Wisdom Teeth

An Overview

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Learning Outcomes

- Recognise and describe 3rd molar impactions
- Explain how to identify proximity of other close anatomical structures
- Management of pericoronitis
- Discuss the management strategies for 3rd molars
- Explain the basic steps of a surgical removal of a 3rd molar

Why might wisdom teeth become impacted?

- Last teeth to develop
  - 3rd molar germ will not appear until ages 4-5yrs
  - Mineralization of the crown between 7-10yrs
  - Crown formation complete 12-16yrs
  - Eruption varies 17-25yrs
- Lack of space
- Irregularity in position – most likely to be ectopic
- Density of overlying and surrounding bone

What symptoms might a patient complain about?

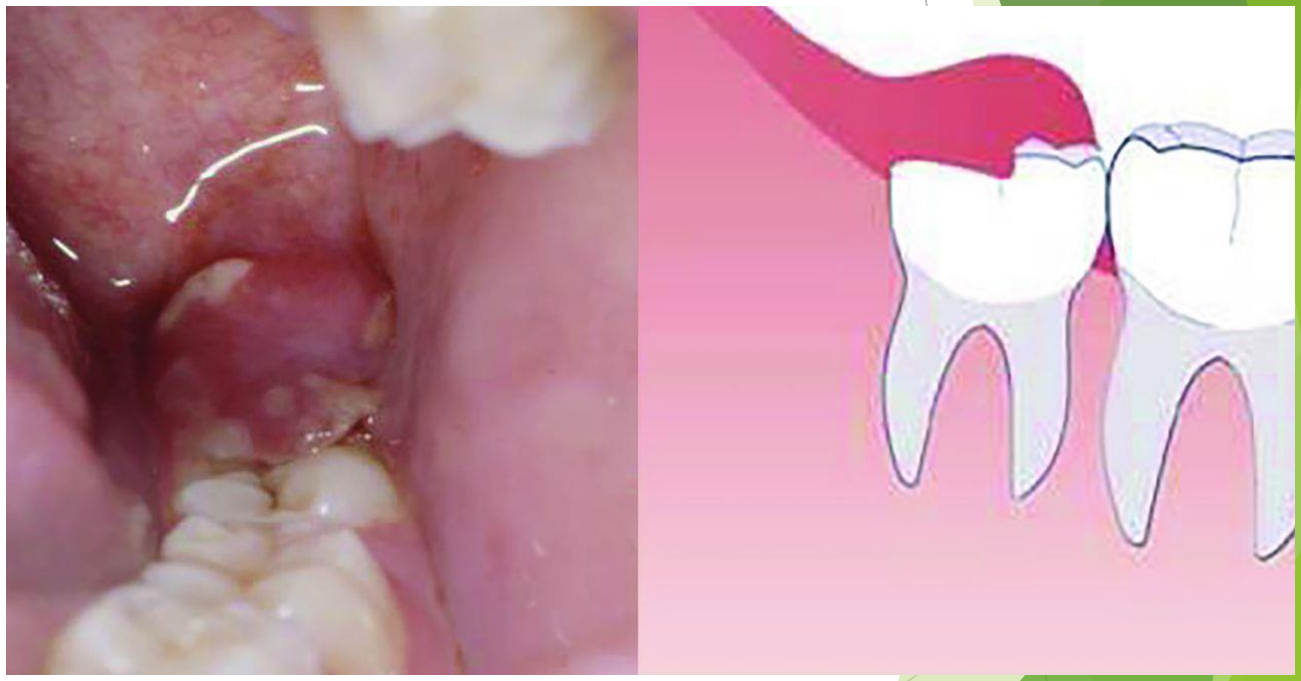
- Pain
  - May be very specific.
  - May be very vague “dull ache”, “pressure”
  - Earache?
  - Headache?
- Swelling
- Infection
- Trismus

Impaction Types

- It is a useful exercise to classify impactions as it assists with:
  - Estimation of difficulty*
  - Surgical approach

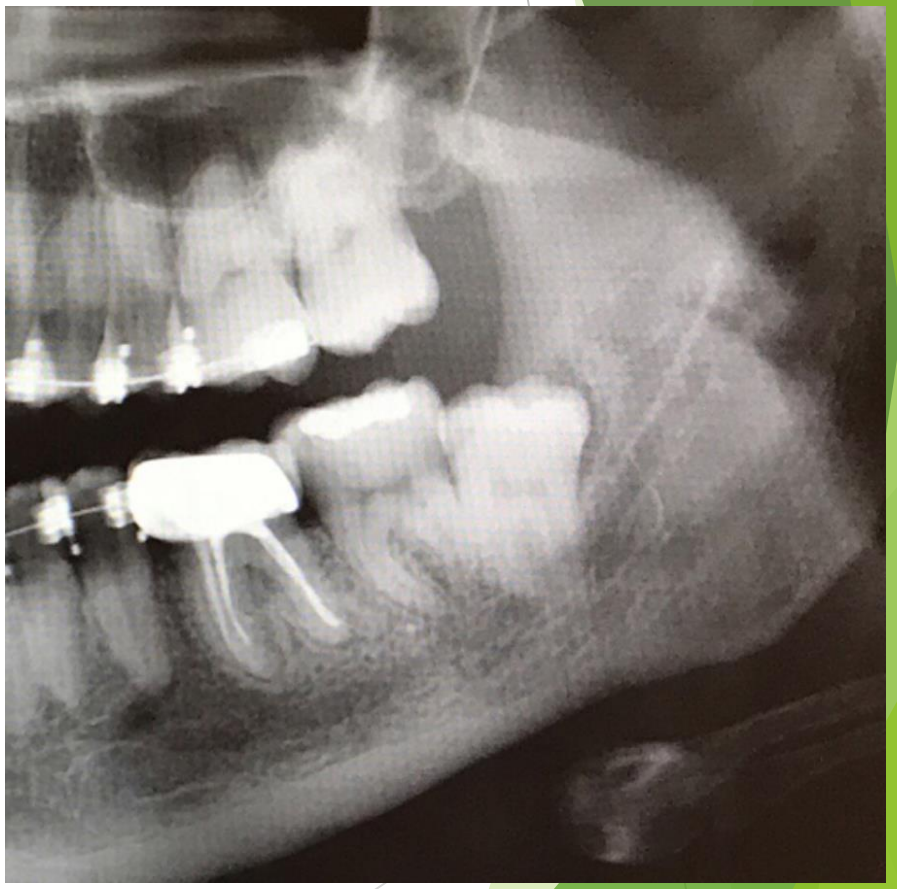
Impaction Types

1. Overlying Tissue Classification
   - Soft tissue impaction



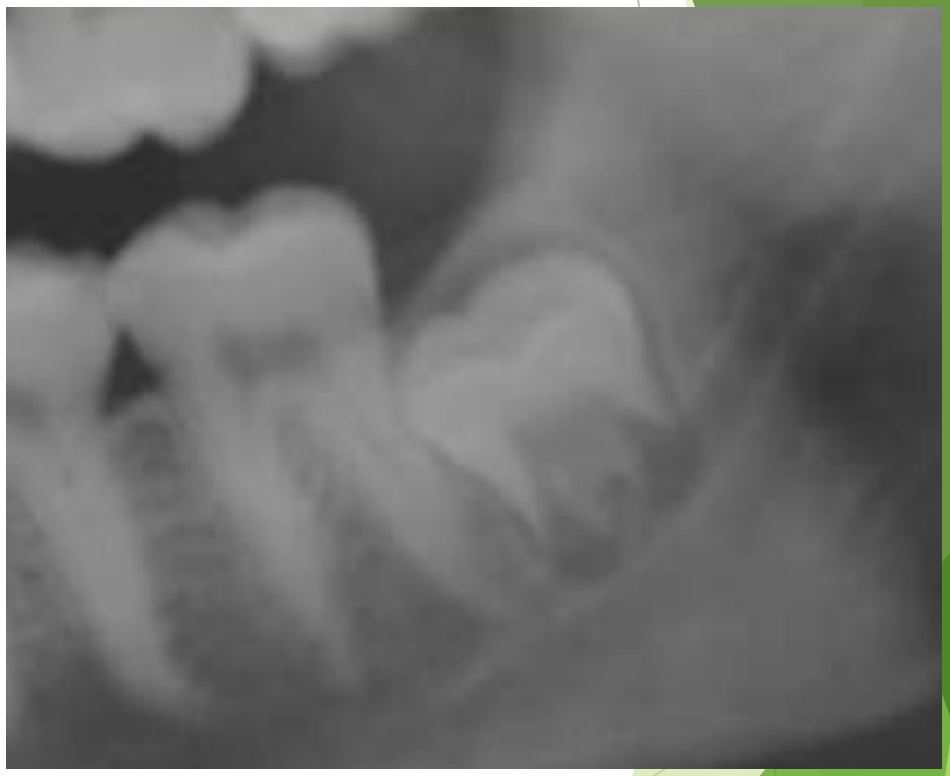
Impaction Types

1. Overlying Tissue Classification
   - Soft tissue impaction
   - Bony impaction - partial



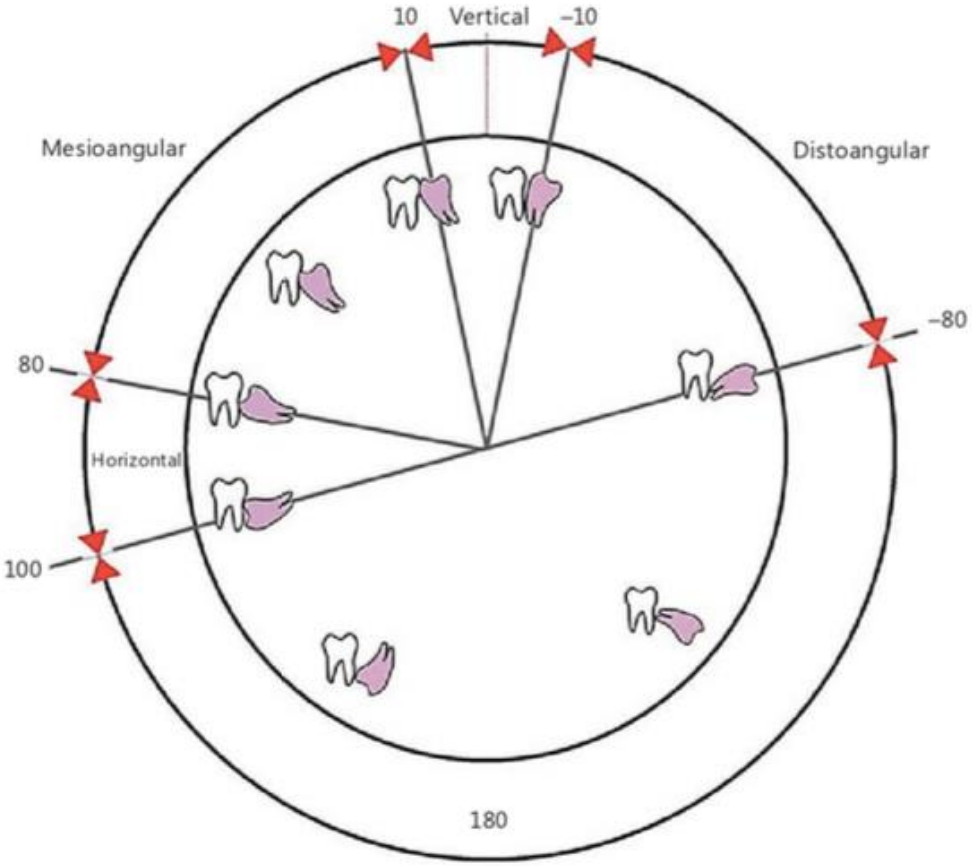
Impaction Types

1. Overlying Tissue Classification
   - Soft tissue impaction
   - Bony impaction – partial
   - Bony impaction - complete



Impaction Types

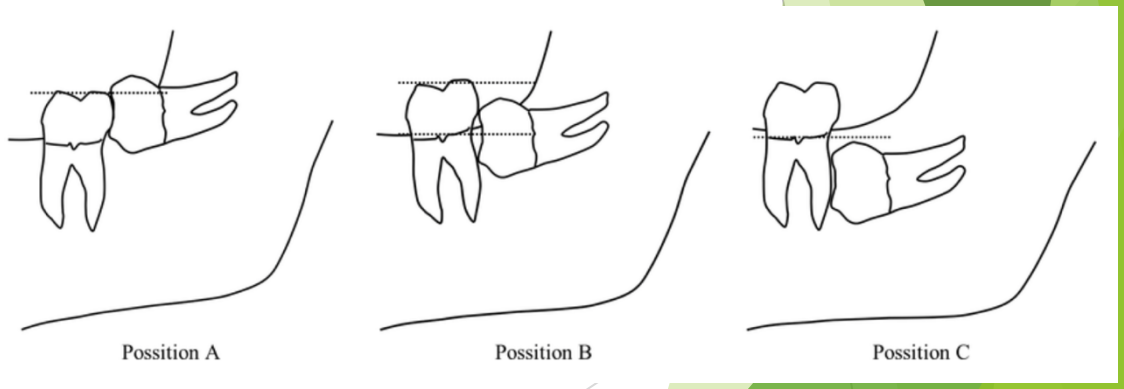
2. Winter's classification, 1926
   - Third molars classified based on their inclination compared to the long axis of the 2nd molar
   - 6 Classifications:
     - Vertical
     - Mesio-angular
     - Horizontal
     - Disto-angular
     - Transverse (buccolingual)
     - Inverted



Impaction Types

3. Pell and Gregory, 1933
   - Looks at depth and space between the ramus

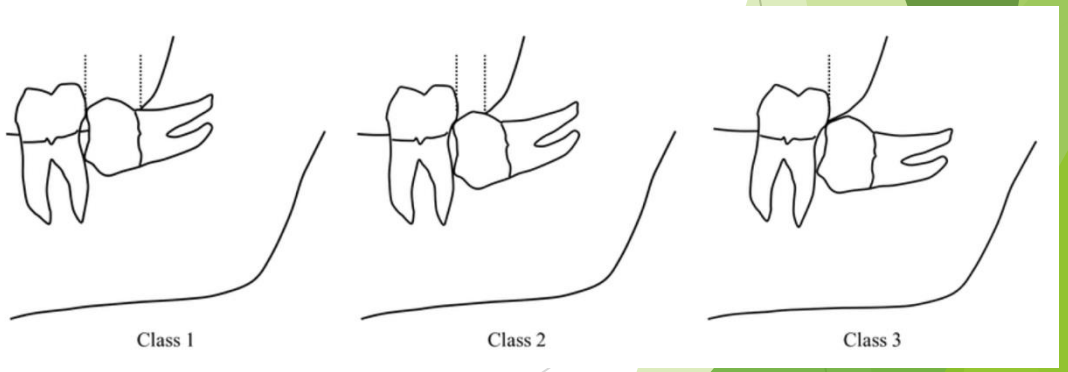
Depth	
Level A	Highest portion of the impacted third molar is level with, or above the occlusal plane
Level B	Highest portion of the impacted third molar is below the occlusal plane BUT above the cervical line of the 2nd molar.
Level C	Highest portion of the impacted third molar is below the cervical line of the 2nd molar



Impaction Types

3. Pell and Gregory, 1933
   - Looks at depth and space between the ramus

Space between the ramus	
Class 1	Sufficient space between the anterior border of the ascending ramus and the distal aspect of the 2nd molar. I.e. greater than the mesio-distal width of the 3rd molar crown.
Class 2	The space available between the anterior border of the ascending ramus and the distal aspect of the 2nd molar is less than the mesio-distal width of the 3rd molar crown.
Class 3	The third molar is embedded in the bone of the ascending ramus because of the lack of space



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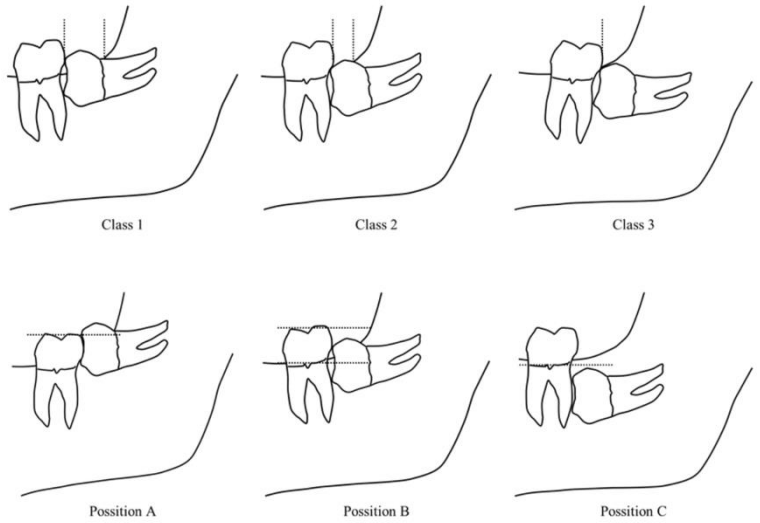


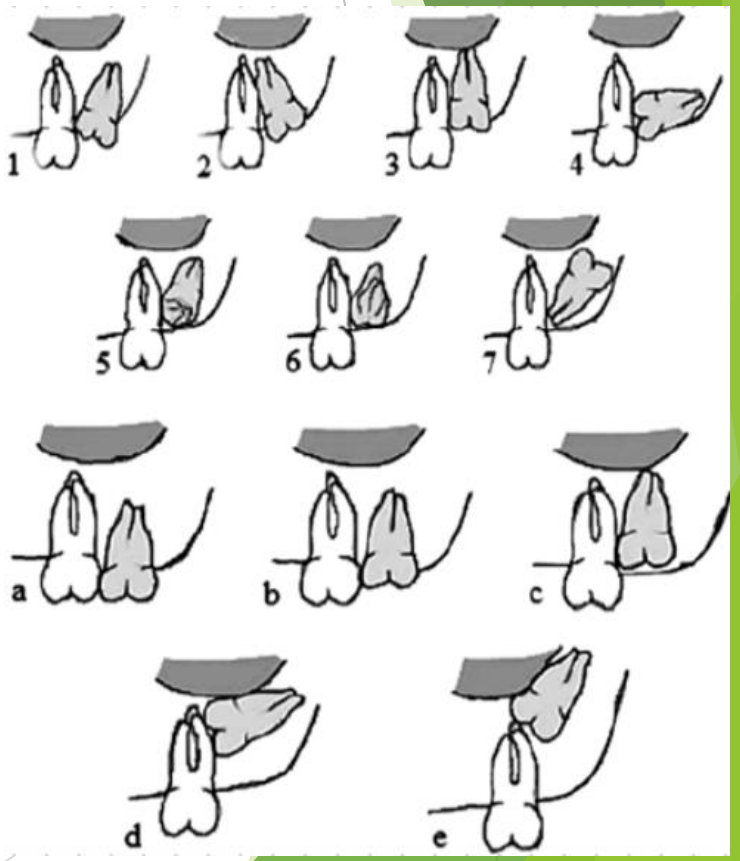
Image from: https://www.researchgate.net/figure/Pell-Gregorys-classification-Class-1-There-is-sufficient-space-available-between-the_fig3_326140898

Impaction Types

4. Archer's classification of upper 3rd molars
   - Classified on inclination and depth

Inclination	
1	mesioangular
2	distoangular
3	vertical
4	horizontal
5	buccoangular
6	linguoangular
7	inverted

Depth	
a	Occlusal surface of the 3rd molar level with the 2nd molar
b	Occlusal surface of the 3rd molar at the middle of the crown of the 2nd molar
c	Occlusal surface of the 3rd molar at the cervical line of the of the 2nd molar
d	Occlusal surface of the 3rd molar at along the root of the of the 2nd molar
e	Occlusal surface of the 3rd molar above the root of the of the 2nd molar



Complications of removal of lower 3rd molars

- Displacement of root or tooth
- Dry socket
- Bony defect distal to the 2nd molar
- Periodontal defect distal to the 2nd molar
- Altered sensation to the lip, chin or tongue (injury to the IAN or lingual nerve)

Mandibular 3rd molars & IAN proximity

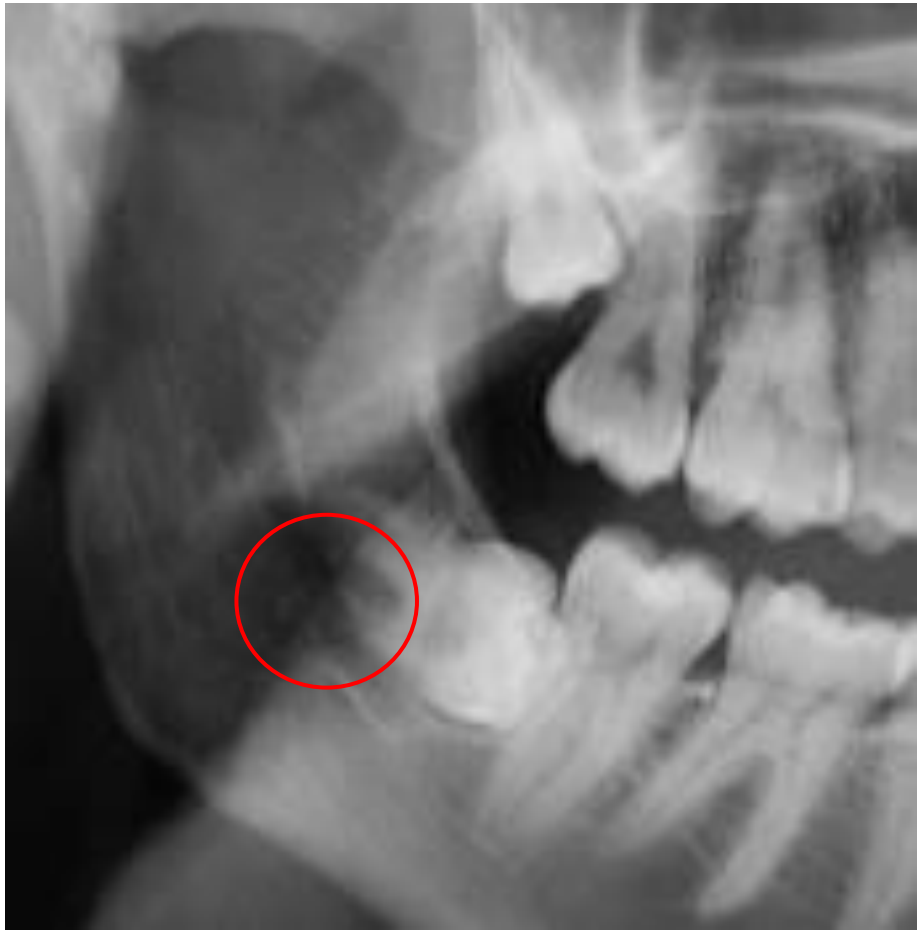
- Risk of an altered sensation to the lip, chin and tongue which may be temporary or permanent
  - Temporary paraesthesia reported 0.5-5%[1]
  - Permanent paraesthesia reported <1%[1]

- There are some signs to look out for on an OPG:
  - Darkening of the roots
  - **Interruption of the radiopaque line (loss of the corticated border)**
  - **Diversion of the ID canal**
  - Dark and bifid apex
  - Deflection of the roots
  - **Narrowing of the ID canal**
  - Narrowing of the roots
  - Juxta-apical area[2]

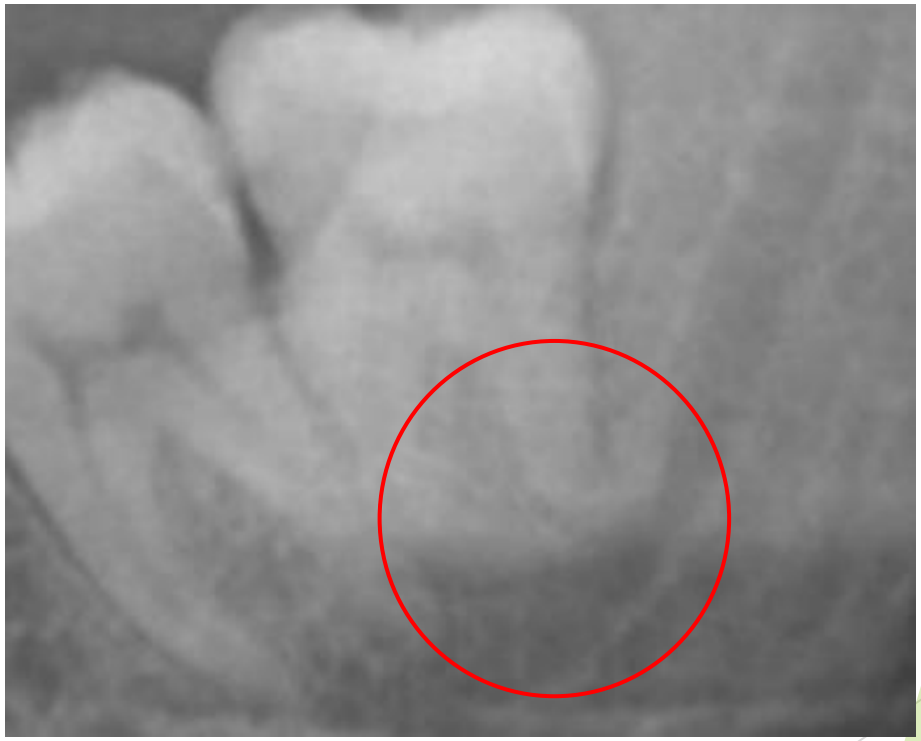
1. Huang, C.-K., et al. (2015). "Use of panoramic radiography to predict postsurgical sensory impairment following extraction of impacted mandibular third molars." Journal of the Chinese Medical Association **78**(10): 617-622.

2. T. Renton, M. Hankins, C. Sproate, M. McGurk, A randomised controlled clinical trial to compare the incidence of injury to the inferior alveolar nerve as a result of coronectomy and removal of mandibular third molars, British Journal of Oral and Maxillofacial Surgery, Volume 43, Issue 1,2005, Pages 7-12.

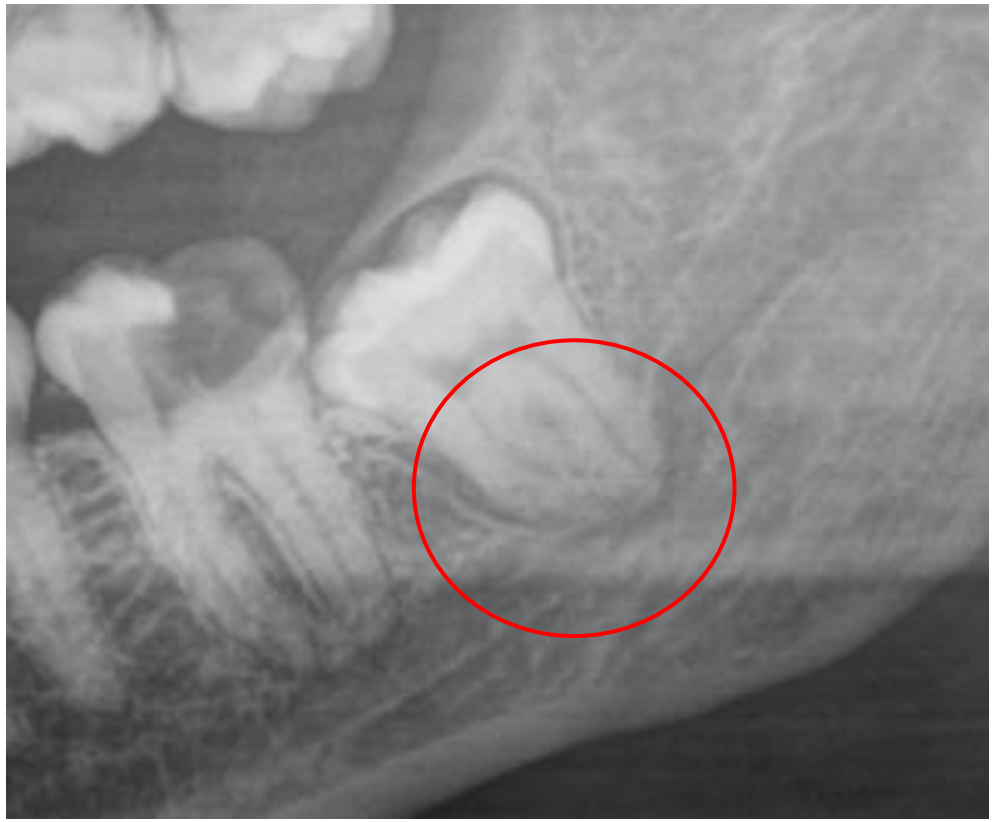
Darkening of roots



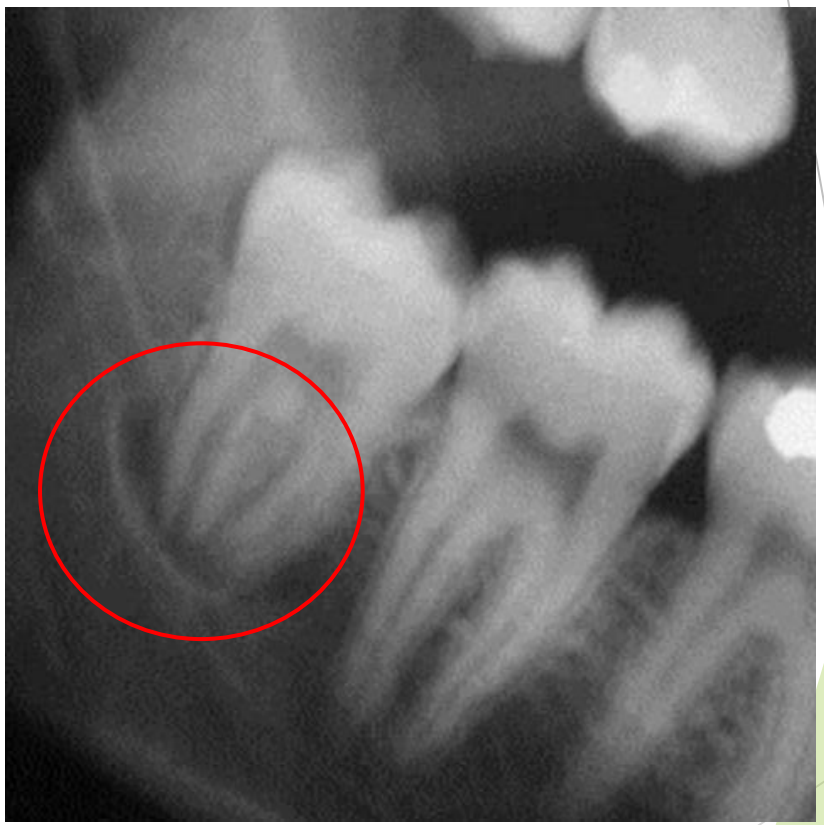
Deflection of roots



Changes to canal



Juxta-apical area

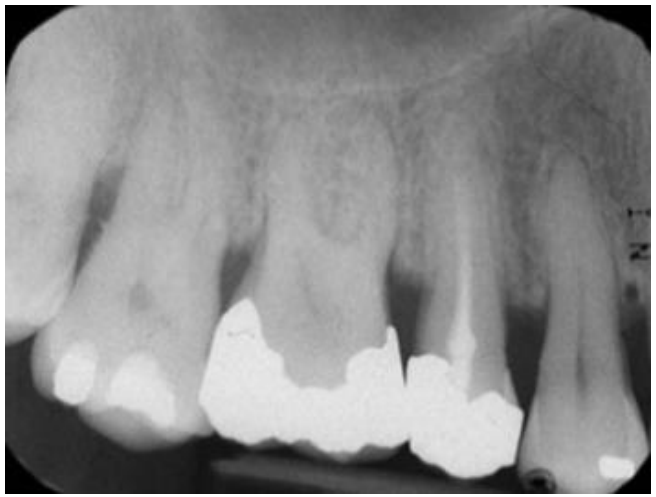


Maxillary 3rd molars

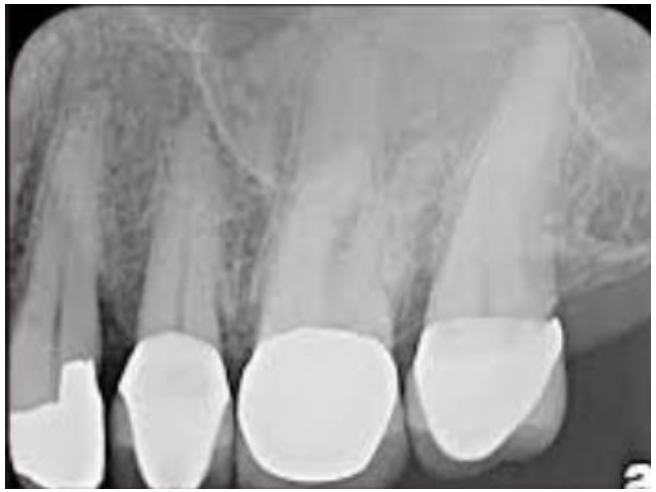
- Complications of removal can include[1]:
  - Oroantral communication
  - Displacement into adjacent anatomical spaces
  - Fracture of the maxillary tuberosity
  - Root fracture
- Assessment is difficult from PA/OPGs due to projection
- CBCT is best for showing relationship but not necessarily indicated

1. Lewusz-Butkiewicz, K., Kaczor, K., & Nowicka, A. (2018). Risk factors in oroantral communication while extracting the upper third molar: Systematic review. *Dental and Medical Problems*, *55*(1), 69–74. https://doi.org/10.17219/dmp/80944

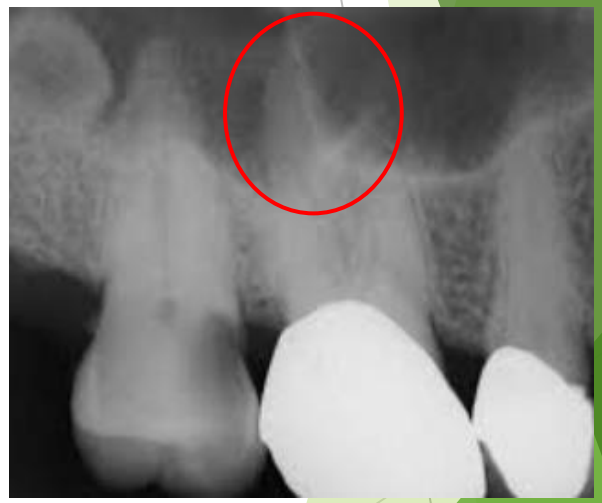
No overlap

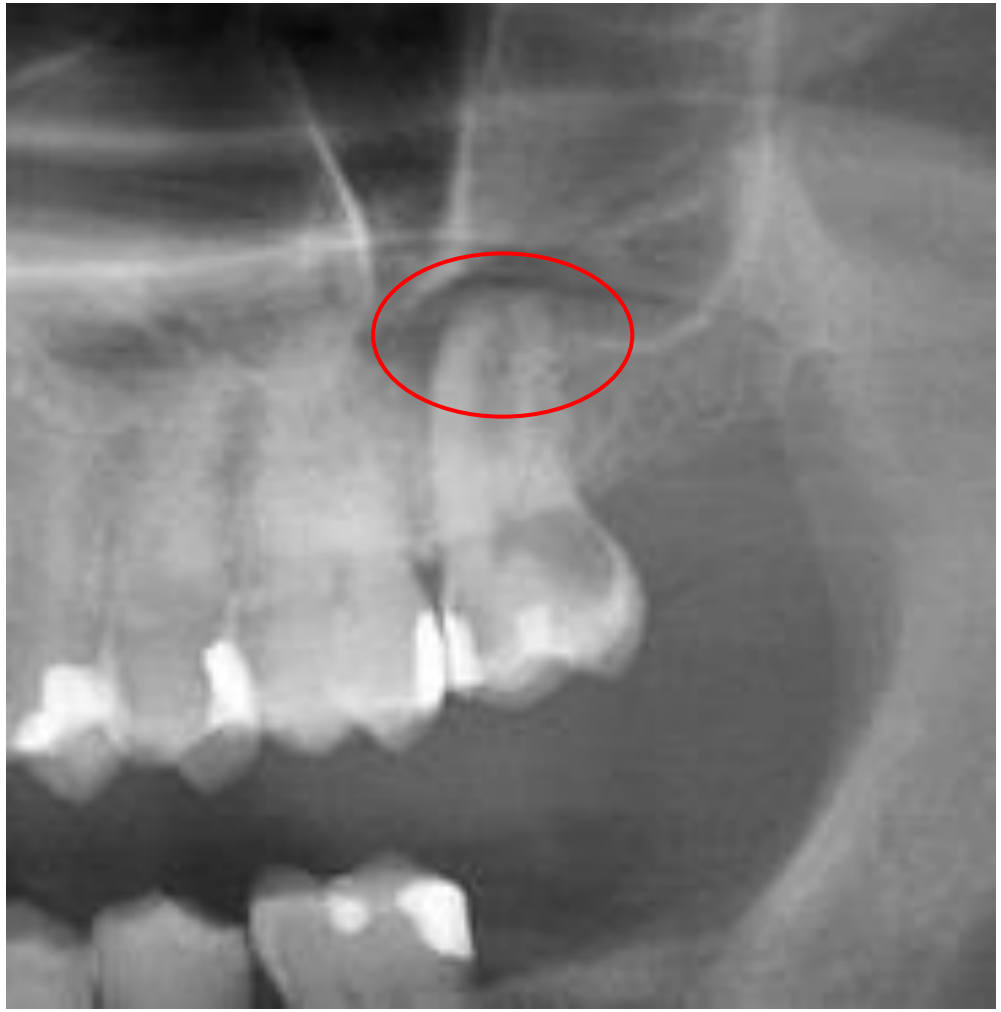


Overlap



Root intimate with sinus

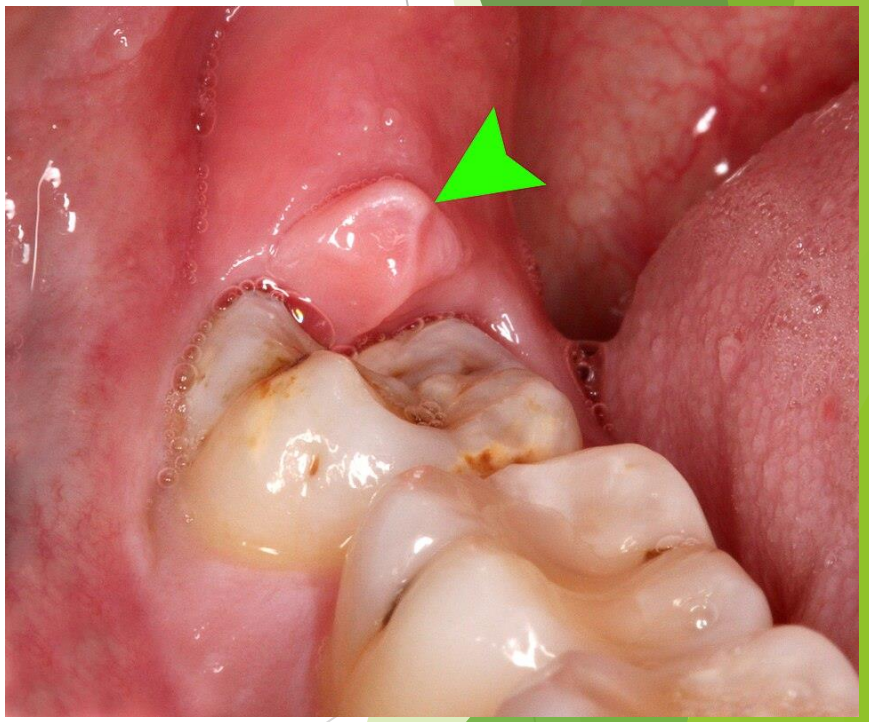




Suggested reading:
Themkumkwun, S et al, 'Maxillary Molar Root Protrusion into the Maxillary Sinus: A Comparison of Cone Beam Computed Tomography and Panoramic Findings' (2019) 48(12) *International journal of oral and maxillofacial surgery* 1570

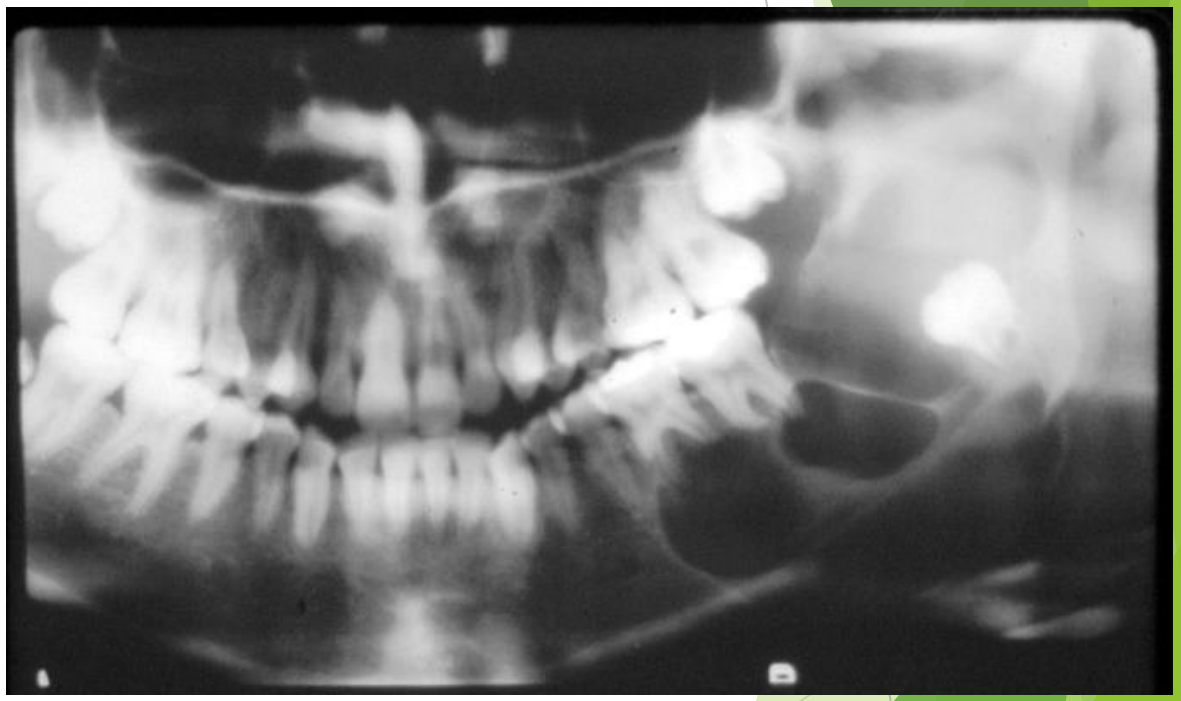
Pathology associated with 3rd molars

- Pericoronitis
  - Inflammation of the gingival tissues overlying a partially erupted tooth
  - Symptoms include:
    - Erythema
    - Swelling
    - Suppuration
    - Radiating pain to FOM, ear or throat
    - Halitosis
    - Trismus (if severe)
  - Management includes:
    - Flushing around the tooth / flap with saline
    - Antibiotics depending on severity (think spreading infection)
    - Remove opposing tooth – often trauma from the upper exacerbates
    - Remove the impacted tooth
    - Operculectomy (not really advised unless for very short term relief)



Pathology associated with 3rd molars

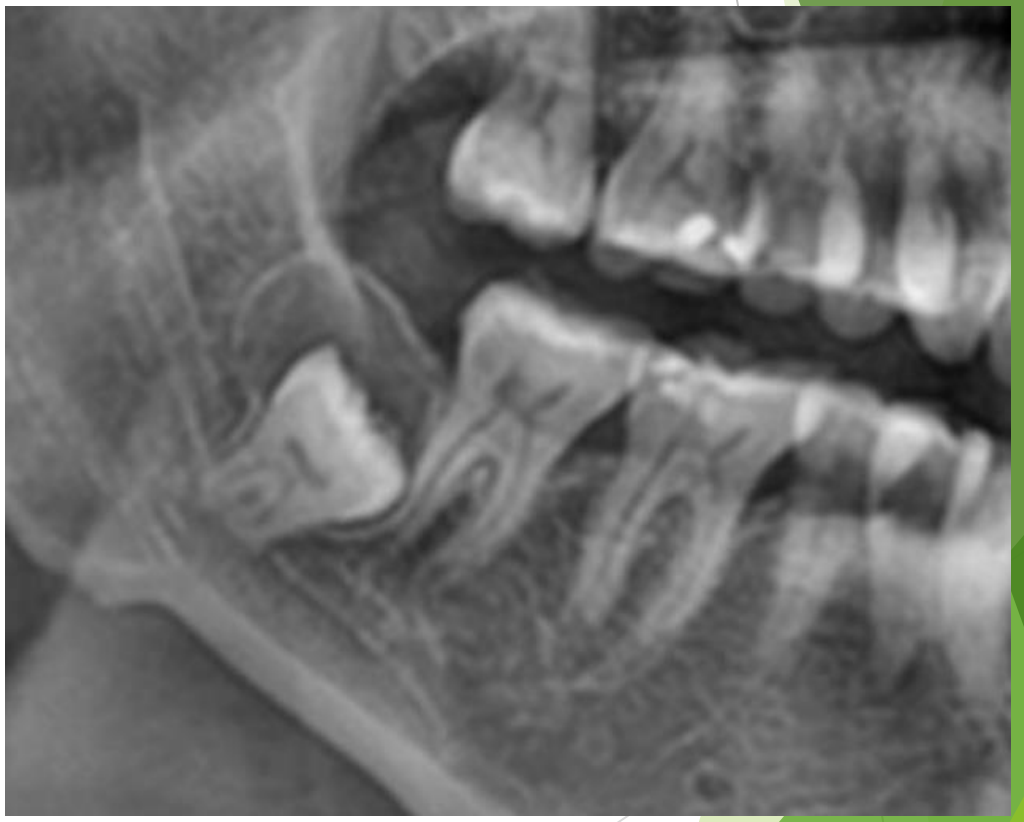
- Pericoronitis
- Periodontitis
- Caries
- Tumors
  - Many types described in literature[1] – ameloblastoma, odontogenic keratocyst, odontogenic fibroma, squamous cell carcinoma



1. Patil S, Halgatti V, Khandelwal S, Santosh BS, Maheshwari S. Prevalence of cysts and tumors around the retained and unerupted third molars in the Indian population. J Oral Biol Craniofac Res. 2014 May-Aug;4(2):82-7. doi: 10.1016/j.jobcr.2014.07.003. Epub 2014 Aug 12. PMID: 25737923; PMCID: PMC4252379.

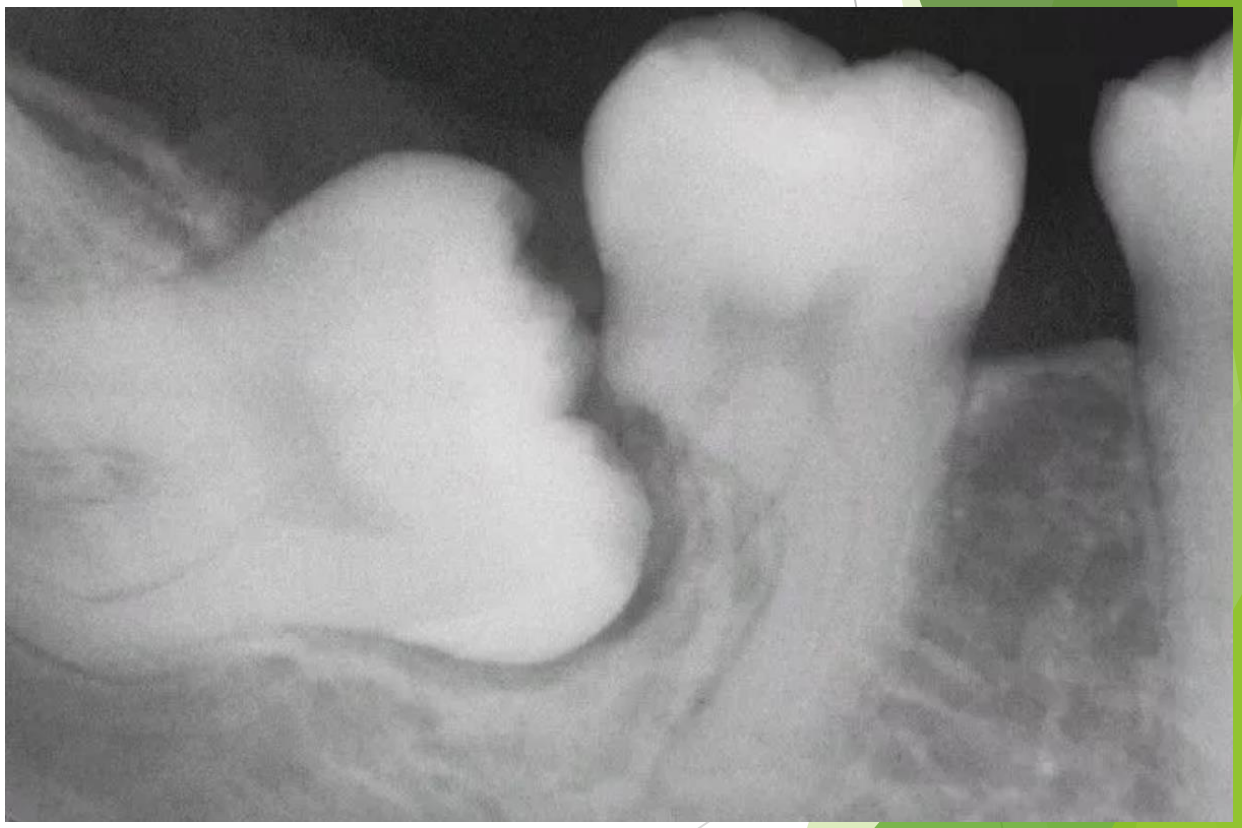
Pathology associated with 3rd molars

- Pericoronitis
- Periodontitis
- Caries
- Tumors
- Cysts
  - Dentigerous cyst being the most common
    - An epithelial lined developmental cyst formed by an accumulation of fluid between the formed enamel surface and the reduced enamel epithelium



Pathology associated with 3rd molars

- Pericoronitis
- Periodontitis
- Caries
- Tumors
- Cysts
- Local and deep space infections
- Root resorption



Indications for removal

- Ongoing pain
- Infection – either single severe or repeat mild
- Caries
- Cysts/tumours
- Resorption of the roots of the 2nd molars
- If it is going to be in a surgical field (e.g orthognathic surgery or ORIF)
- As part of an orthodontic treatment plan
- $$$?[1]

1. Hanna K, Sambrook P, Armfield JM, Jamieson L, Brennan DS. Third molor extractions among Australian adults: findings from the 2013 National Dental Telephone Interview Survey. Int Dent J. 2018 Apr;68(2):77-83. English. doi: 10.1111/idj.12330.

Management of 3rd molars: Removal

- Removal difficulty can mostly be estimated based on:
  - Classification of impaction
  - Maturation stage of the tooth
  - Age of the patient

- Complications of surgery can include:
  - Tooth or Root displacement
  - Injury to nerves
  - Injury to blood vessels
  - Damage to adjacent teeth

General principles

- Flap
- Trough
- Section
- Elevate
- Irrigate
- Close

Surgical Wisdom Tooth Removal

https://www.youtube.com/watch?v=7iO3Uq_LmYM

Management of 3rd molars: Coronectomy

- Deliberate retention of the roots
- Procedure involves:
  - Flap
  - Sectioning off the crown, 2-4mm below the CEJ
  - Removal of all residual enamel
  - MUST NOT mobilise the roots

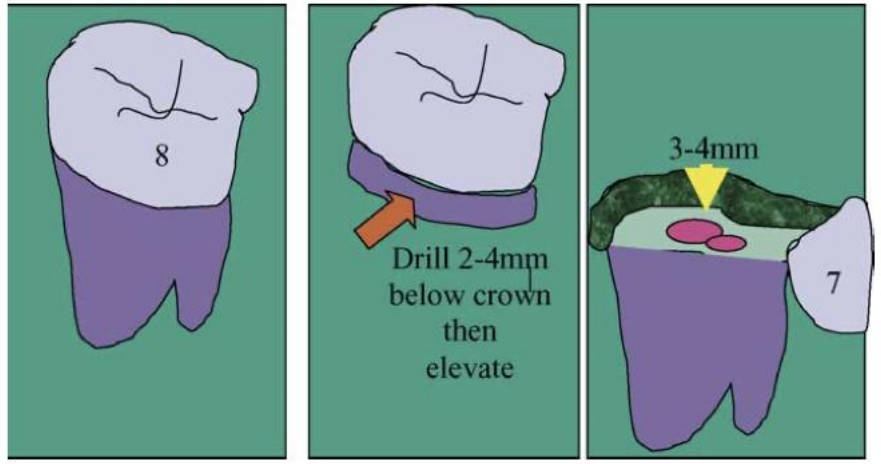
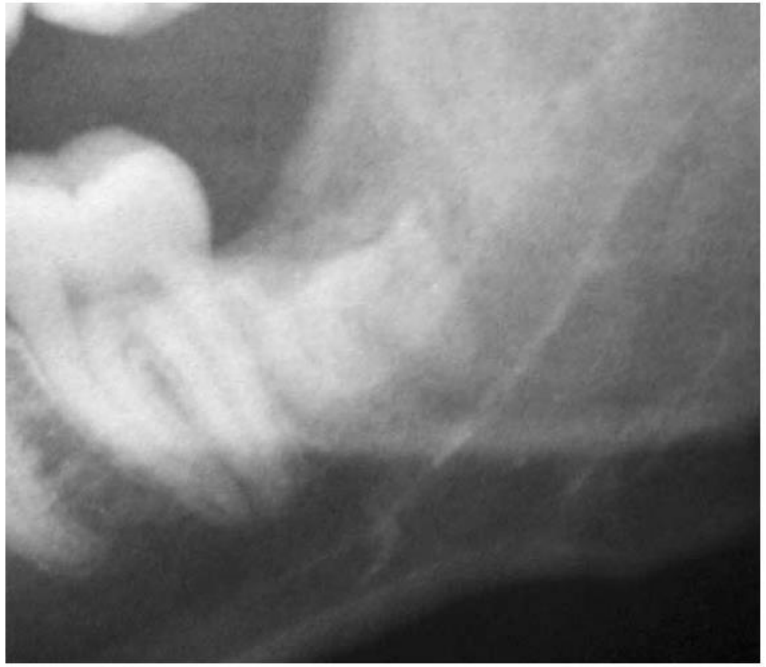


Figure 2. Method used for coronectomy.



Renton, T et al, 'A Randomised Controlled Clinical Trial to Compare the Incidence of Injury to the Inferior Alveolar Nerve as a Result of Coronectomy and Removal of Mandibular Third Molars' (2005) 43(1) *British journal of oral & maxillofacial surgery* 7

Management of 3rd molars: Active surveillance

- Consider monitoring symptoms
- Monitor periodontal pocketing
- Surveillance OPG periodically