Radiologic Interpretation - Panoramic Radiograph Part 1.

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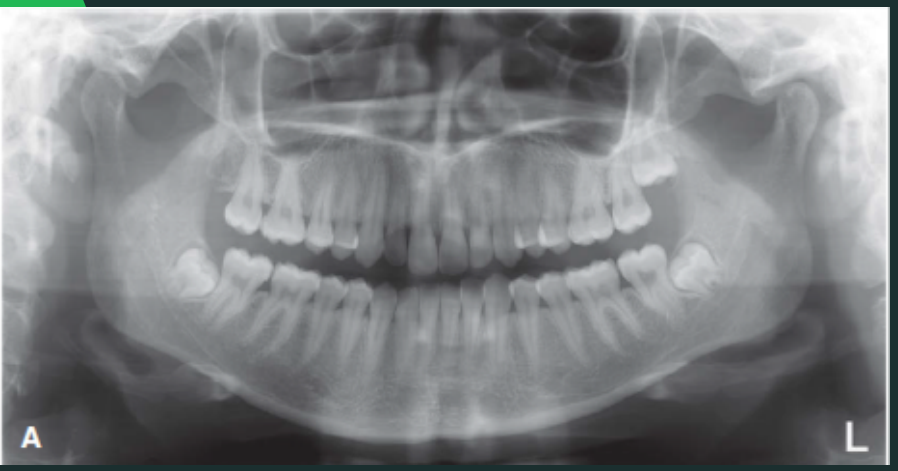
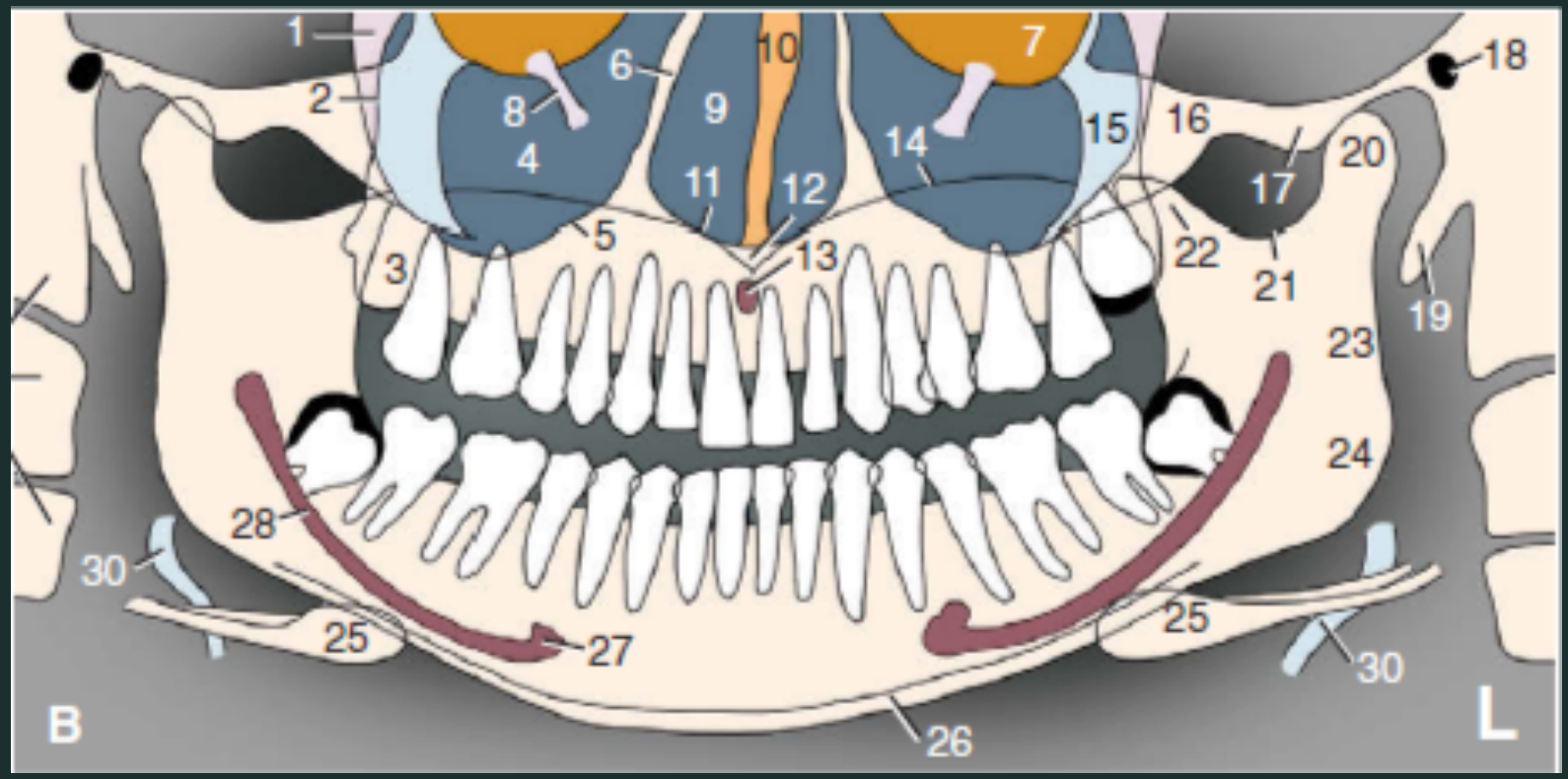
Learning objectives

- Revise Panoramic radiographic anatomy and artefacts
- Review indications for panoramic imaging / OPG
- Understand basic interpretation skills
  - Radiographic features of dento-alveolar findings
  - Use appropriate radiology terminology
- Follow systematic approach

Note the double image of palate, hyoid & spine

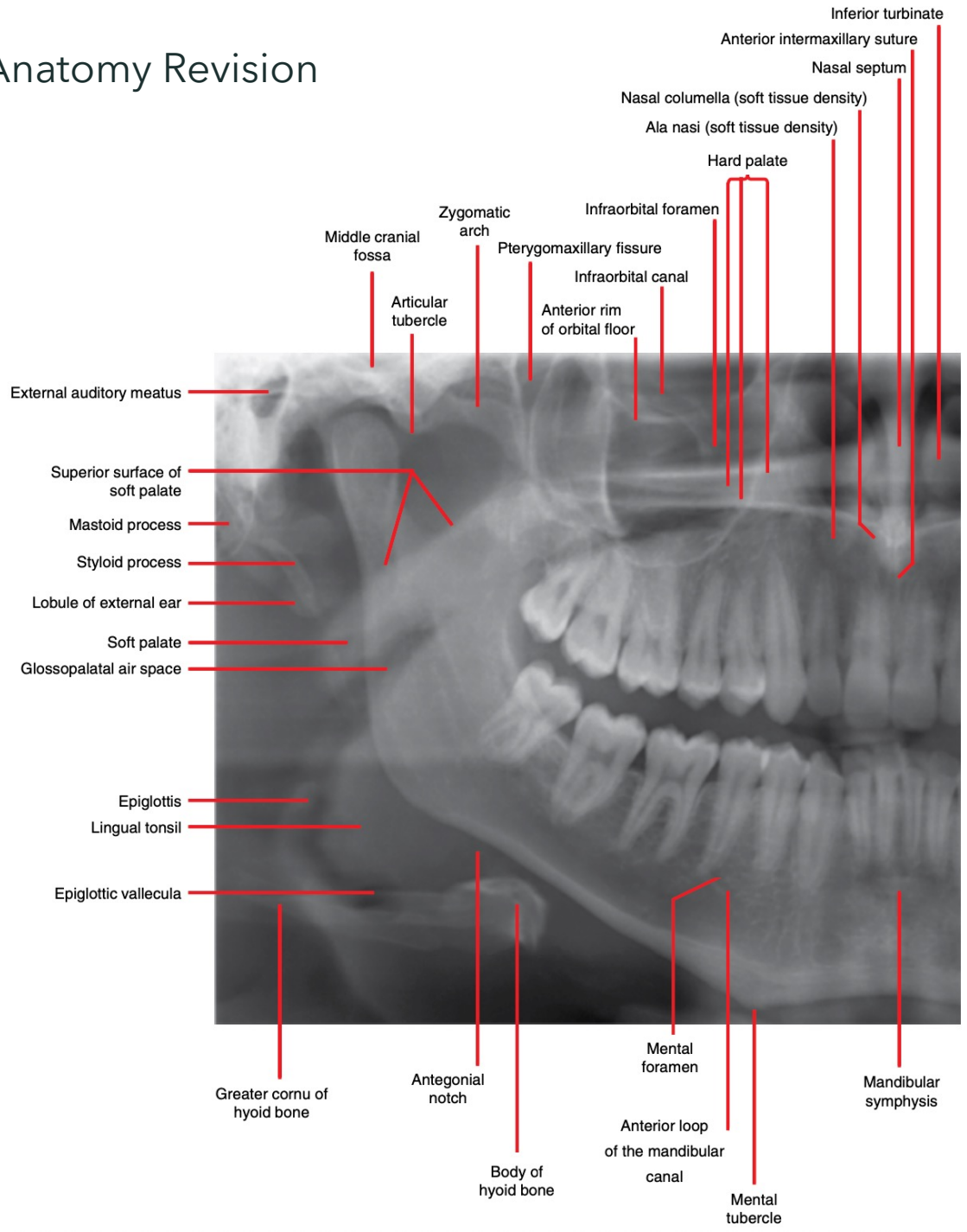


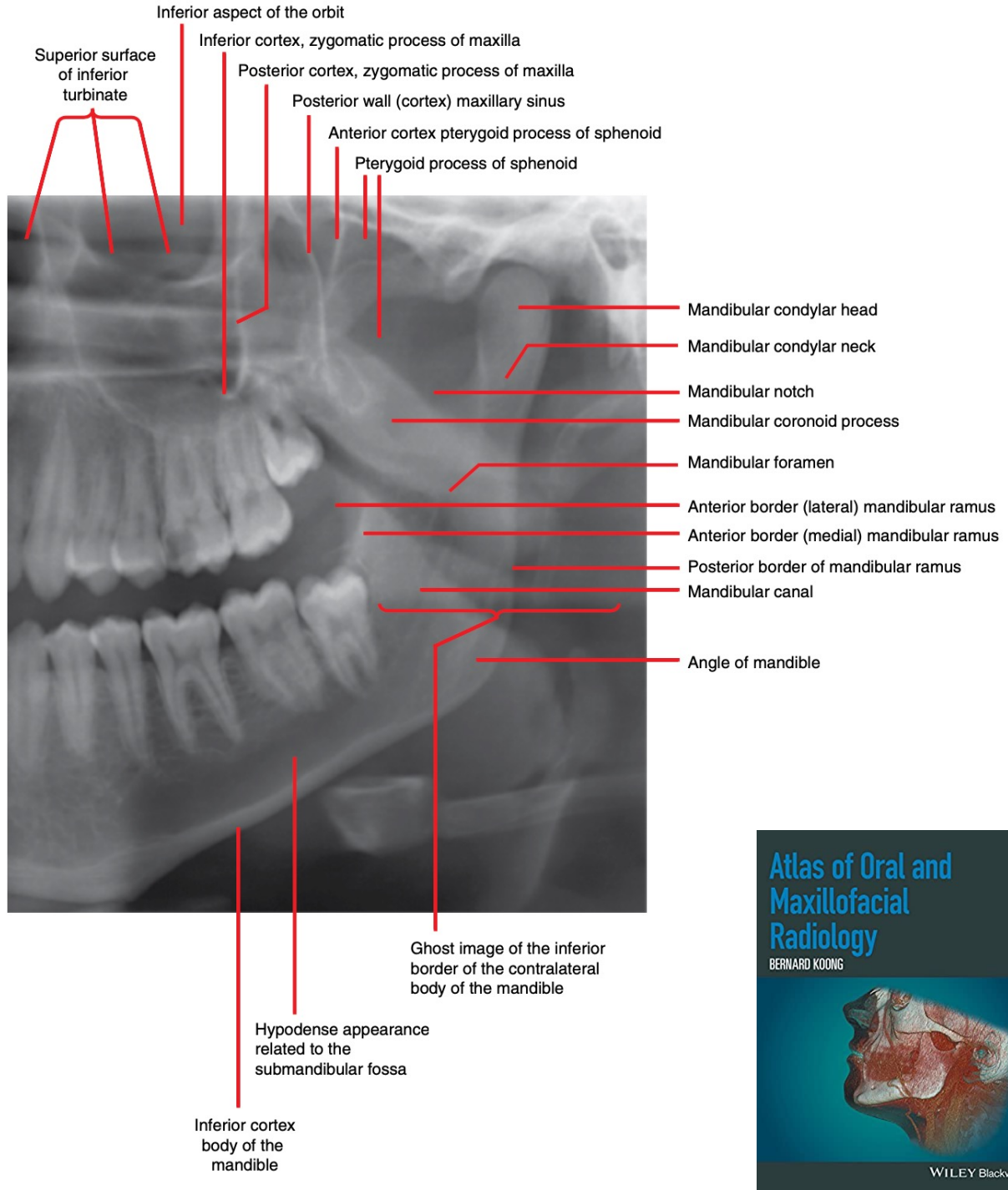
PR ANATOMY REVISION



1. Pterygomaxillary fissure
2. Posterior border of maxilla
3. Maxillary tuberosity
4. Maxillary sinus
5. Floor of the maxillary sinus
6. Medial border of maxillary sinus/ lateral border of the nasal cavity
7. Floor of the orbit
8. Infraorbital canal
9. Nasal cavity
10. Nasal septum
11. Floor of the nasal cavity
12. Anterior nasal spine
13. Incisive foramen
14. Hard palate/floor of the nasal cavity
15. Zygomatic process of the maxilla
16. Zygomatic arch
17. Articular eminence
18. External auditory meatus
19. Styloid process
20. Mandibular condyle
21. Sigmoid notch
22. Coronoid process
23. Posterior border of ramus
24. Angle of mandible
25. Hyoid bone
26. Inferior border of mandible
27. Mental foramen
28. Mandibular canal
29. Cervical vertebrae
30. Epiglottis

Anatomy Revision





General Indications for OPG

"General dental screening"? *OPGs are NOT accurate for caries assessment*

- Heavily compromised dentition – gross caries, multiple periapical inflammatory lesions
- Periodontal screening (periodontal bone loss)
- Impacted third molars
- Mixed dentition status
- Orthodontics
  - Crowding, impacted canines, etc.
- Dental anomalies
- Jaw (intrabony) Pathology
- TM Joints (gross morphological change)
- Trauma (esp. mandibular fracture)

Medicolegal Responsibilities

1. Radiation dosages with CBVT and panoramic film must be explained
2. There is an increased duty to explain dosages and risks of radiographs on dentist's own premises
3. Dentists who record panoramic radiographs need to take responsibility for all non-dental diagnosis or have them assessed by or referred to a DMF radiologist or radiologist
4. Dentists who record small volume CBVT need to assess whether a referral to a DMF radiologist/radiologist is appropriate
5. Dentists who record large volume CBVT need to refer all data sets to DMF radiologists/radiologists for review, as they have the highest medicolegal risk
6. There needs to be thorough discussion of dosage of CBVT for paediatric patients
7. If the dentist has a CBVT on-site, it is not advisable to expose paediatric patients to CBVT
8. Dentist “self-reports” must be held to a similar standard as a specialist report

OPG Radiology Report

- All dental images MUST have radiology reports
- ~ 40% of dental imaging is self-reported by dentists
  - 1.5% unreported
  - ~40% reported by medical radiologists
  - **~20% are reported by DMF radiologists**

Ref: Selim, DG, C. Sexton, and P. Monsour. "Dentomaxillofacial Radiology in Australia and Dentist Satisfaction with Radiology Reports." Australian Dental Journal 63, no. 4 (2018): 402-13.

Radiology Report Referral Pathways

1. Request scan & report to an **imaging clinic** (Medicare Rebate)
    a) Patient details
    b) Referrer details
    c) Select imaging modality (eg. OPG / Occlusograph / CT / …)
    d) Write reasons for referral (ie clinical indications / history)
2. Report only (Private)
    a) Teleradiology (online referral with enclosed image)

Key Points of OPG Interpretation

- Review the initial indication for OPG
- Identify OPG artefacts
- Must know normal radiographic anatomy of maxillofacial region
  → so, abnormal changes to normal anatomy can be identified
- Study radiographic features of various jaw pathologies
- **Systematic approach**
  - Have a routine

OPG artefacts revision

- Foreign materials eg. Earrings, necklace, denture left in situ, etc.
- Ghost images
- Incorrect patient positioning
  - Chin down
  - Chin up
  - Head tilting
  - Head rotation
  - Movement
    - Horizontal (following the beam or opposite to the beam direction)
    - Vertical
    - Swallowing
  - Soft tissue position
    - Tongue to the palate
    - Lips closed
  - Focal trough position
    - Head in front of the focal trough
    - Head behind the focal trough
  - Neck extension
  - Collision with shoulder

Systematic approach

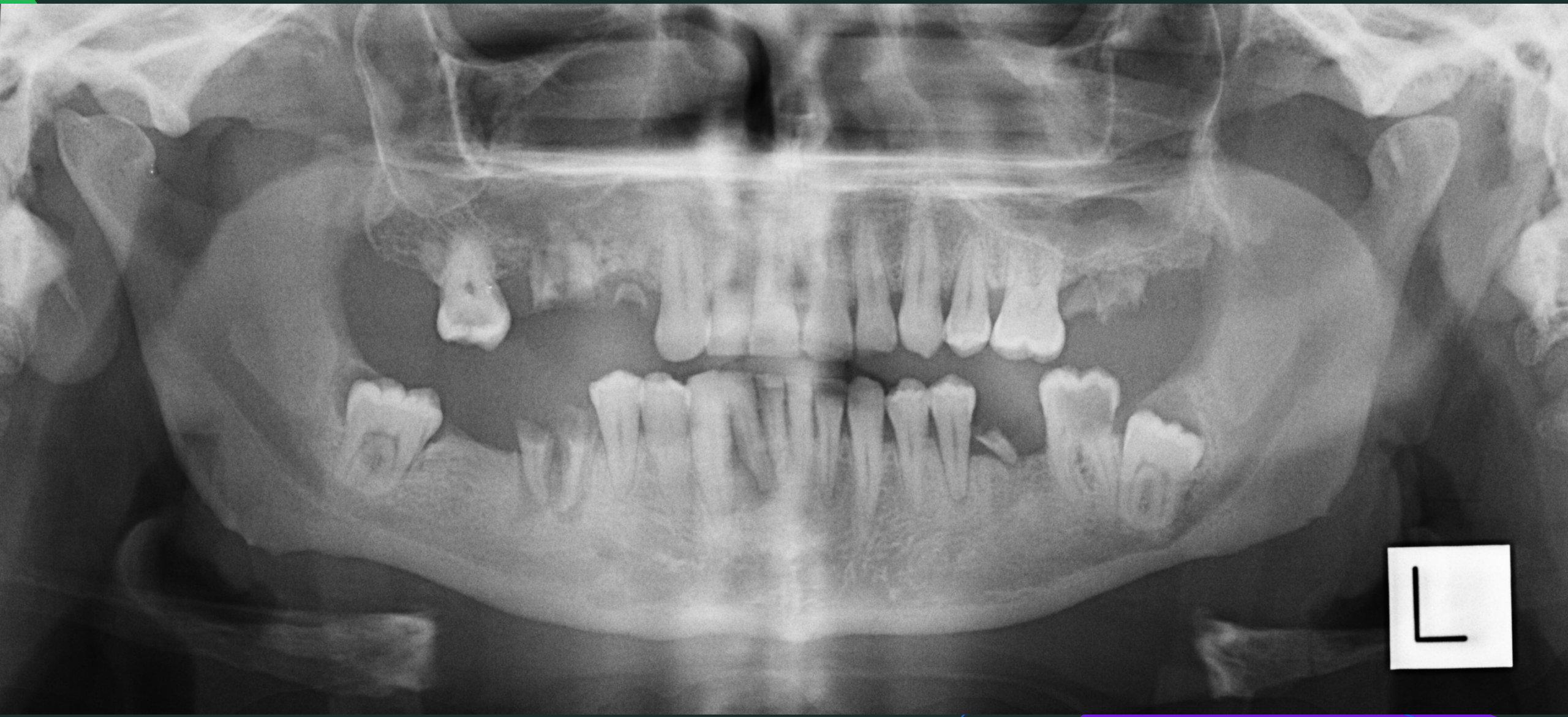
00. Any Technical or Positional Error?

1. **Address Clinical Concerns**
2. **Dentoalveolar**
    a) Count teeth & identify ectopic and/or impacted teeth
    b) Dental Anomalies (Position, Shape,…)
    c) Periodontal bone loss
    d) Dental pathology (non-carious tooth loss, caries, fracture, periapical pathologies, etc.)
3. Maxilla and Mandible
    a) Abnormal (radio)lucencies
    b) Abnormal (radio)opacities
    c) Altered trabecular pattern
    d) Fractures
    e) Jaw Asymmetry
4. Maxillary sinuses (esp. mucosal changes)
5. TM Joints (esp. morphological change of condyles)
6. Soft Tissues (swelling, soft tissue calcifications eg. Tonsiloliths, salivary gland stones, etc.)
7. Other sites: Spine, orbits, etc. (structural changes)

OPG CASES

Case 1.

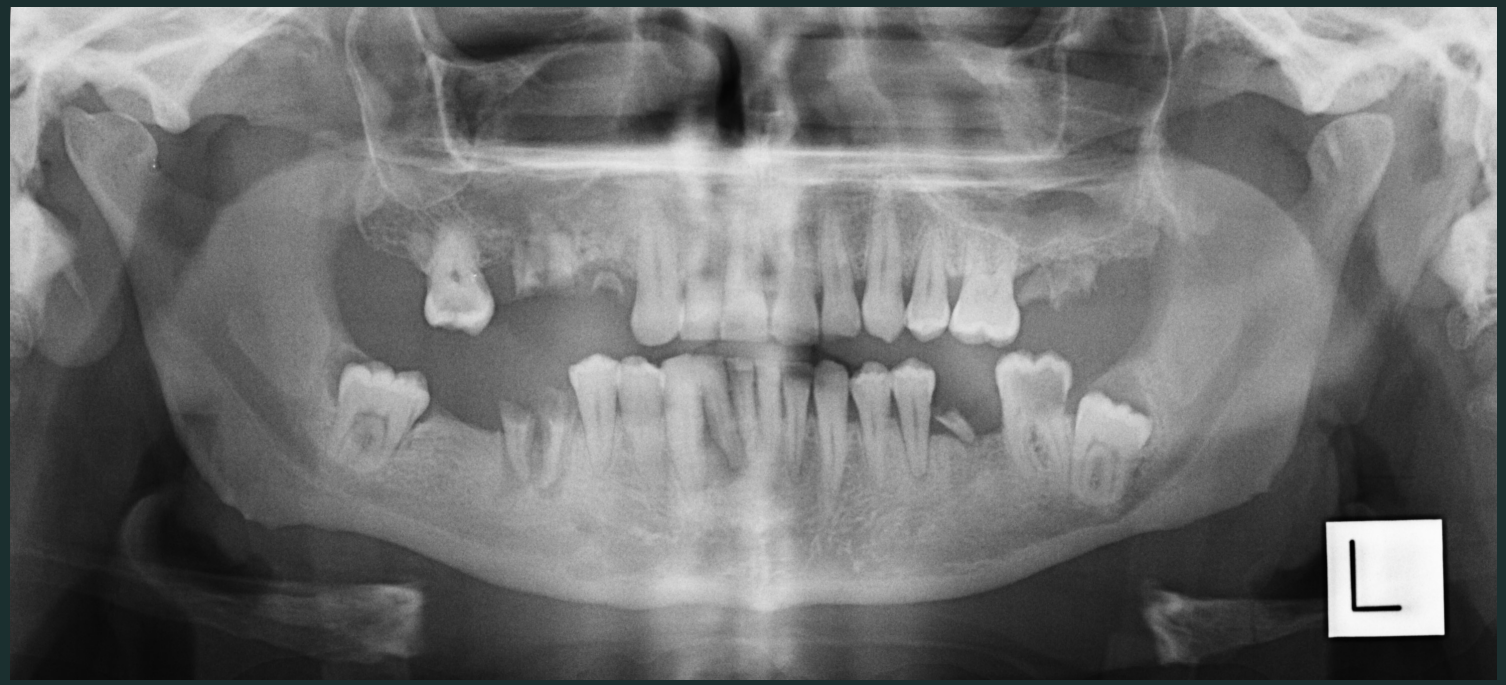
Reason for Scan: Heavily compromised dentition



Case 1 Main Focus: Dento-alveolar Findings

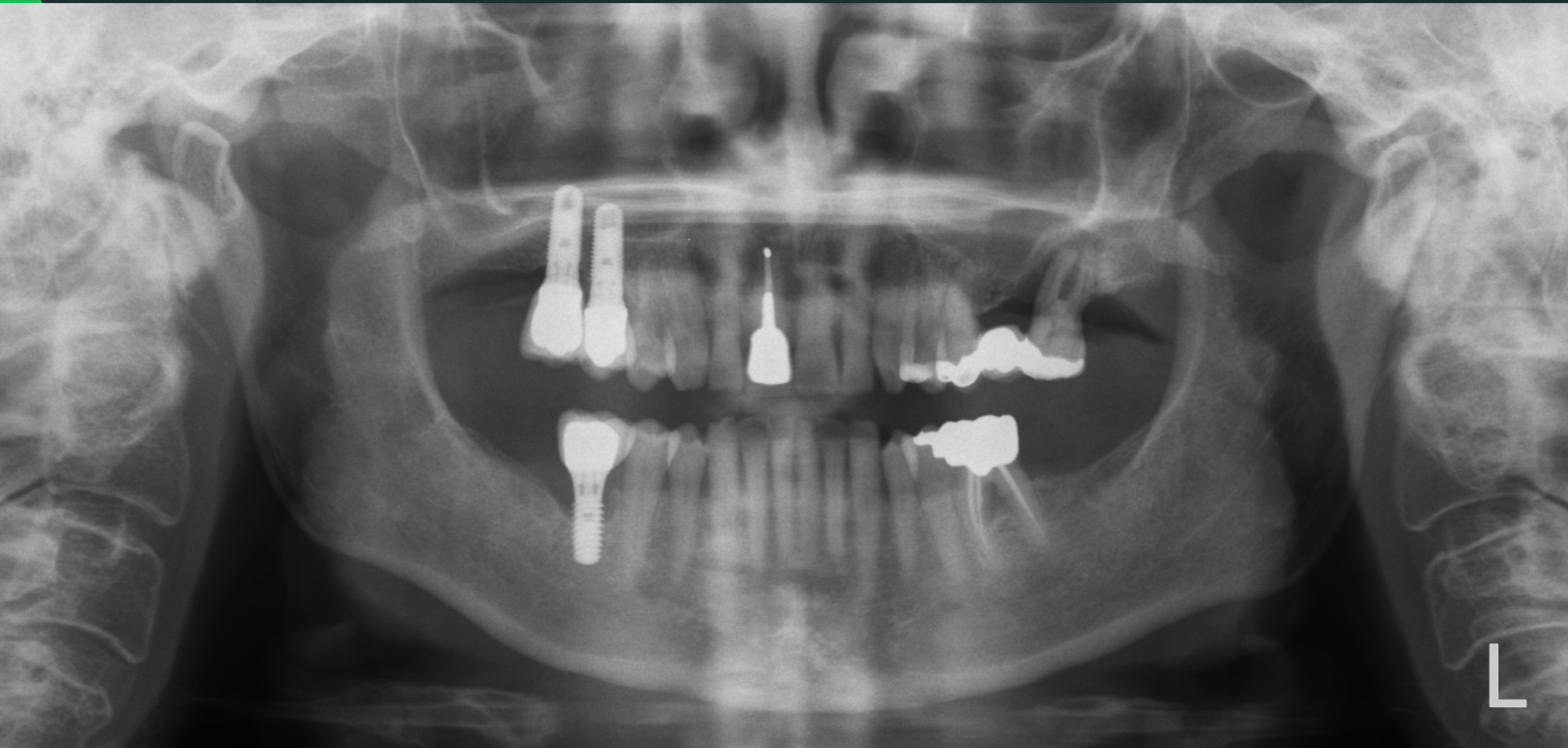
1. **Count teeth including root remnants**
2. Identify impacted teeth – give brief description
3. Periodontal bone loss
4. Existing restoration
5. **Caries**
6. Existing endodontic therapy
7. **Inflammatory lesions**
    - Relationship with adjacent vital structures eg. Maxillary Sinuses and Mandibular Canals

OTHER FINDINGS - Systematic Approach



Case 2.

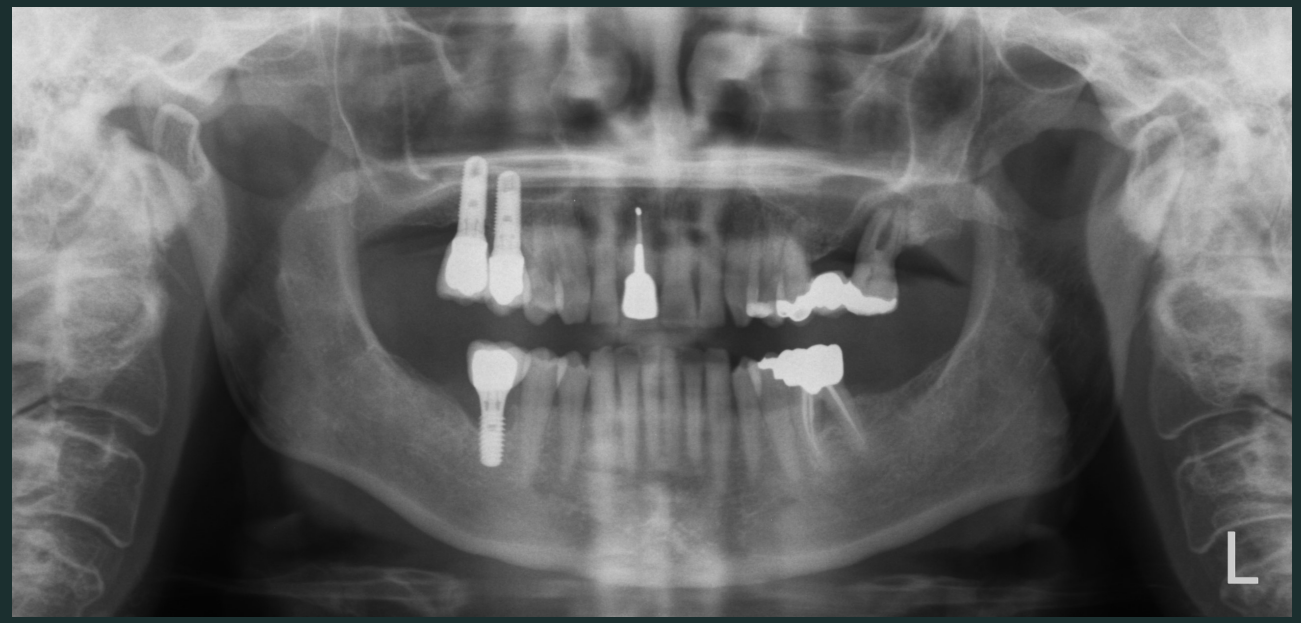
Periodontal Disease



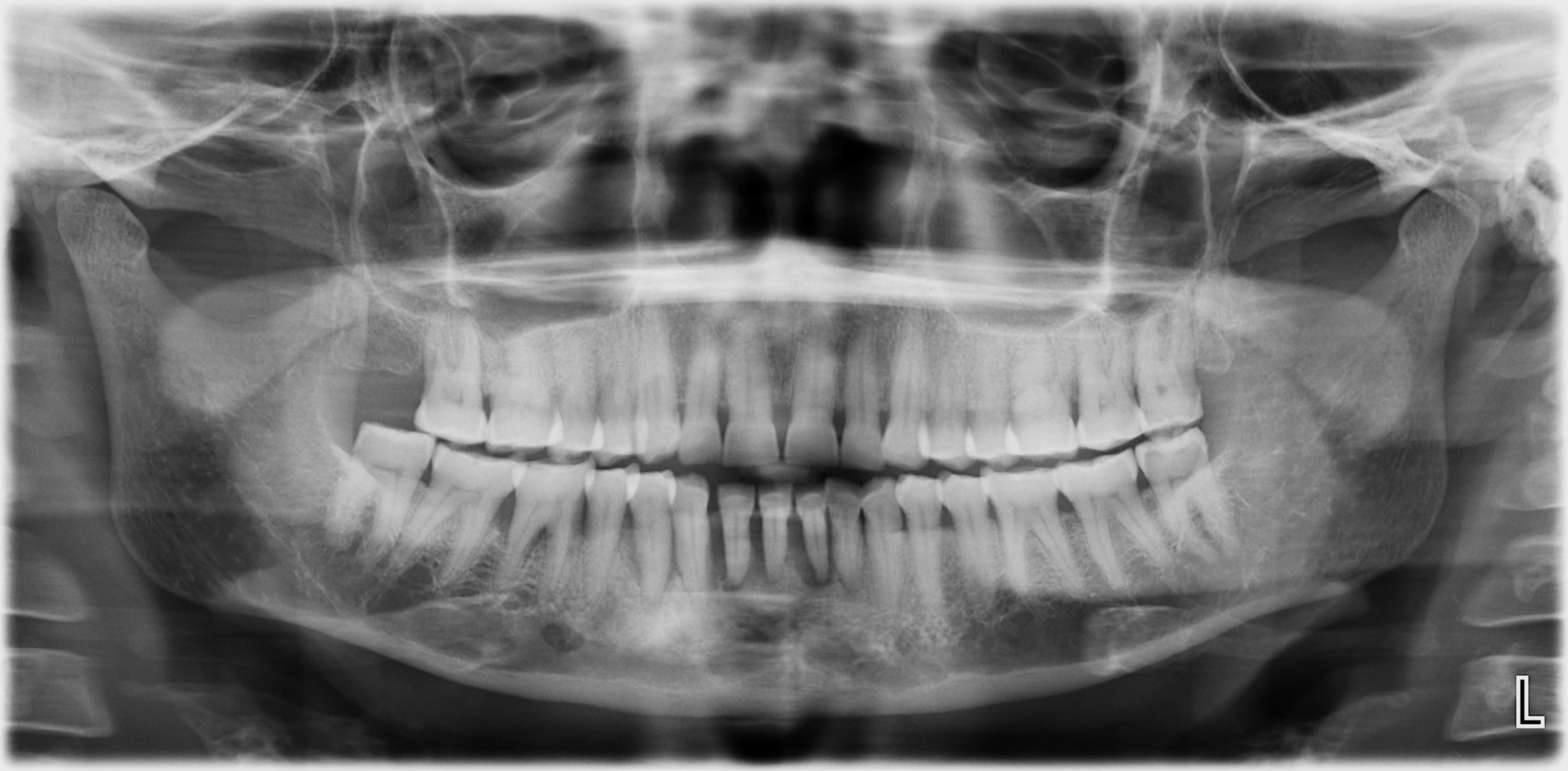
Case 2 Main Focus: Periodontal Bone Loss

1. Count teeth
2. **Count implants**
3. **Peri-implant bone loss**
4. **Periodontal bone loss**
5. Existing restoration
6. Caries
7. Existing endodontic therapy
8. Inflammatory lesions
    - Relationship with adjacent vital structures eg. Maxillary Sinuses and Mandibular Canals

OTHER FINDINGS - Systematic Approach

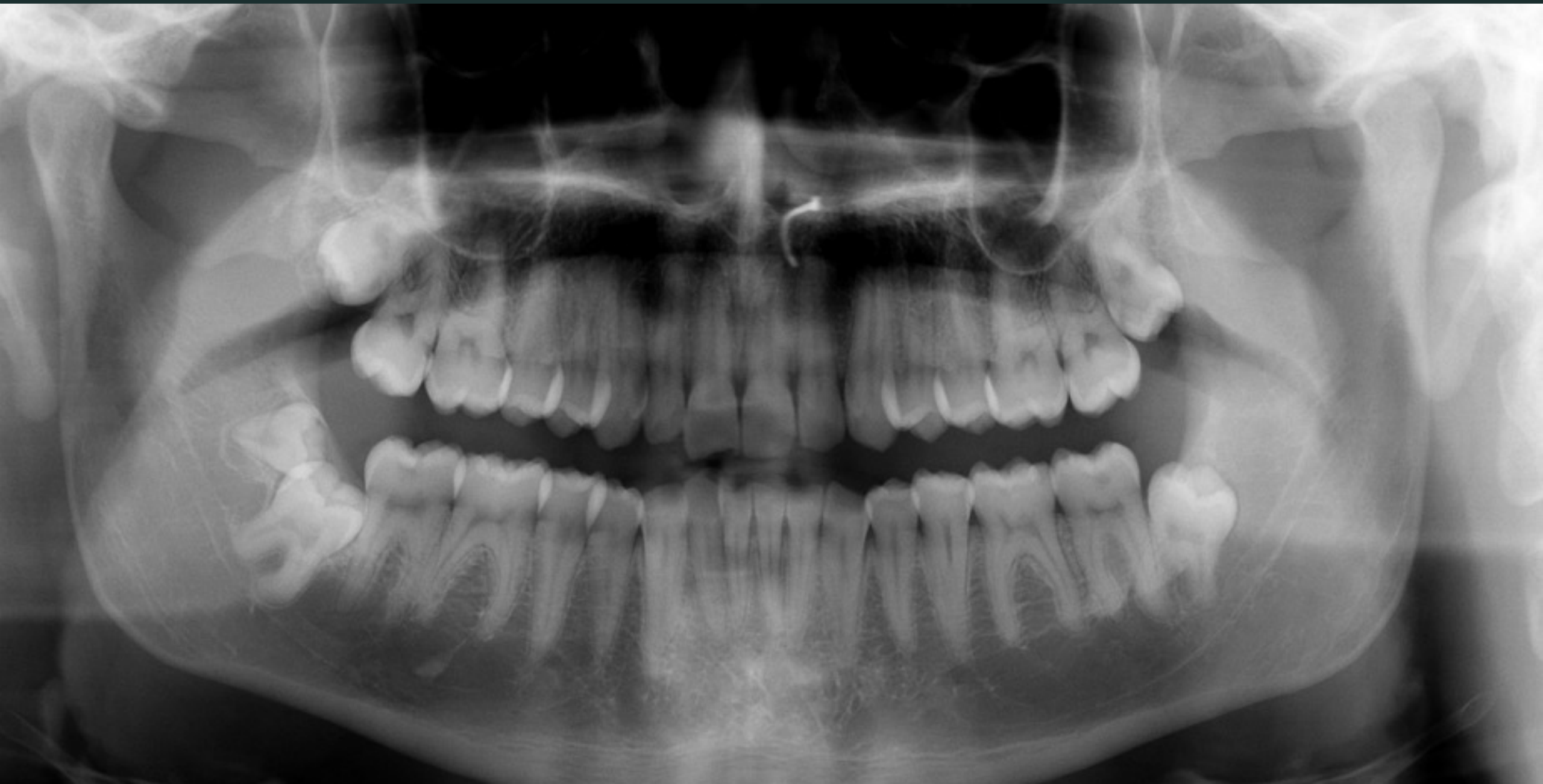


Periodontal Disease #2

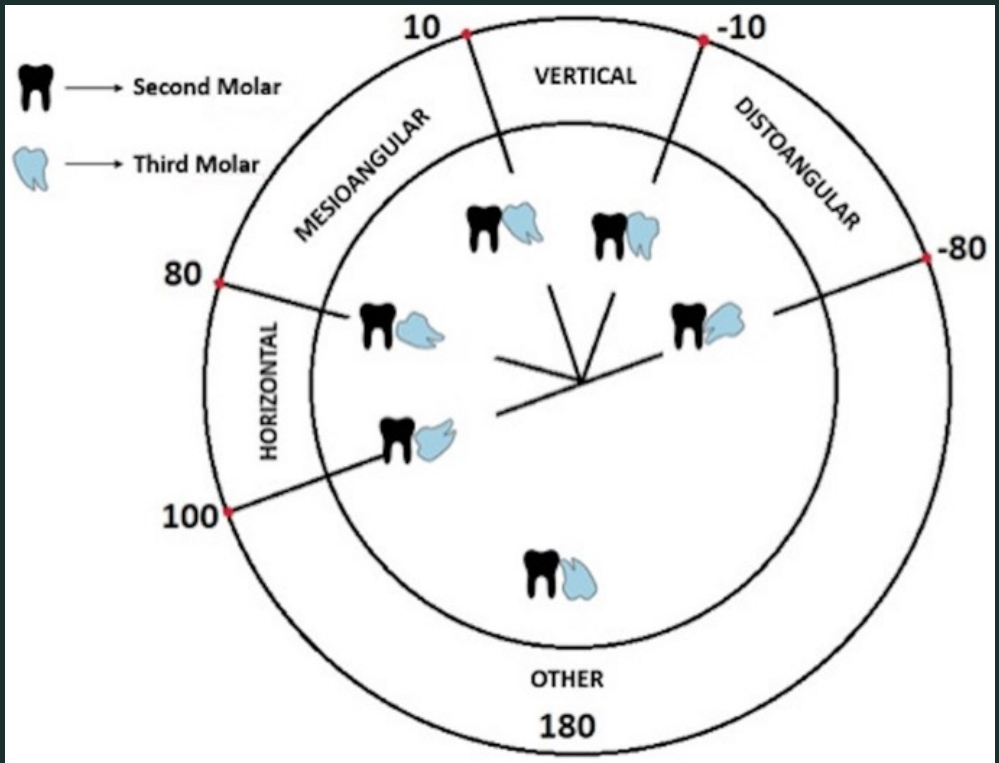


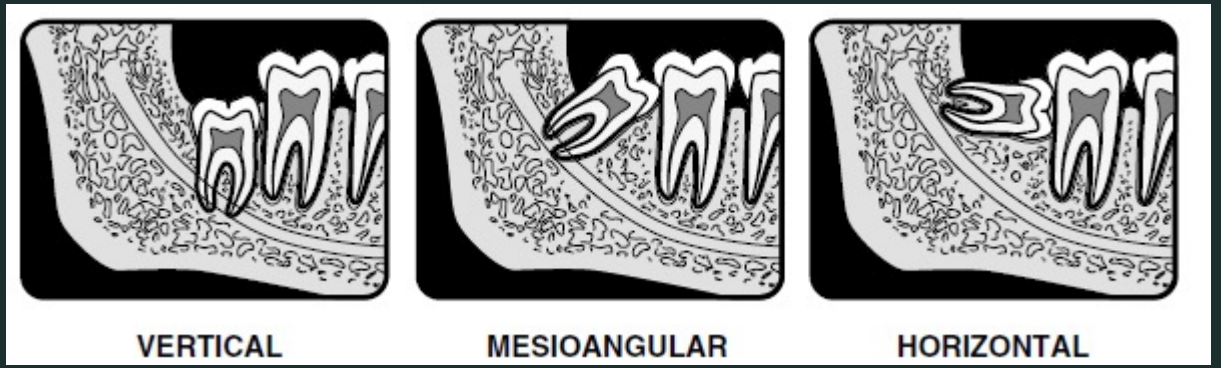
Case 3.

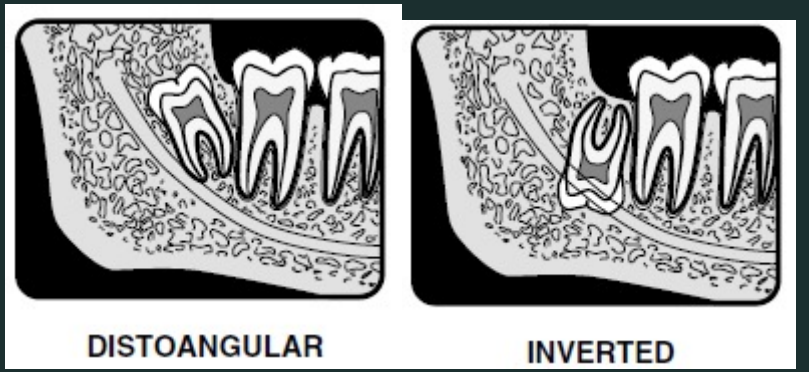
Impacted third molars & incidental finding of a supernumerary tooth



Third molar impaction – Winter's Classification



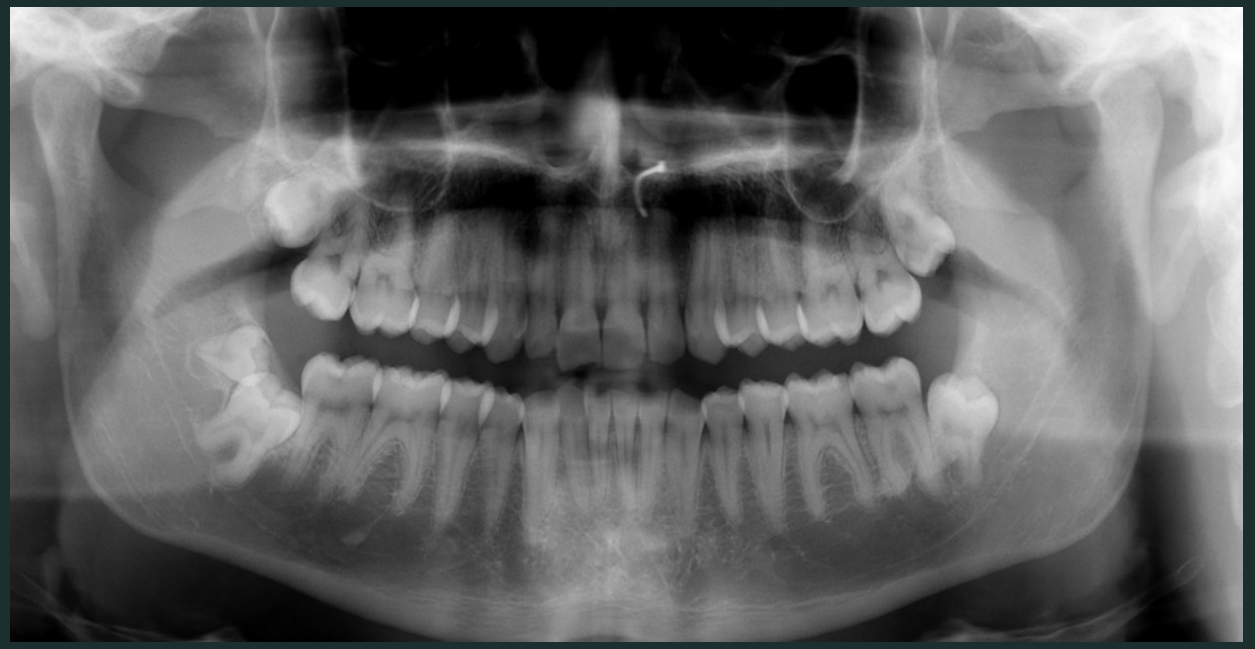




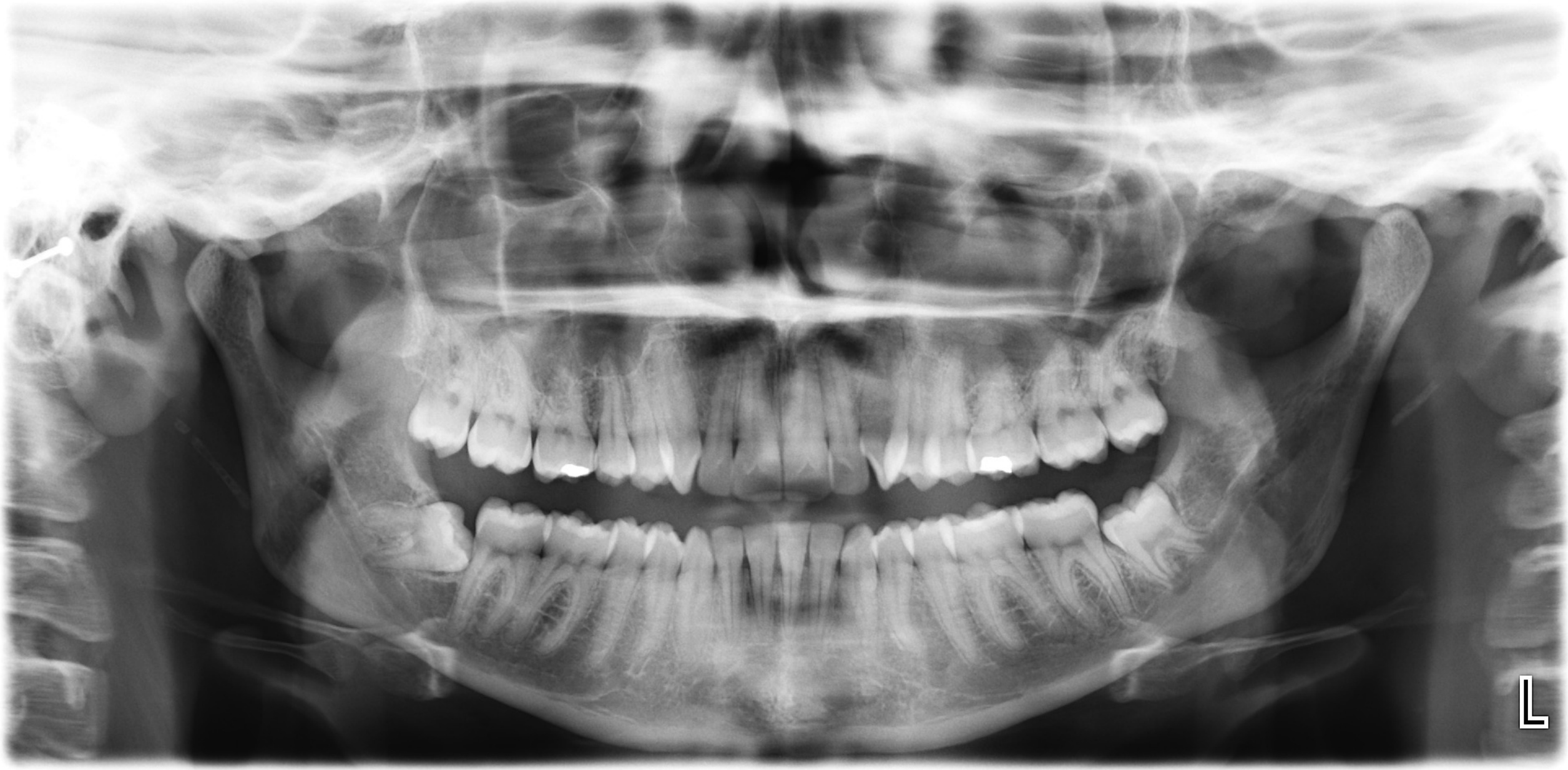
Case 3 Main Focus: Impacted Third Molars

1. **Count teeth including supernumerary**
2. **Describe the supernumerary tooth**
3. **Describe the impacted teeth**
4. Periodontal bone loss
5. Existing restoration
6. Caries
7. Existing endodontic therapy
8. Inflammatory lesions
    - Relationship with adjacent vital structures eg. Maxillary Sinuses and Mandibular Canals

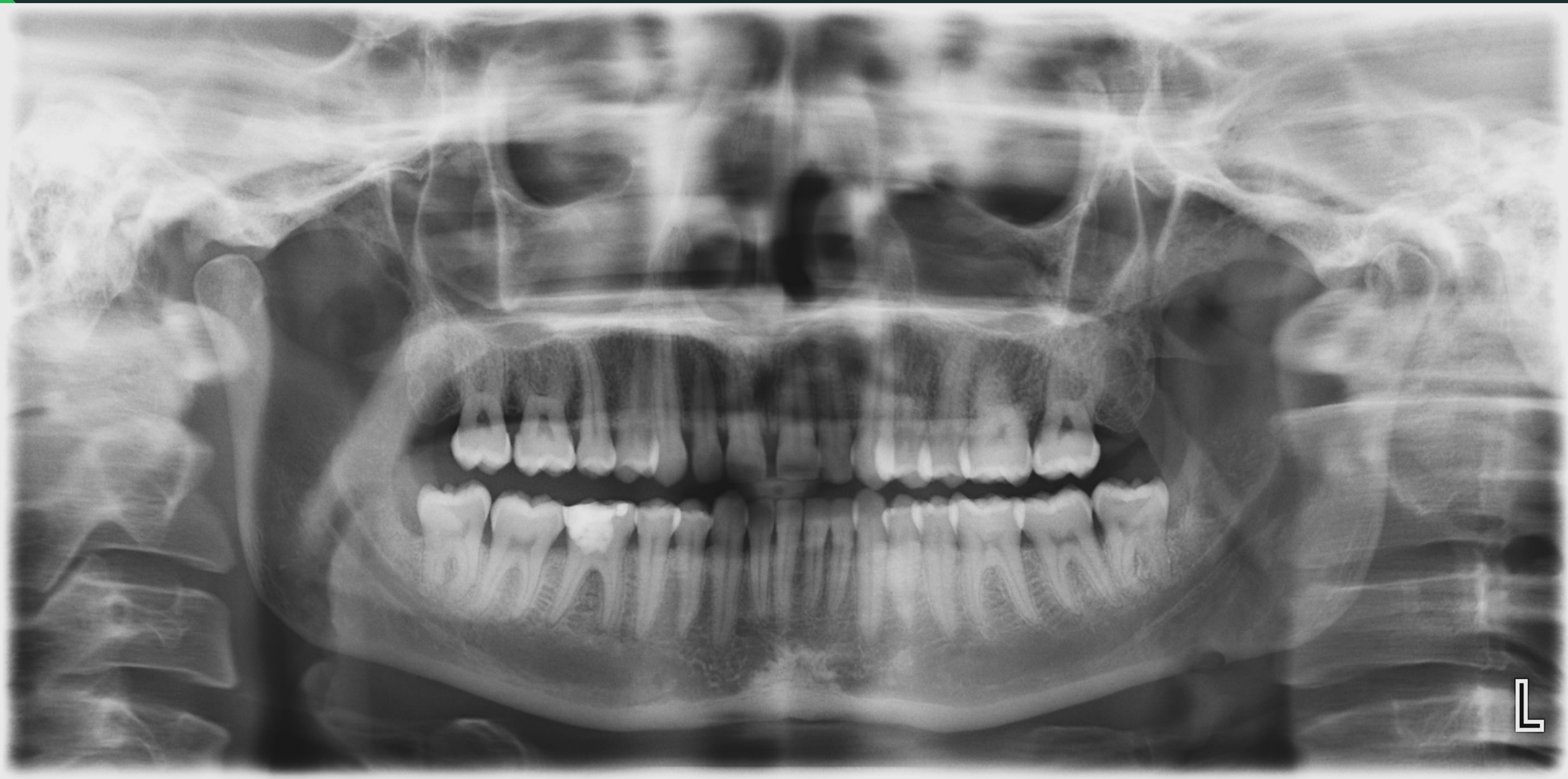
OTHER FINDINGS - Systematic Approach



Impacted third molars #2

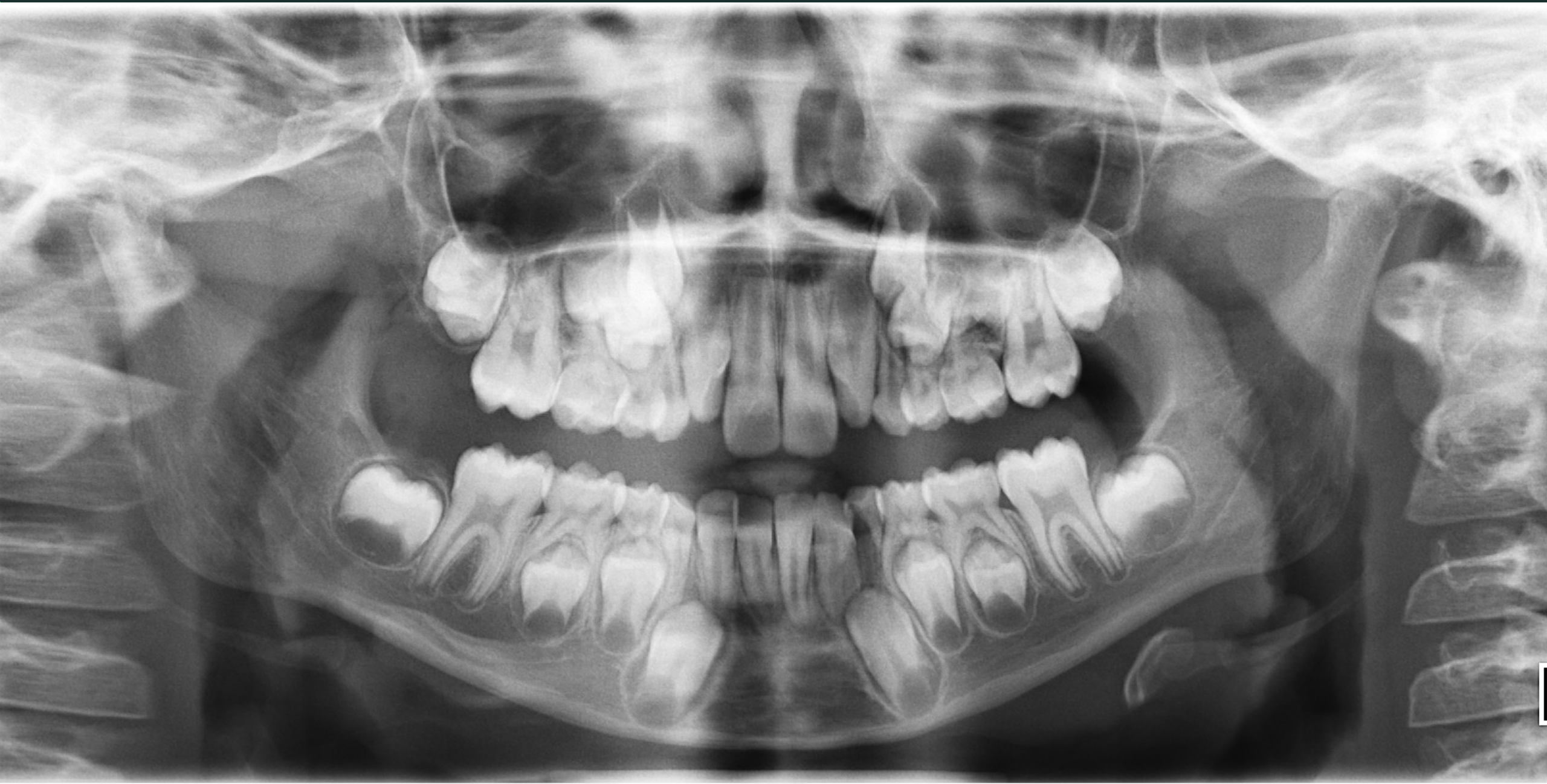


Episodic Pain from Mandibular Third Molars



Case 4.

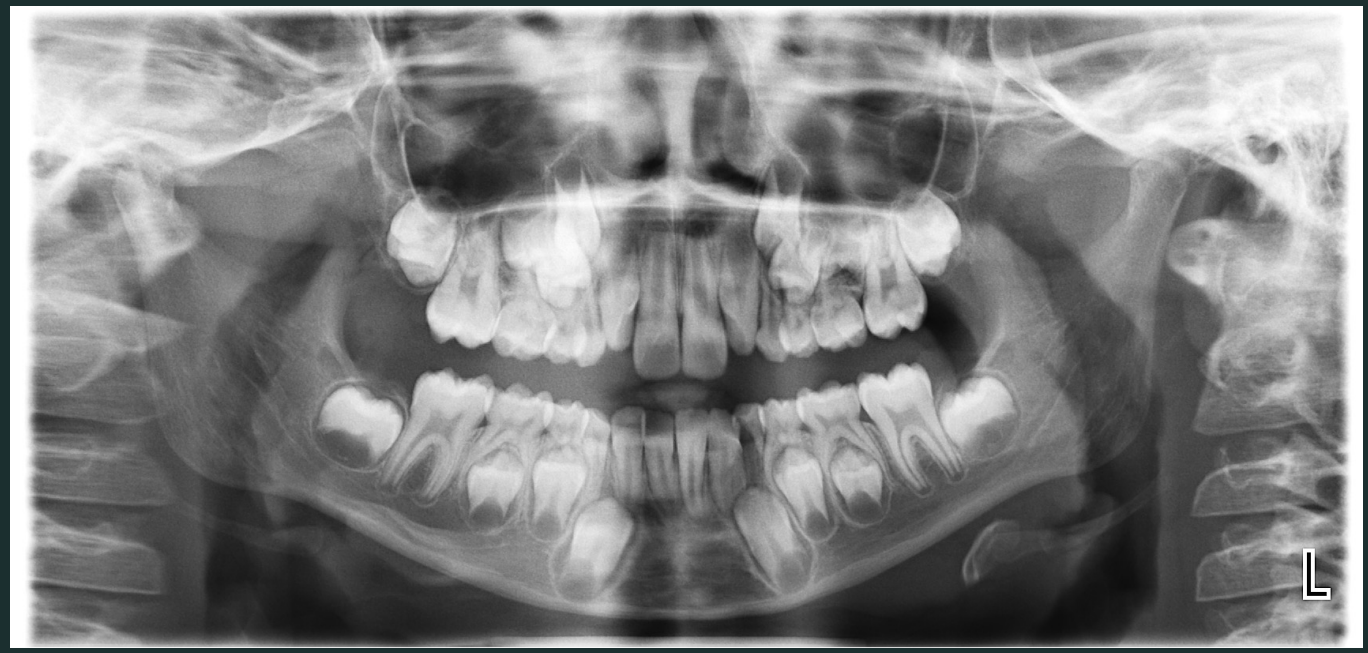
Mixed dentition – Permanent Teeth Development and Position



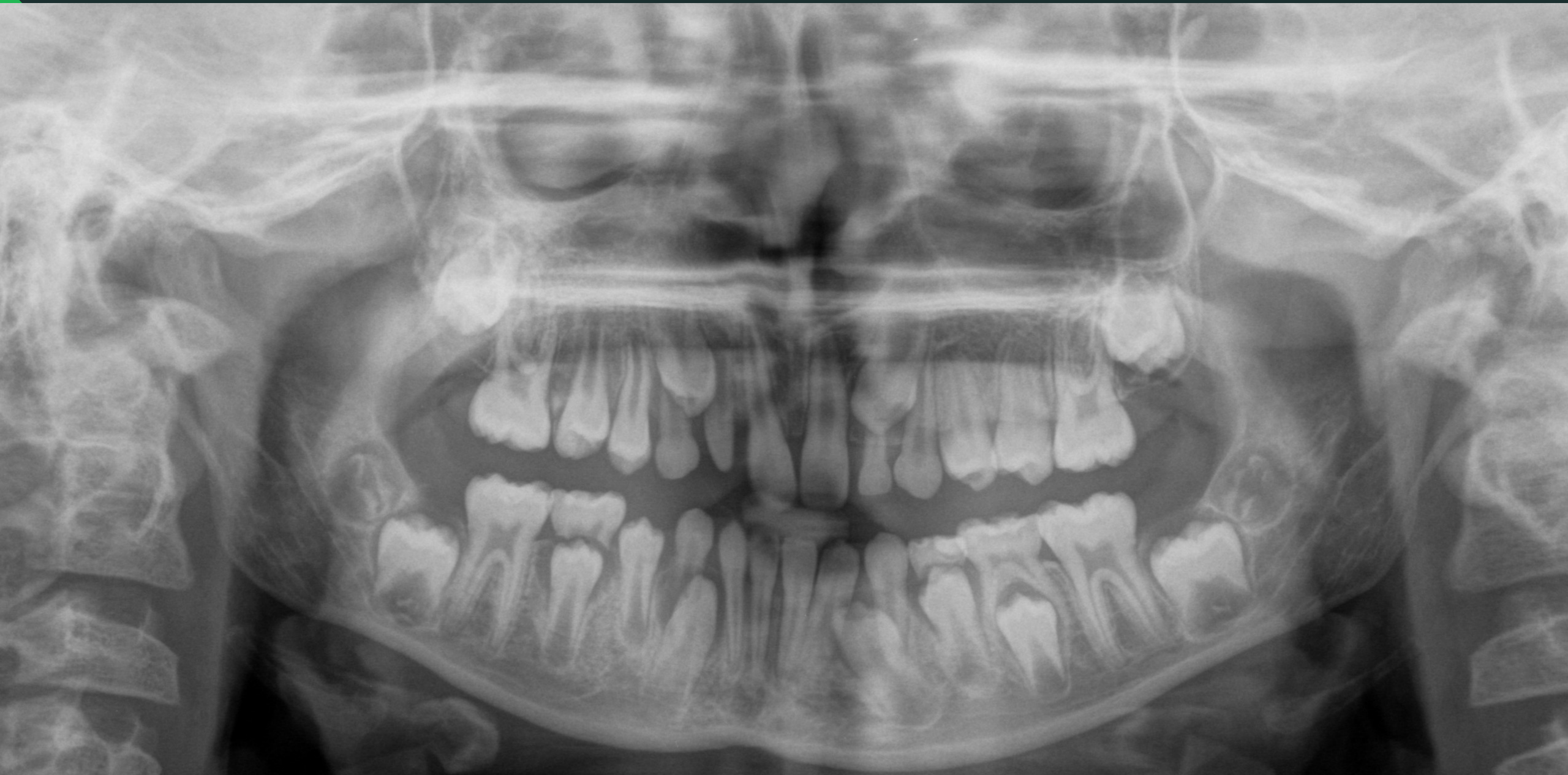
Case 4 Main Focus: Mixed Dentition

1. **Count teeth**
2. **Check permanent teeth development and position**
3. **Is the dentition appropriate for age?**
4. **Crowding and rotated teeth**
5. **Check Dental Anomalies**
6. Periodontal bone loss
7. Existing restoration
8. Caries
9. Inflammatory lesions
    - Relationship with adjacent vital structures eg. Maxillary Sinuses and Mandibular Canals

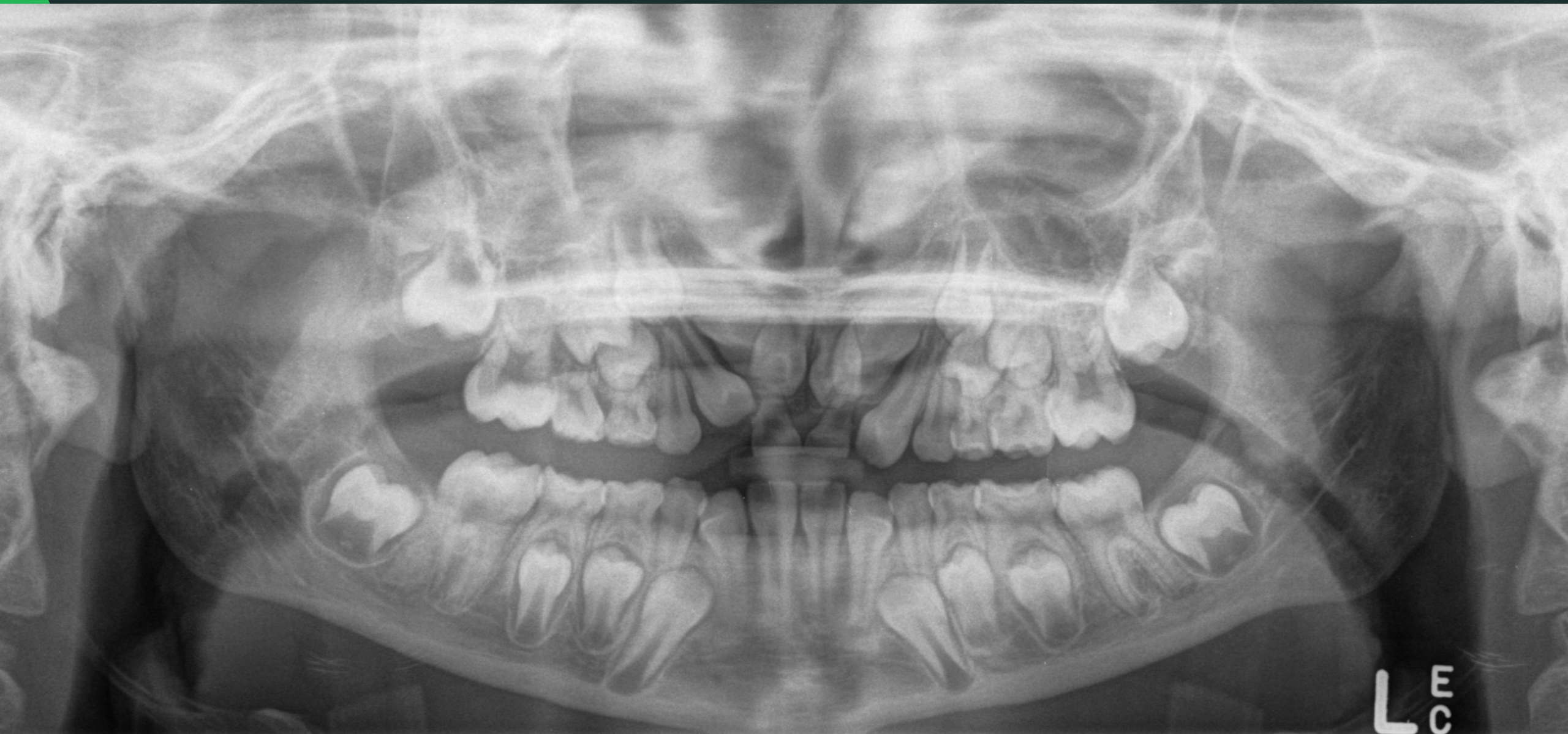
OTHER FINDINGS - Systematic Approach



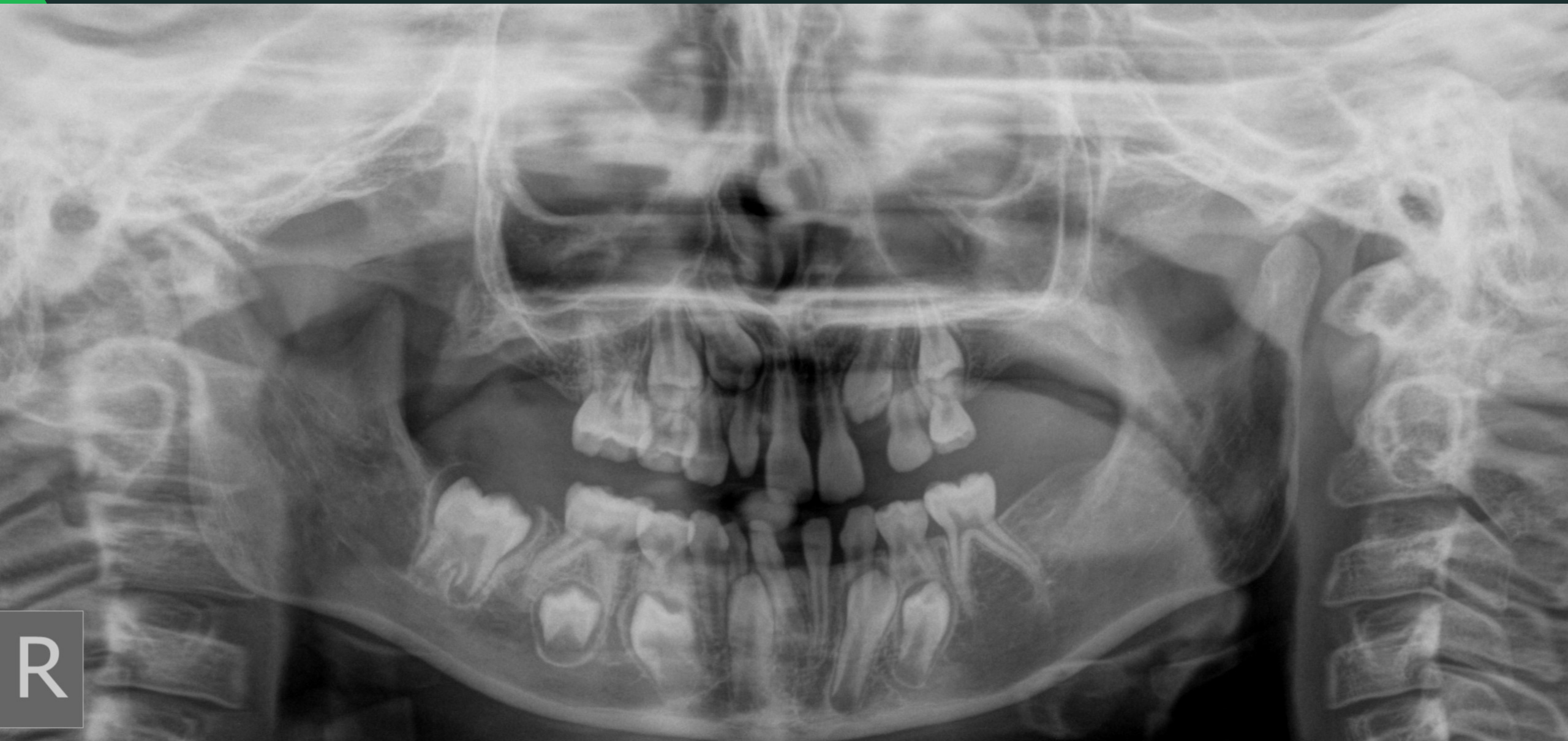
Mixed dentition #2 – Permanent Teeth Development and Position



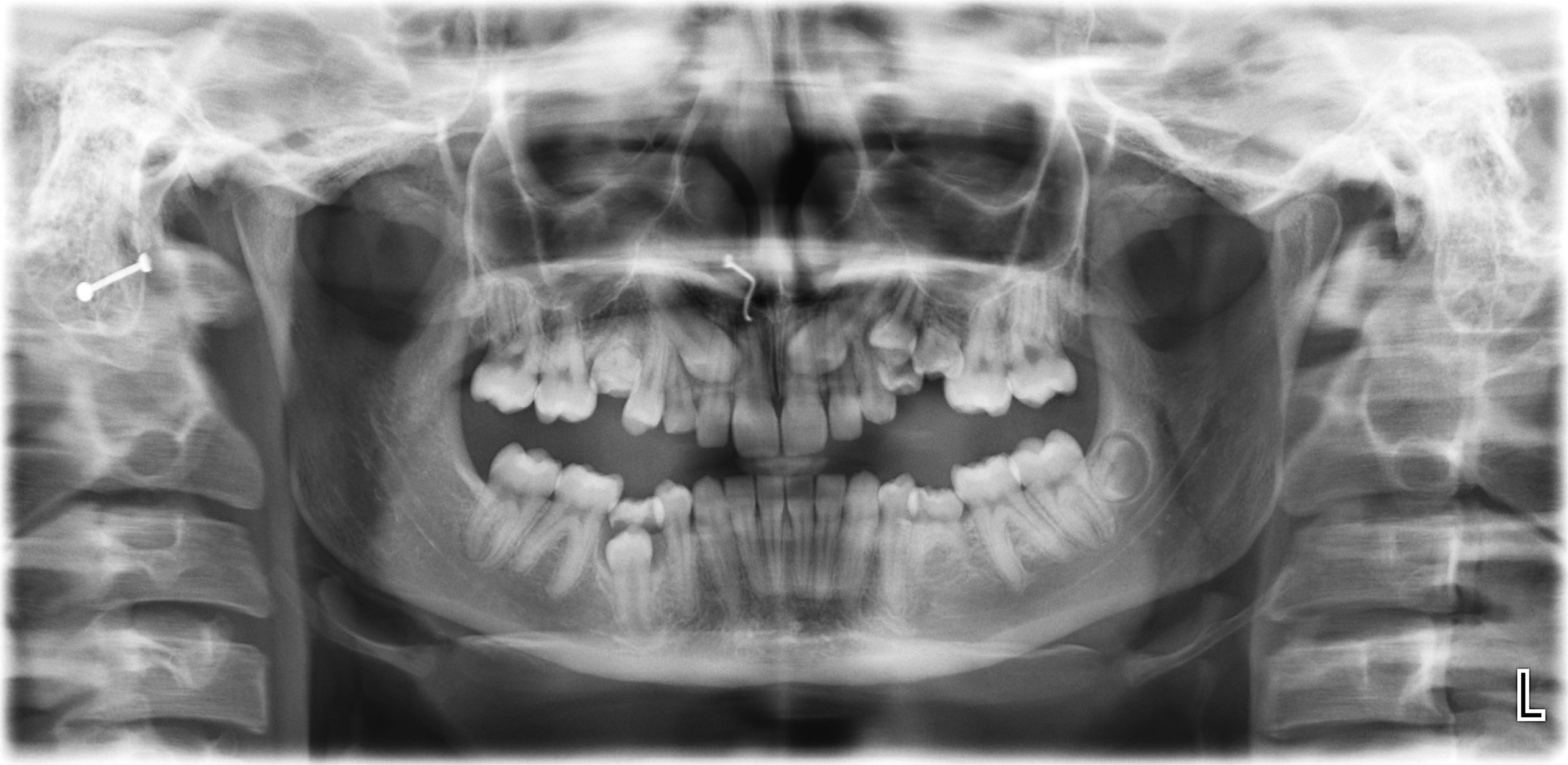
Mixed dentition #3 – Permanent Teeth Development and Position



Mixed dentition #4 – Permanent Teeth Development and Position



Mixed dentition #5 – Submerged Deciduous Molars + Permanent Teeth Development and Position




Part 1 END