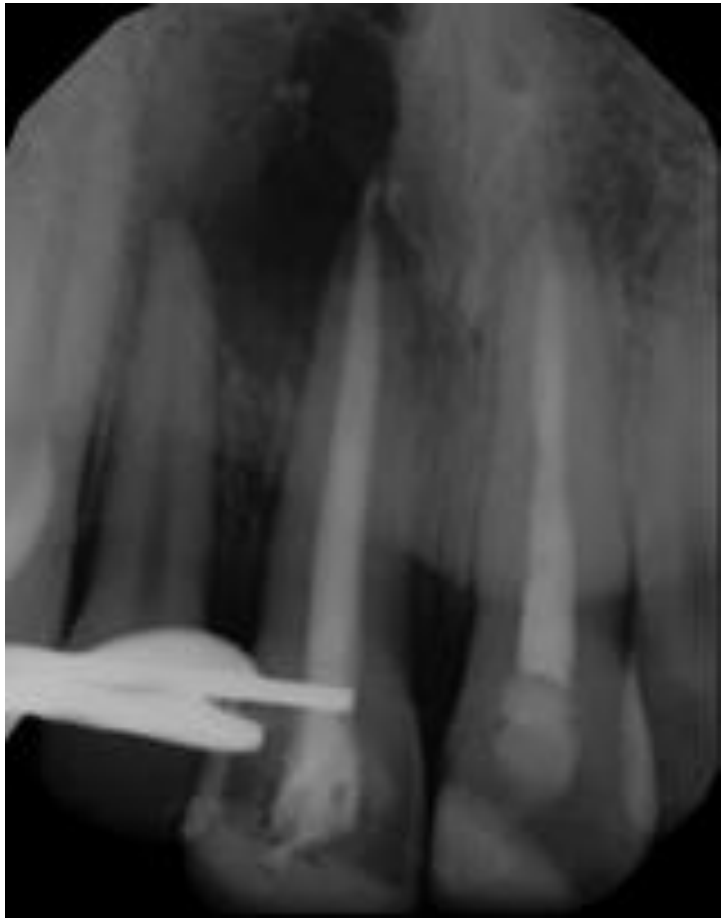


Trauma Challenges

- **Isolation**
  - Consider slit dam technique
  - Consider clamping adjacent teeth
  - Consider clamping gingival tissue
  - Wedgets (may help avoid palatal anesthesia

Access

Consider Facial versus Lingual Access in Trauma Cases



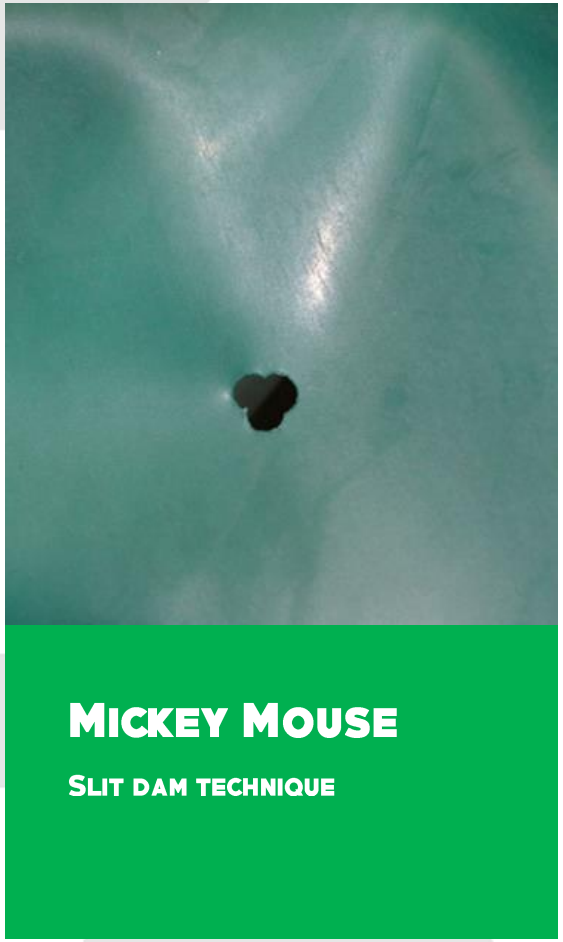
Tell. Show. Do

Retainer

- Tooth Ring
- Jewelry
- Floss (Whiskers of a favorite animal)

Rubber Dam

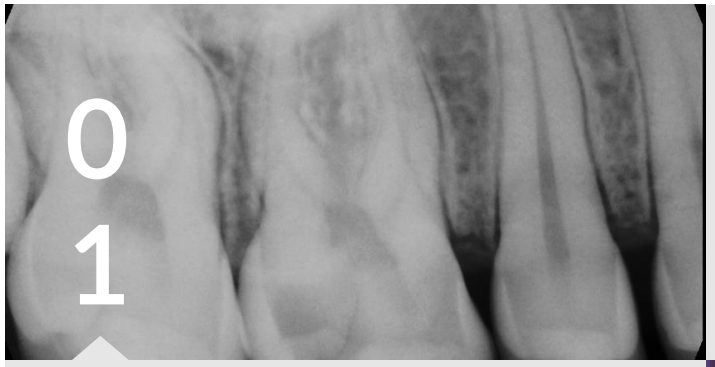
- Rain Coat
- Trampoline



Indirect Pulp Cap : Technique

1. Rubber Dam Isolation
2. Caries Removal (Clean DEJ)
3. Avoid Pulpal Exposure
4. SmartMTA
5. Glass Ionomer Base (Optional)
6. Final Restoration

Indirect Pulp Cap : Technique



Isolate

Rubber dam isolation to protect the pulp from bacterial contamination

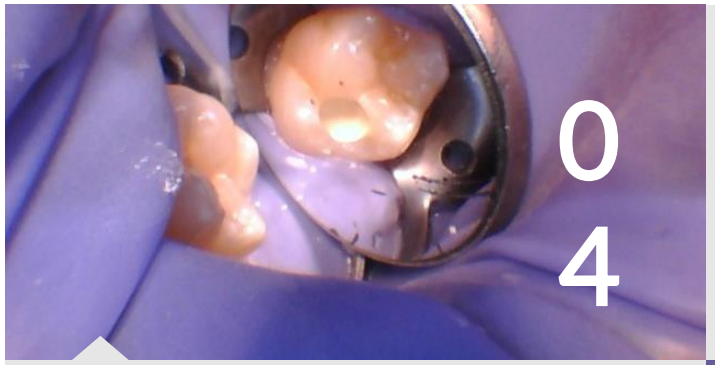
Partial Caries Removal

Remove the coronal pulp to the level of the CEJ

Medicate

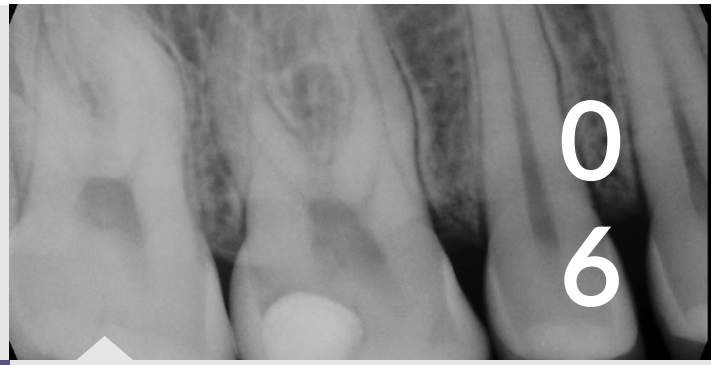
Place SmartMTA on the pulpal floor using an amalgam carrier.

Indirect Pulp Cap : Technique



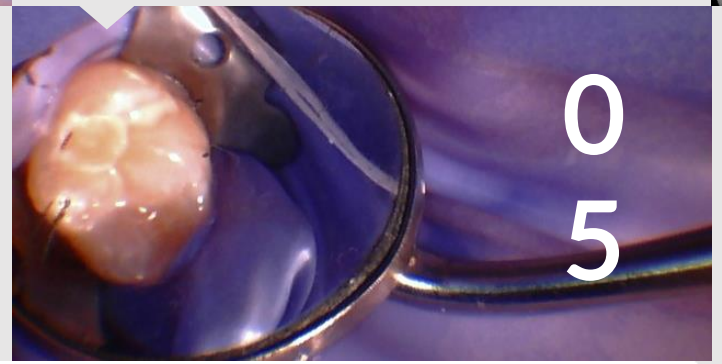
Restore

Final restoration should be placed the same day of treatment if behavior allows.



Adapt

Adapt SmartMTA onto the floor. Clean up excess material. A glass ionomer base can be used over the medicament.



Document

A final periapical radiograph should be made to allow for re-evaluation upon recalls.

Dentin enamel junction

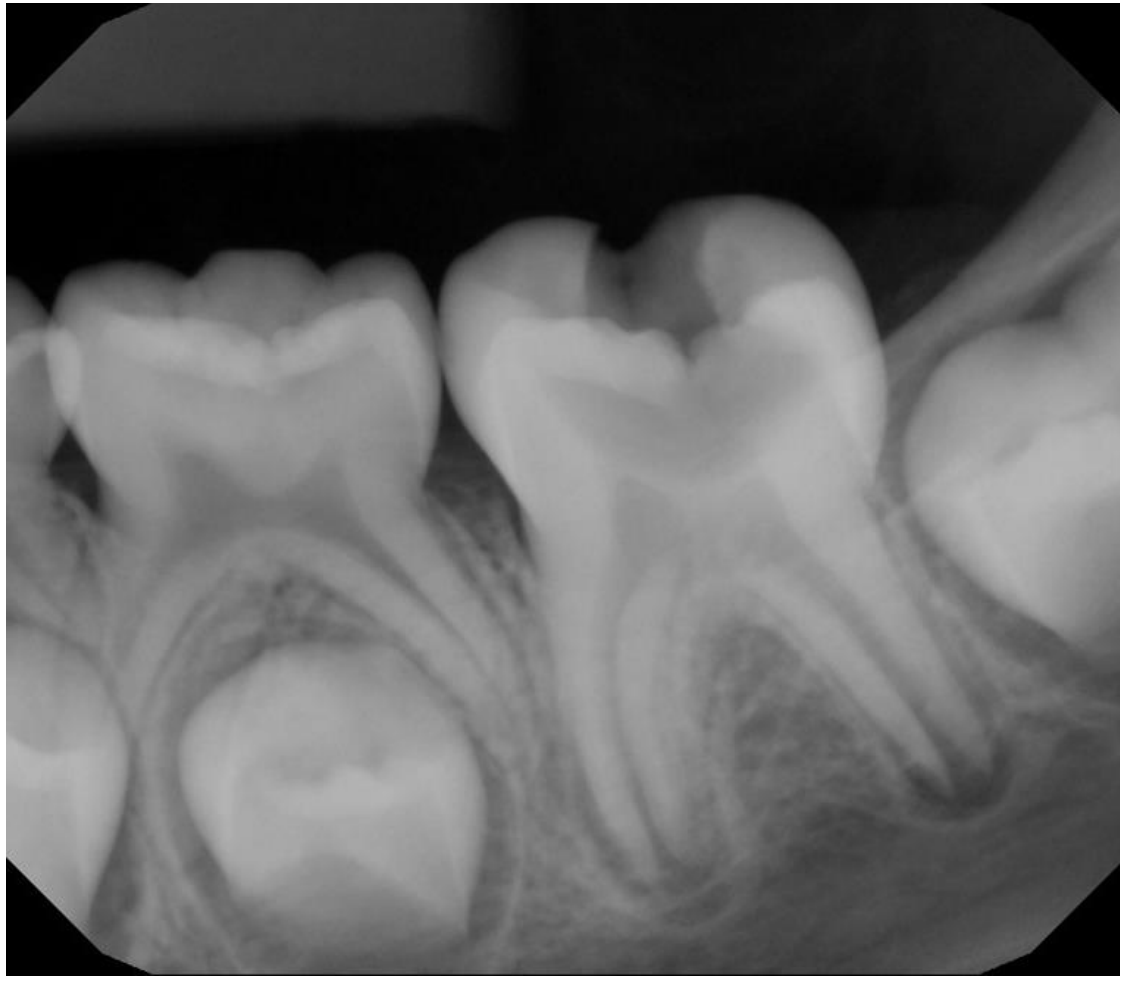
Criteria for Success

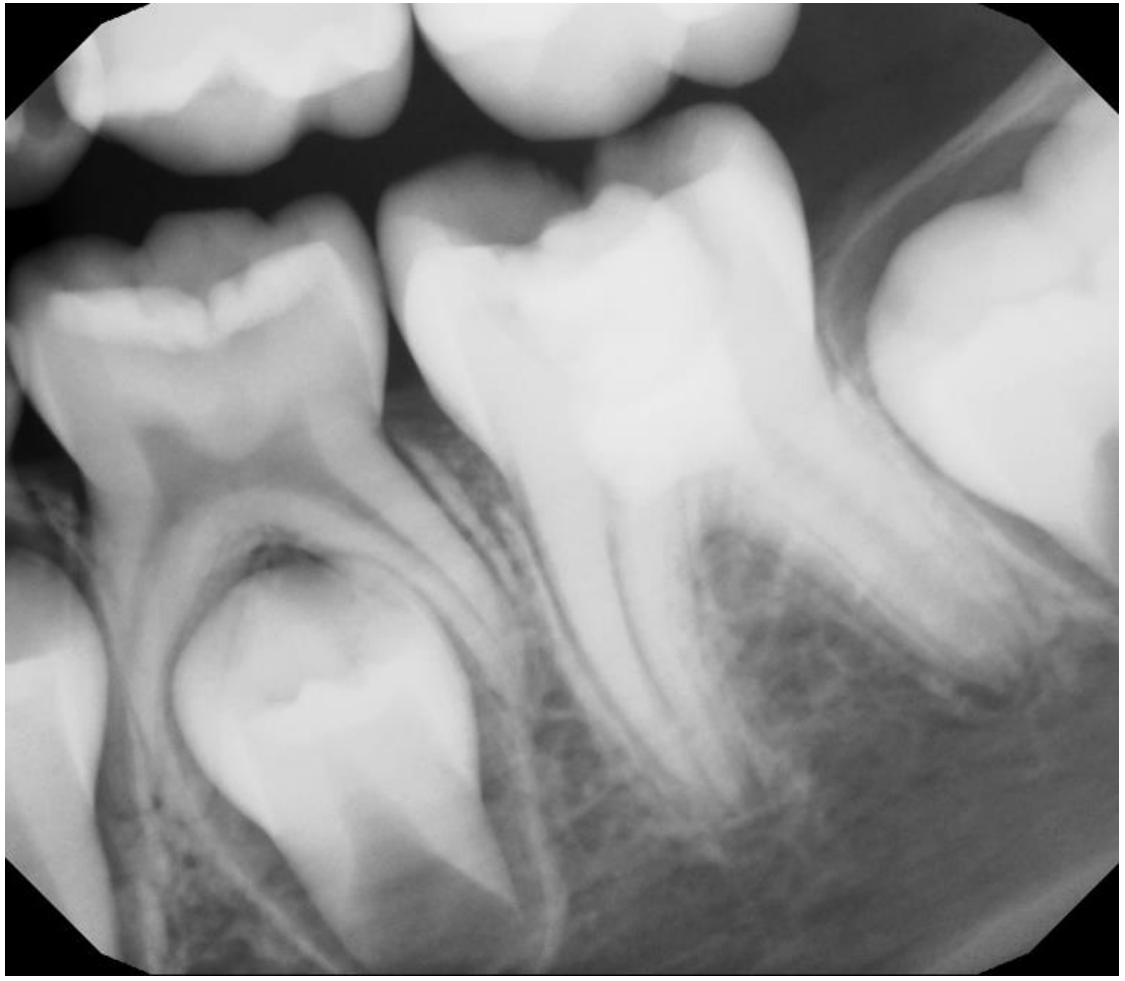
Vital Pulp Therapy

Criteria for Success

- Objective:
  - Maintain vitality
  - No post-treatment signs or symptoms
  - Pulp healing and dentin bridge formation
  - No apical pathology
  - No postoperative radiographic external root resorption

Maintain Vitality



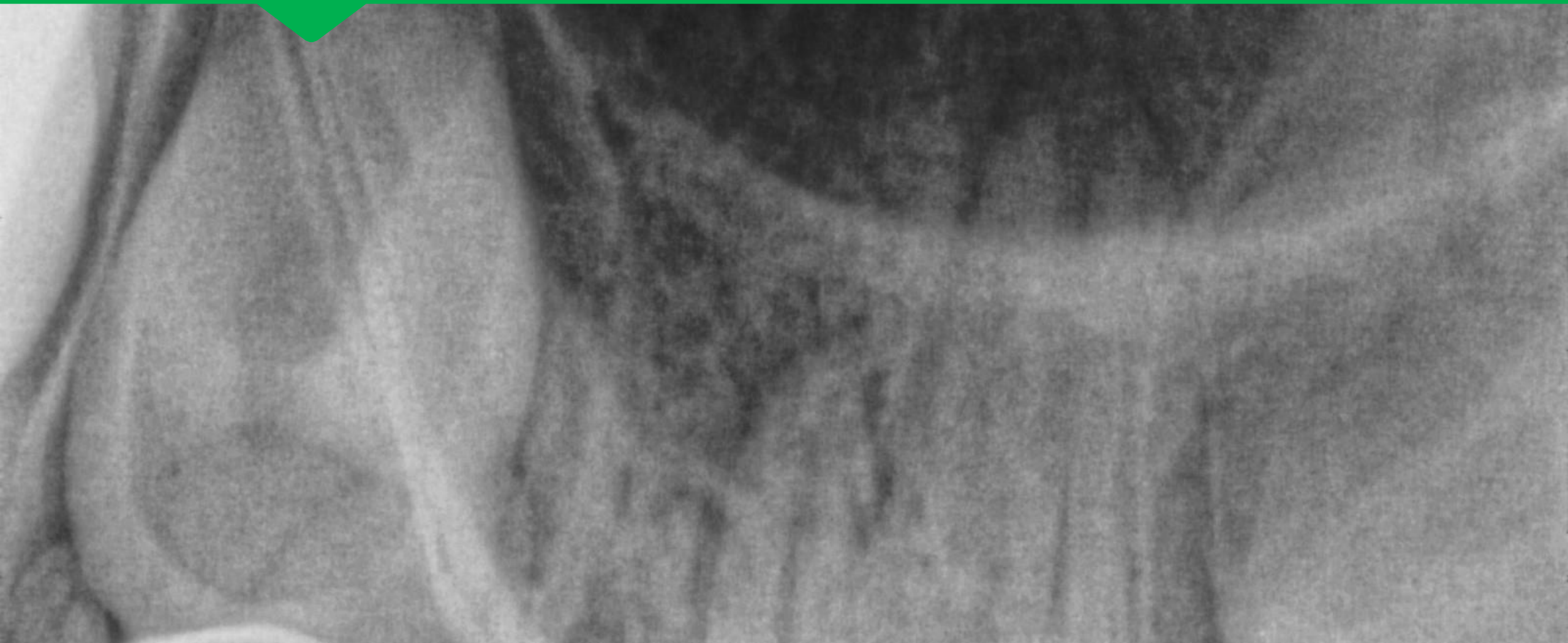


No Post Treatment Signs/Symptoms

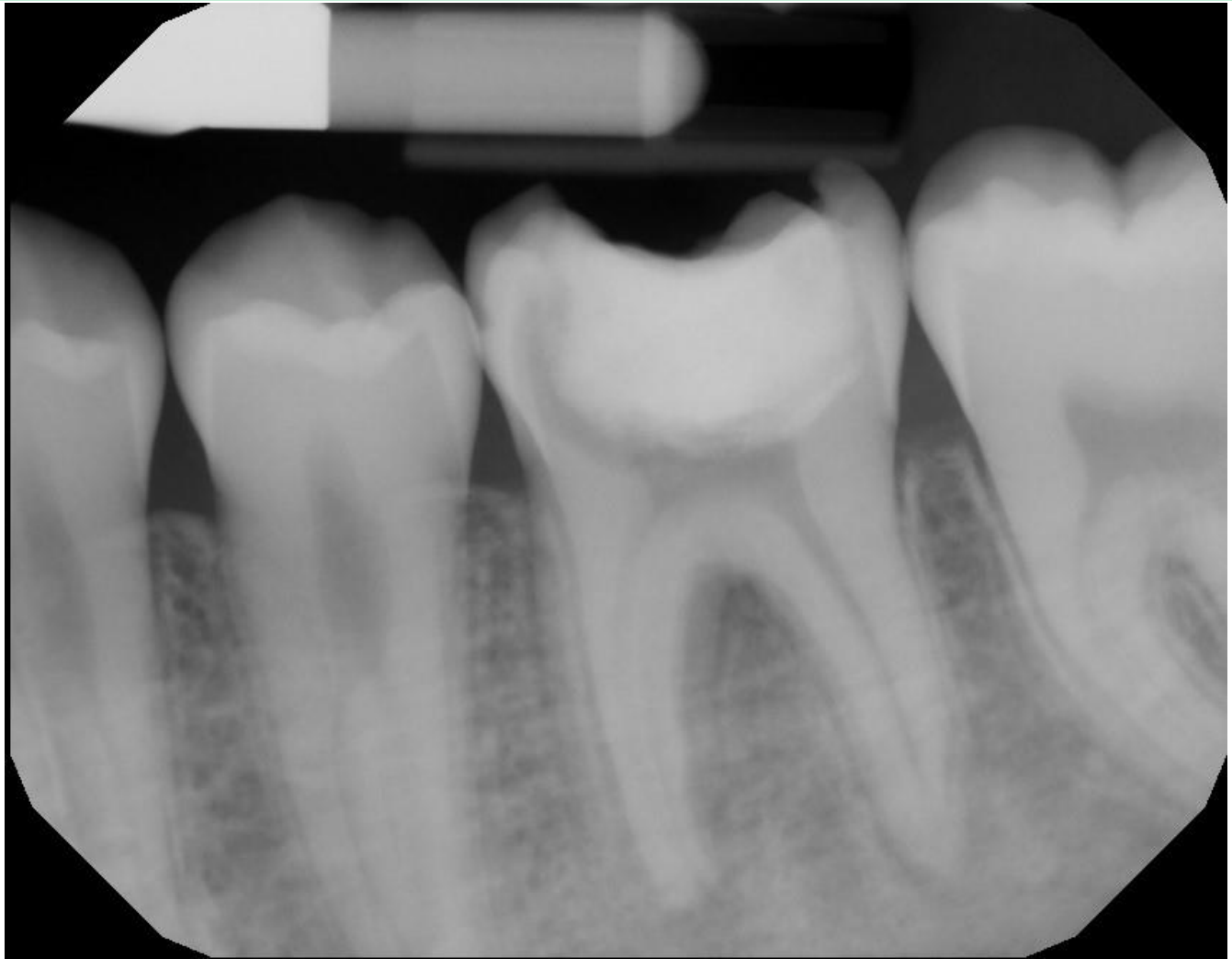
Pulpal Healing. Dentin Bridge Formation

No Furcal or Apical Pathosis

No External Root Resorption



Survival

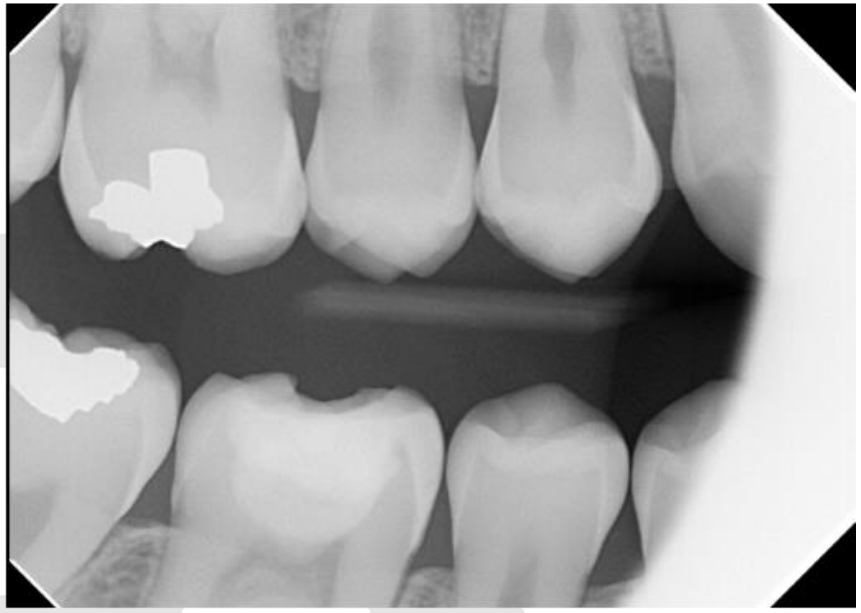


Cases

6 Month Recall

07/2014

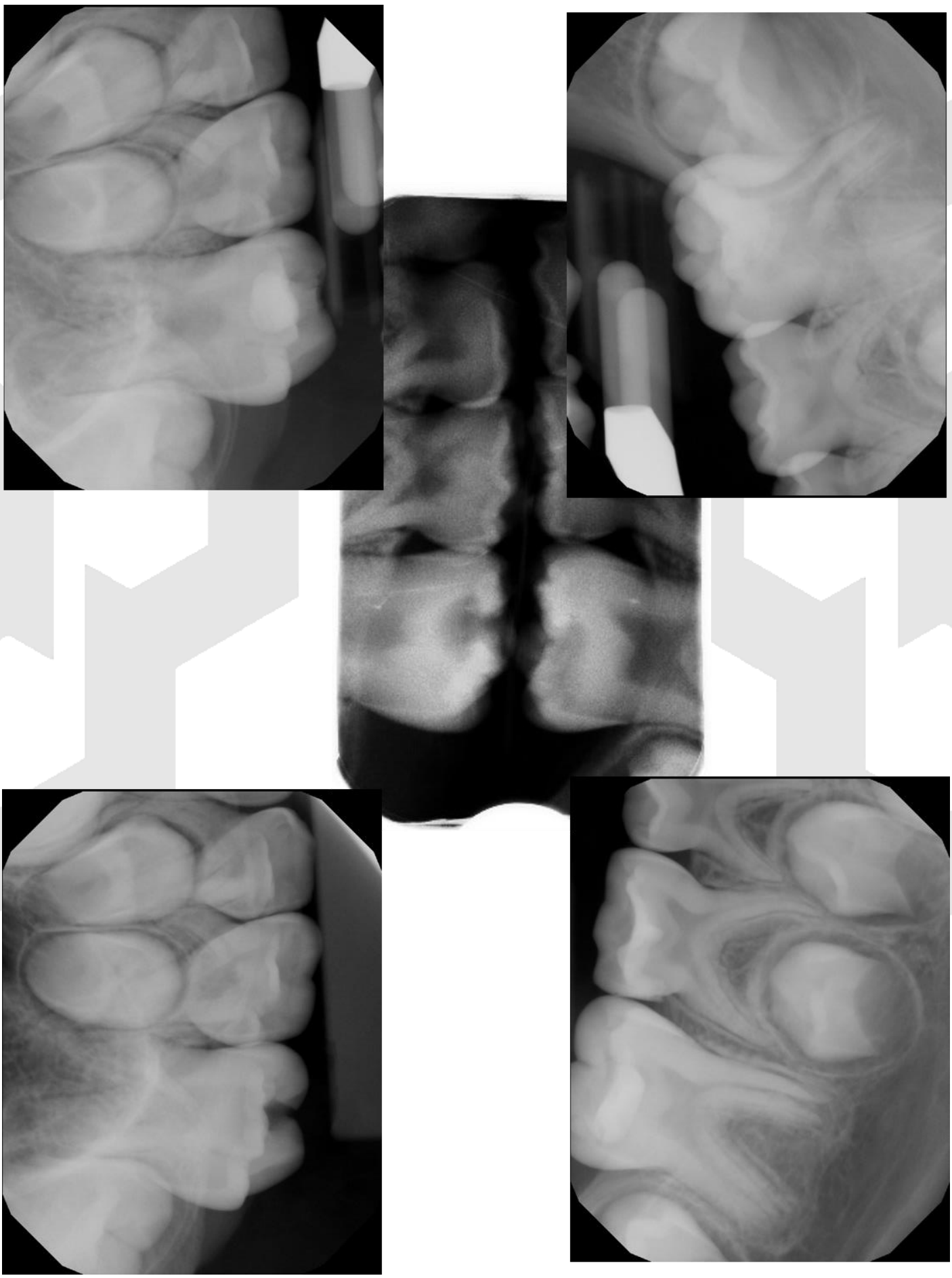
02/2015



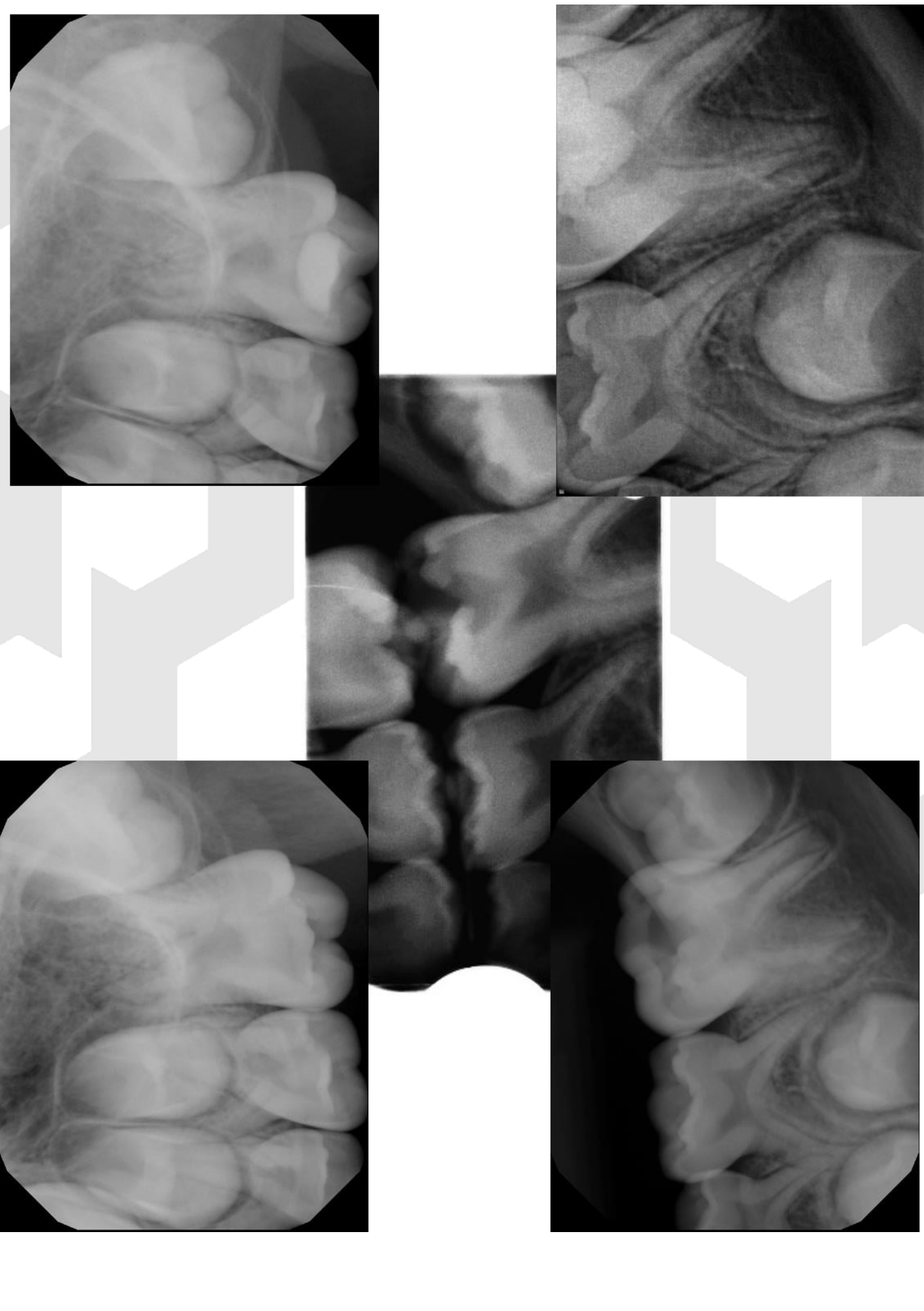
02/2015

Treatment

Recall (Left)



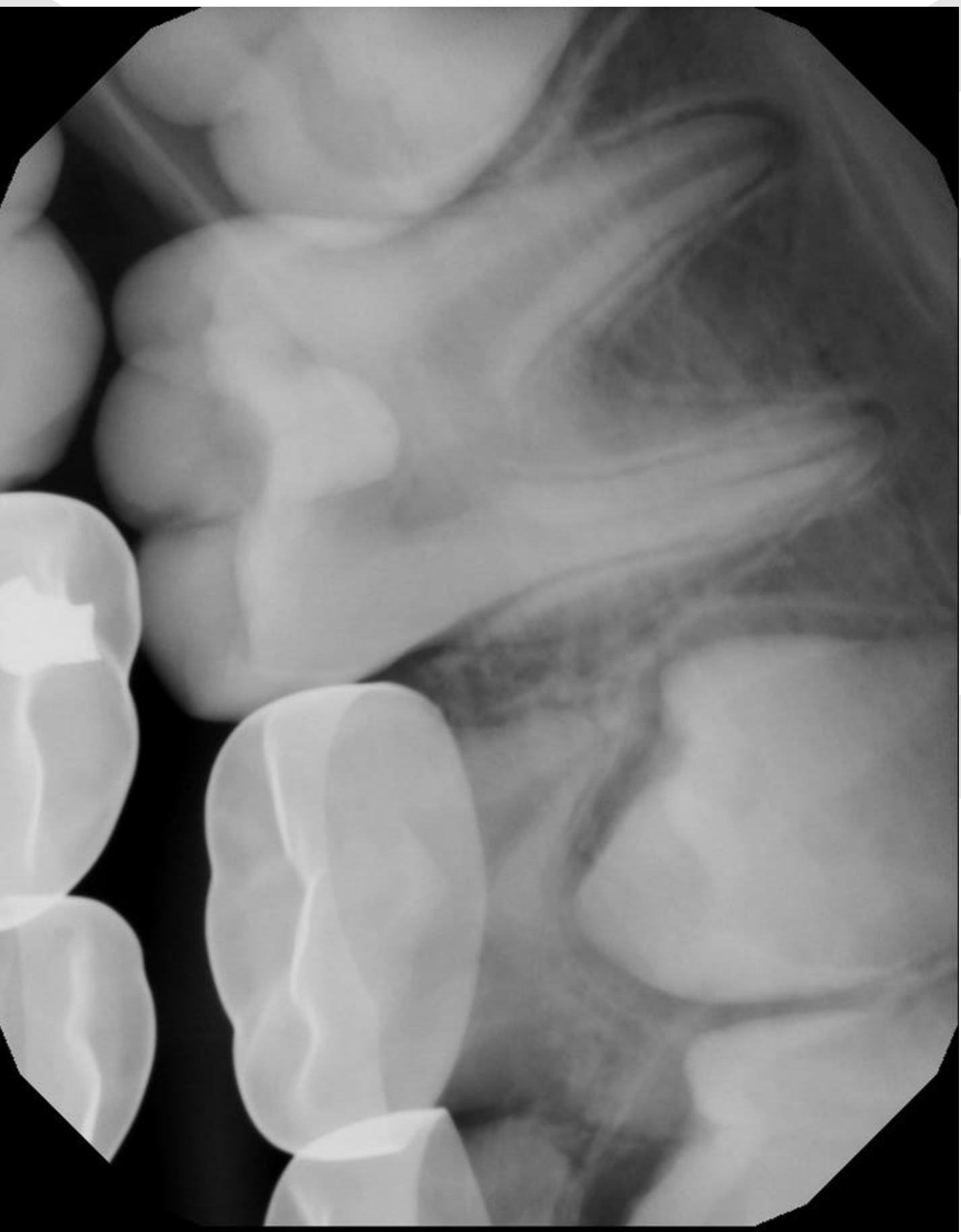
Recall (Right)



Initial

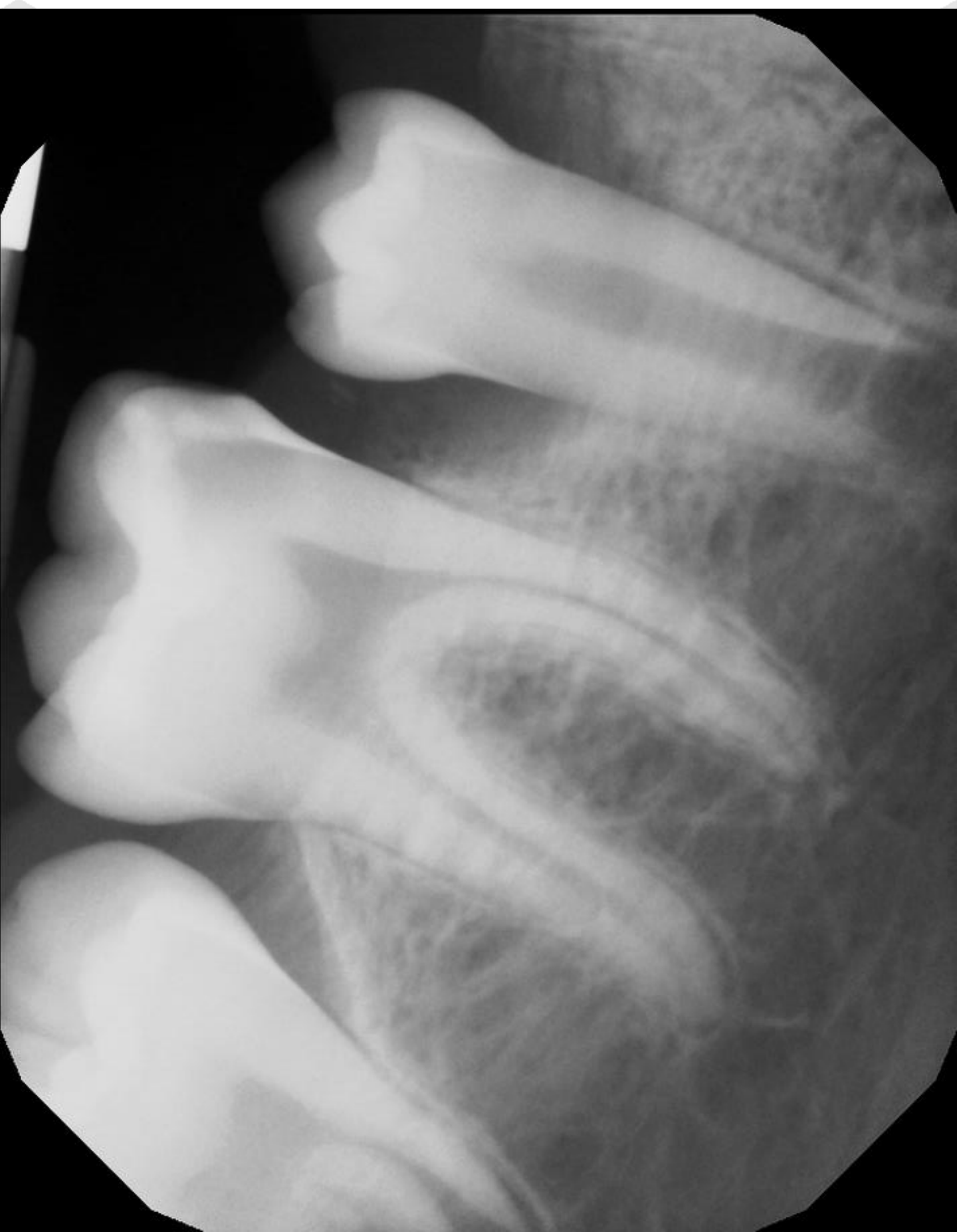
2 Year Recall

2 Year Recall

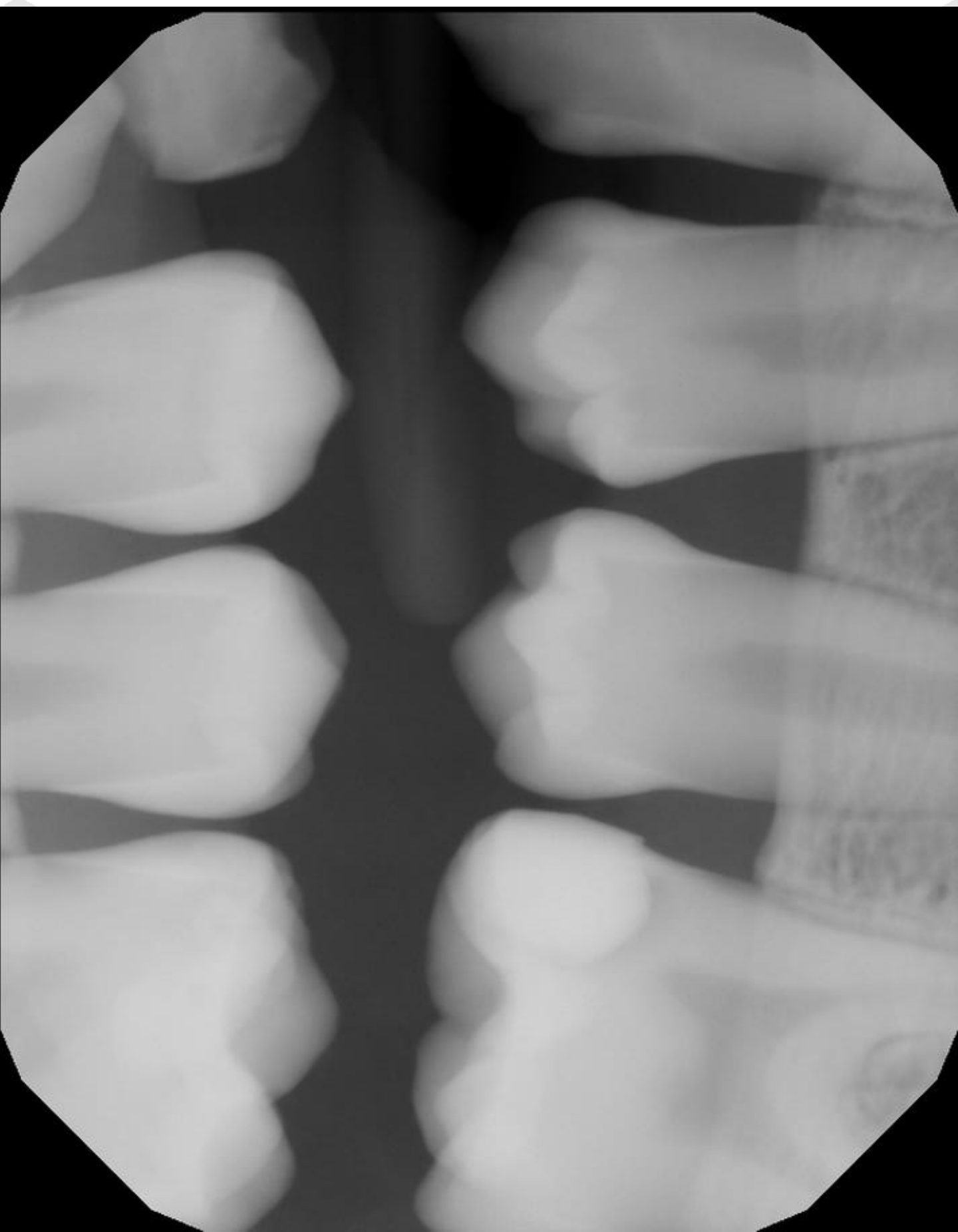


3 Year Recall

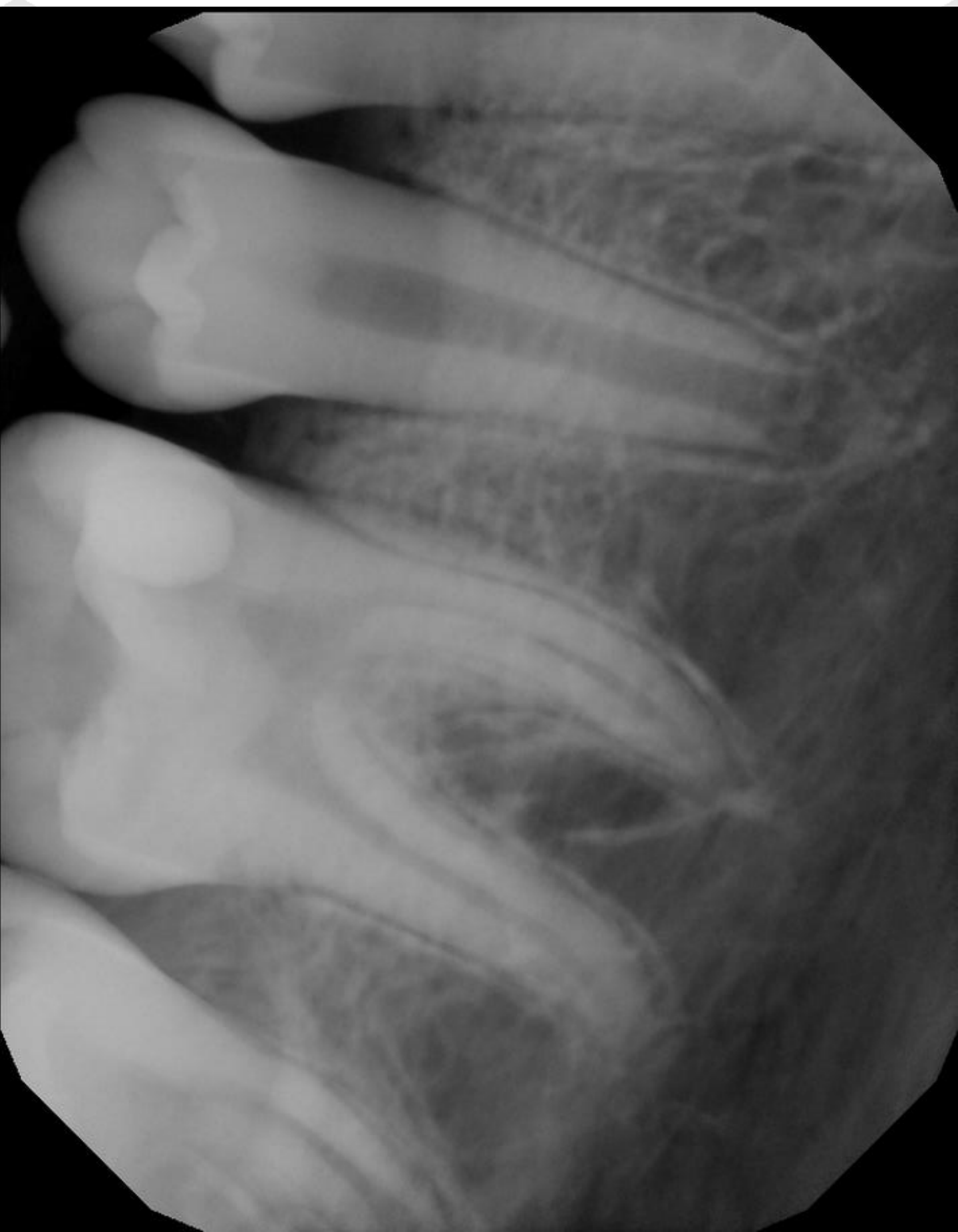
Initial



1 Year Recall



1 Year Recall



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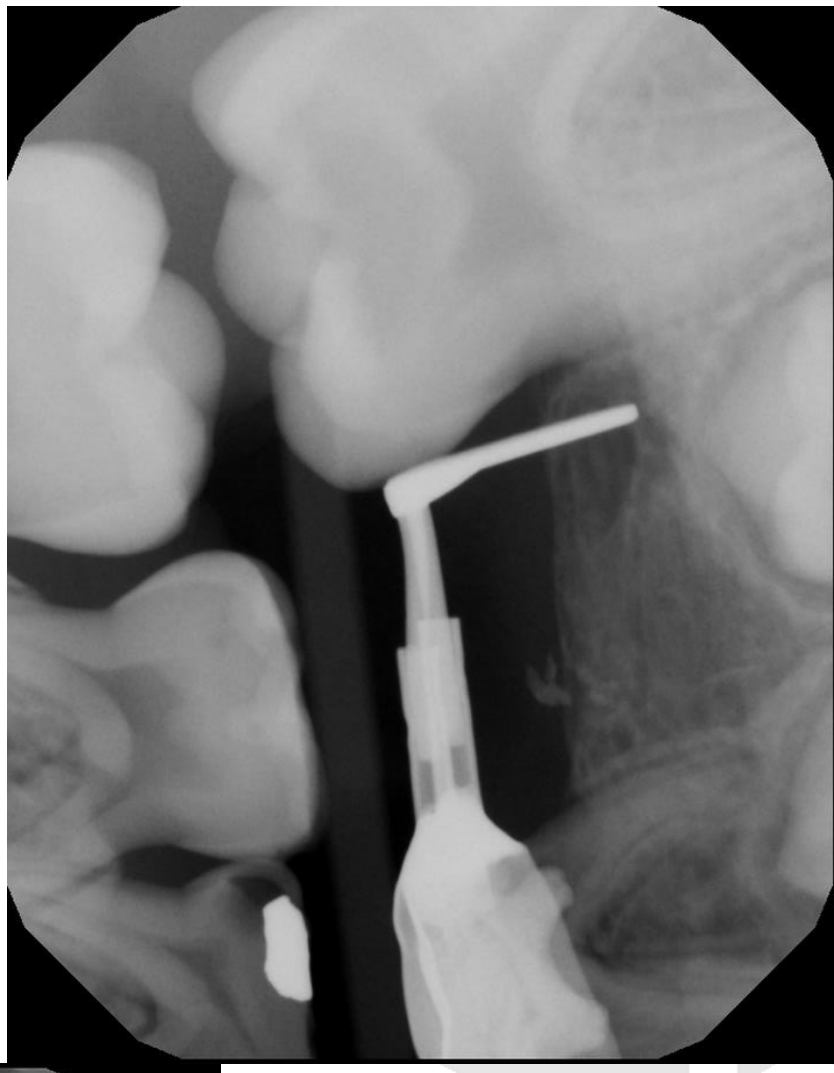
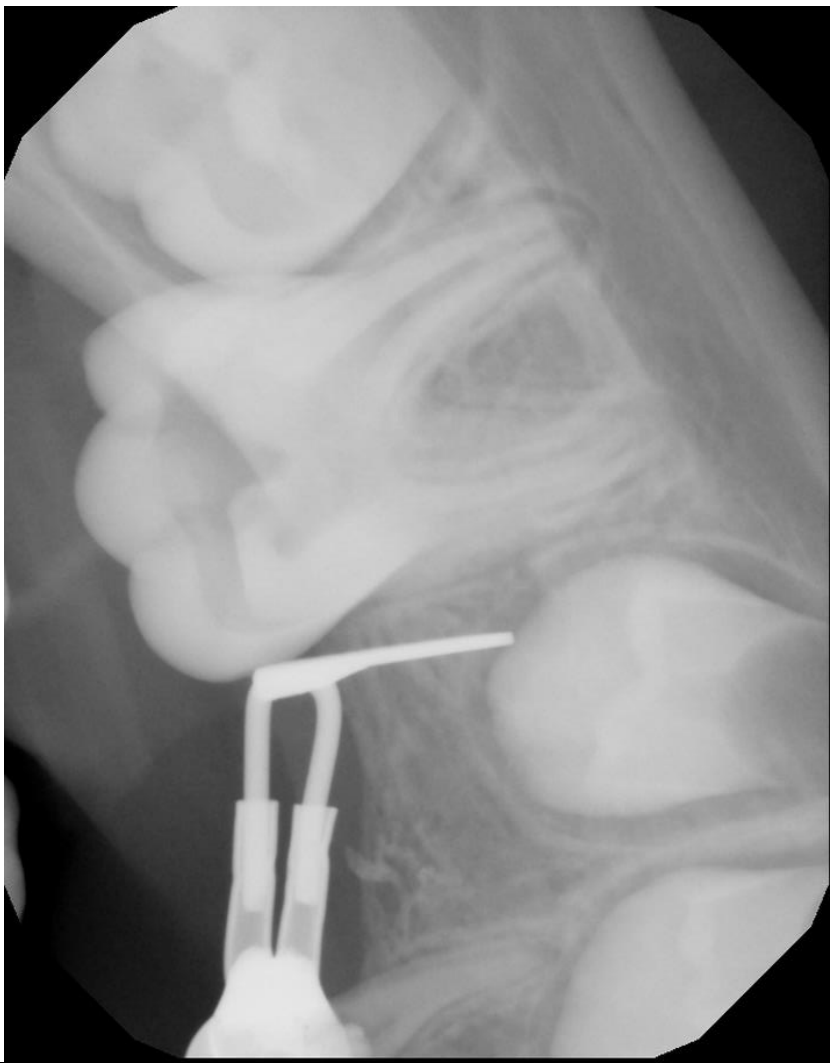
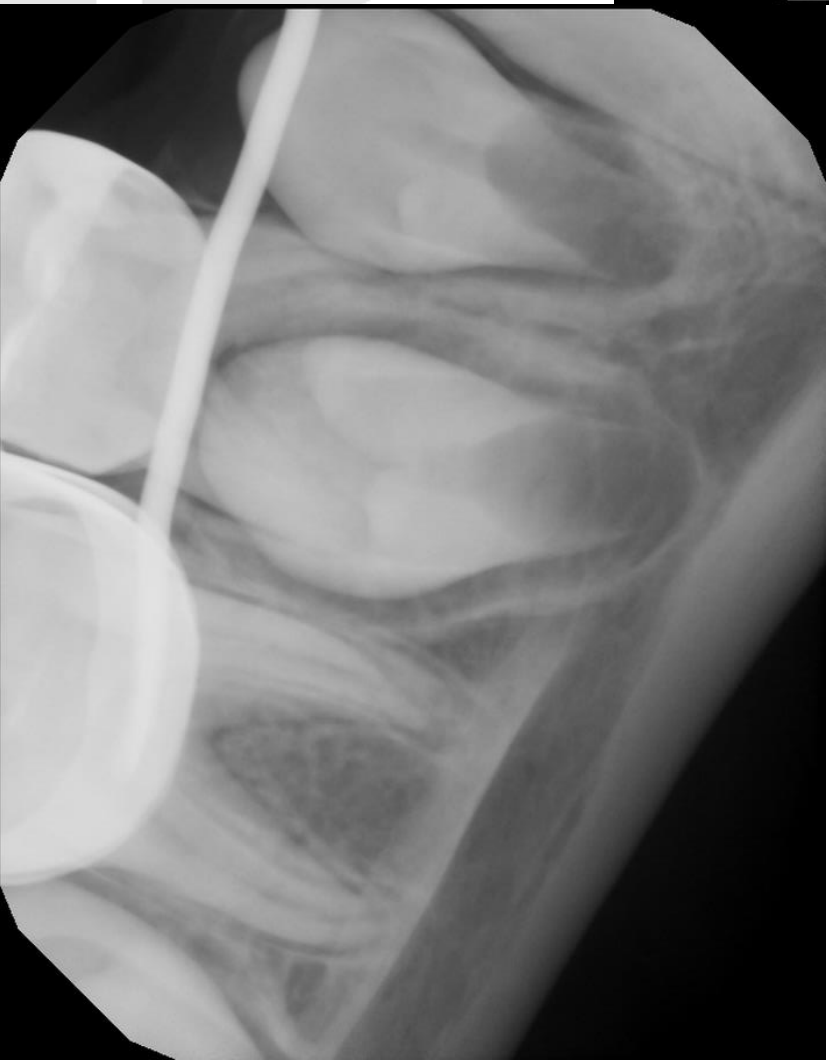


Initial

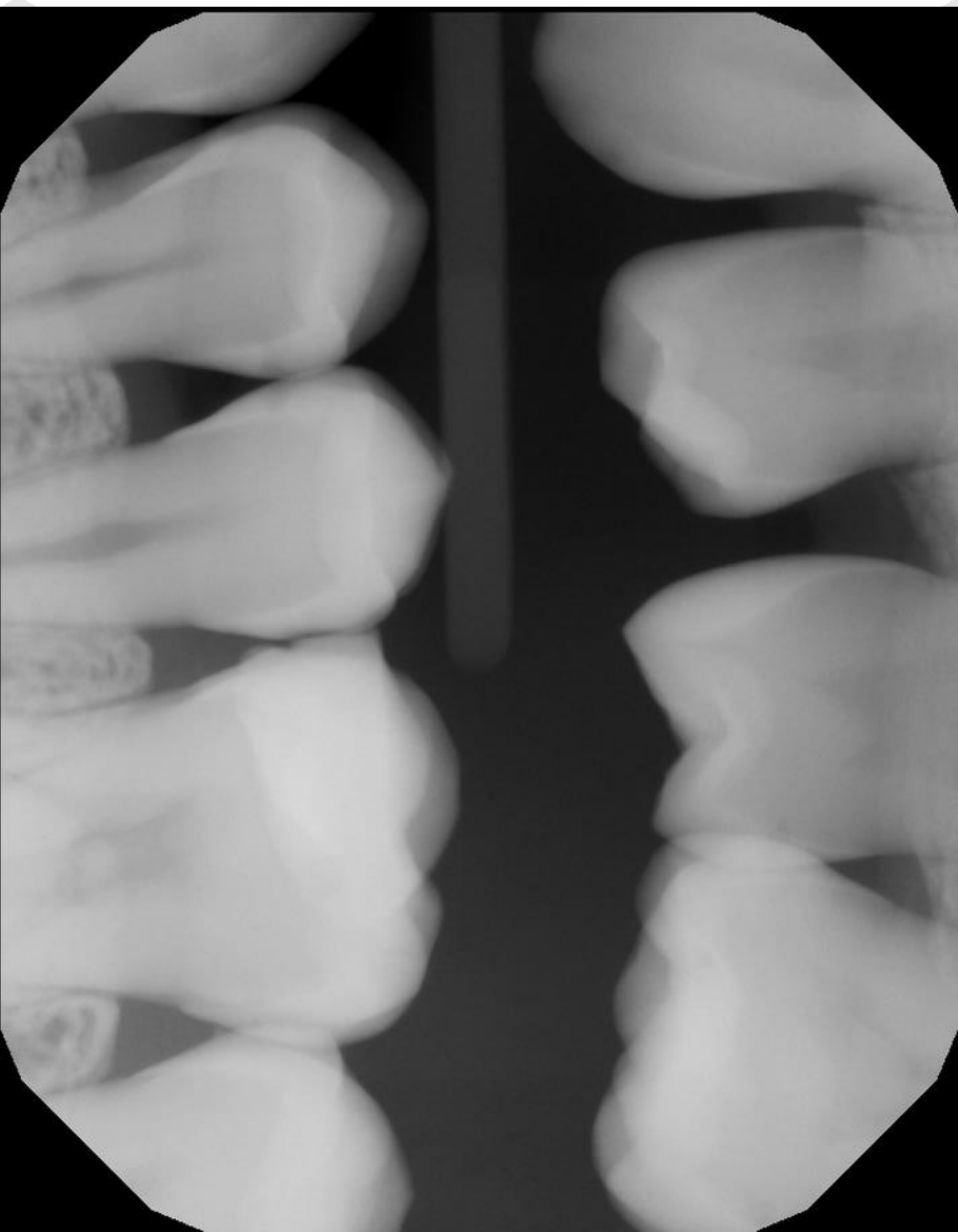


1 Year 6 Month Recall

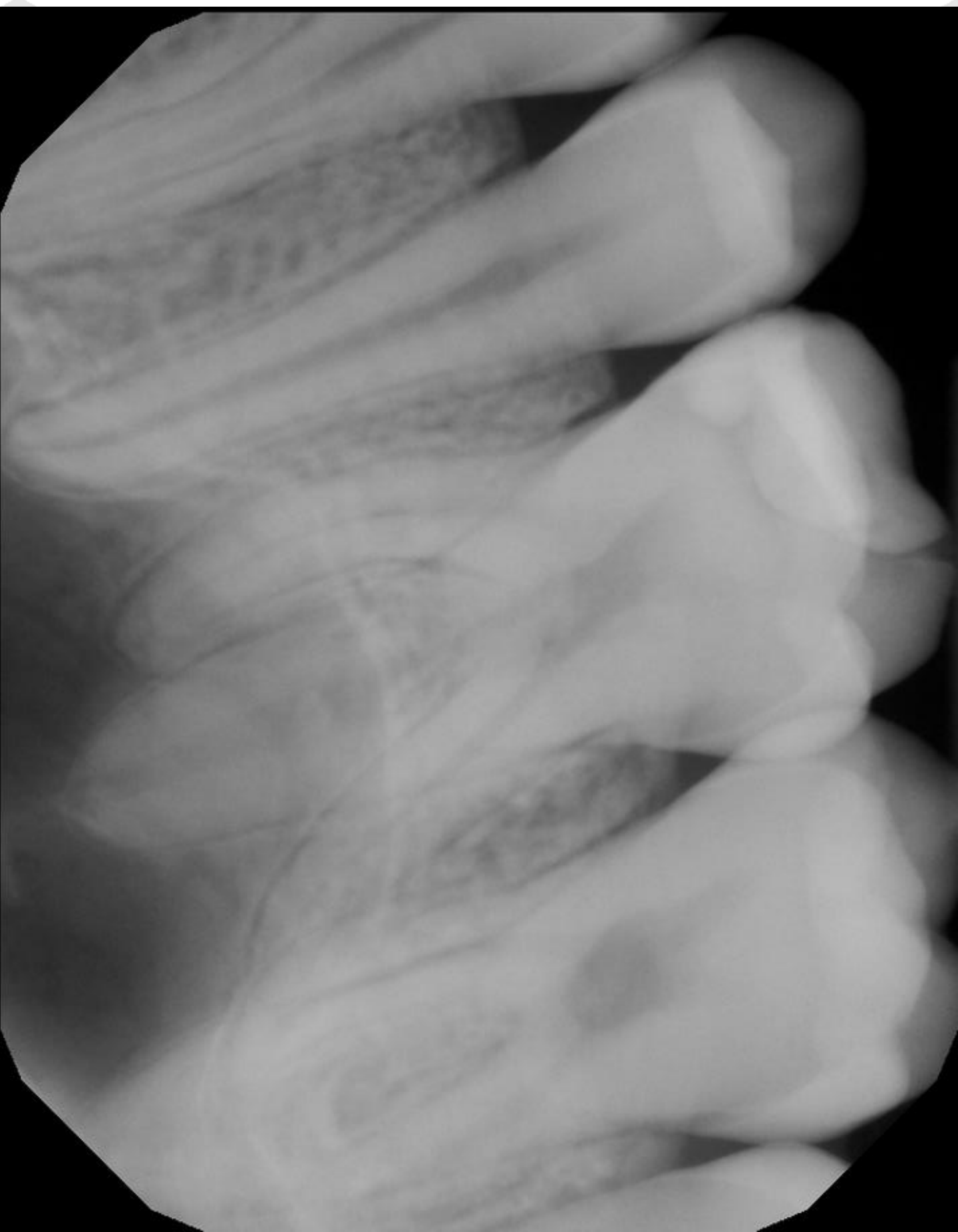


Initial

1 Year Recall

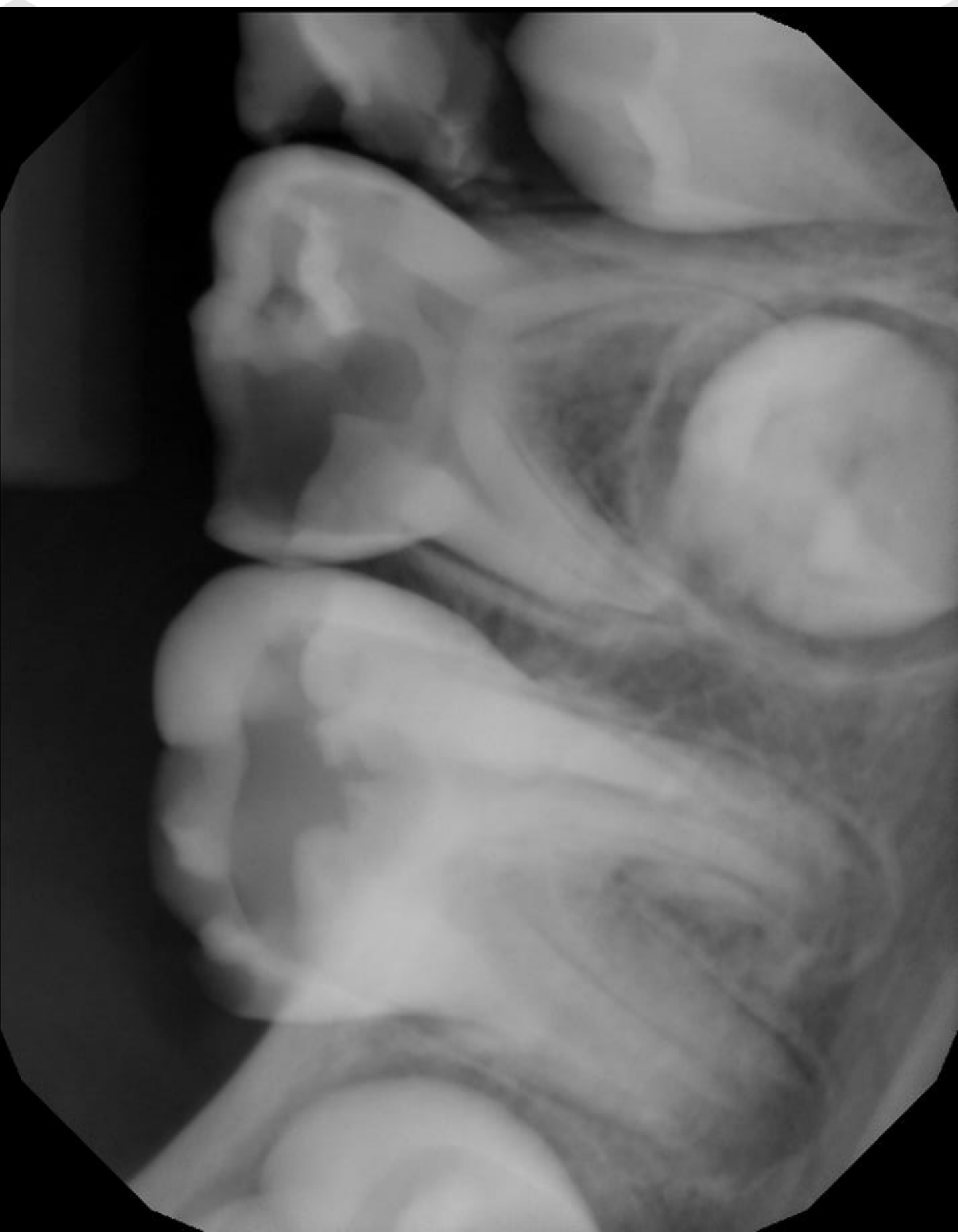


1 Year Recall

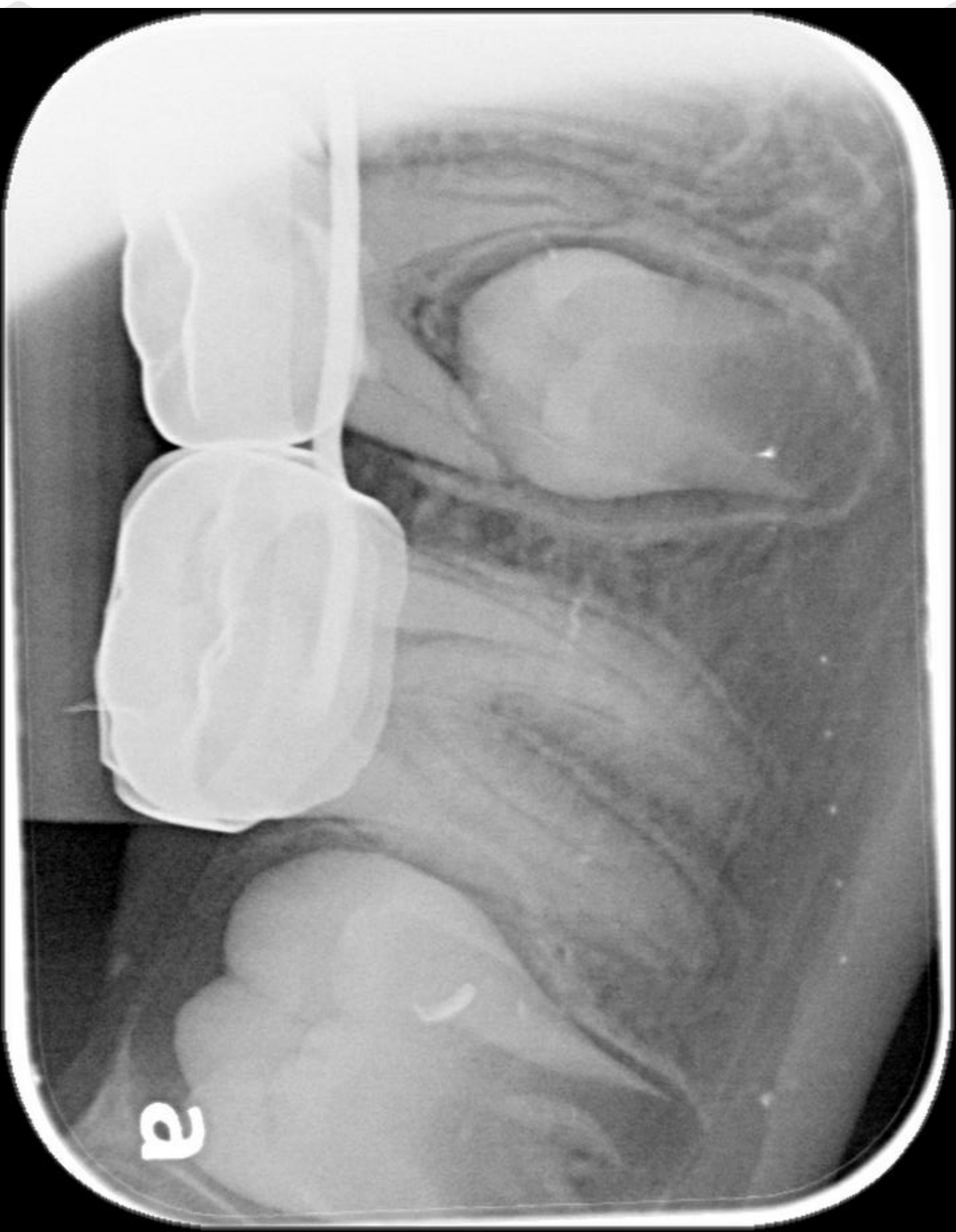


1 Year 6 Month Recall

Initial



2 Year Recall



Initial

1 Year Recall

3 Year Recall

Accidents Happen!

Clinical Tip

Consider complete caries removal to aid in diagnosis.

When To Consider Complete Caries Excavation

- To aid in a diagnosis
- Evaluate restorability
- Symptoms of Irreversible Pulpitis
  - Partial or Full Pulpotomy
  - Only when inflammation is limited to coronal portion of the pulp
  - Younger individuals
- Increase retention for restoration (Pulpotomy)

Direct Pulp Therapy

Direct Pulp Cap : Technique

1. Rubber Dam Isolation
2. Caries Removal (Caries Detect as Adjunct)*
3. Exposures Controlled with NaOCl cotton pellet (2-10 minutes), if hemostasis is not achieved consider irreversible pulpitis (pulpotomy, RCT, extraction)
4. Rinse and Dry
5. SmartMTA Placement (1.5-3 mm)
6. Glass Ionomer Base*
7. Final Restoration

*Optional

Clinical Tip

Use 3-6% Sodium Hypochlorite or 2% Chlorhexidine to obtain hemostasis

NaOCl

- 3-6% NaOCl
  - Organic Solvent
  - Antibacterial
  - Lubricates
  - Higher Concentrations have increased Cytotoxicity

2% Chlorohexidine Gluconate

- Cationic Molecule
- High Concentration: bactericidal, cell wall destruction
- Lower Concentration: bacteriostatic, leakage of positive ions from bacteria
- No statistical difference indicated vs NaOCl as an irrigant
- Does *NOT* remove organic tissue

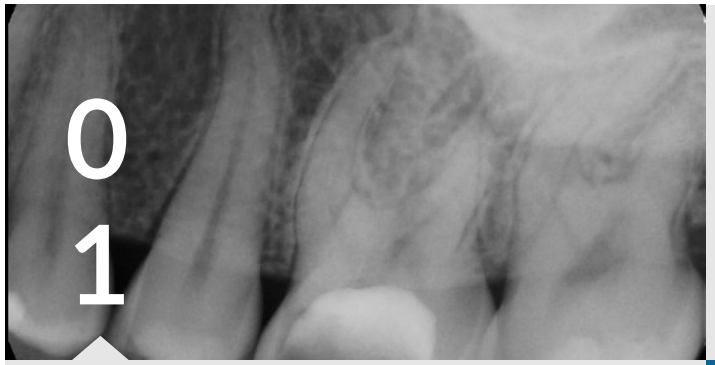
Hemostasis

- If hemostasis cannot be obtained:
  - Control gingival hemostasis if necessary
  - Check for remaining coronal pulp tissue
  - Check for Perforation
  - Consider irreversible pulpitis if hemostasis cannot be obtained

Clinical Tip

Caries detect stains organic matrix, which could lead to excess removal of healthy tissue.
Use with caution at the dentin-enamel junction and pulpal floor.

Direct Pulp Cap : Technique

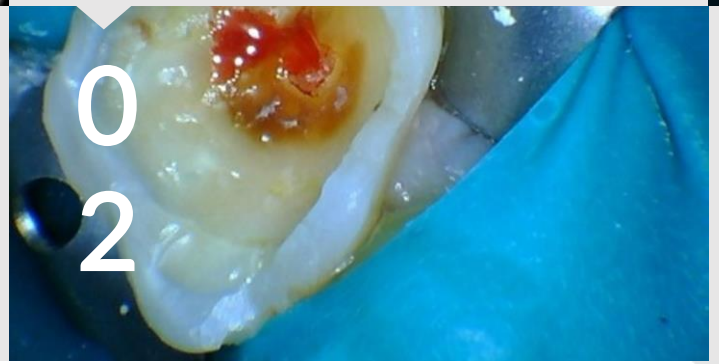


Caries Removal

Complete caries removal is necessary.

Isolate

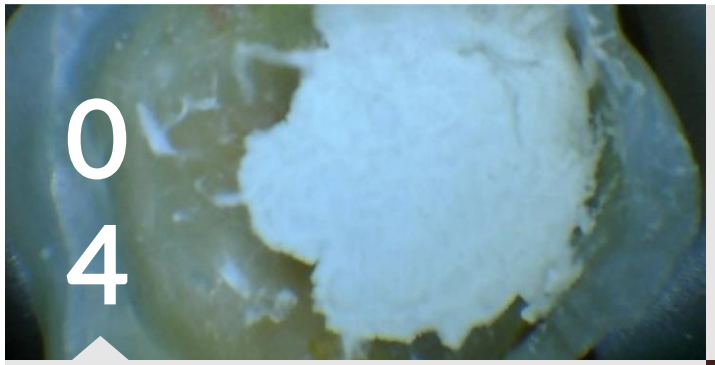
Rubber dam isolation to protect the pulp from bacterial contamination



Hemostasis

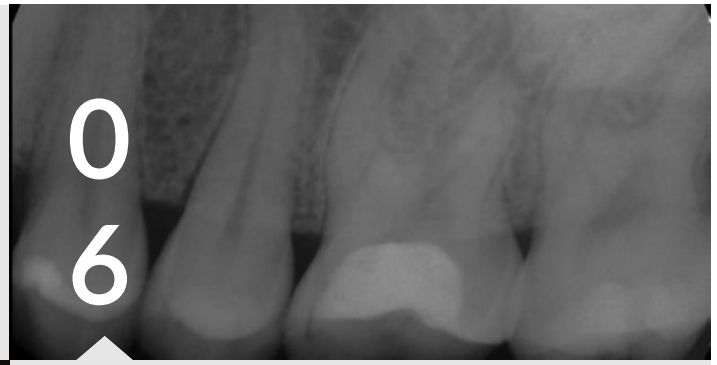
Obtain hemostasis with 3-6% Sodium Hypochlorite

Direct Pulp Cap : Technique



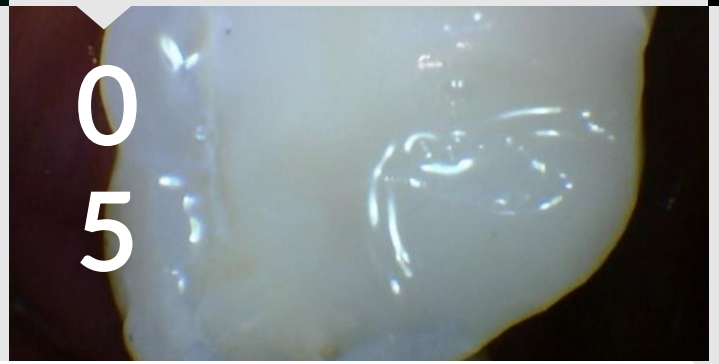
Restore

Final restoration should be placed the same day of treatment if behavior allows.



Medicate

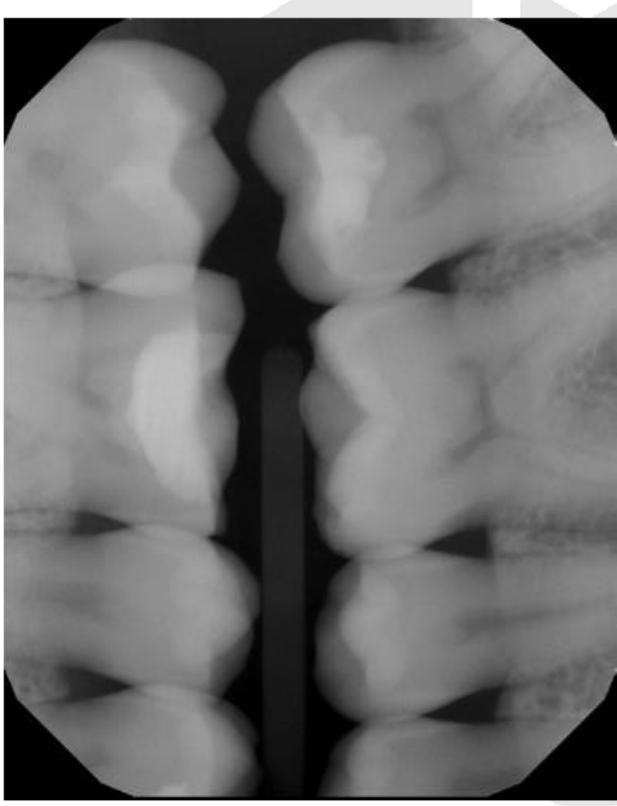
Adapt SmartMTA into the access cavity. A glass ionomer base can be used over the medicament.

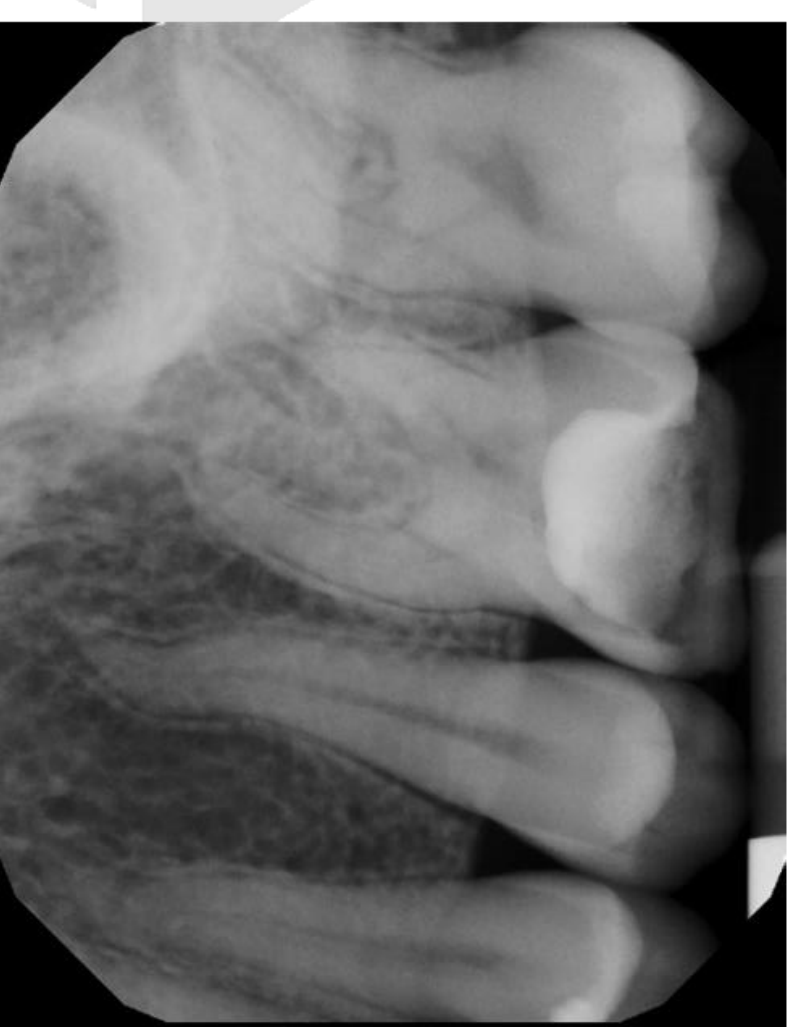


Document

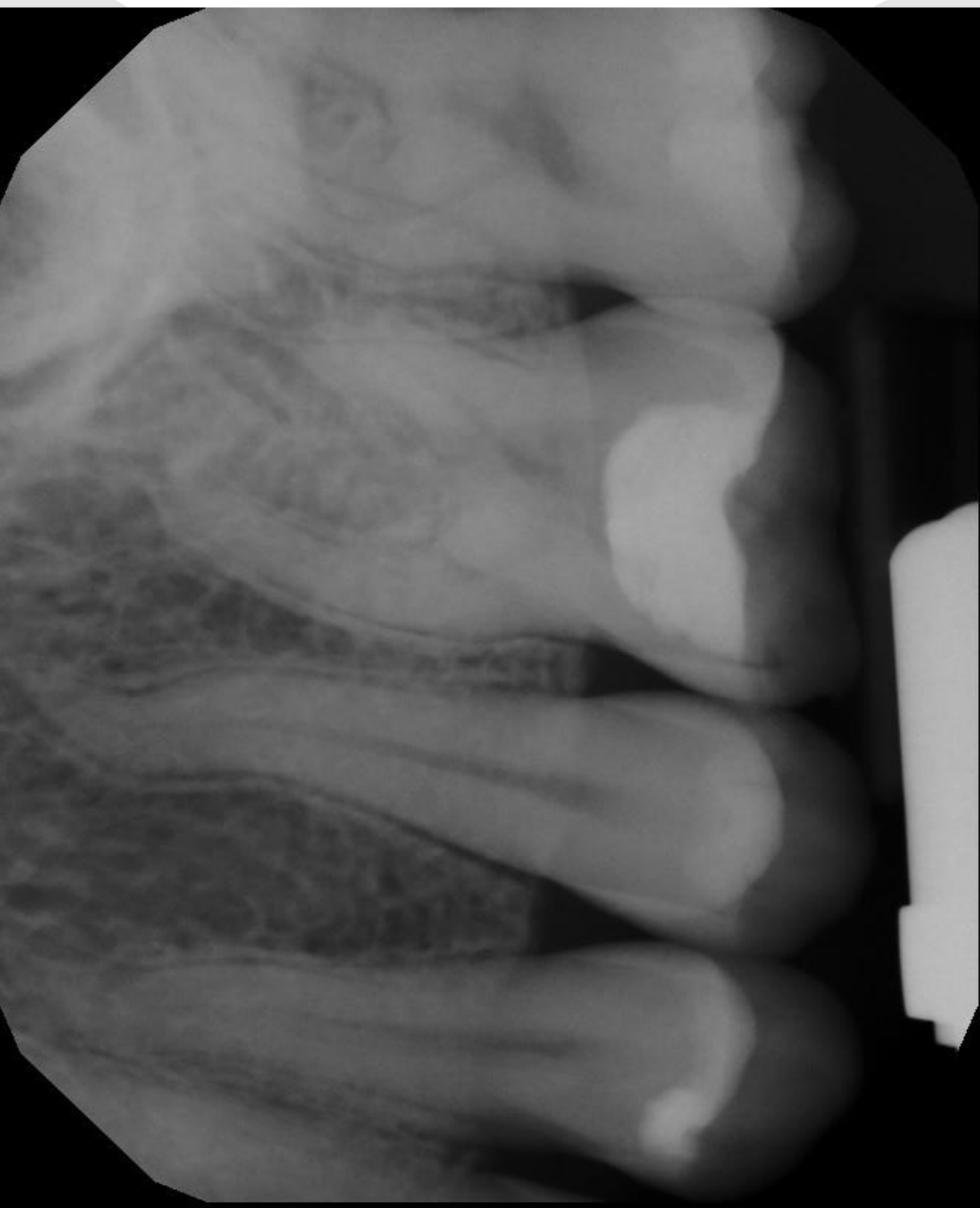
A final periapical radiograph should be made to allow for re-evaluation upon recalls.

Initial, Post Op

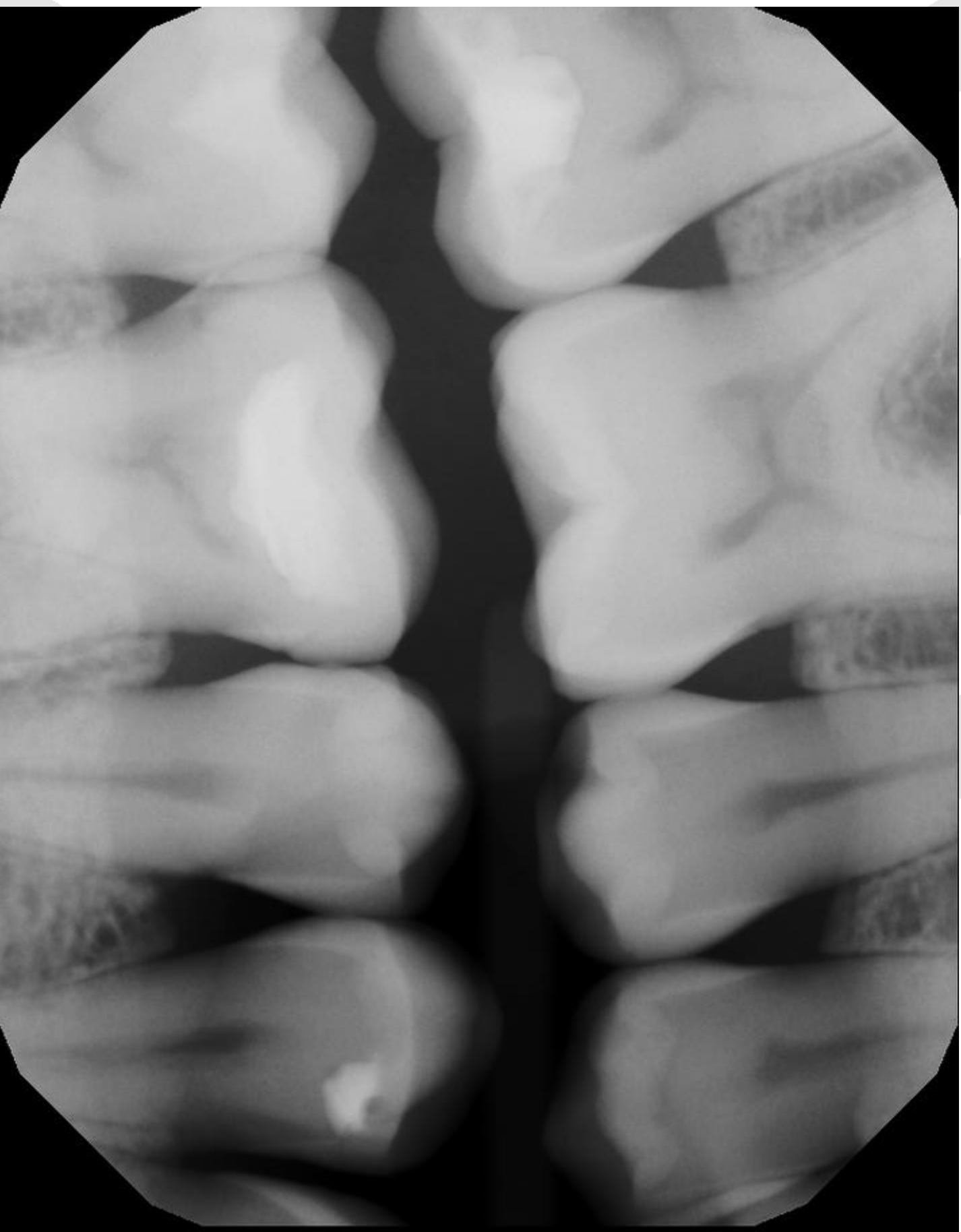




2 Year Recall



2 Year Recall



4 Year Recall

Cases

Initial

Caries Removal

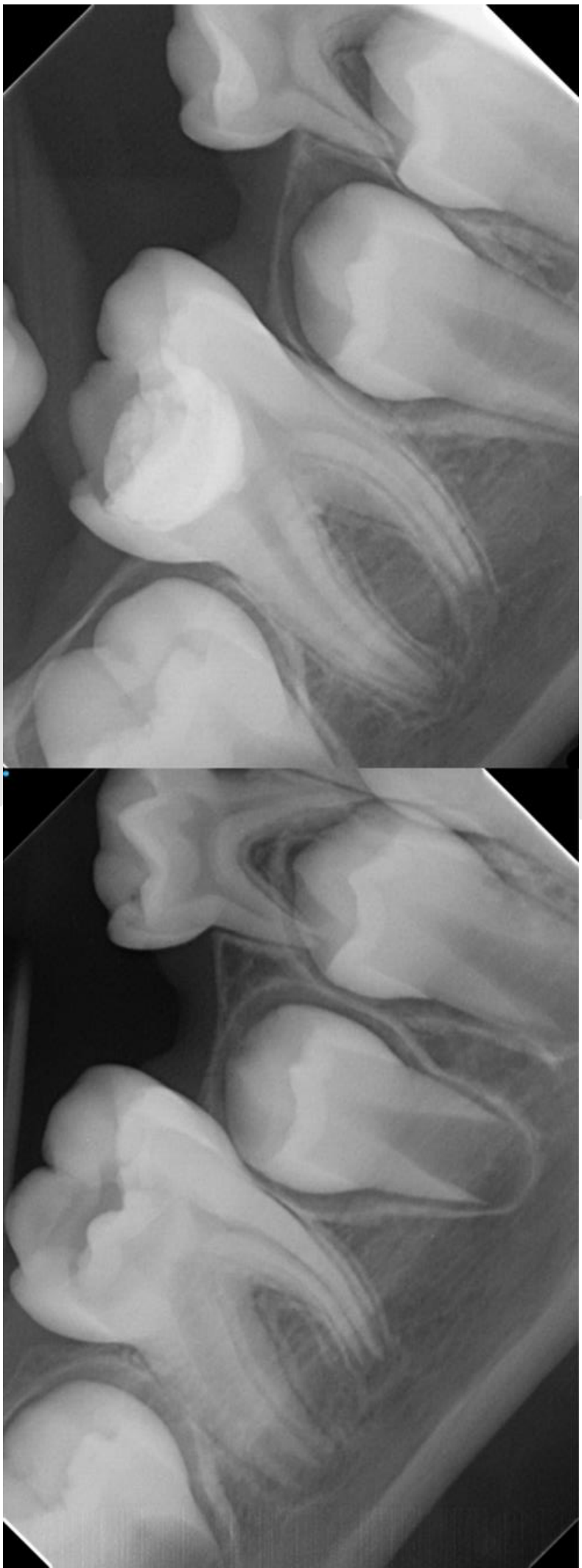
Hemostasis

Medication

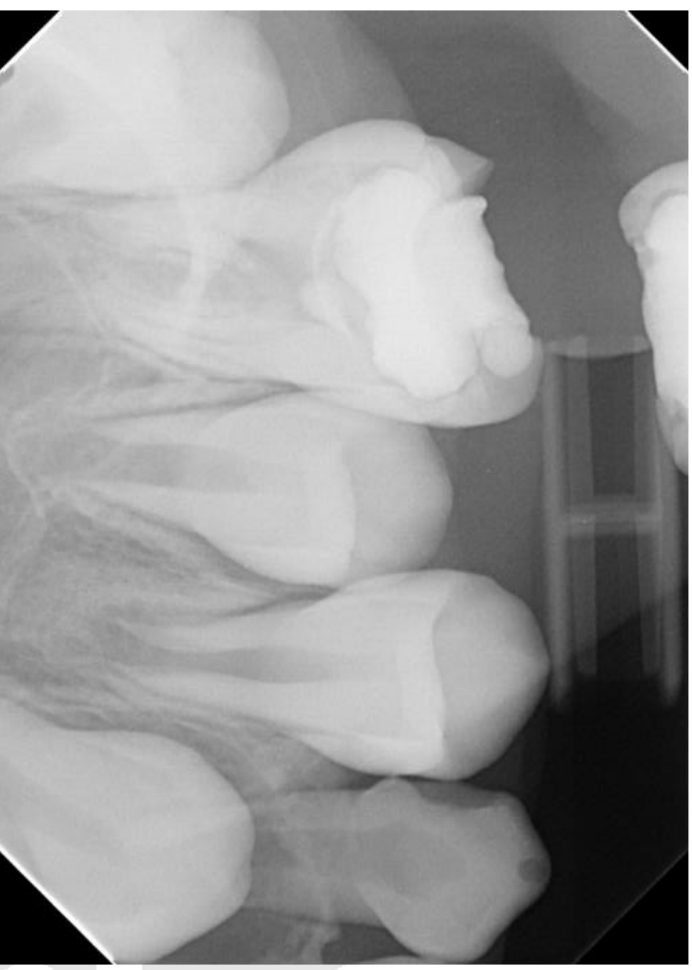
Temporization Not Necessary

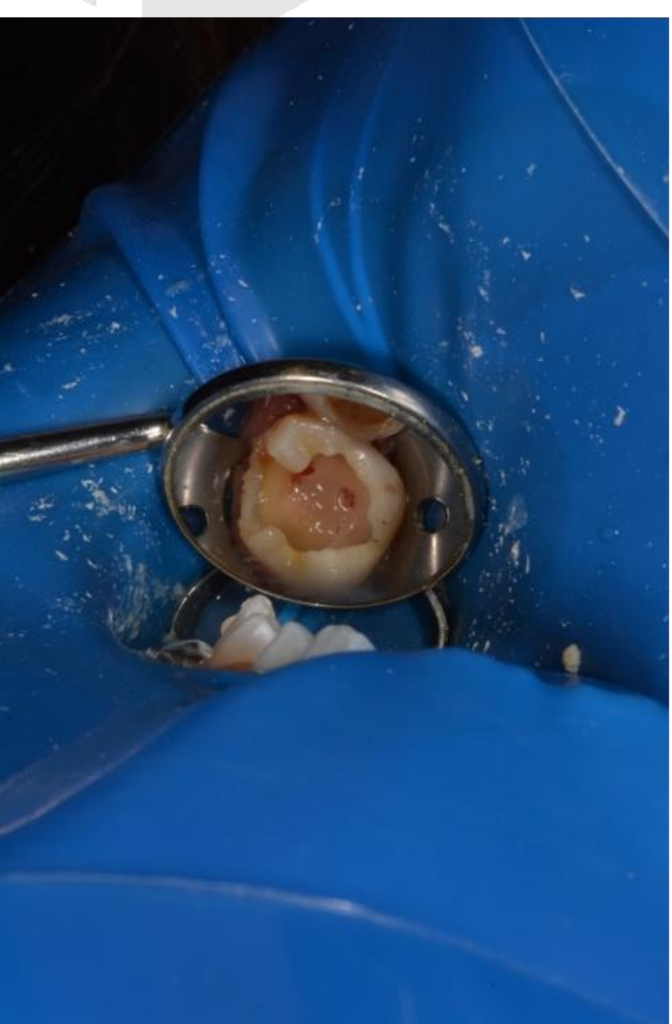
2 Year Recall

2 Year Recall

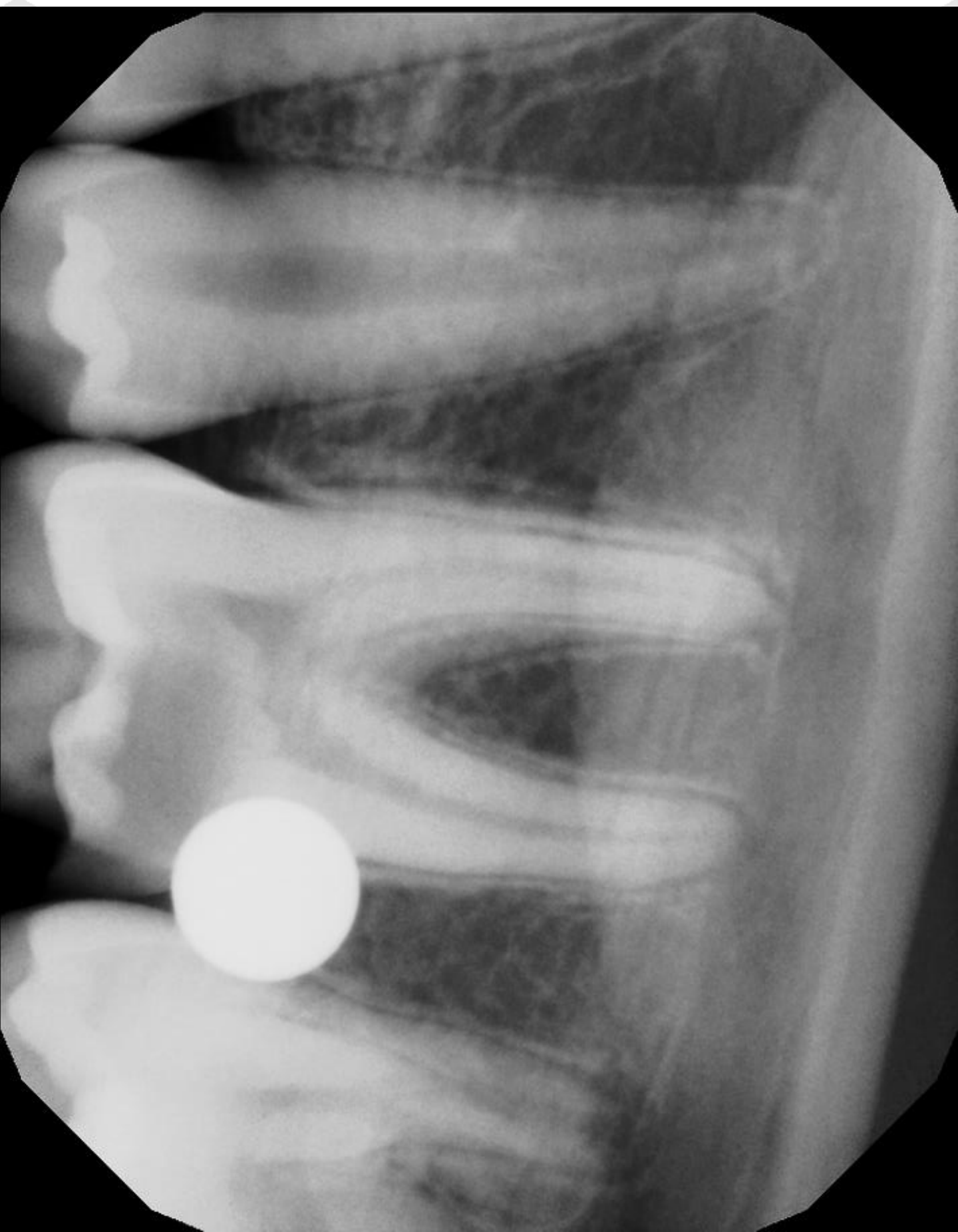


2 Year Recall





Initial

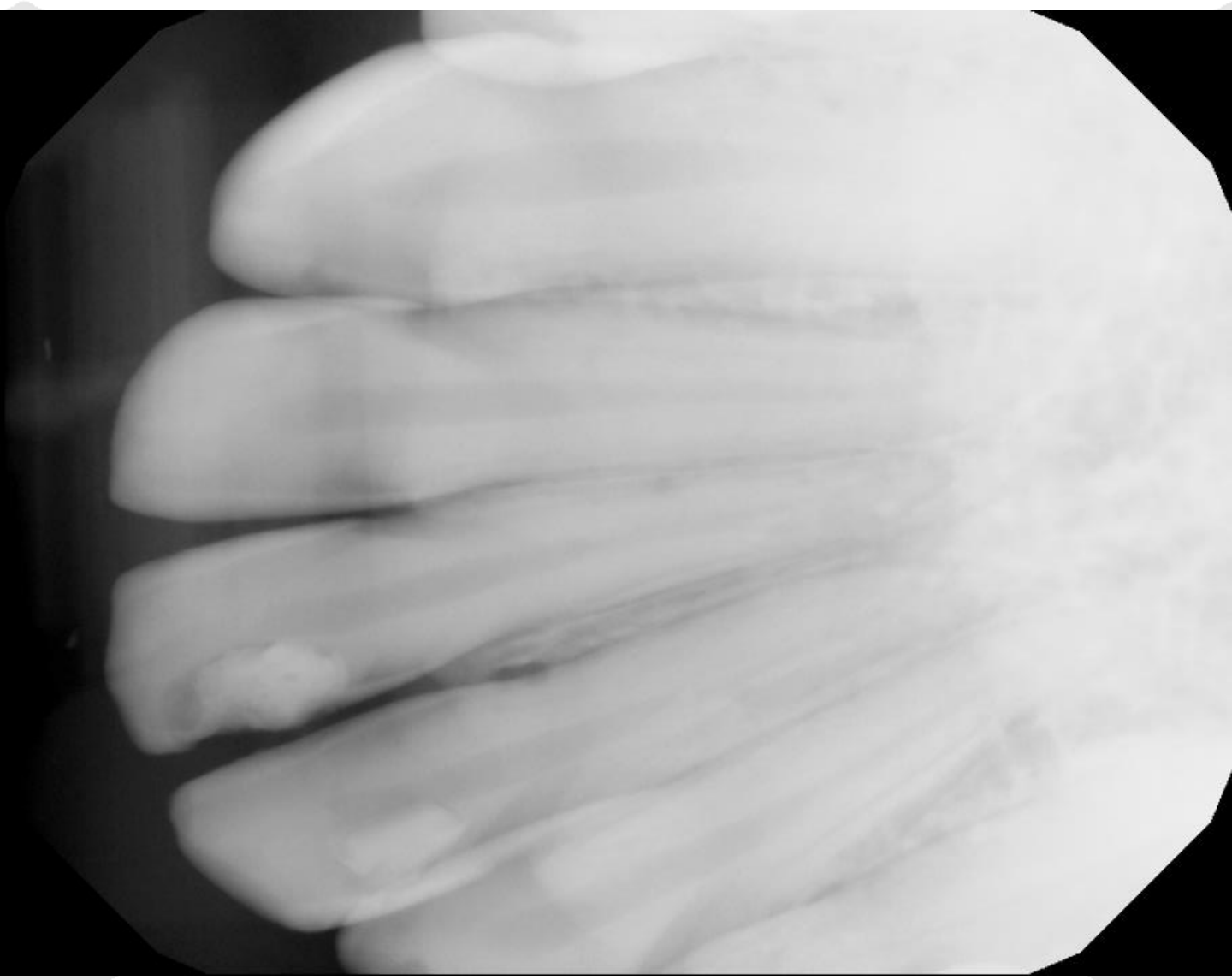


Post Op

10 Month Recall

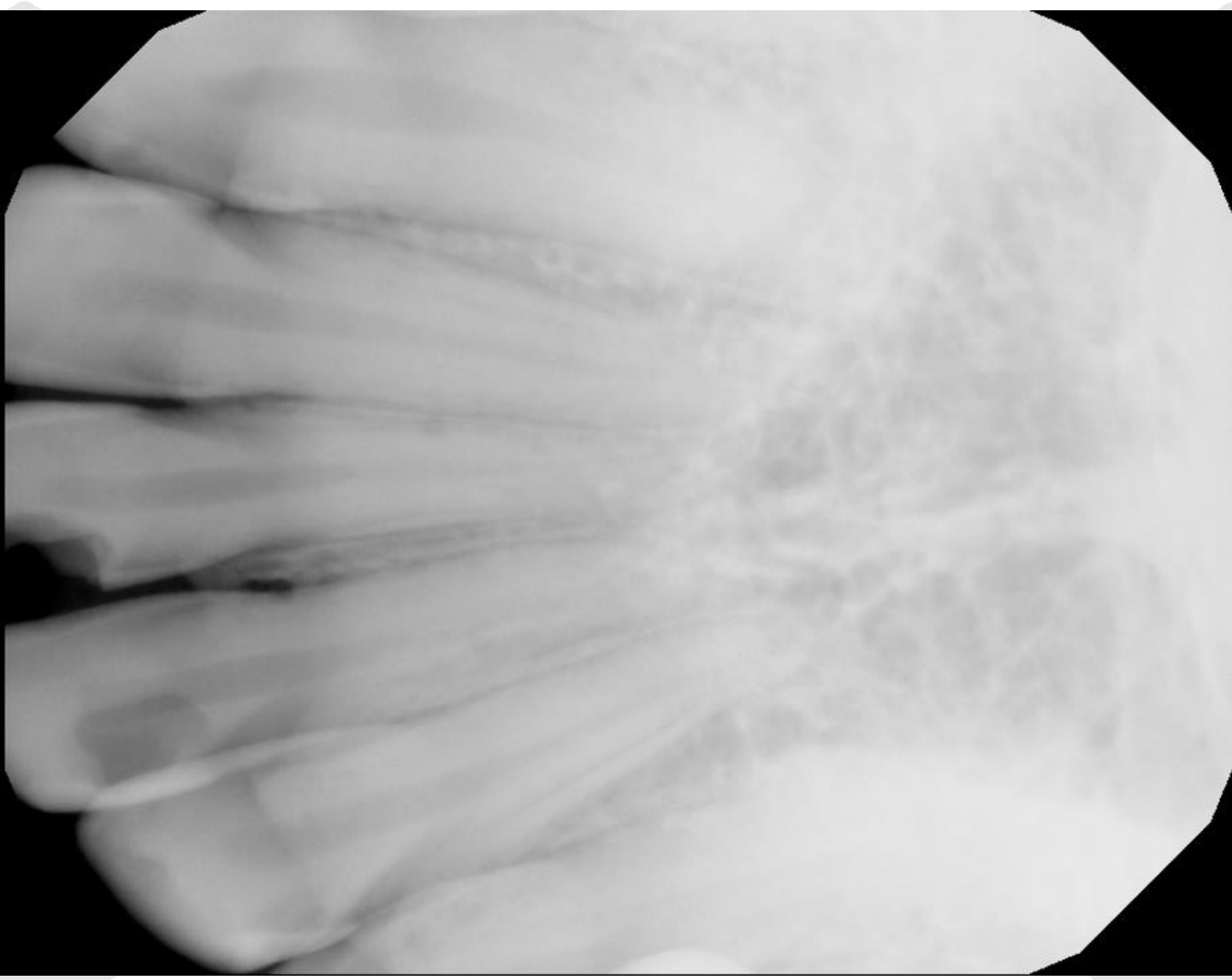
Initial

Post Op, GI



Recall

9 Month Recall



Initial

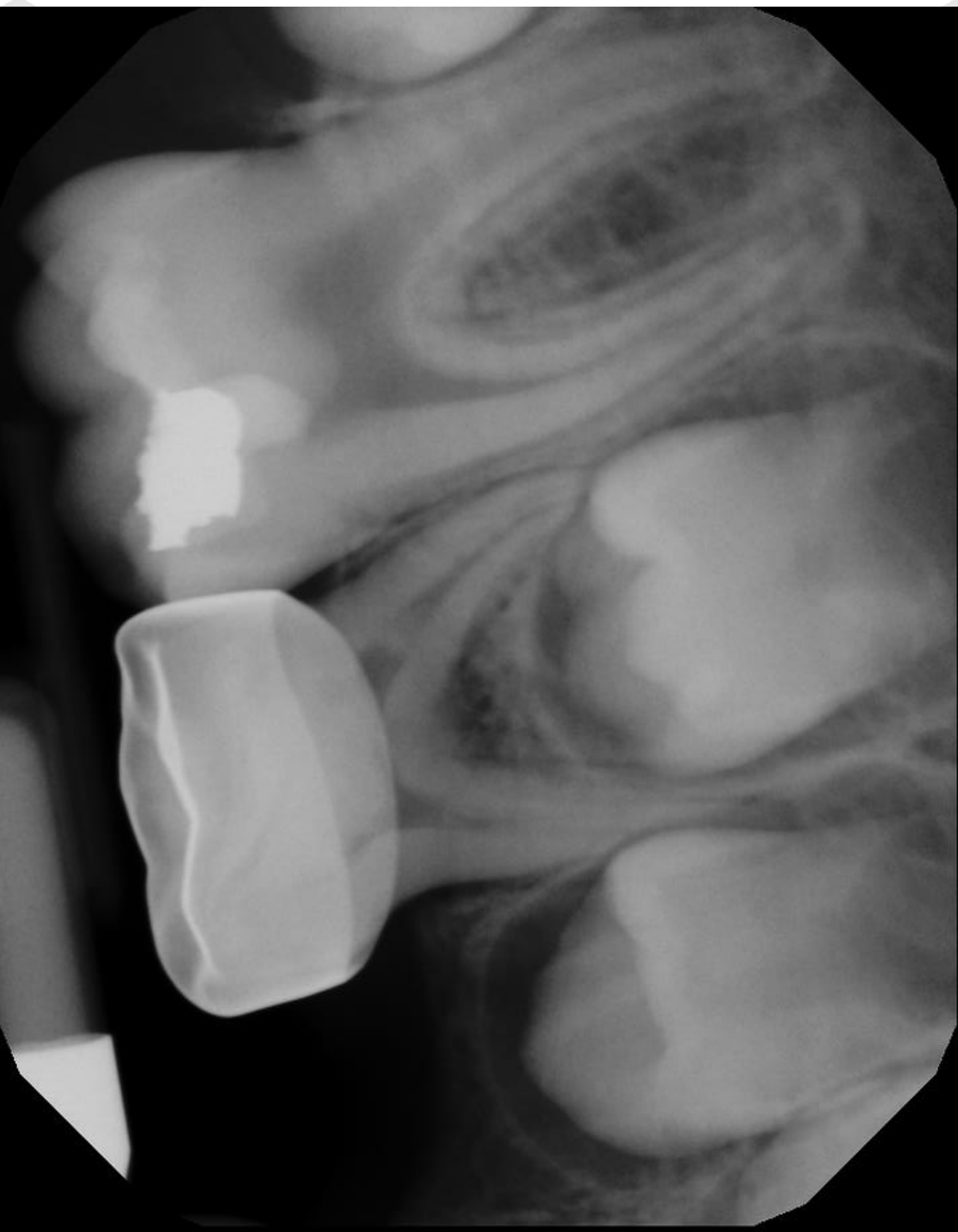
Post Op

2 Year Recall

Initial

Post Op

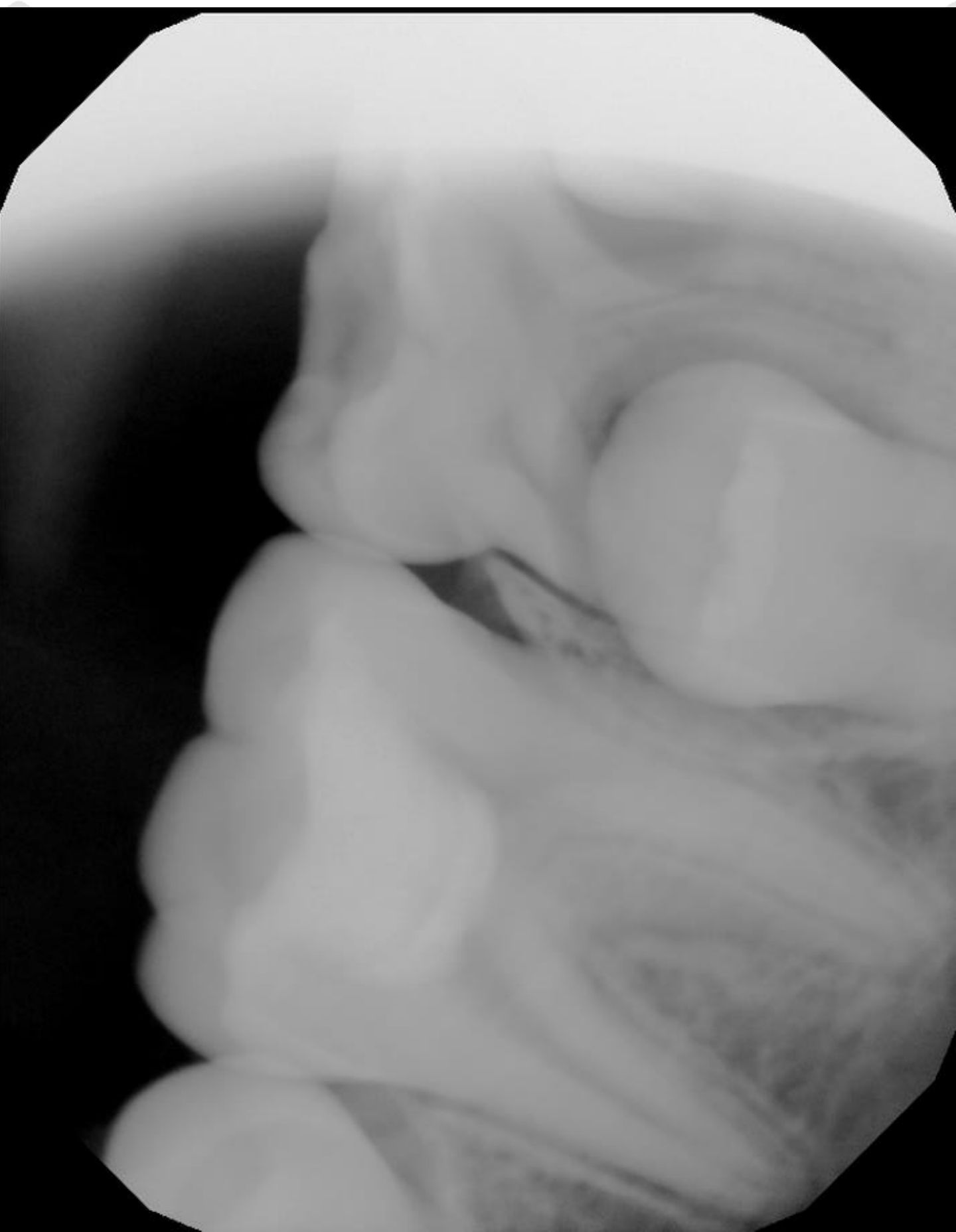
Recall



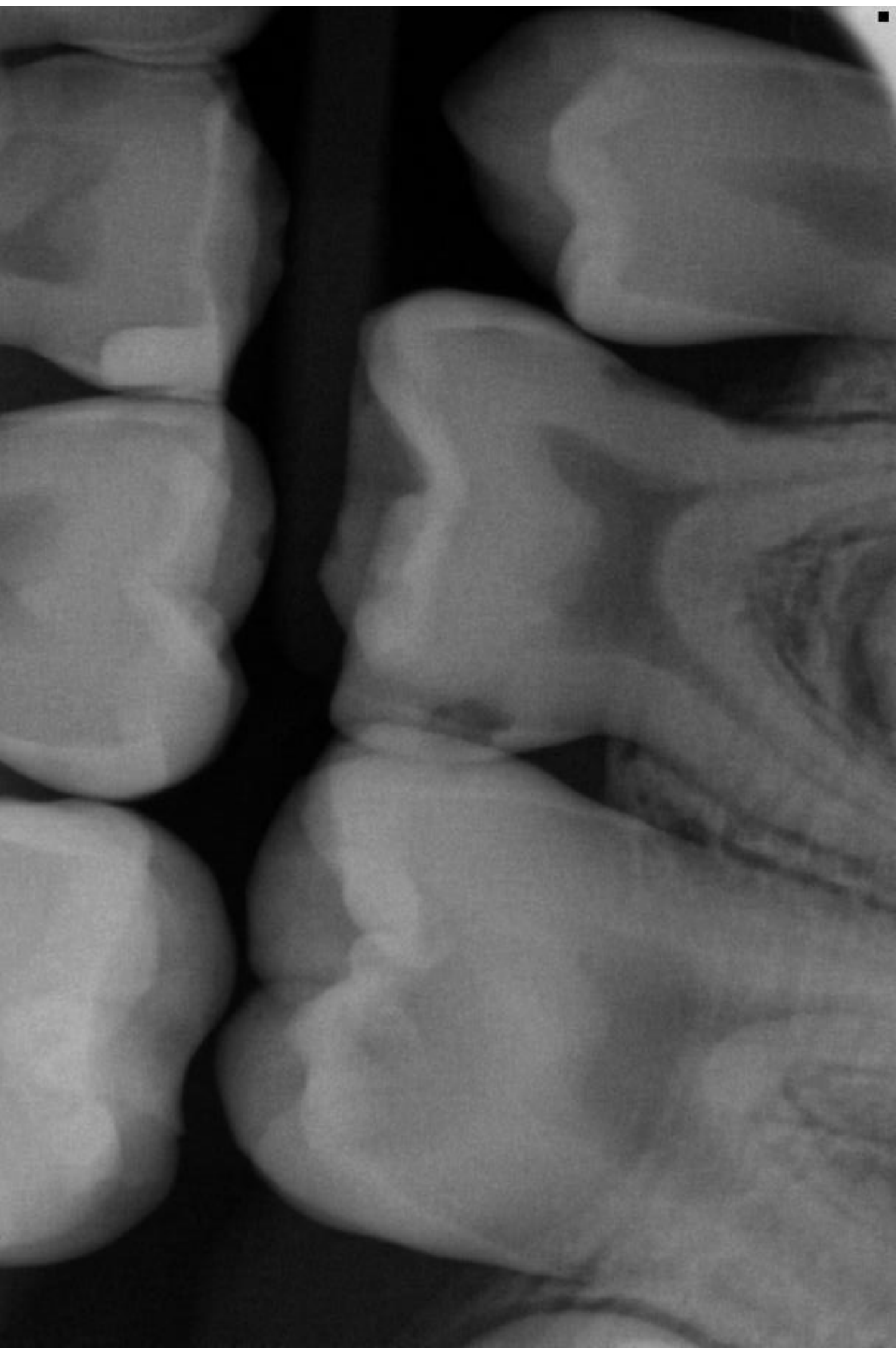
Initial

Post Op

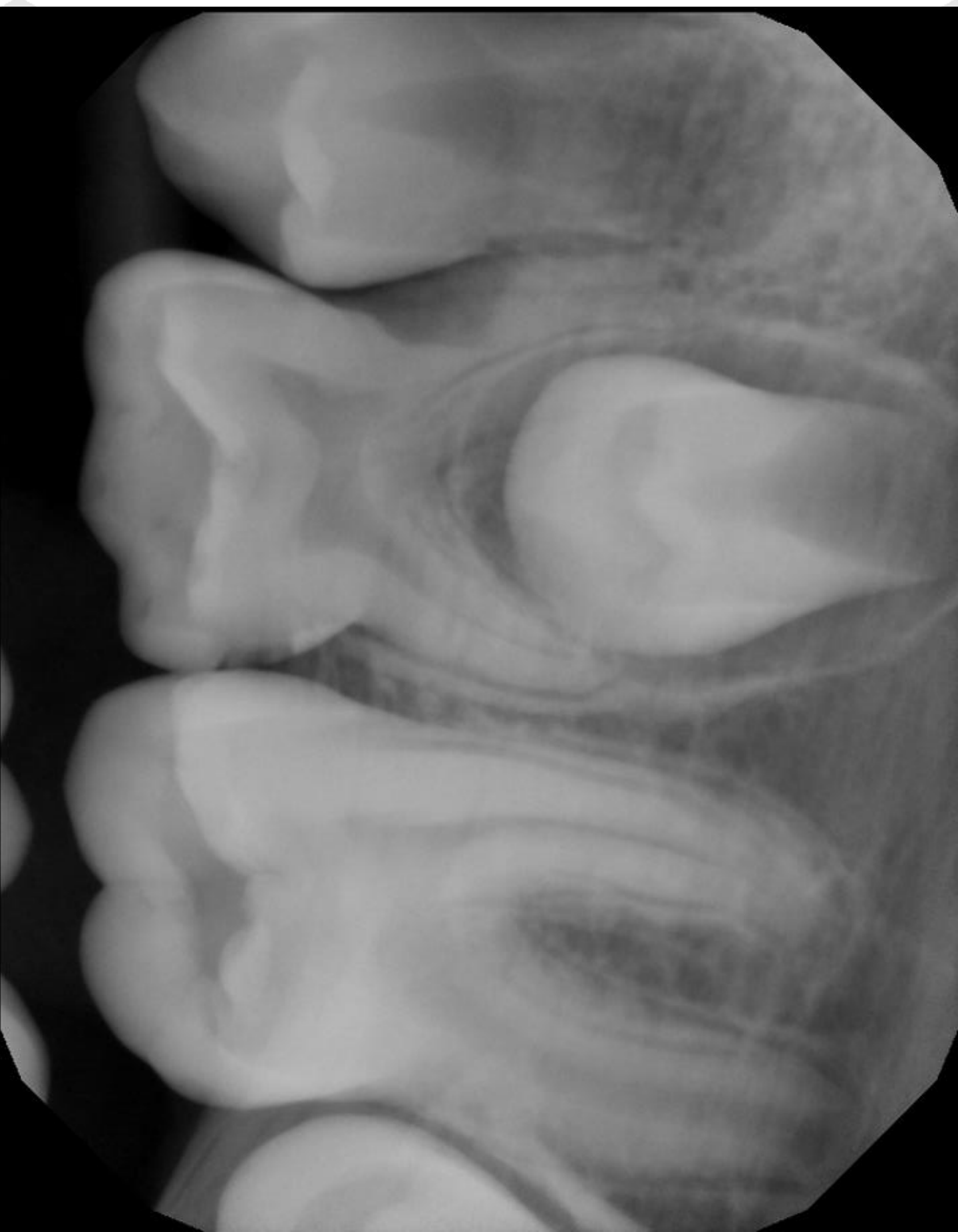
2 Year 6 Month Recall



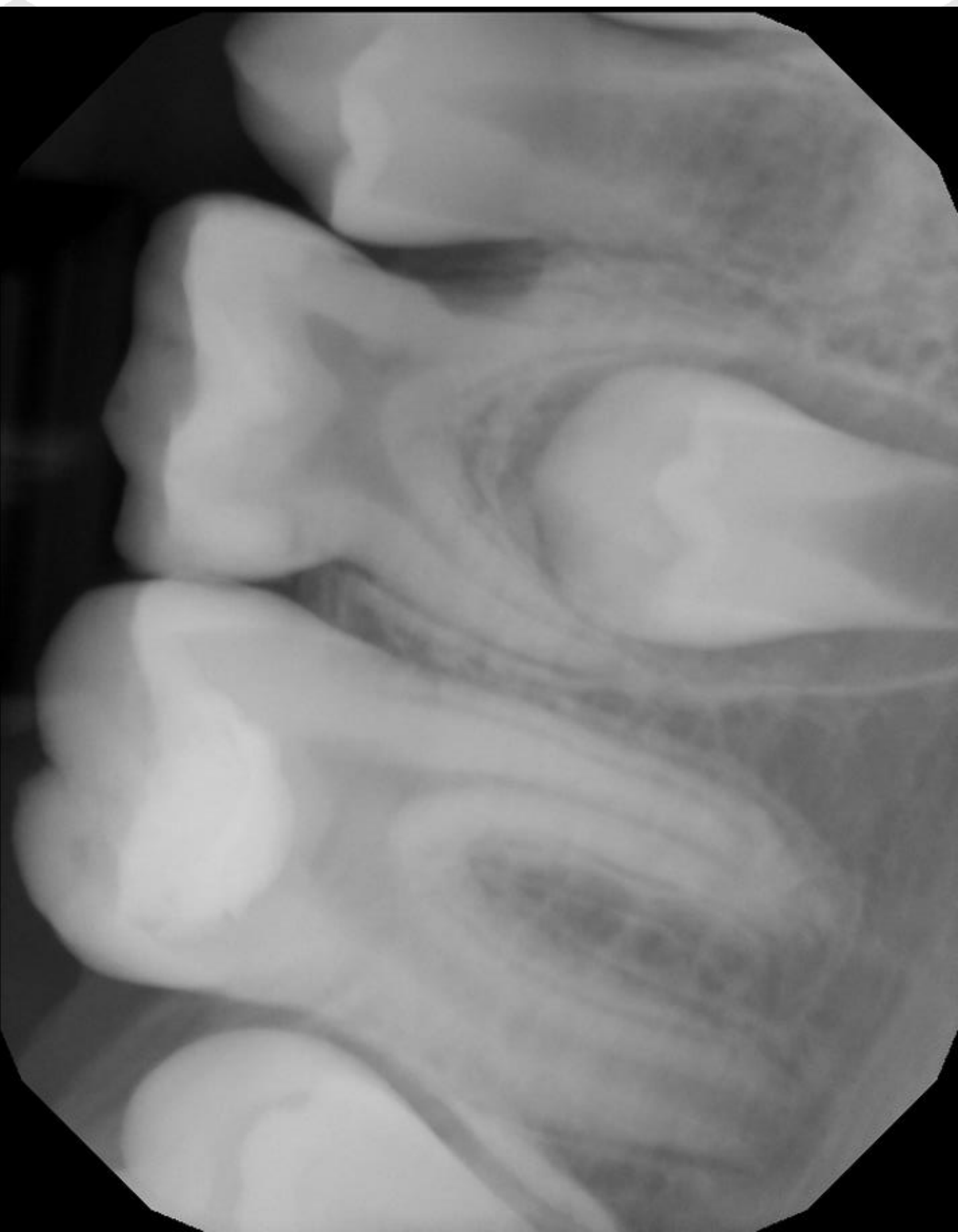
Initial



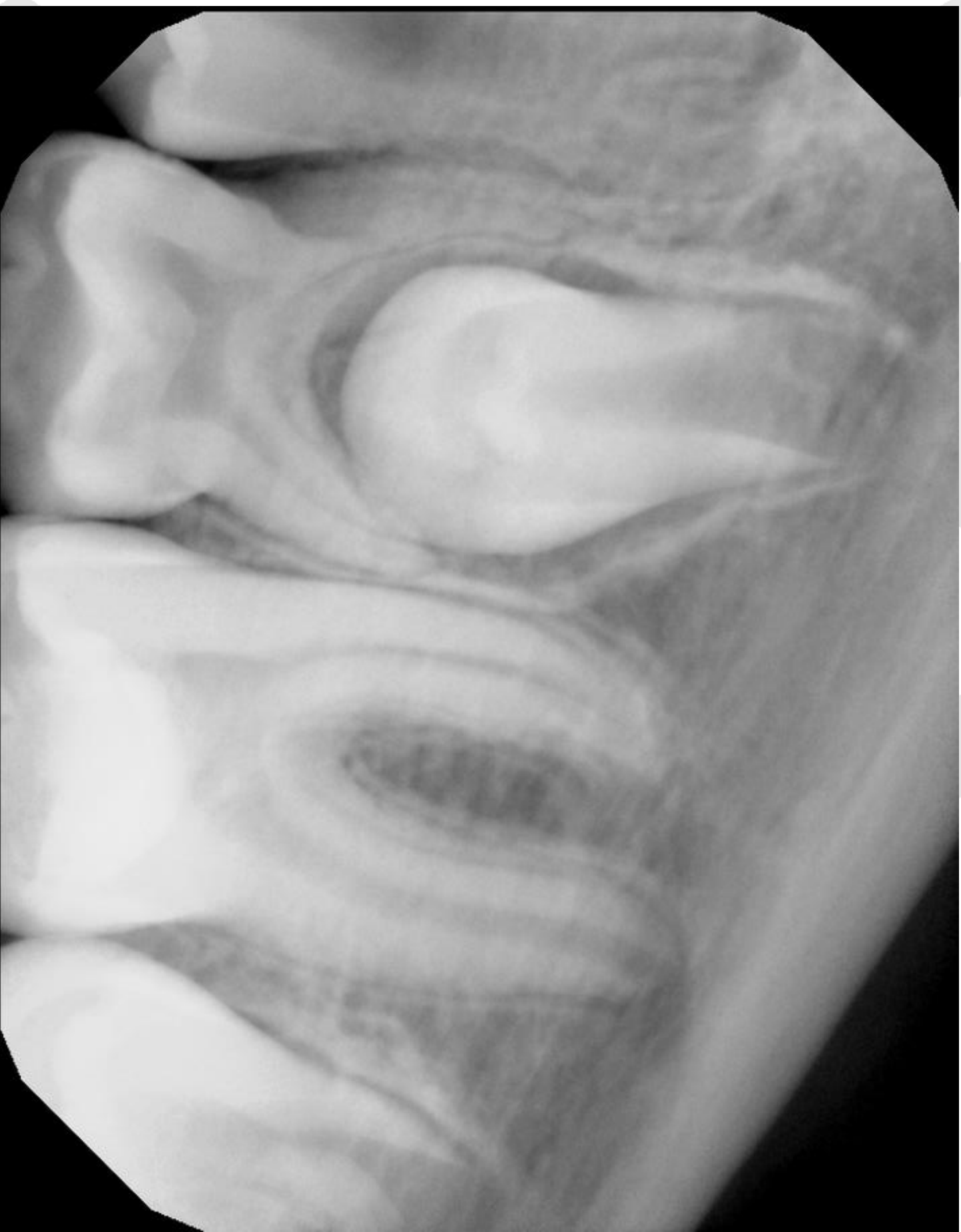
Initial



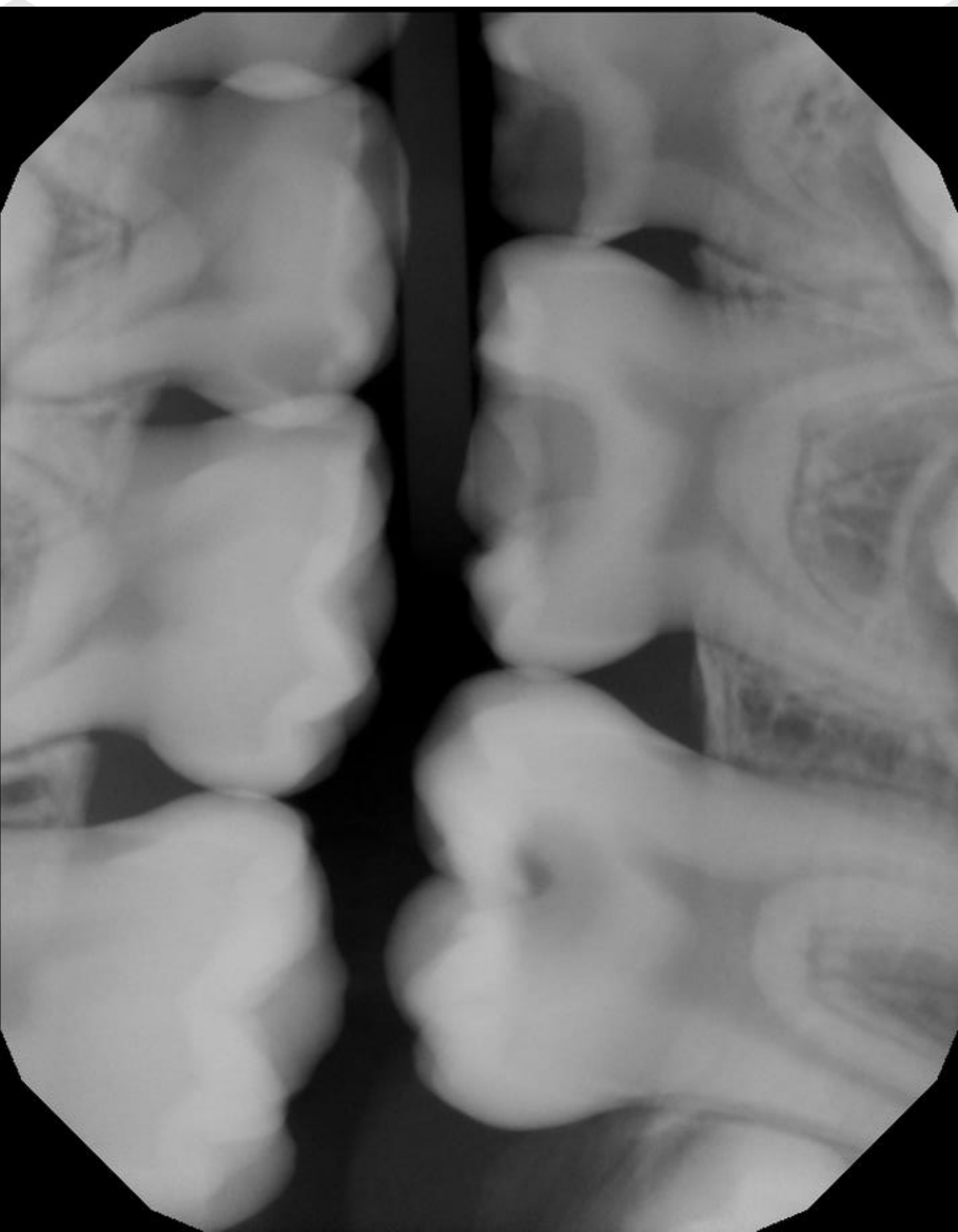
Post Op



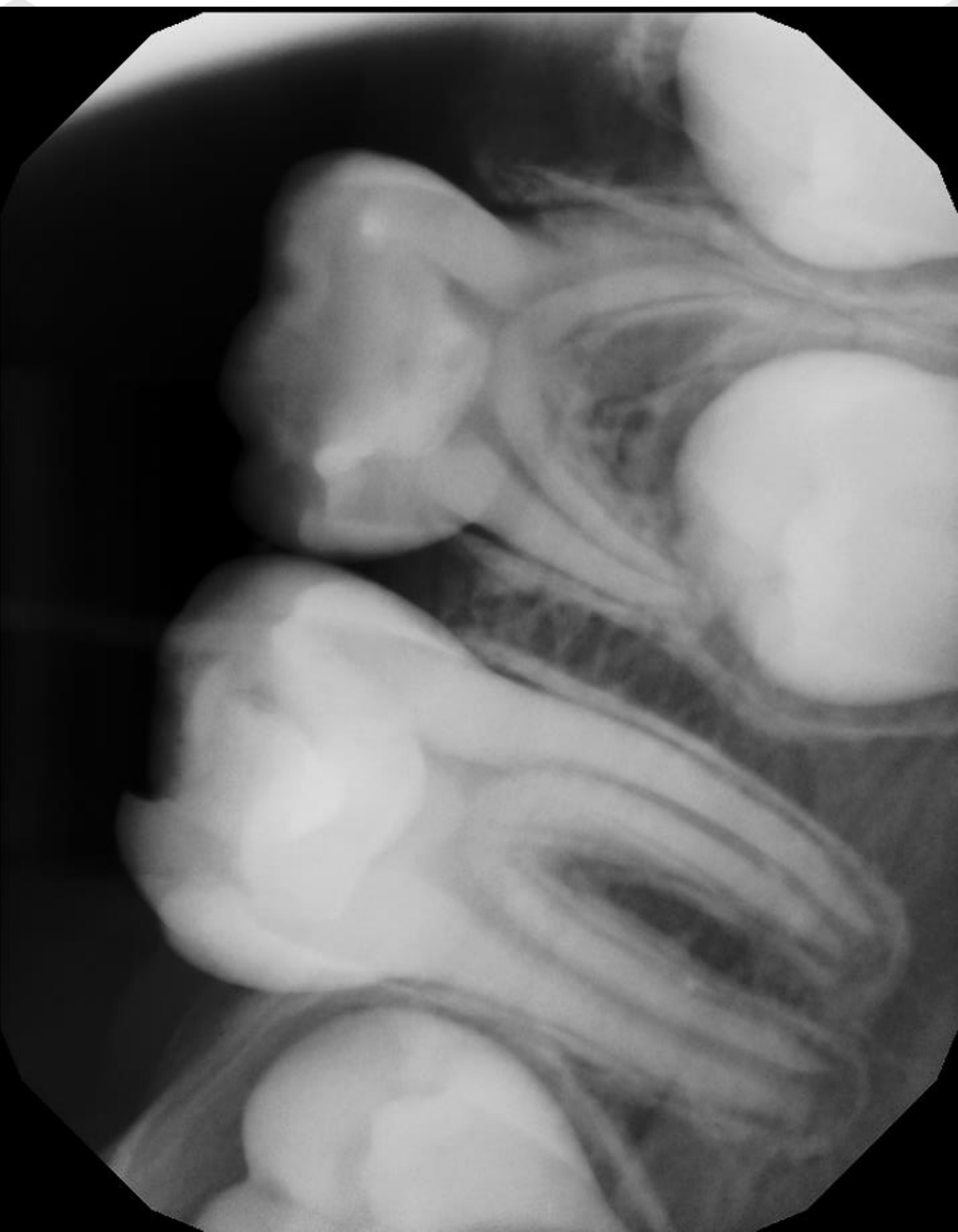
6 Month Recall



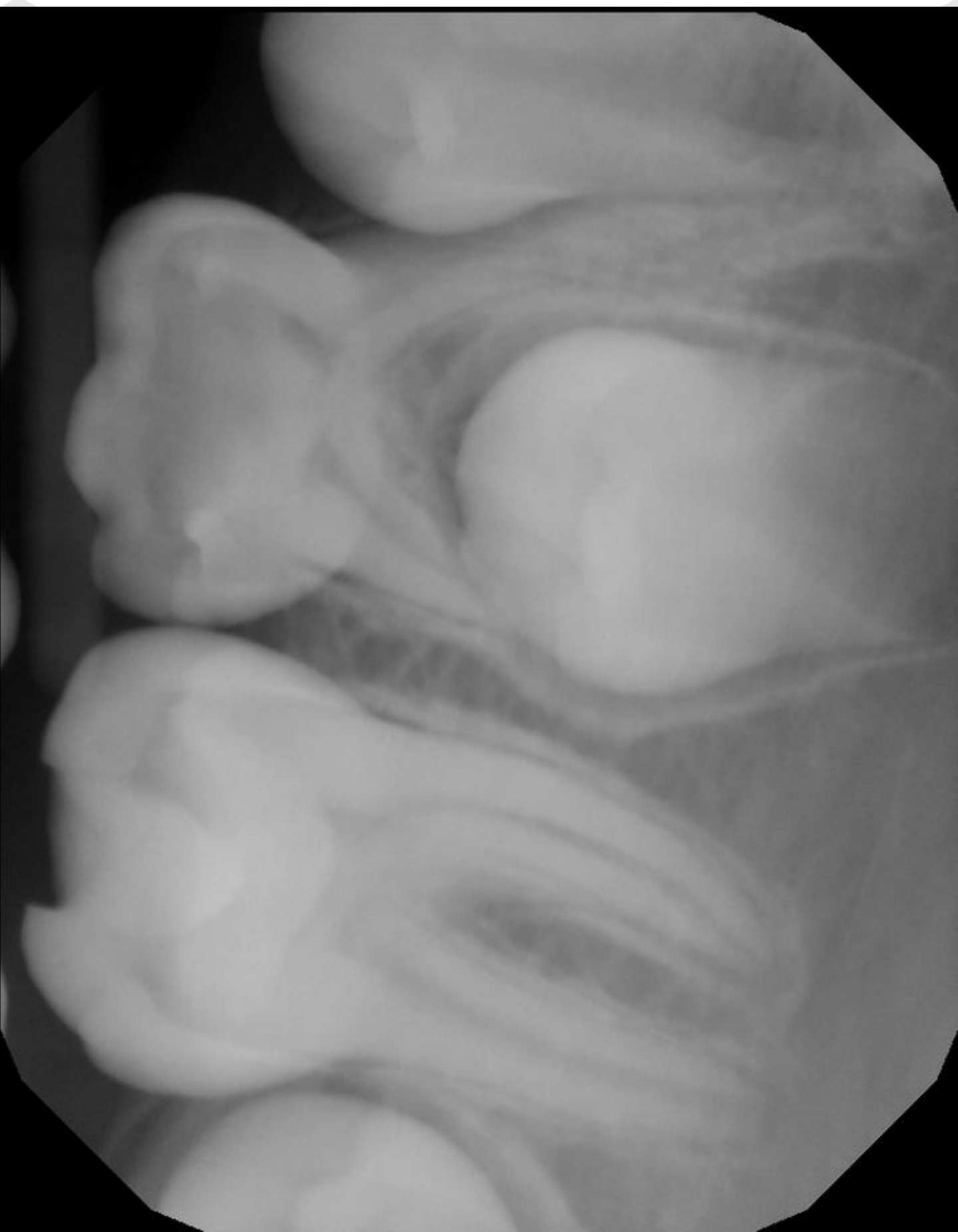
Initial



Post Op



6 Month Recall



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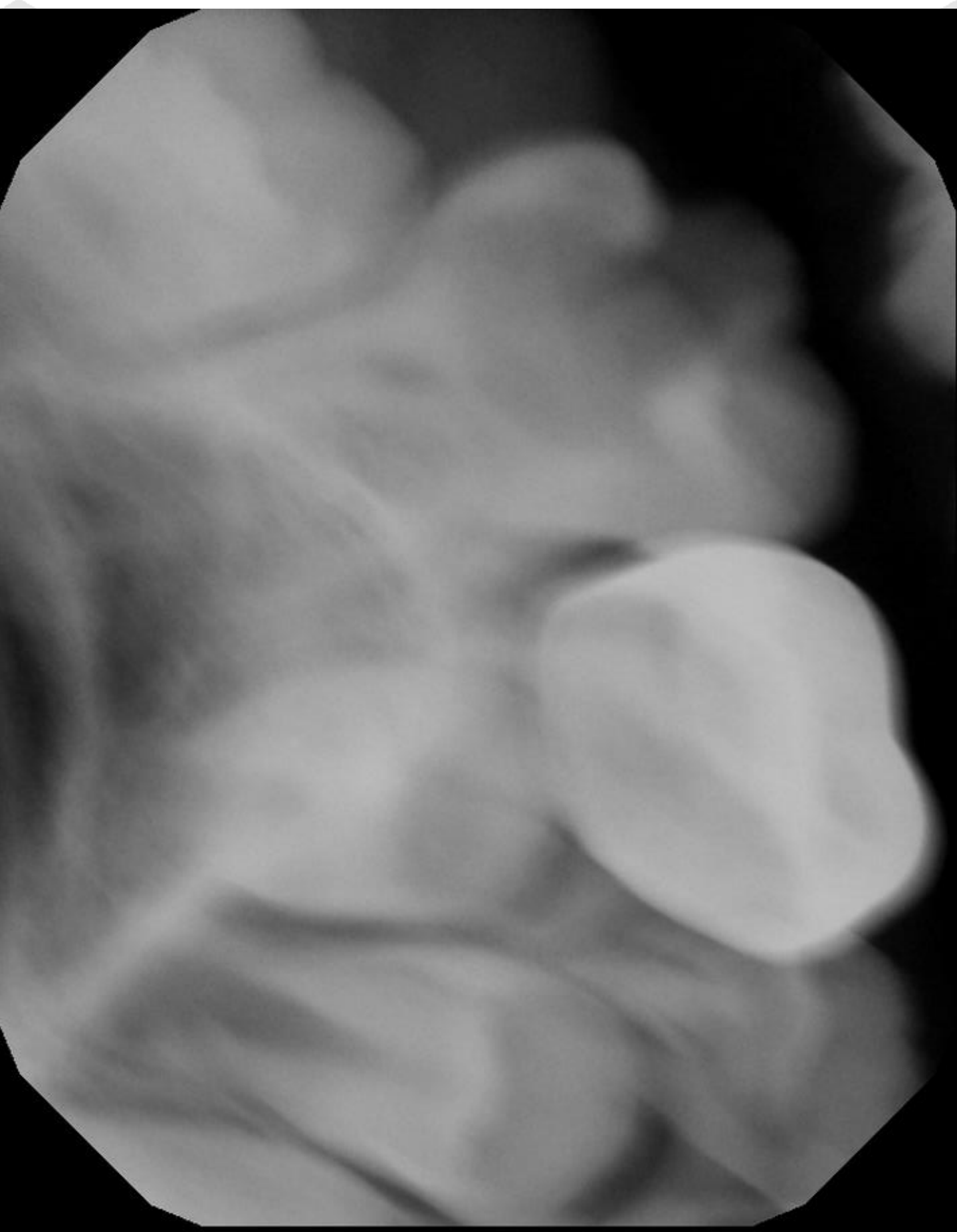
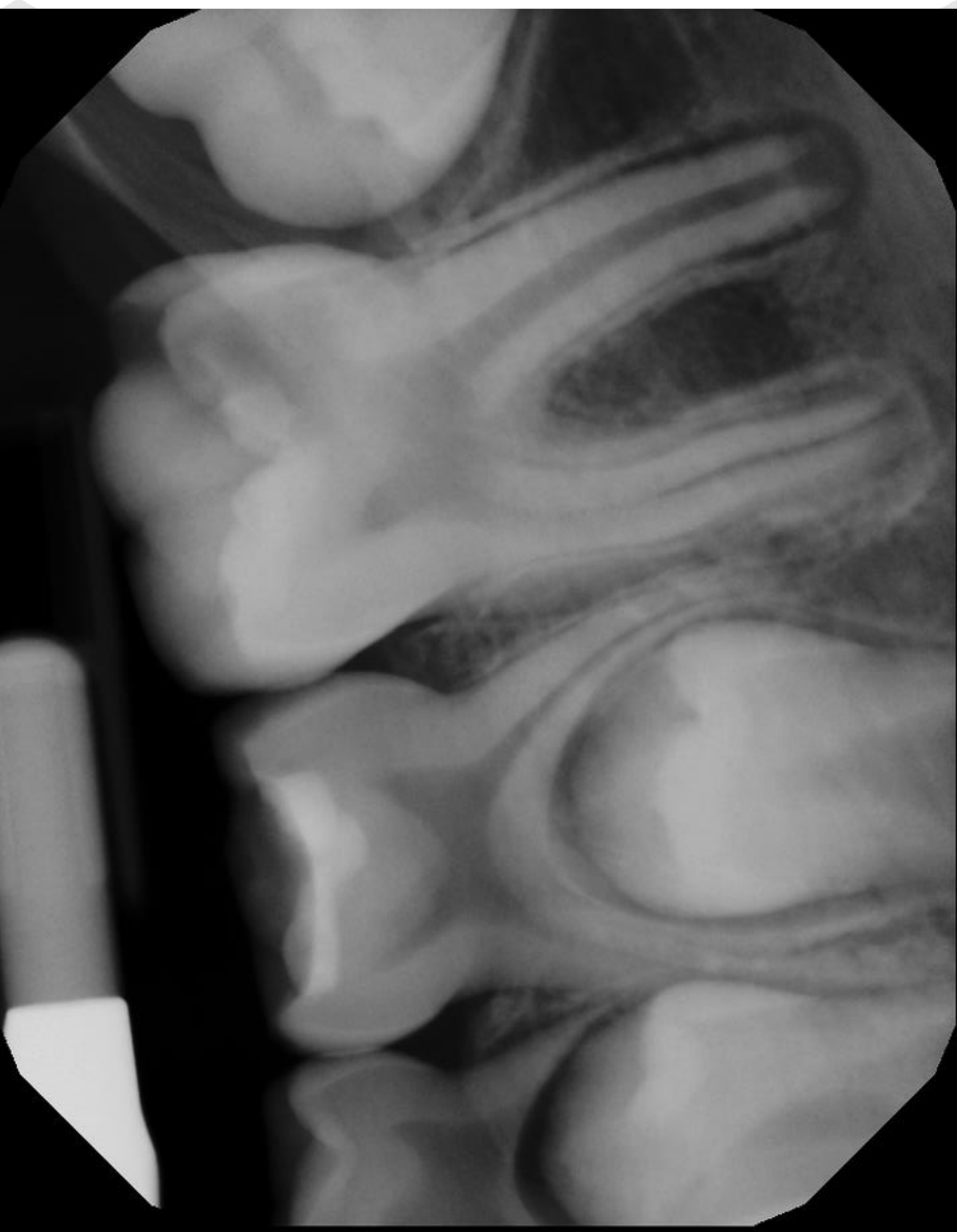


Post Op

Recall

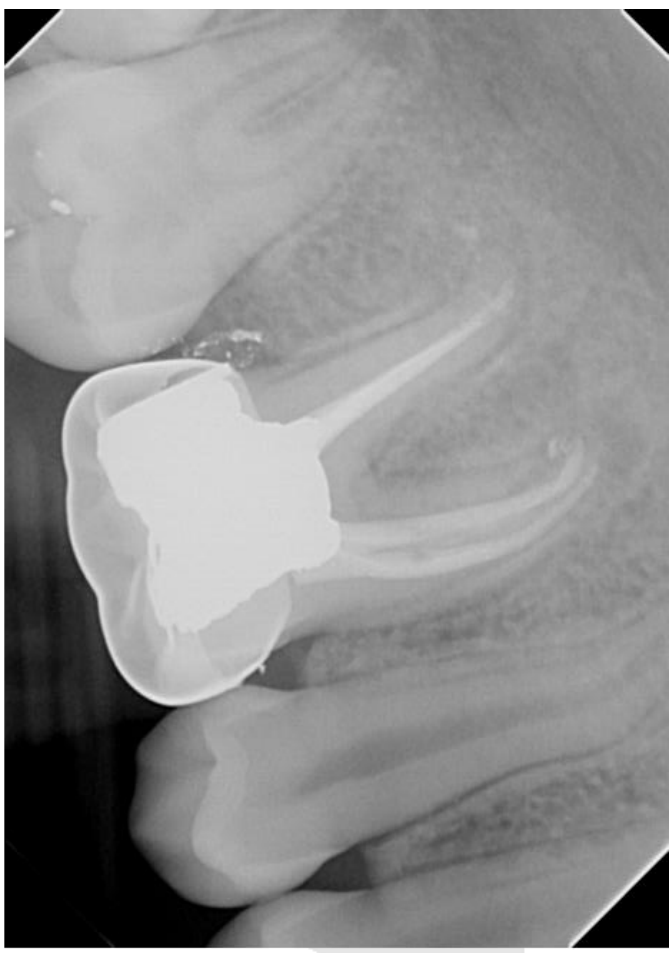
Initial



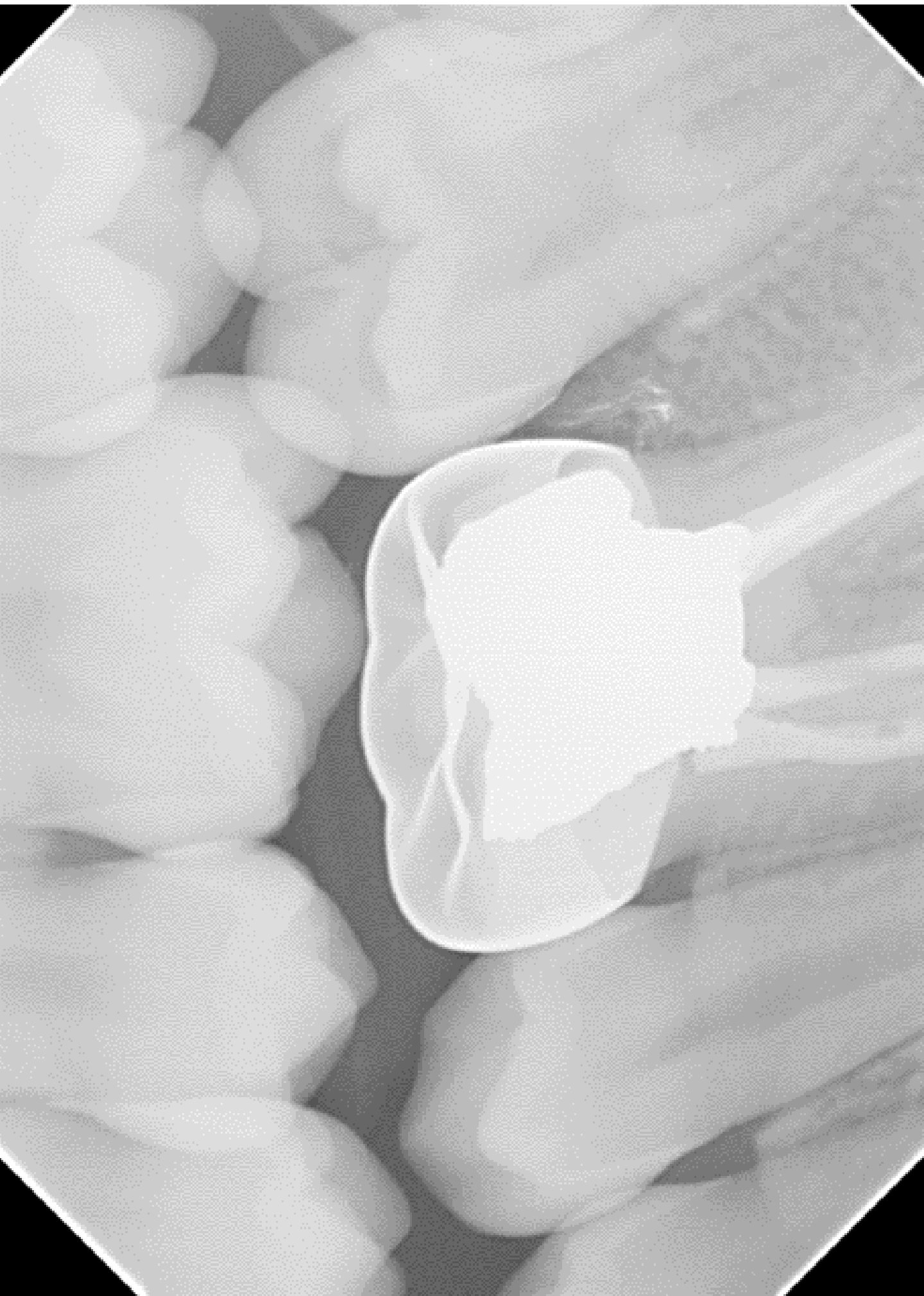
1 Year Recall

2 Year Recall

When things don’t work out…



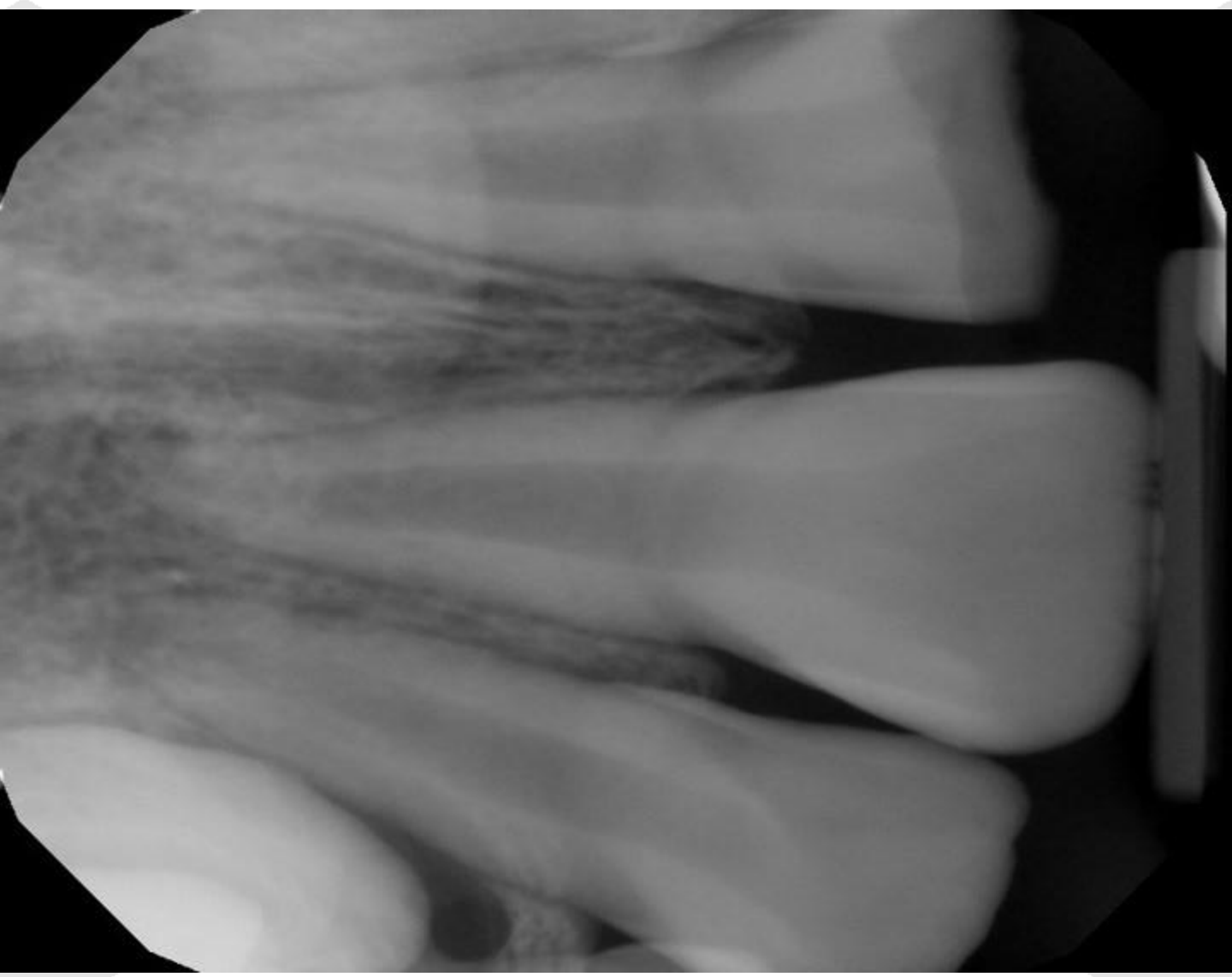
Final Restoration



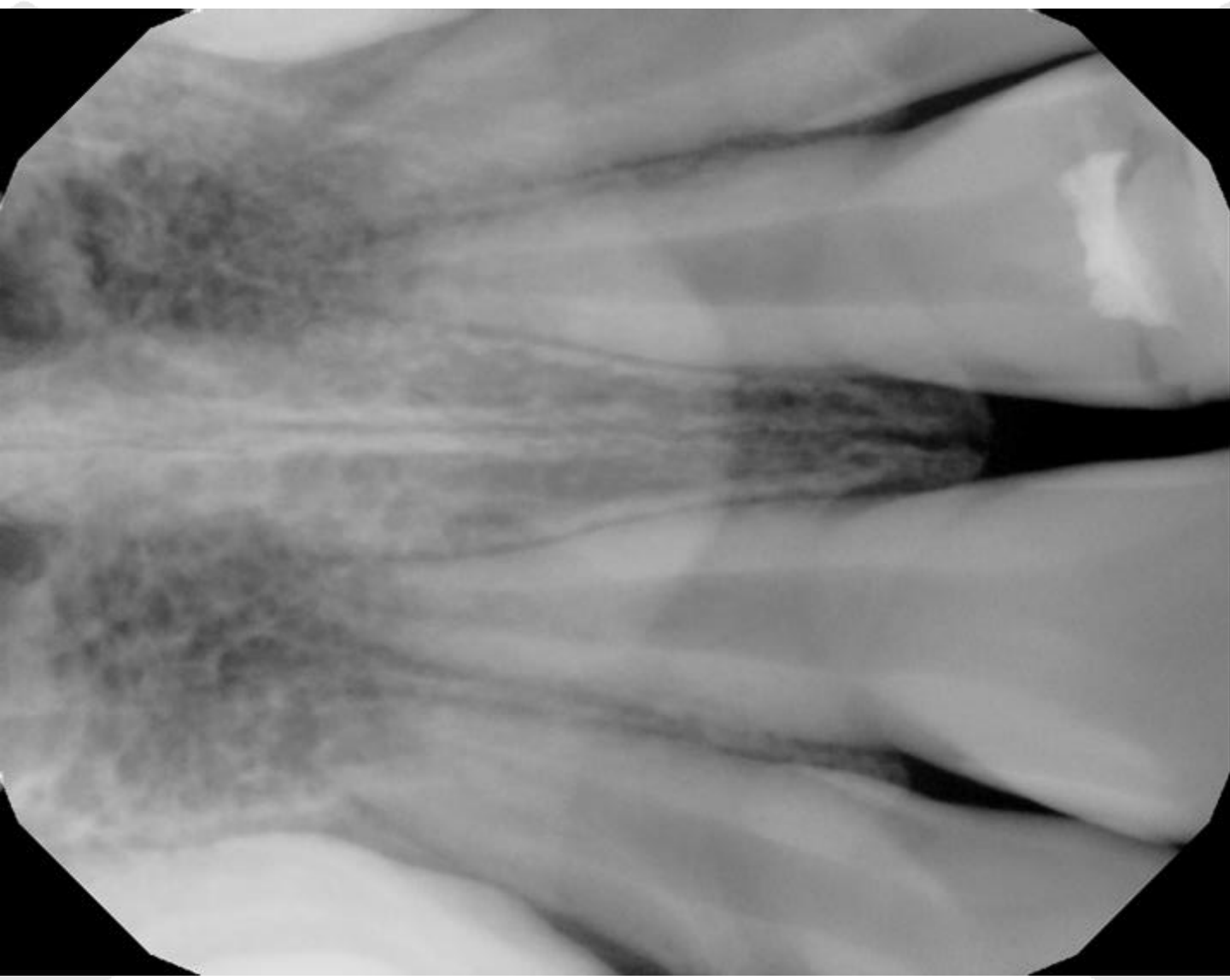
Partial and Full Pulpotomies

Initial

Initial



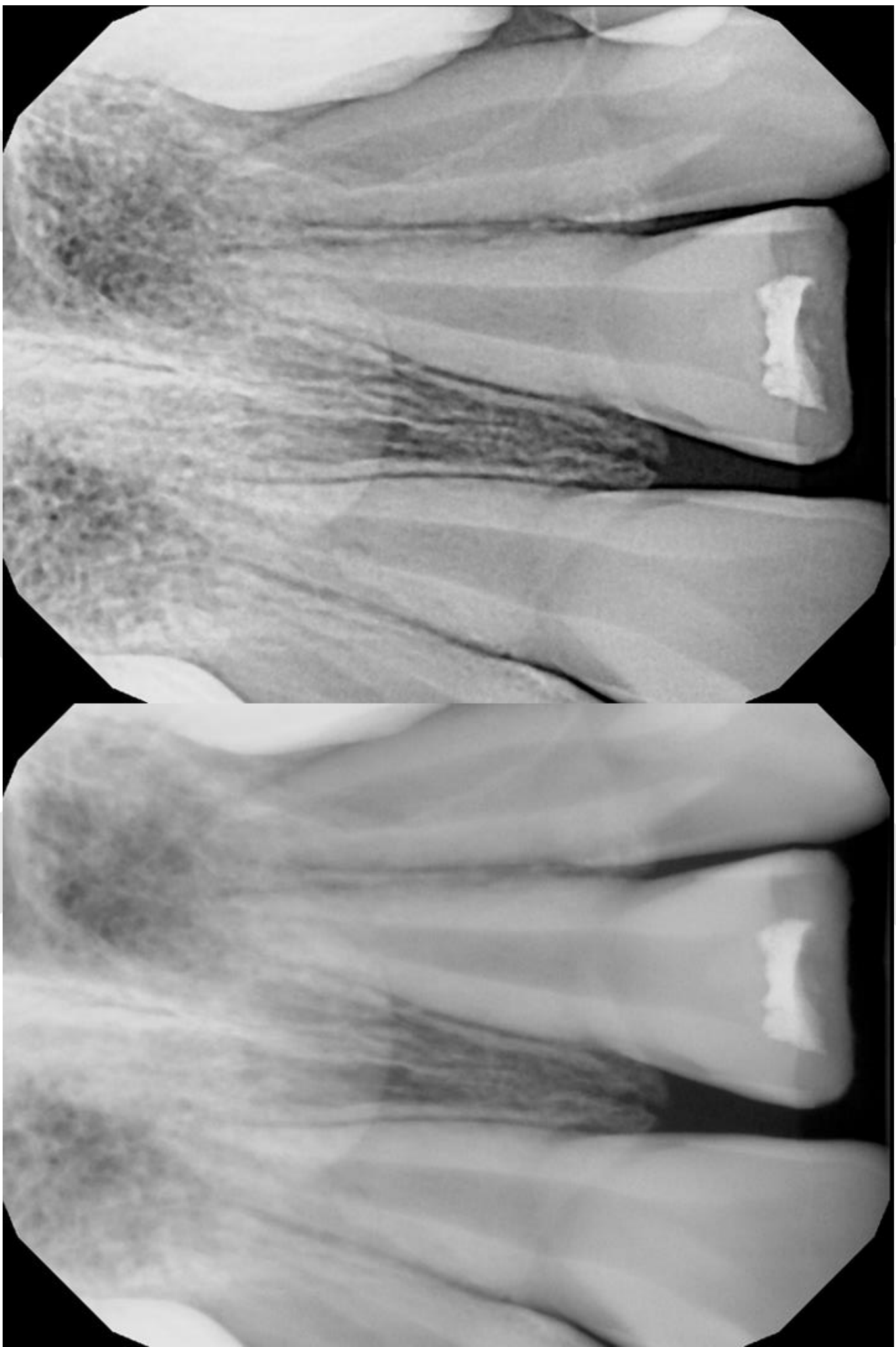
Post Op



Post Op

Recall

Recall



Clinical Tip

A partial pulpotomy can be performed days after trauma as long as there is healthy radicular pulp.

Partial Pulpotomy

- Trauma Success
  - 96% Cvek, 1978
    - 14-60 months, average 31 months
  - 81% Caprioglio A et al, 2014
    - 36 month follow up
- Calcium Hydroxide and MTA are equivocal in success

Partial Pulpotomy Technique

1.Anesthetic
2.Rubber Dam Isolation
3.Shallow Pulpotomy Diamond Bur
4.Disinfection of Pulp/Dentin (NaOCl)
5.2 mm Depth, SmartMTA
6.Glass Ionomer*
7.Restoration

Partial Pulpotomy : Technique

Isolate

Rubber dam isolation is indicated to prevent bacterial contamination of the pulp. In some cases of trauma isolation may be difficult.

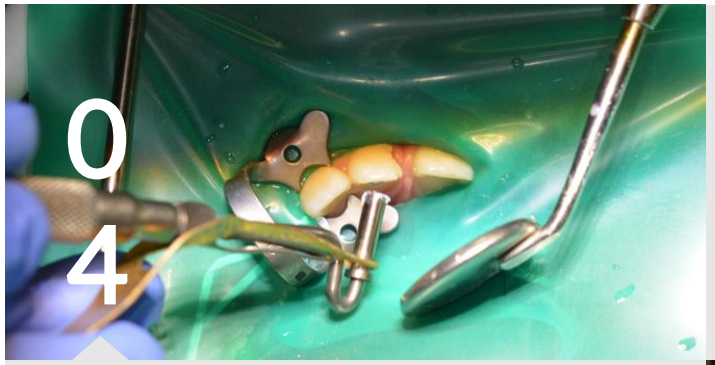
Diagnose

SmartMTA can be used for vital pulp therapy after traumatic dental injuries.

Access

Perform a shallow pulpotomy with a high speed and diamond bur with copious irrigation. Obtain hemostasis and disinfect with Sodium Hypochlorite

Partial Pulpotomy: Technique

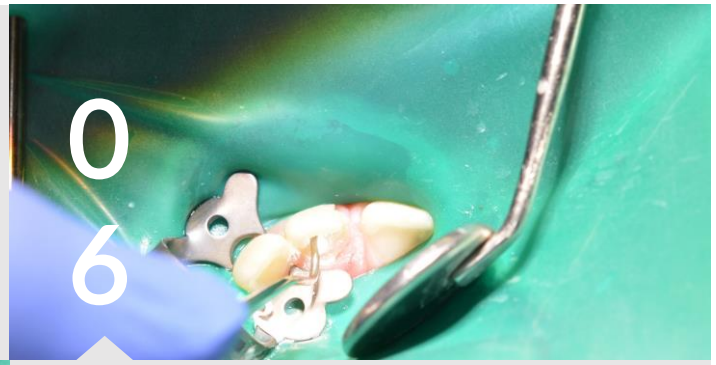


Medicate

Place SmartMTA into the pulp chamber using an amalgam carrier.

Adapt SmartMTA

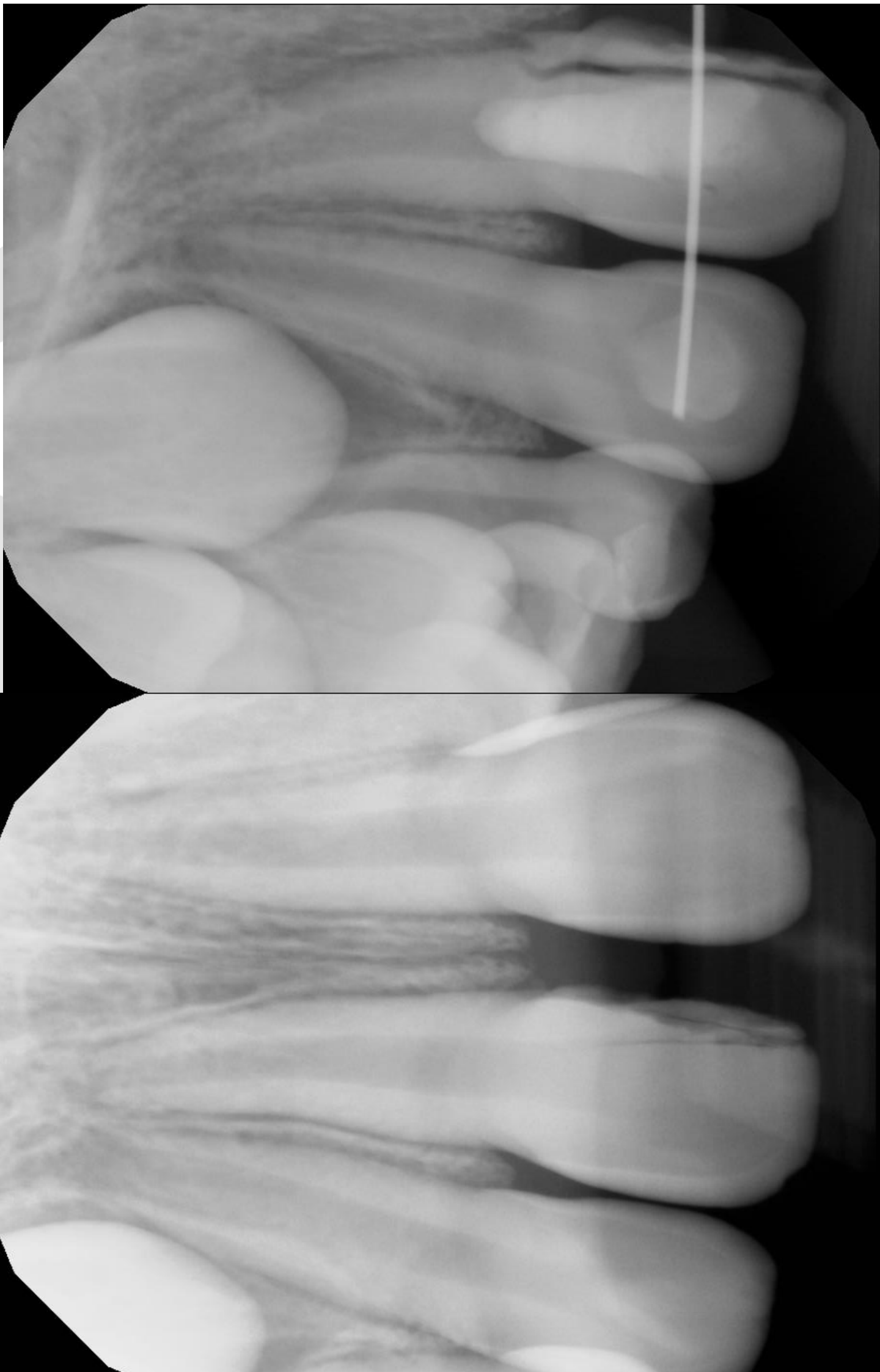
Adapt SmartMTA into the pulp chamber using a damp cotton pellet. Ensure the pellet is not saturated with water.



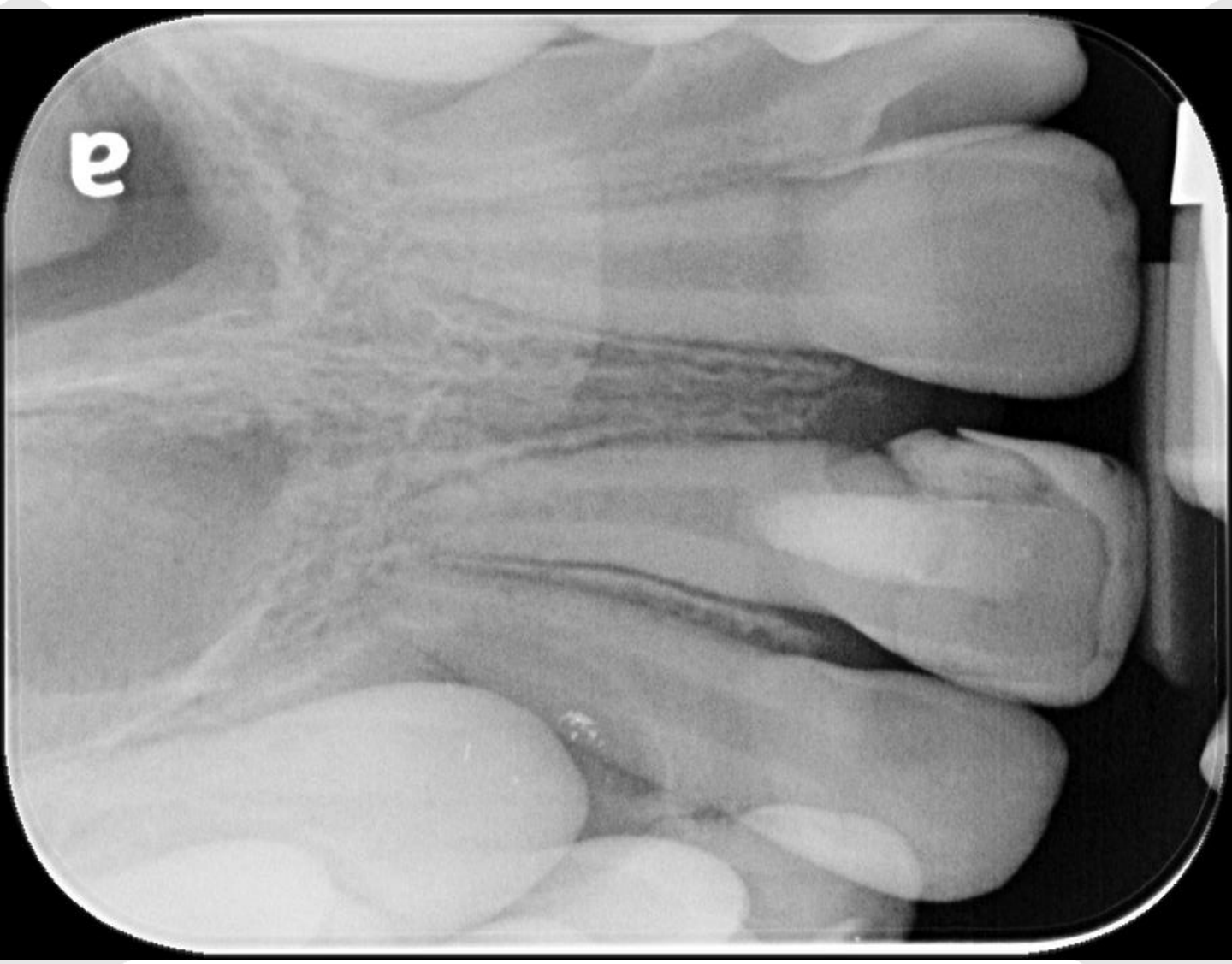
Clean Margins. Restore

Clean SmartMTA from the margins and place a restoration. Final restoration should be placed the same day of treatment if behavior allows.

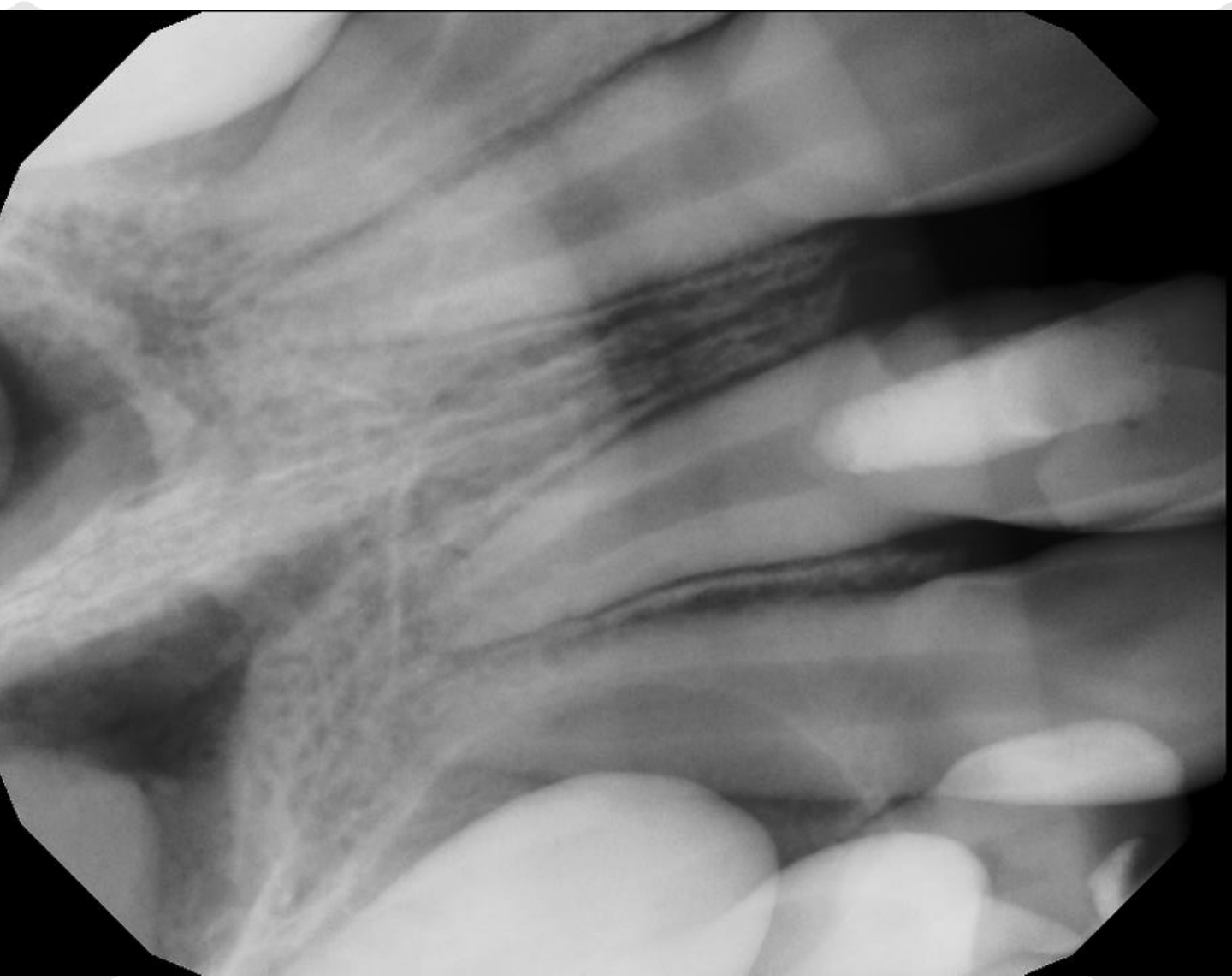
Initial, Post Op



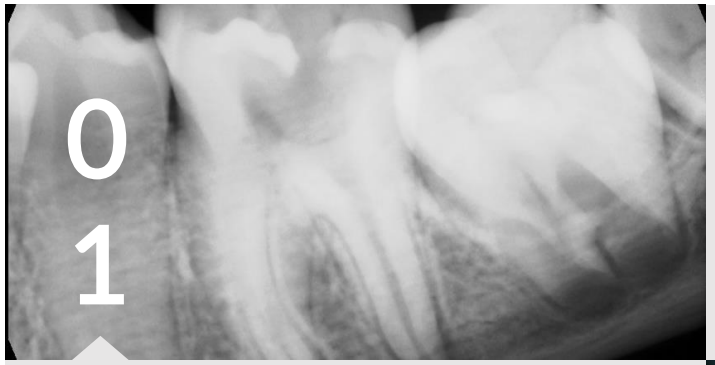
Recall



1 Year Recall

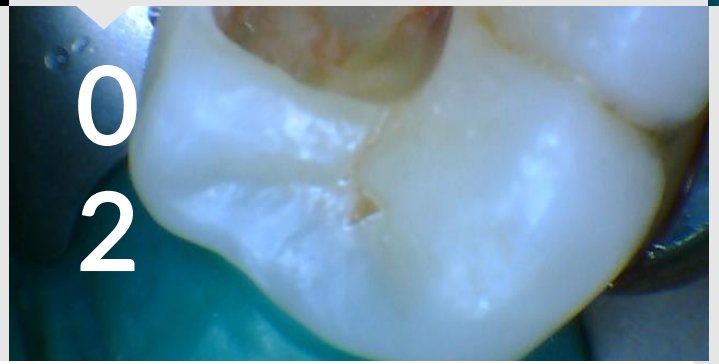


Partial Pulpotomy : Technique



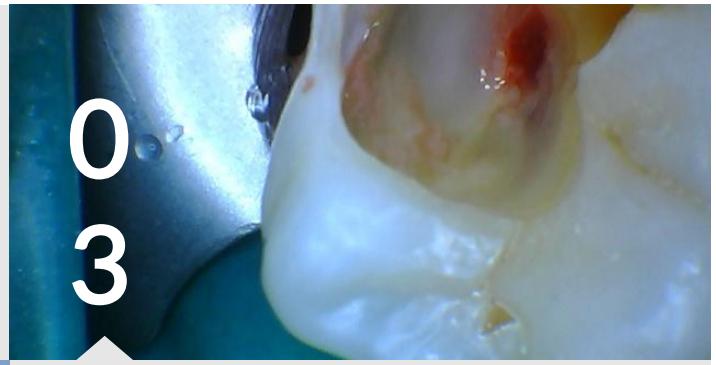
Isolate

Rubber dam isolation to protect the pulp from bacterial contamination



Caries Removal

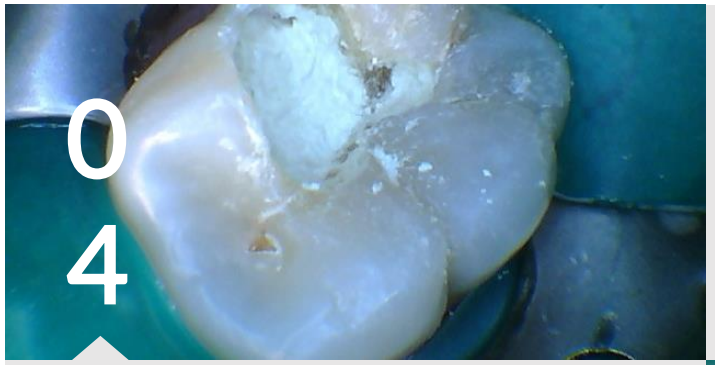
Remove the coronal pulp until healthy tissue is evident



Hemostasis

Obtain hemostasis with 3-6% Sodium Hypochlorite

Partial Pulpotomy: Technique

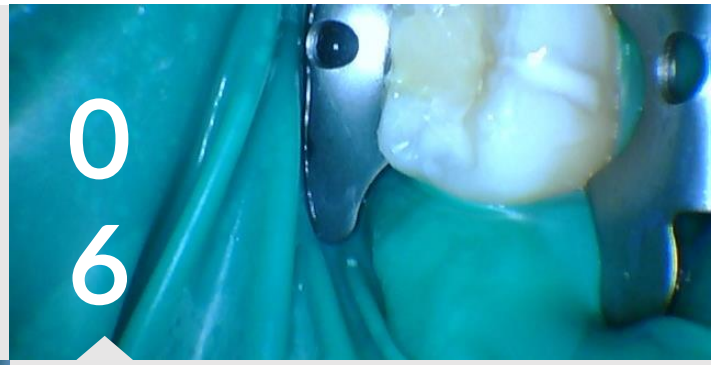


Medicate

Adapt SmartMTA into the access cavity. A glass ionomer base can be used over the medicament.

Temporization Not Necessary

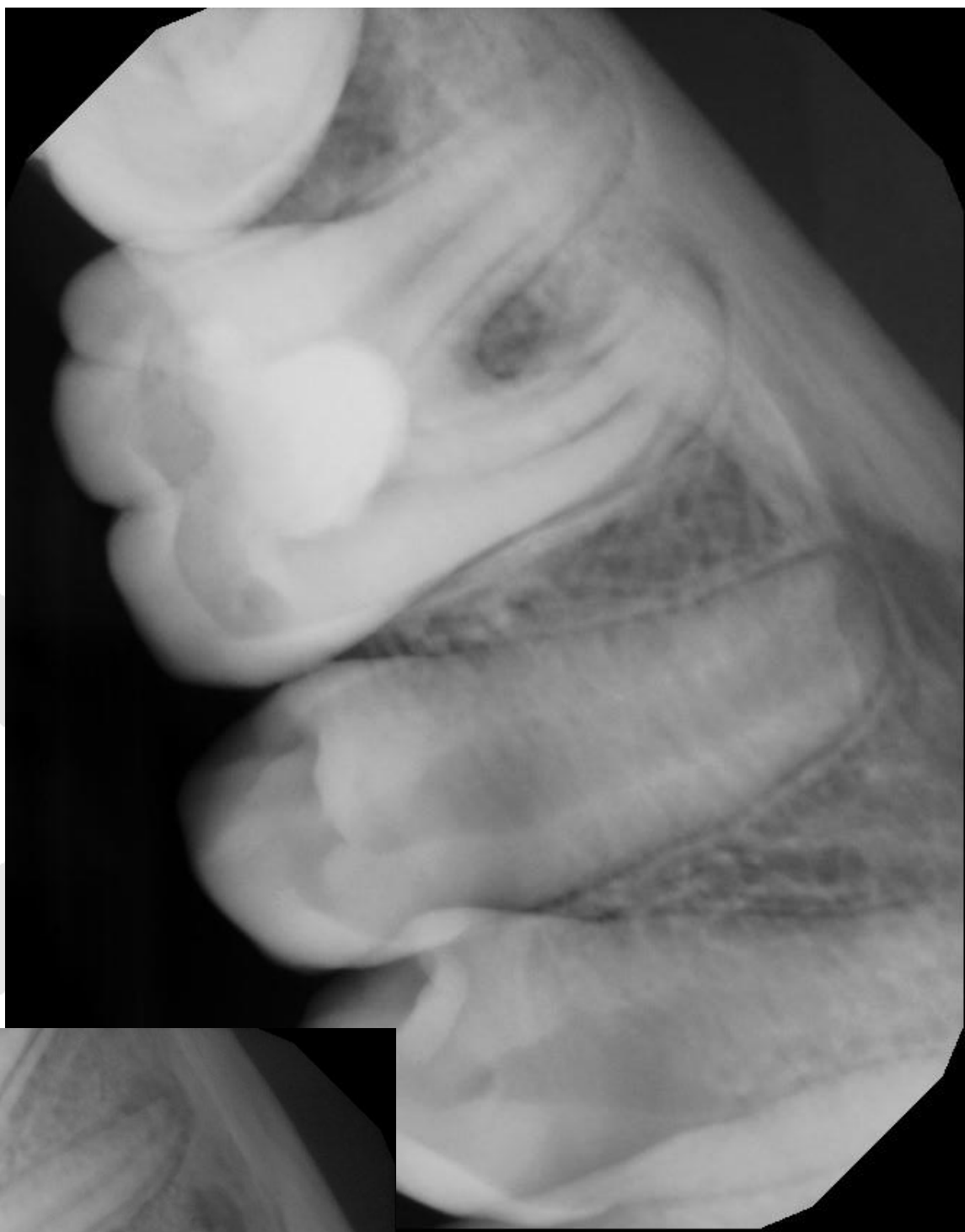
When placing a composite restoration place a glass ionomer base over the MTA to allow for etching and bonding.



Restore

Final restoration should be placed the same day of treatment if behavior allows.

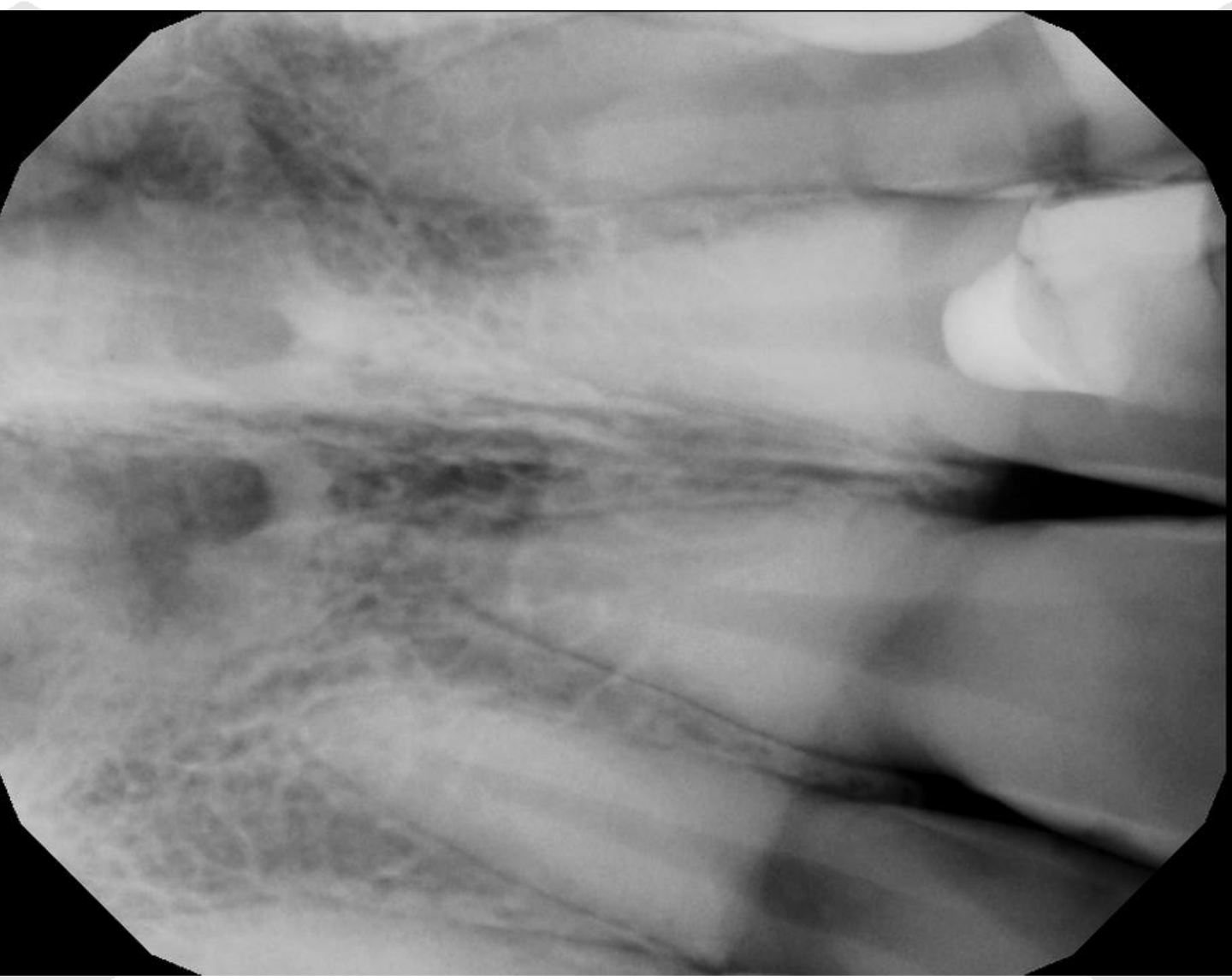
3 Month Recall



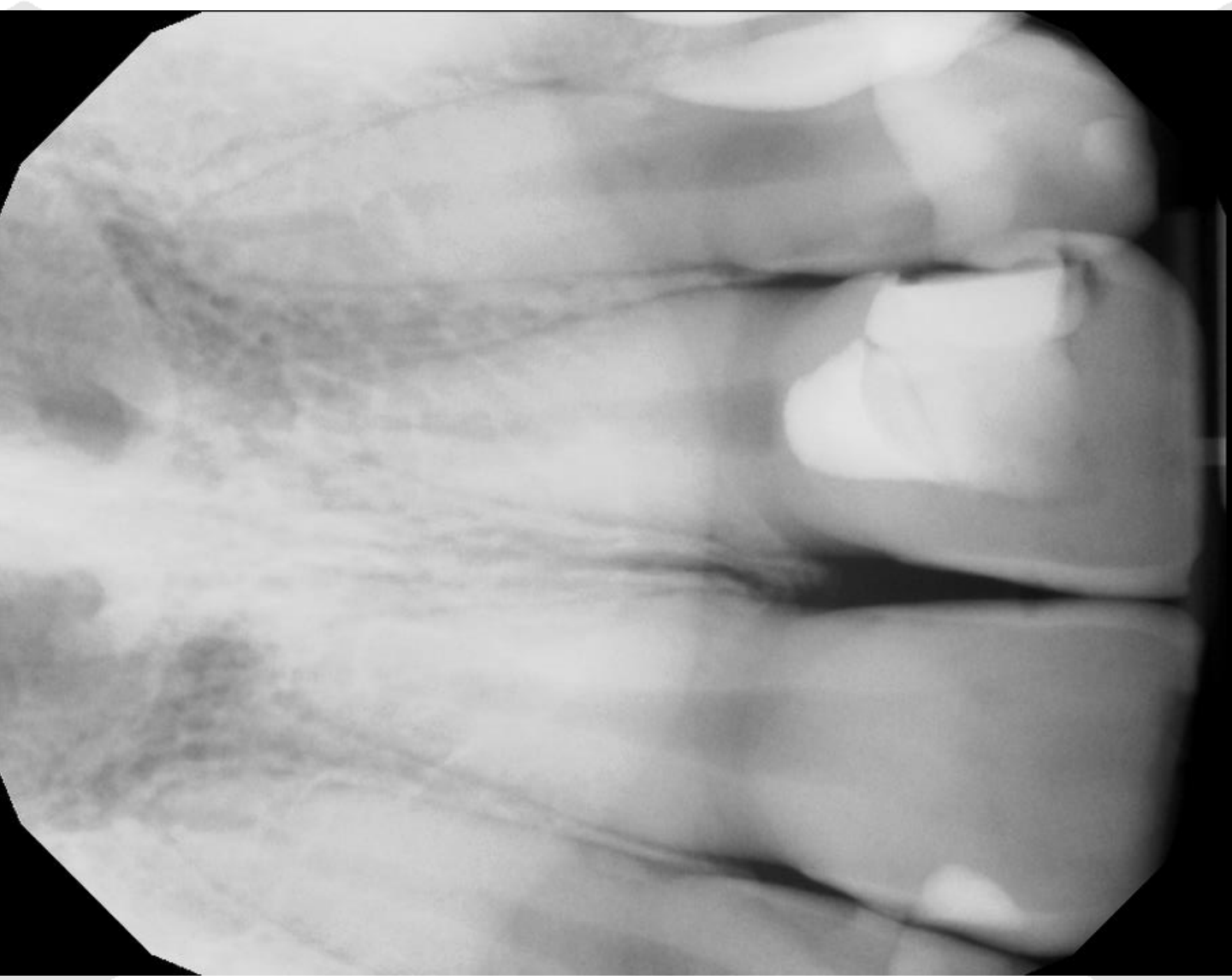
Cases

Initial

Post Op



1 Year Recall



Initial

March 13, 2018

Re:

Dear Dr.

Thank you for referring to our office for surgical care.

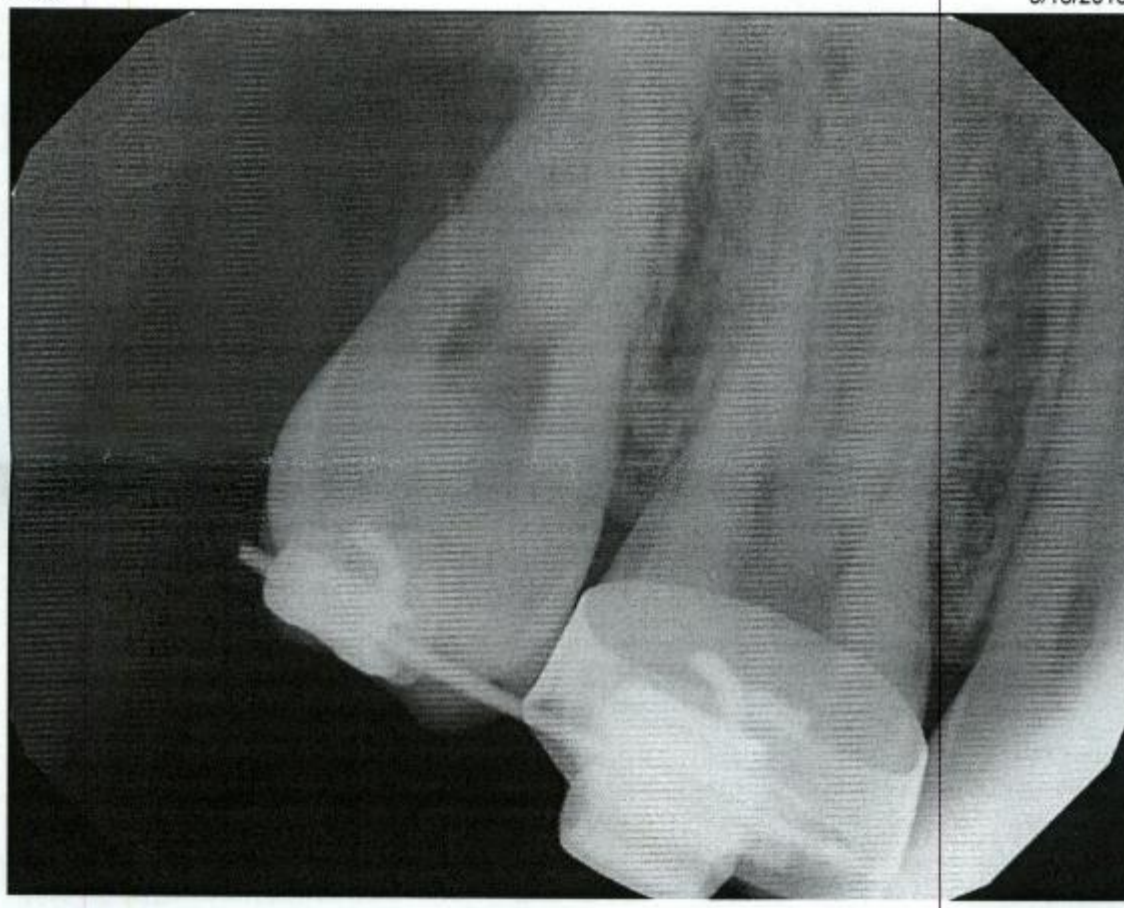
I saw today and removed the following teeth with IV sedation: 1, 16, 17, 32, 11.

did well during the procedure. Unfortunately during extraction of tooth #1, tooth #2 was damaged with loss of what I assume to be the MB root, close to the furcation. This will require additional follow up and likely endodontic treatment. We have appointed him with his general dentist for f/u. I will attach the periapical post op of tooth #2 and I also have a photograph of the root as well.

Dr. thank you again for the kind referral.

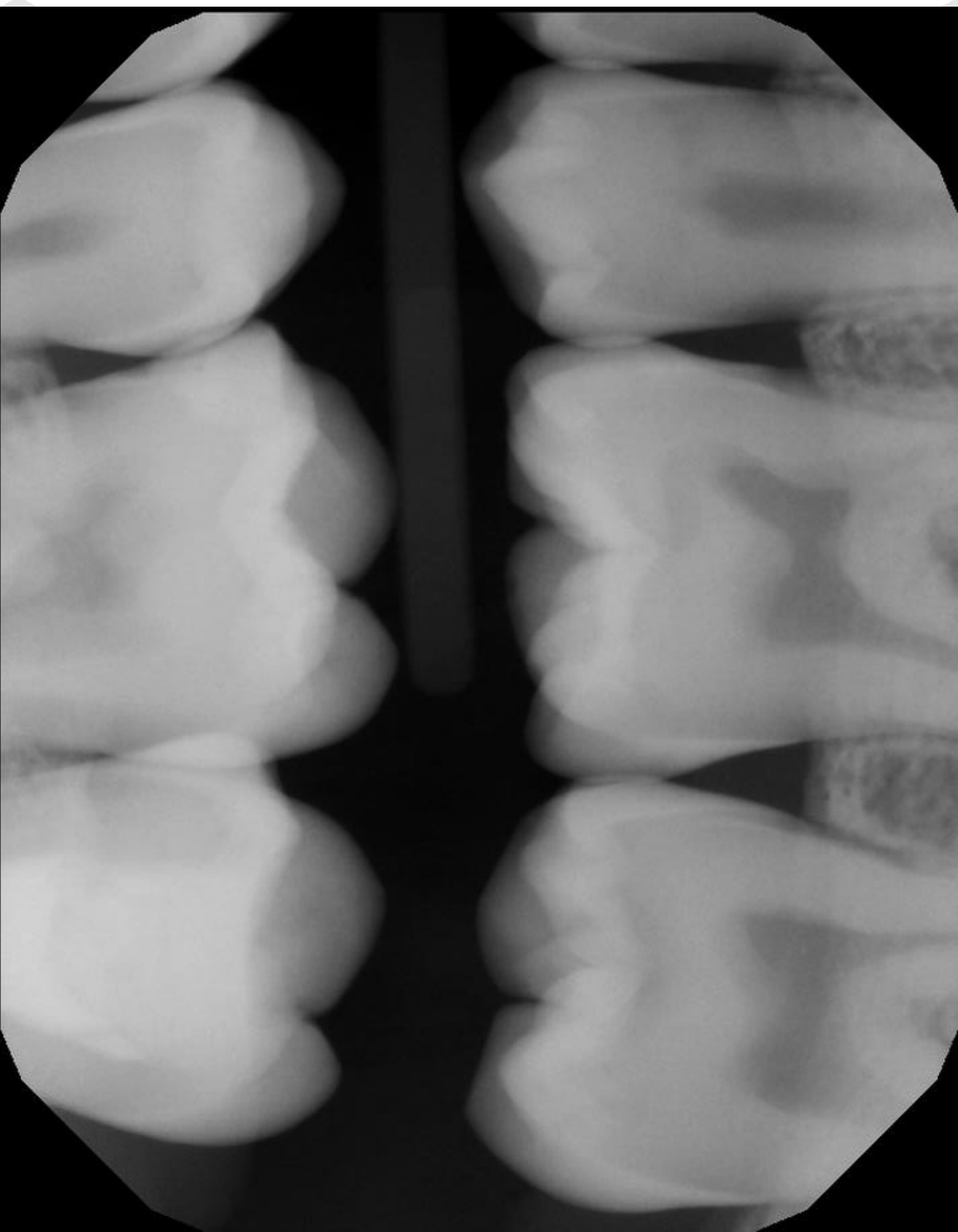
Sincerely,

CC. Dr. Jarod Johnson



Post Op

1 Year 6 Month Recall

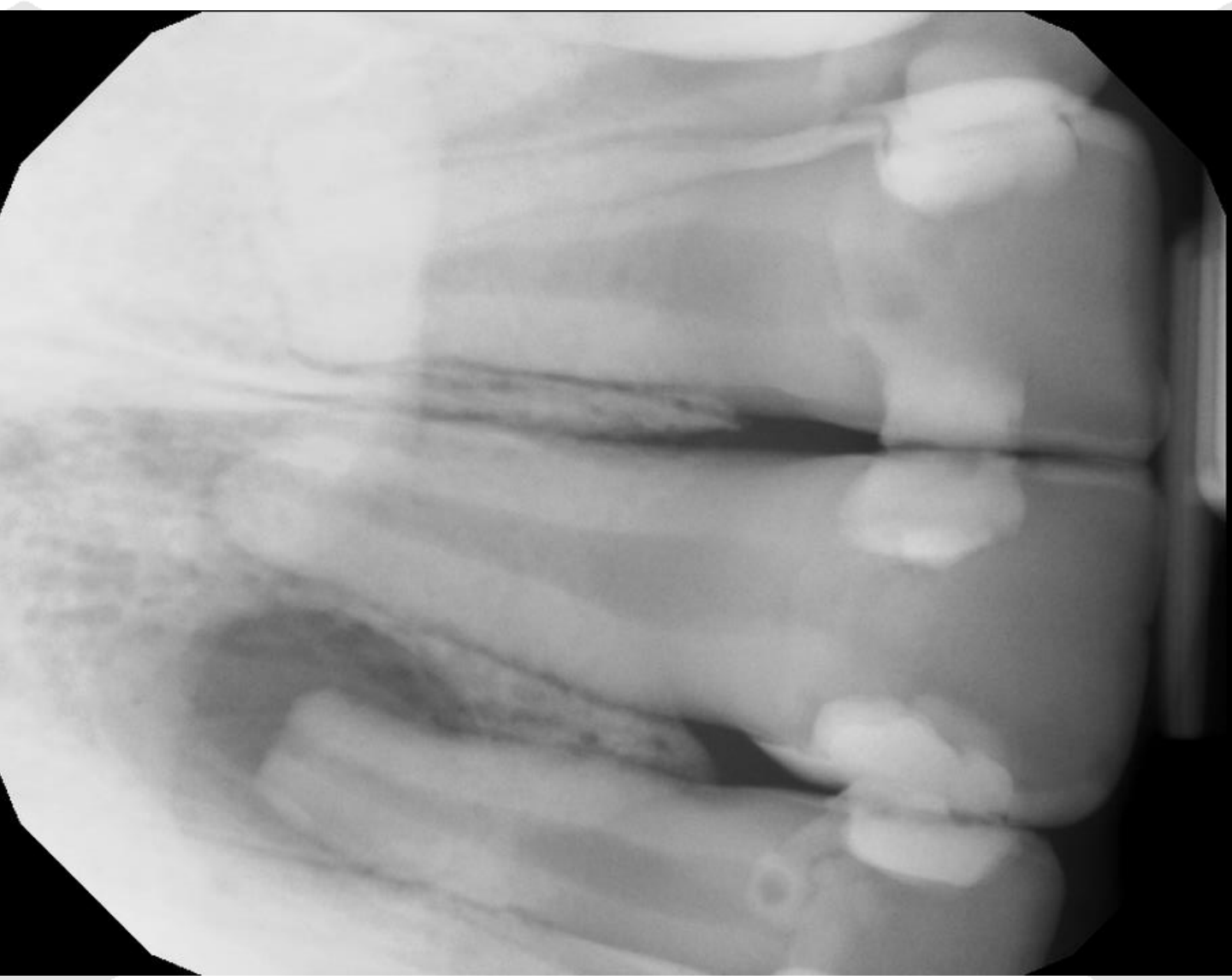


1 Year 6 Month Recall

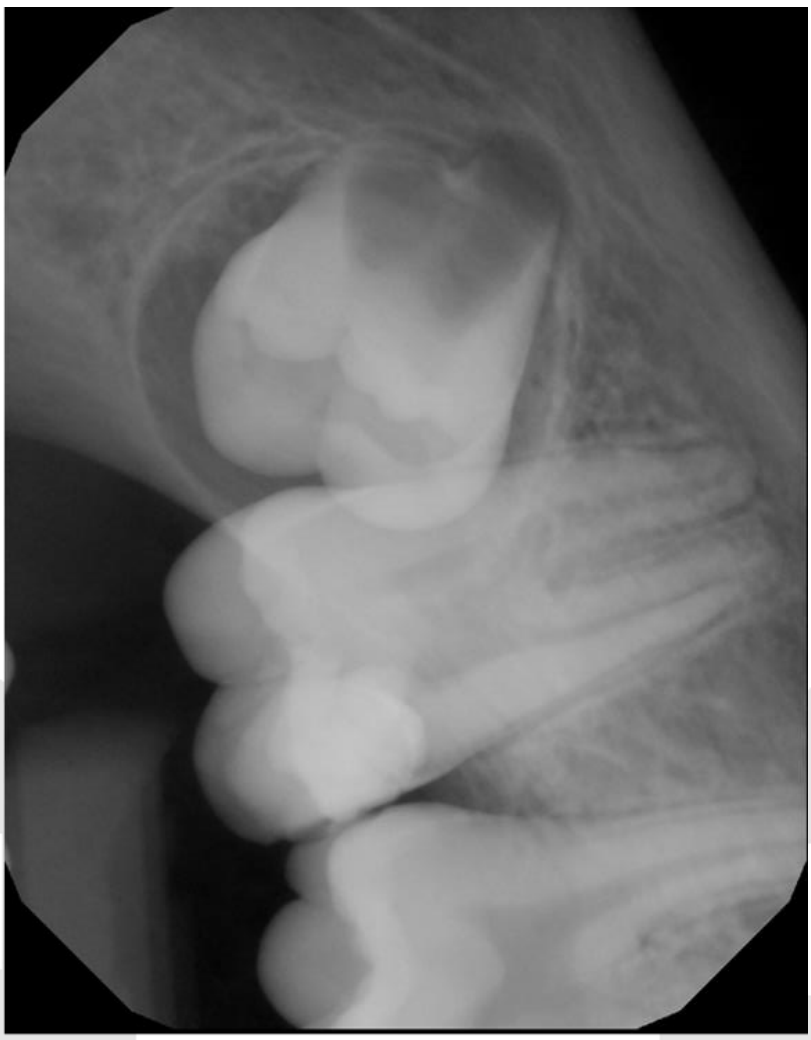
Initial

Post Op

2 Year Recall



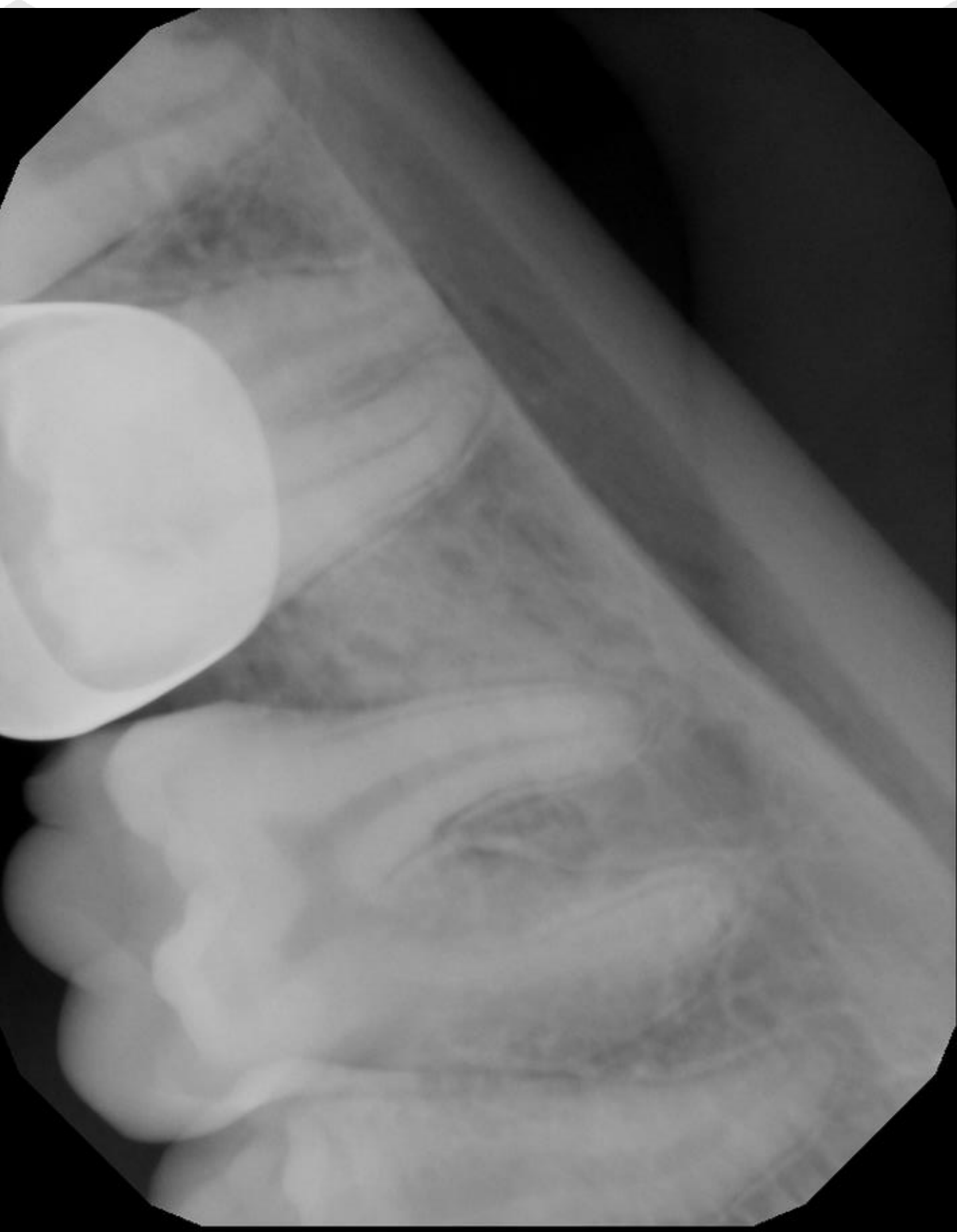
Initial, Post Op



2 Year Recall

2 Year Recall

3 Year Recall



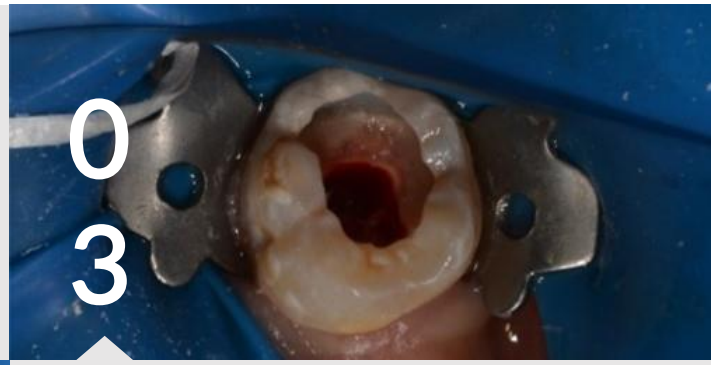
Pulpotomy Technique

Isolate

Rubber dam isolation to protect the pulp from bacterial contamination

Amputate

Remove the coronal pulp to the level of the CEJ



Hemostasis

Obtain hemostasis with 3-6% Sodium Hypochlorite

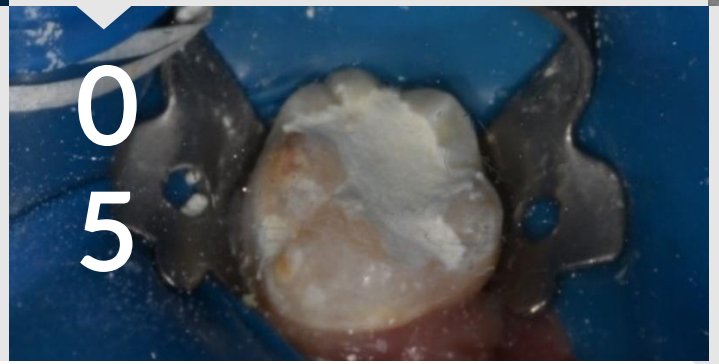
Pulpotomy Technique

Temporization Not Necessary

Due to the long setting time of ProRoot MTA this case was temporized with IRM, this step is no longer necessary.

Medicate

Adapt SmartMTA into the access cavity. A glass ionomer base can be used over the medicament.



Restore

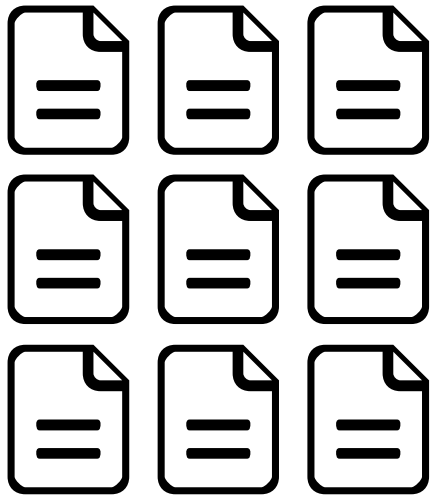
Final restoration should be placed the same day of treatment if behavior allows.

Recall

J Dent. 2019 Sep;88:103158.

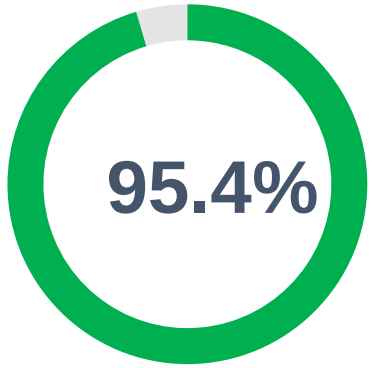
Pulpotomy for mature carious teeth with symptoms of irreversible pulpitis: A systematic review.

Cushley S, Duncan HF, Lappin MJ, Tomson PL, Lundy FT, Cooper P, Clarke M, El Karim I.

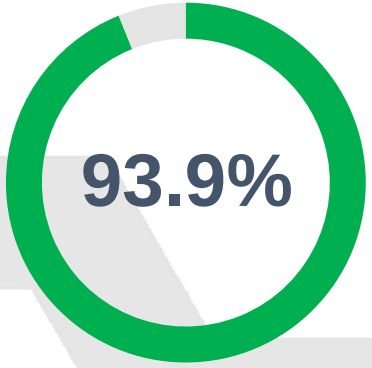


9 Studies

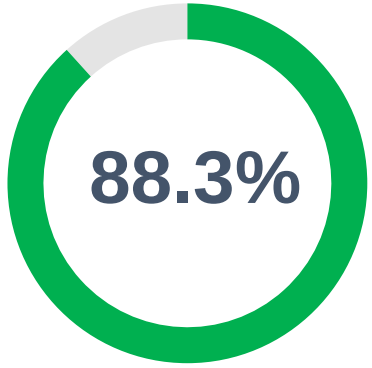
Clinical



Radiographic



Clinical



Radiographic

Results from the only comparative clinical trial showed pulpotomy to have comparable success to root canal treatment at 12, 24- and 60-month follow-up.

Clinical Tip

Patients with signs and symptoms of irreversible pulpitis can be treated with a pulpotomy if hemostasis can be obtained in 5 minutes.

Cases

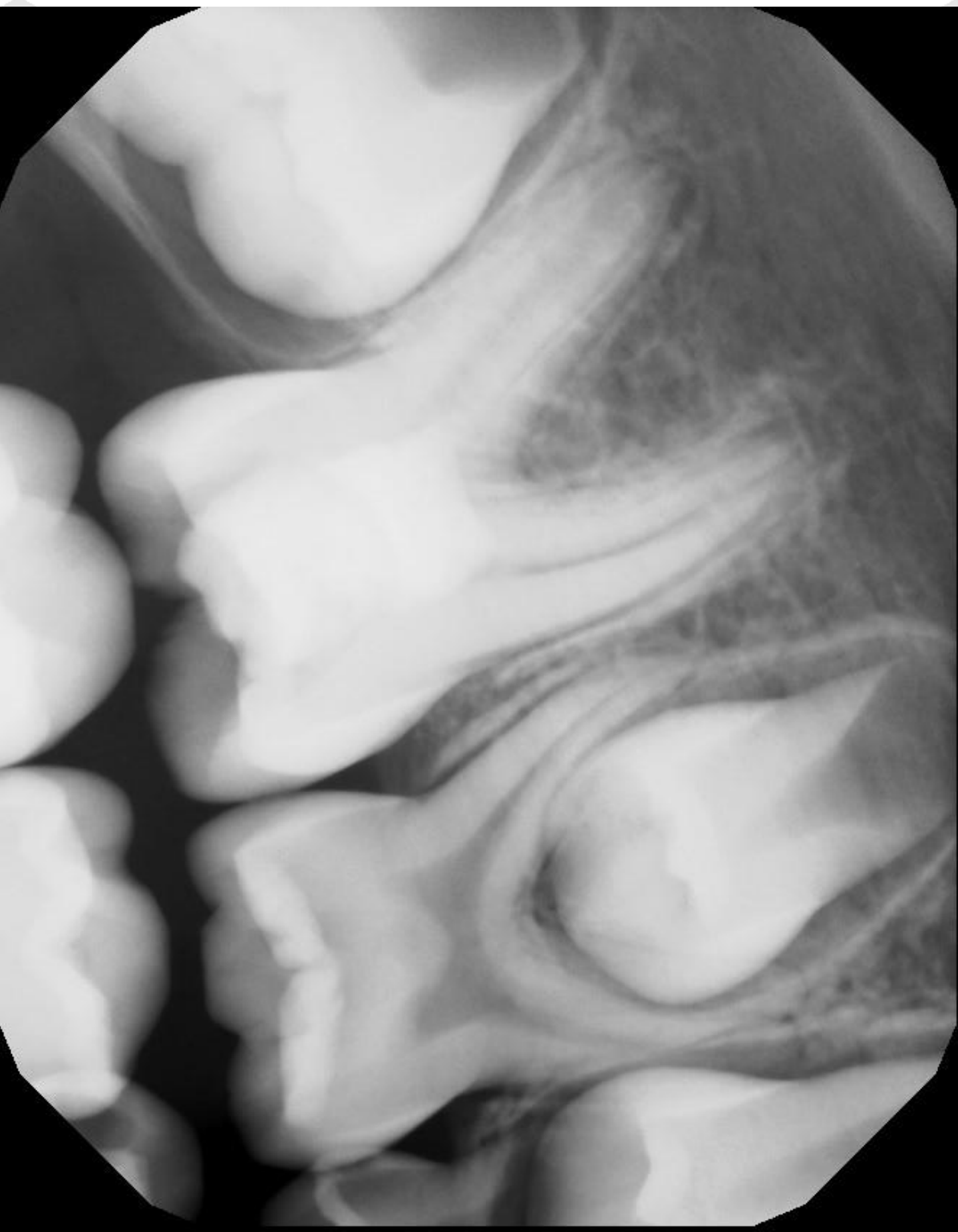
Initial

Caries Removal, Hemostasis

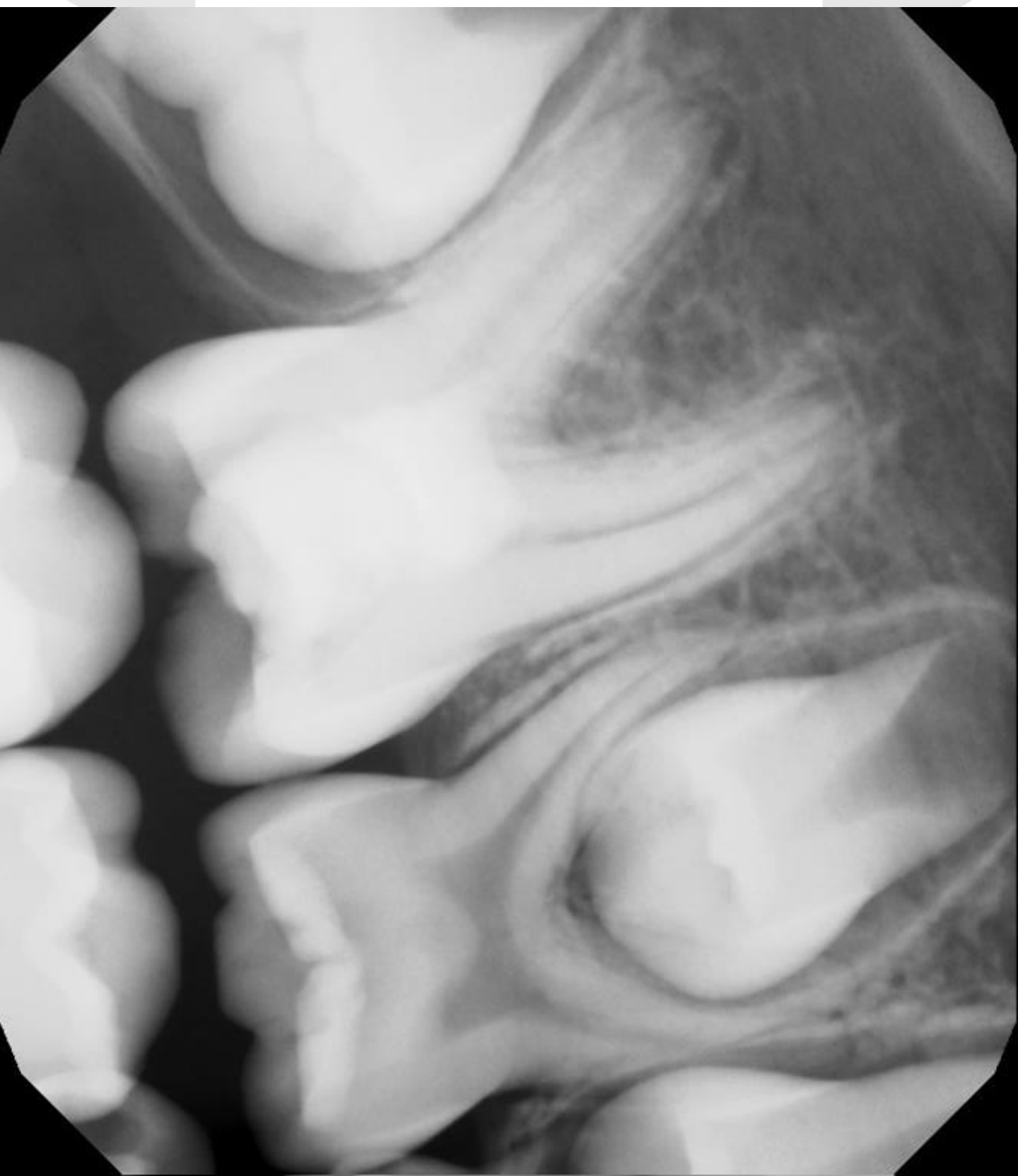
Medication

Restoration

1 Year Recall



1 Year Recall



Initial, Post Op

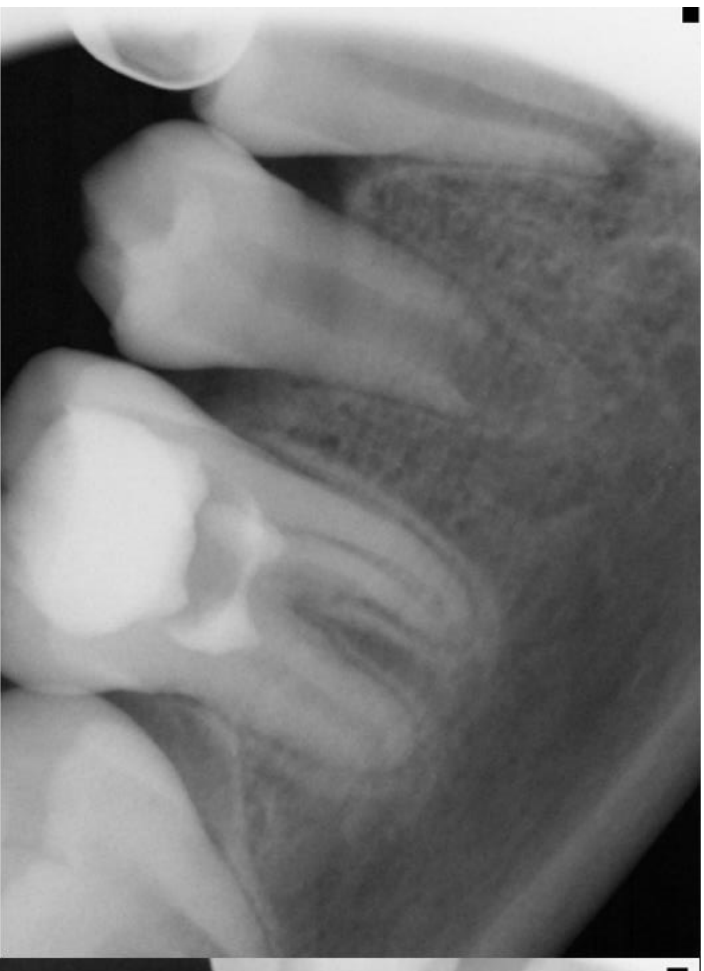
Recall

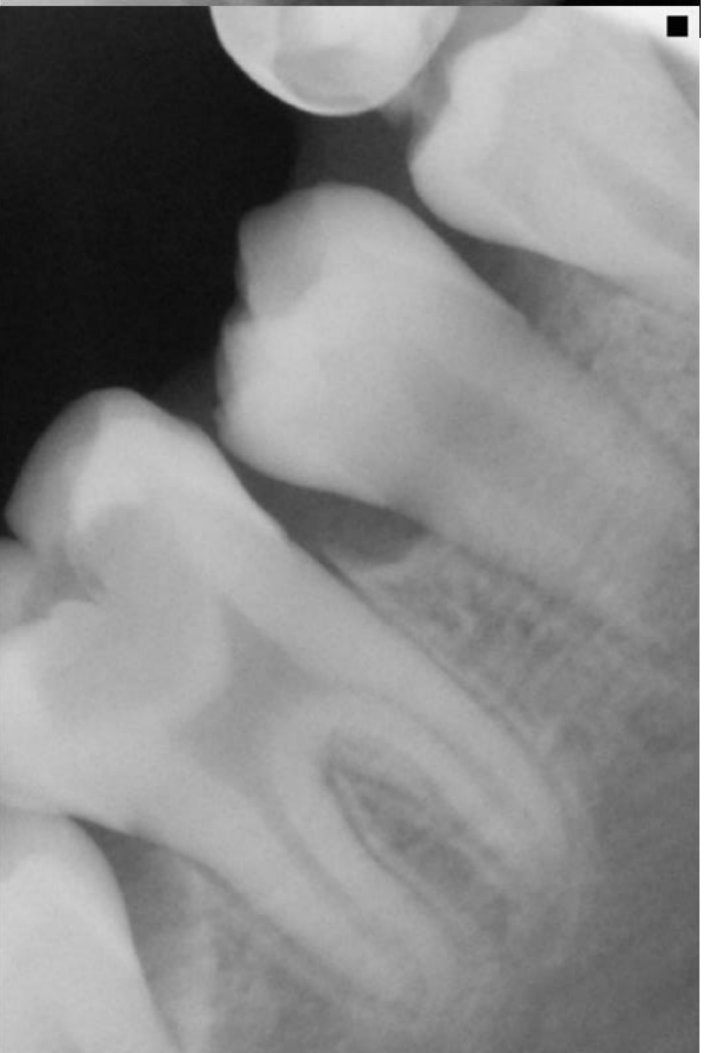
Recall

Recall

Recall

Recall

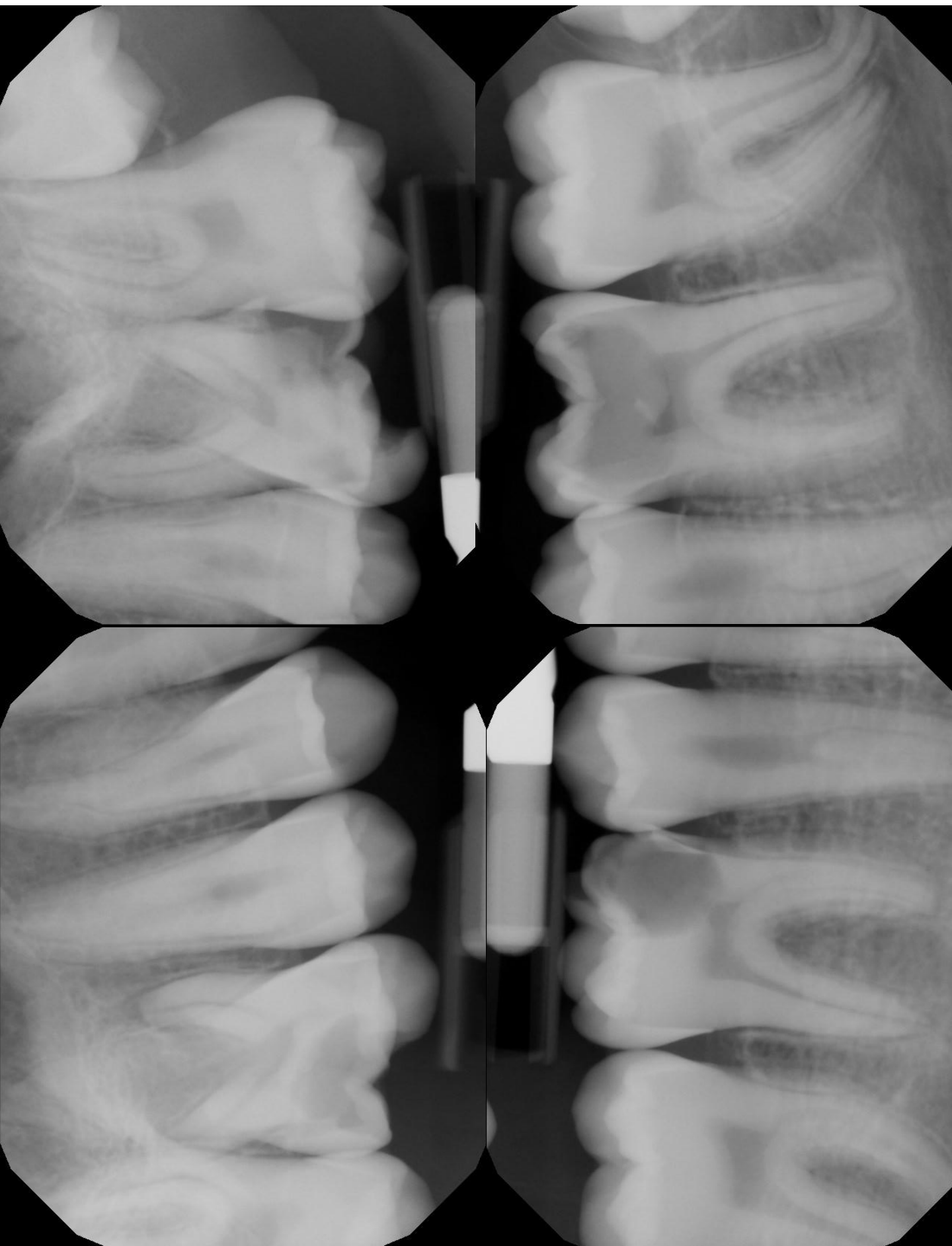




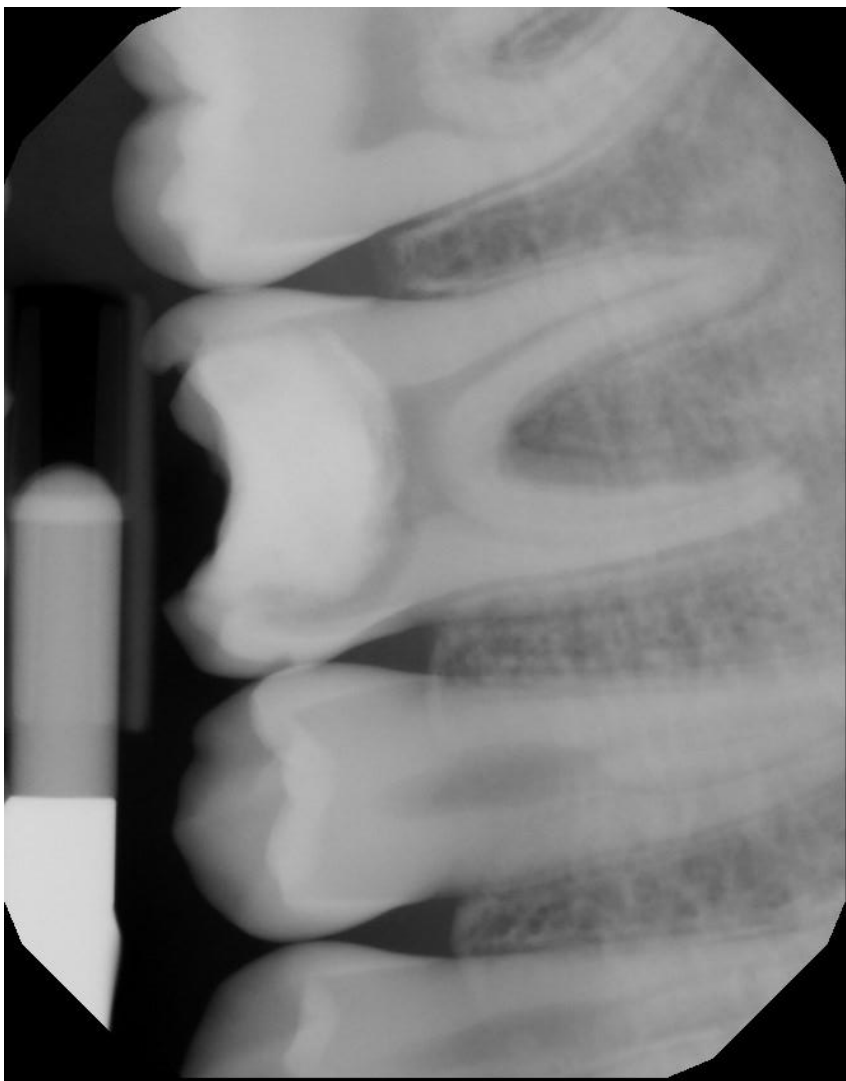
"Experience is what you get when you don't get what you wanted."

Randy Pausch

Initial



Anesthesia Difficulties



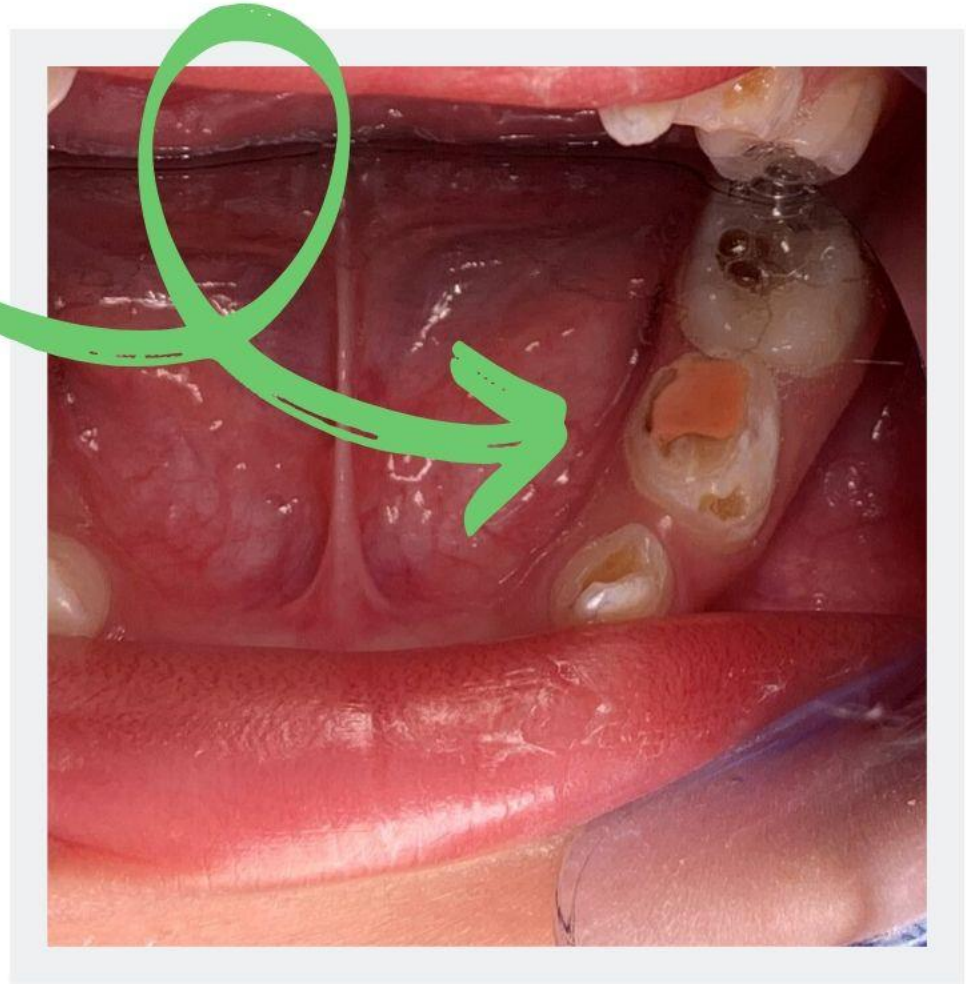
Local Anesthesia

block

and infiltrate

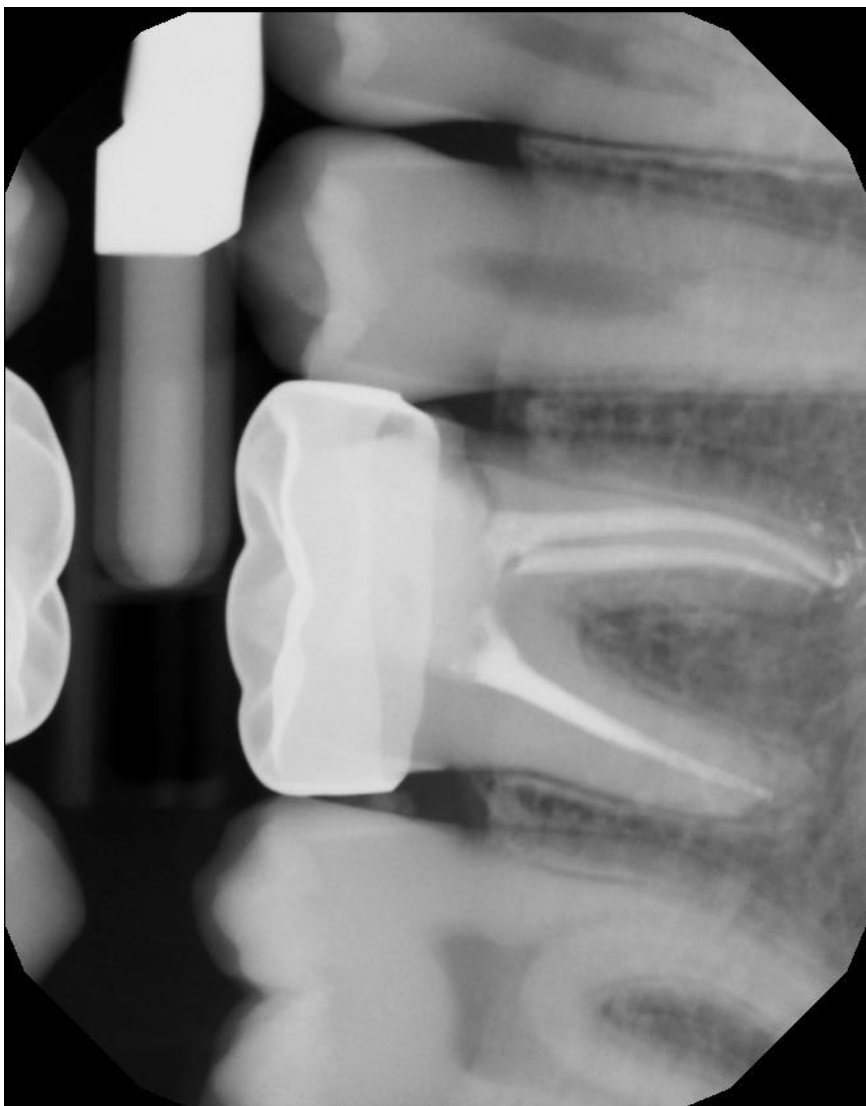
Still Having Difficulty...

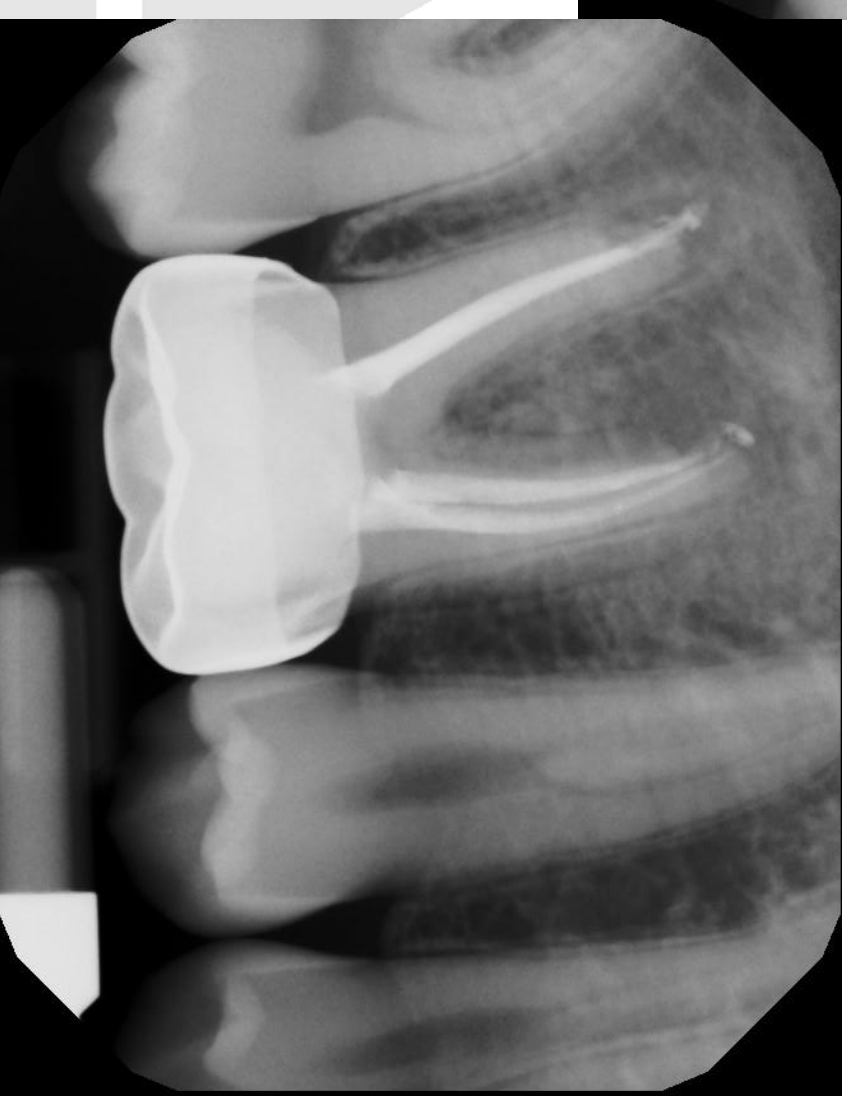
temporize



Post Op

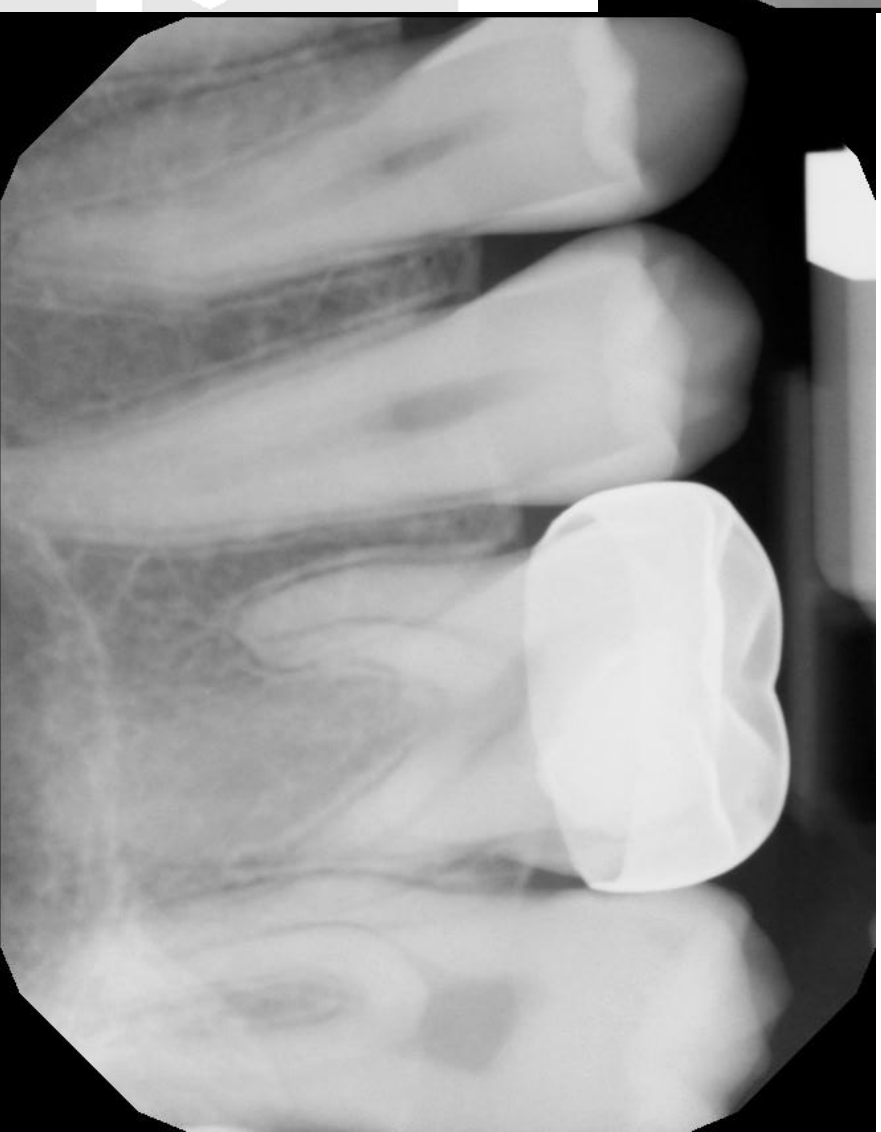
NSRCT



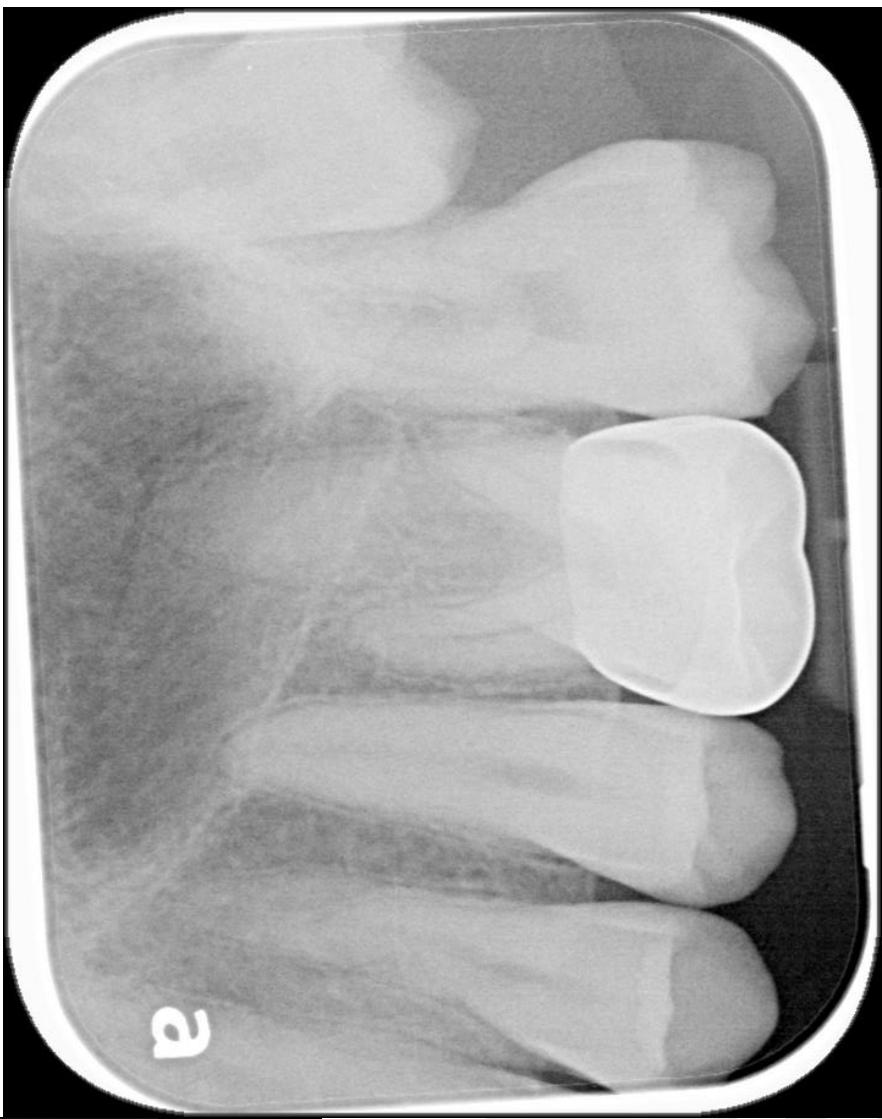


6 Month Recall

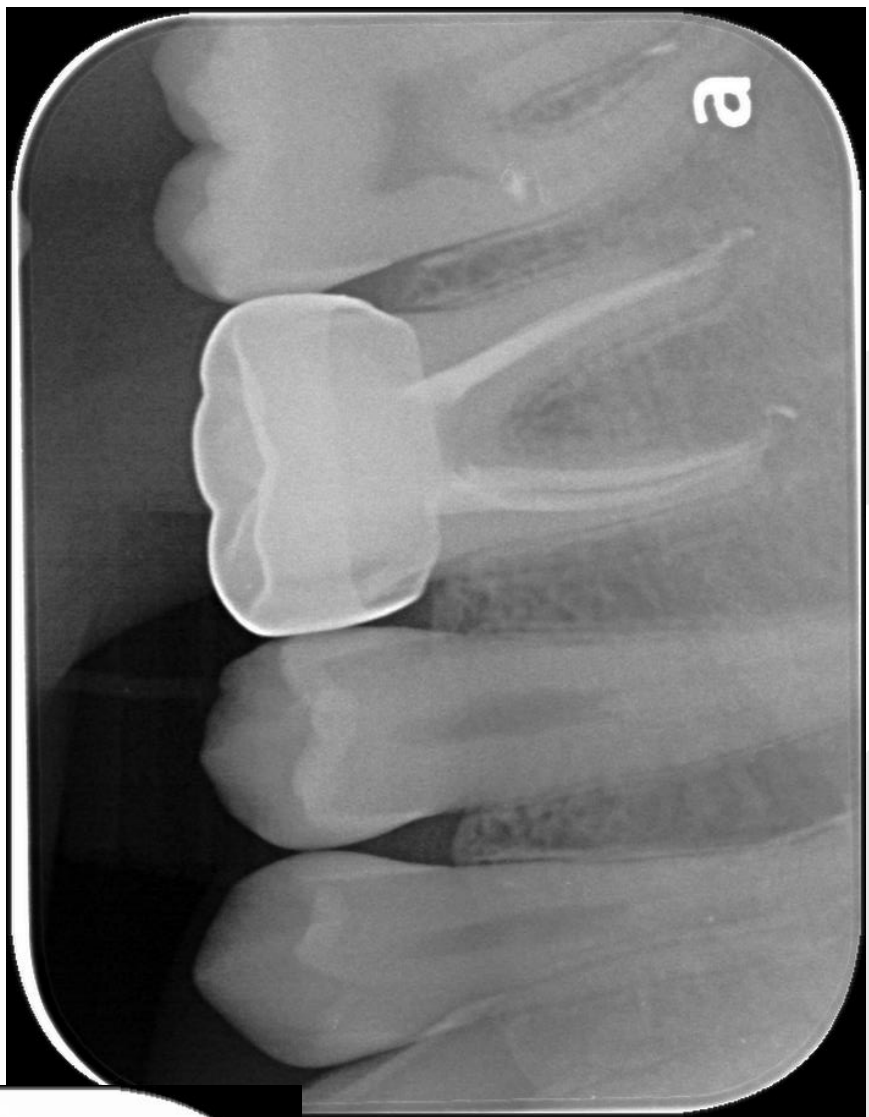
1Year Recall

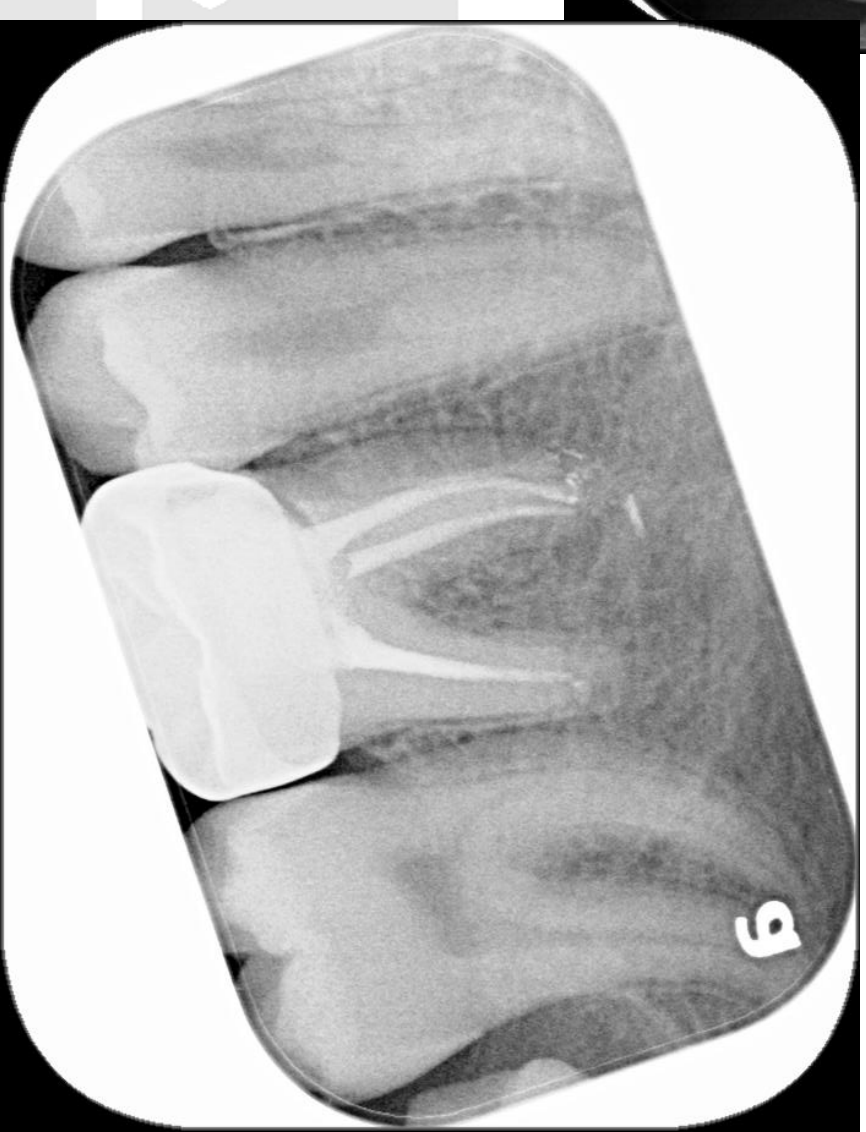


2 Year Recall

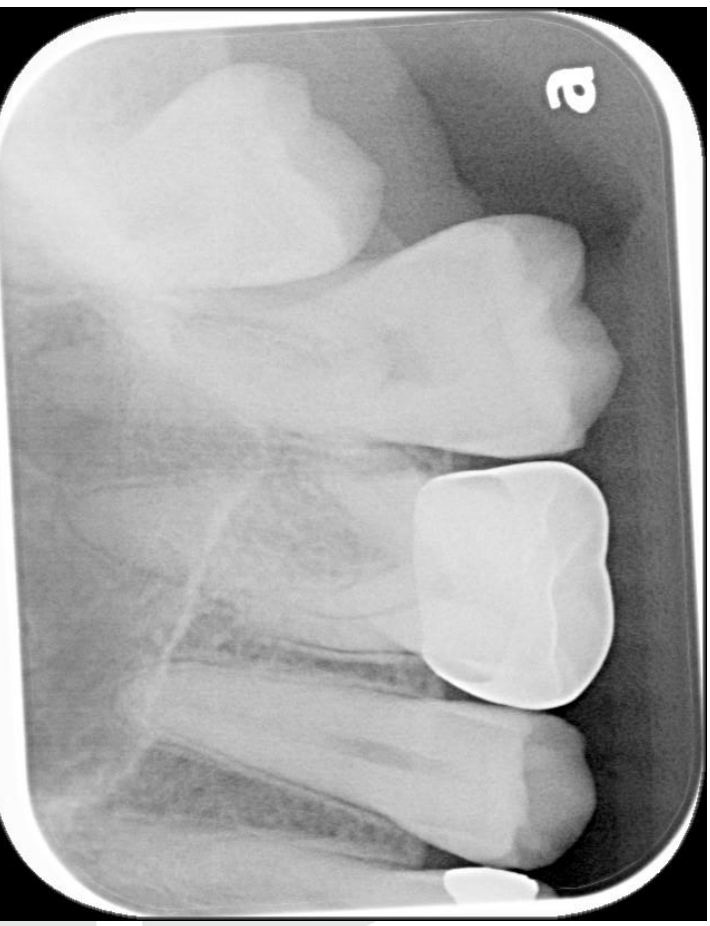


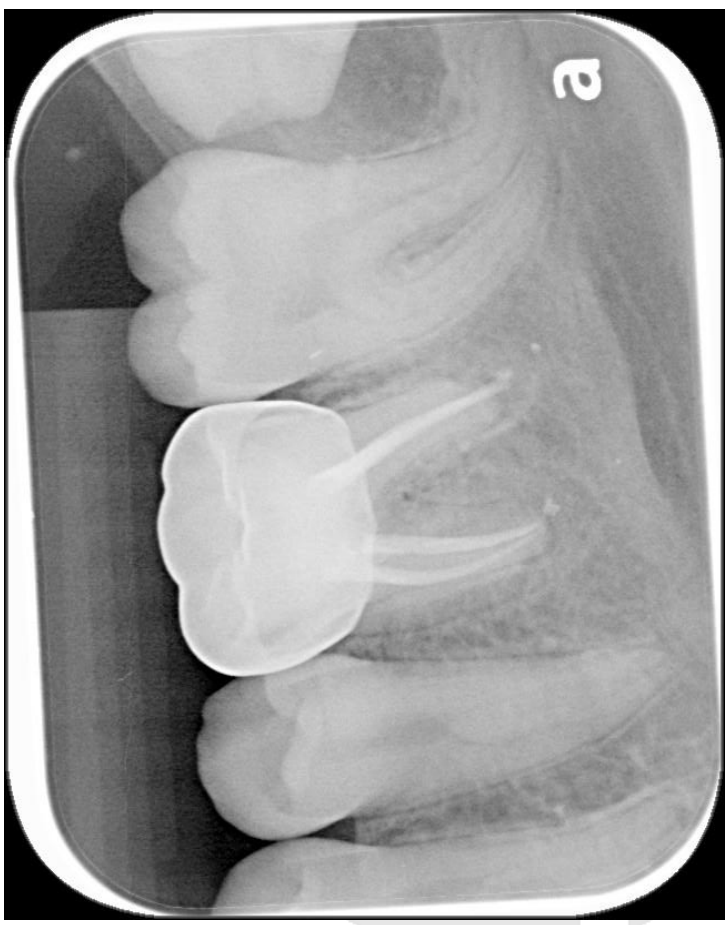
2 Year Recall

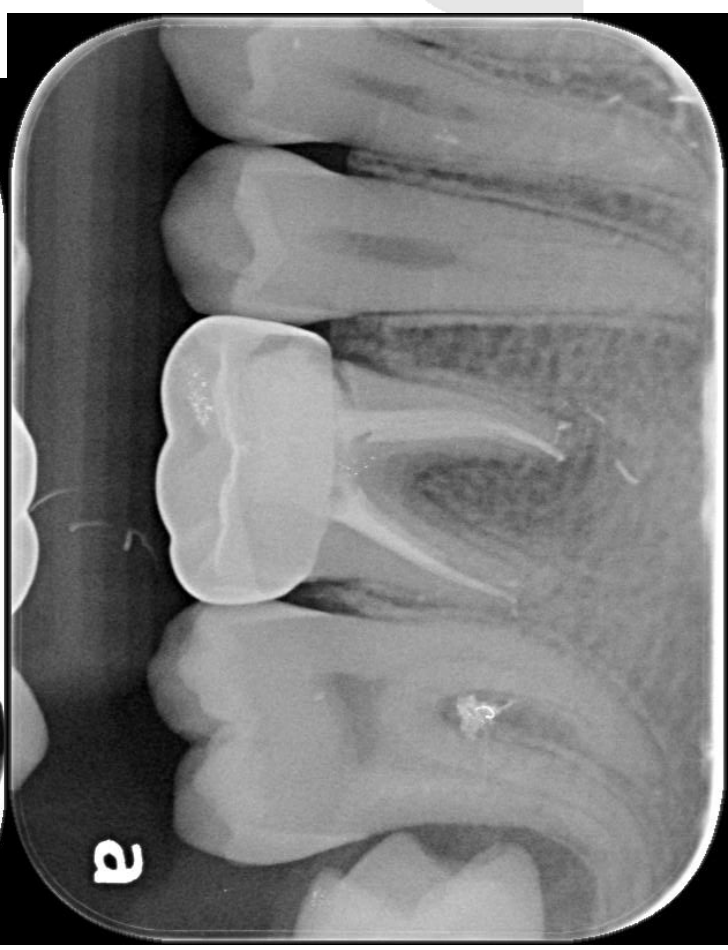




3 Year Recall



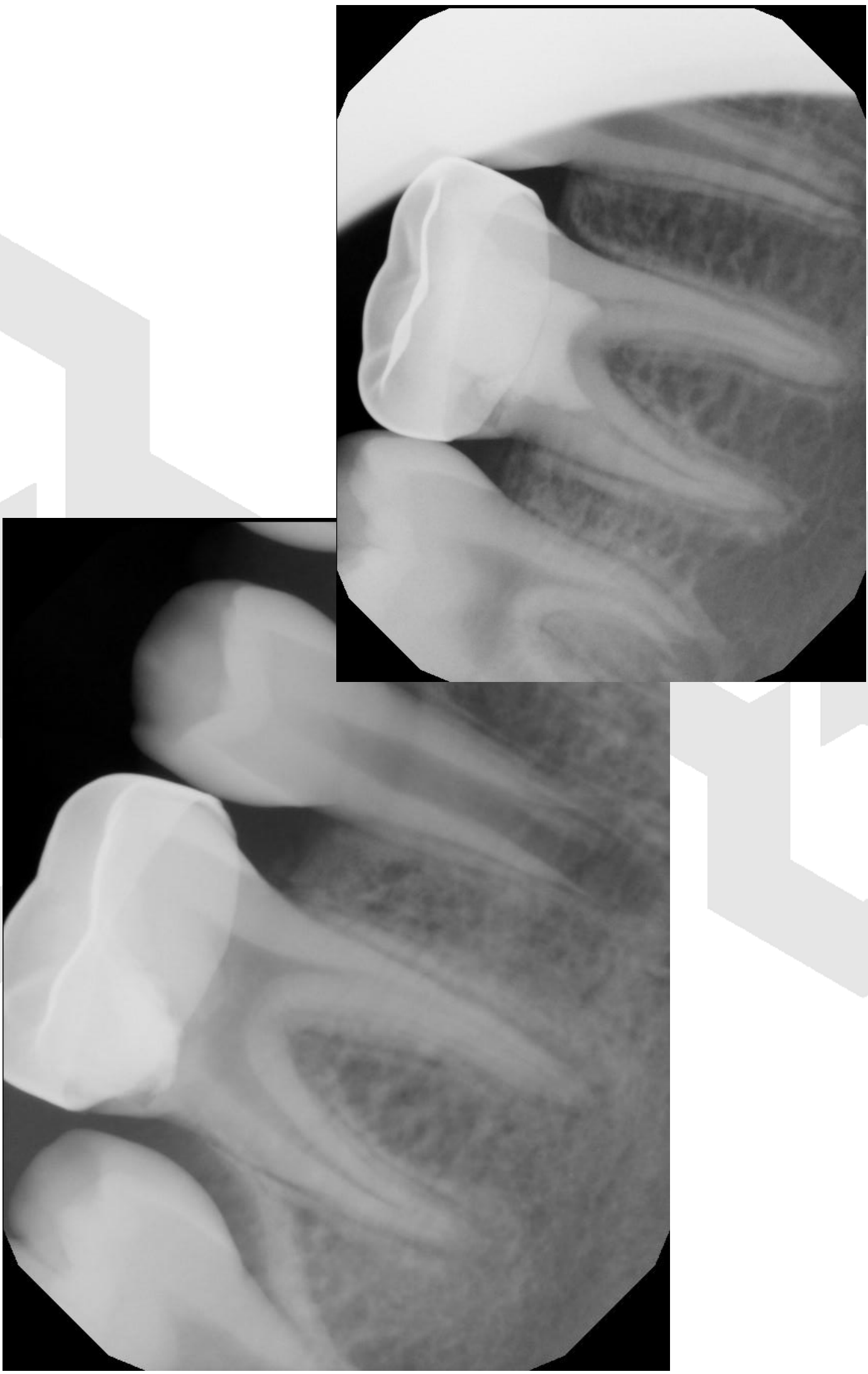




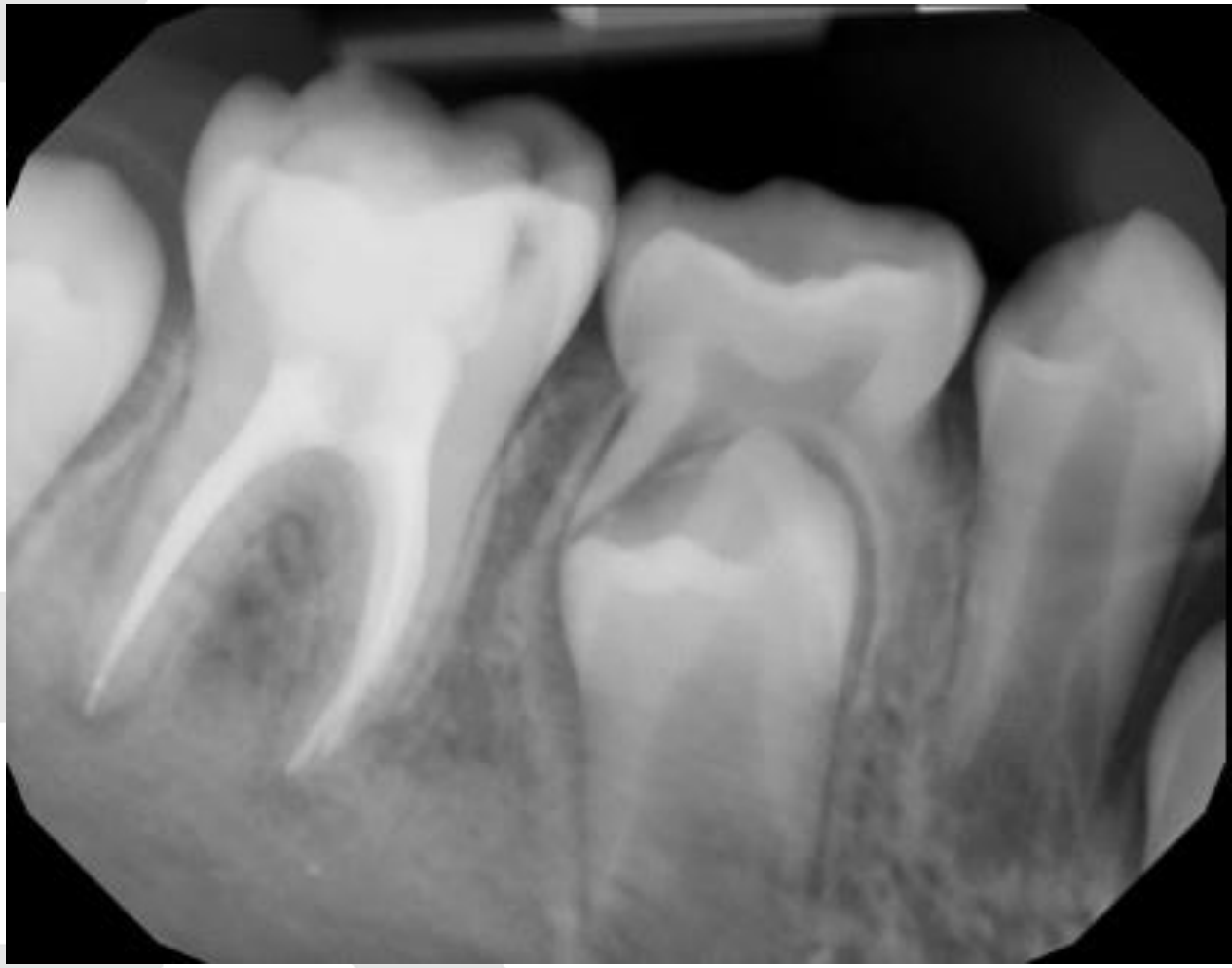
Initial

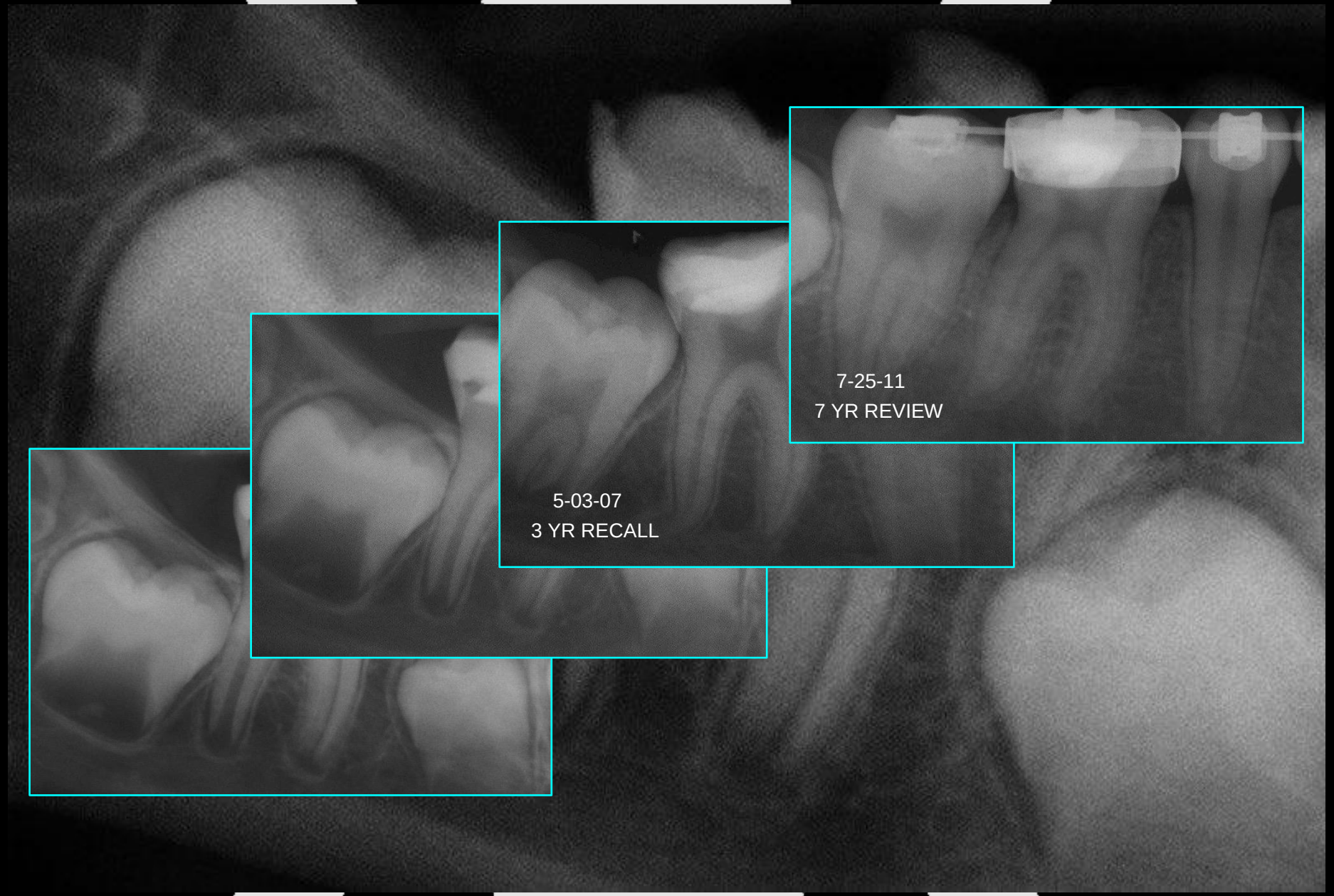
6 Month Recall

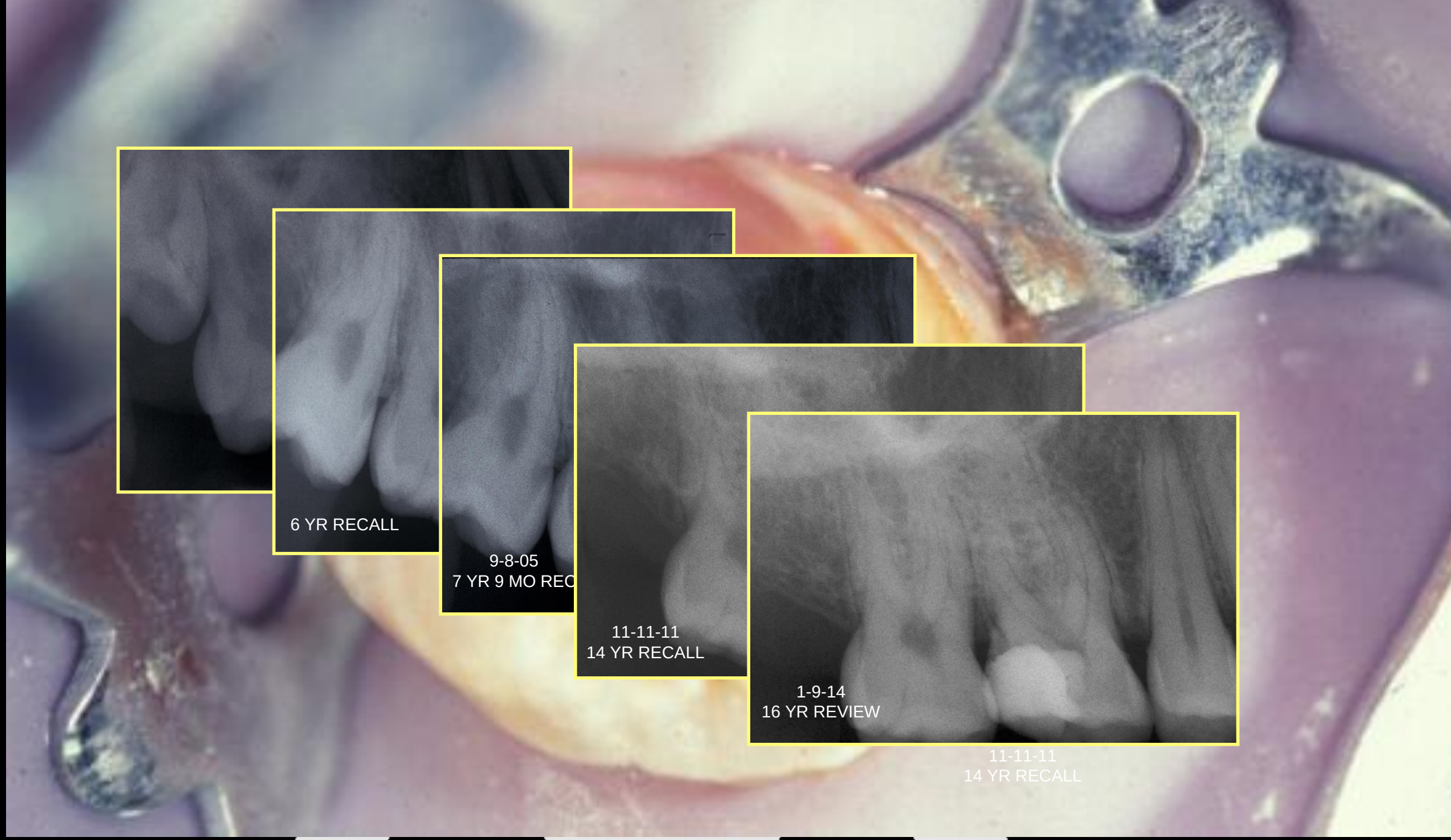
1 Year Recall

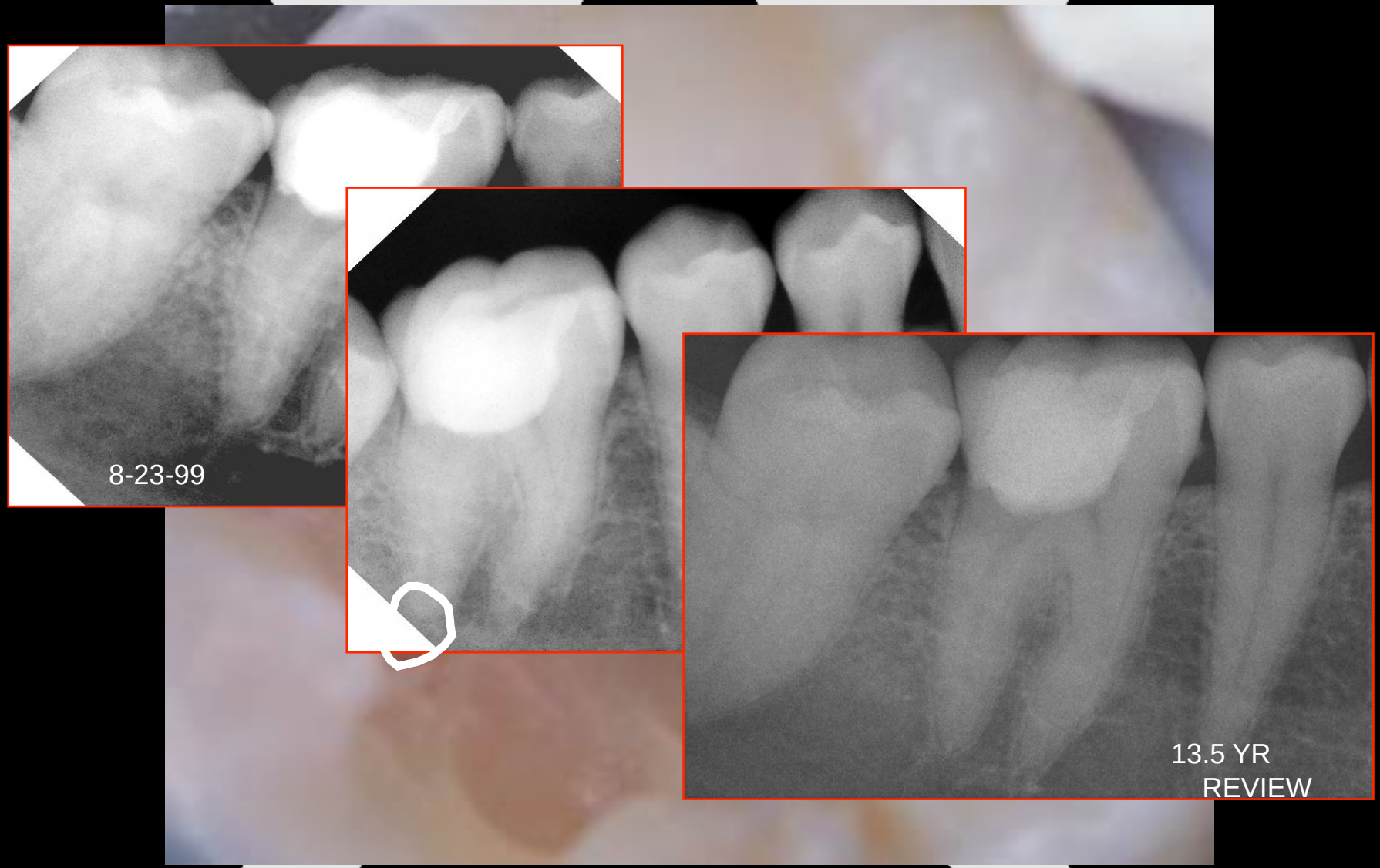


Difficulty with Hemostasis : Conventional NSRCT




7-25-11
7 YR REVIEW
5-03-07
3 YR RECALL


6 YR RECALL
9-8-05
7 YR 9 MO REC
11-11-11
14 YR RECALL
1-9-14
16 YR REVIEW
11-11-11
14 YR RECALL


8-23-99
13.5 YR
REVIEW

A Story


D4
E3
F3


Text arctic
to 31996
dr.jarod@arcticdental.com

Thank you.


arcticdental
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