Odontogenic Tumors

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Odontogenic tumors are pathologic outcomes from tissue elements that are part of the tooth-forming apparatus, that is, odontogenic tissues. These tumors occur exclusively in the bones of the jaw particularly around the teeth-bearing segments.

The general dentist possesses a unique opportunity to be the first health care professional to see anatomic or radiographic changes.

(WHO) has a classification system for odontogenic and maxillofacial bone tumors (5th edition, 2022) which is:

Benign epithelial odontogenic tumors:

- Adenomatoid odontogenic tumour
- Squamous odontogenic tumour
- Calcifying epithelial odontogenic tumour
- Ameloblastoma, extraosseous/peripheral
- Ameloblastoma, unicystic
- Ameloblastoma, conventional
- Adenoid ameloblastoma
- Metastasizing ameloblastoma

Benign mesenchymal odontogenic tumors:

- Odontogenic fibroma
- Odontogenic myxoma
- Cementoblastoma
- Cemento-ossifying fibroma.

Benign mixed epithelial and mesenchymal odontogenic tumors :

- Ameloblastic fibroma
- Primordial odontogenic tumour
- Odontoma
  - Odontoma, compound type
  - Odontoma, complex type
- Dentinogenic ghost cell tumour.

Clinical Considerations

- lesions are very destructive and surgical management involves the face, oral tissues, and jaws of both young and old patients.
- Correlation of clinical, radiographic, and histologic analyses is necessary to prevent over- or under-treatment.
- There are no clinical signs, symptoms, or physical findings that permit diagnosis ofspecific odontogenic tumors.

Imaging

- Plain radiography (periapical, occlusal, panoramic).
- Computed tomography (CT), CT three-dimensional (3D) reconstruction.
- Computer generated models.
- Magnetic resonance imaging (MRI)
- Positron emission tomography (PET) scan CT

Radiographic images do not provide pathognomonic identification of odontogenic lesions, because several odontogenic tumors as well as nonodontogenic lesions may share imaging characteristics.

Diagnostic considerations (Biopsy)

Definitive diagnosis is established only after incisional, excisional, or intraoperative frozen section biopsy for histologic analysis.

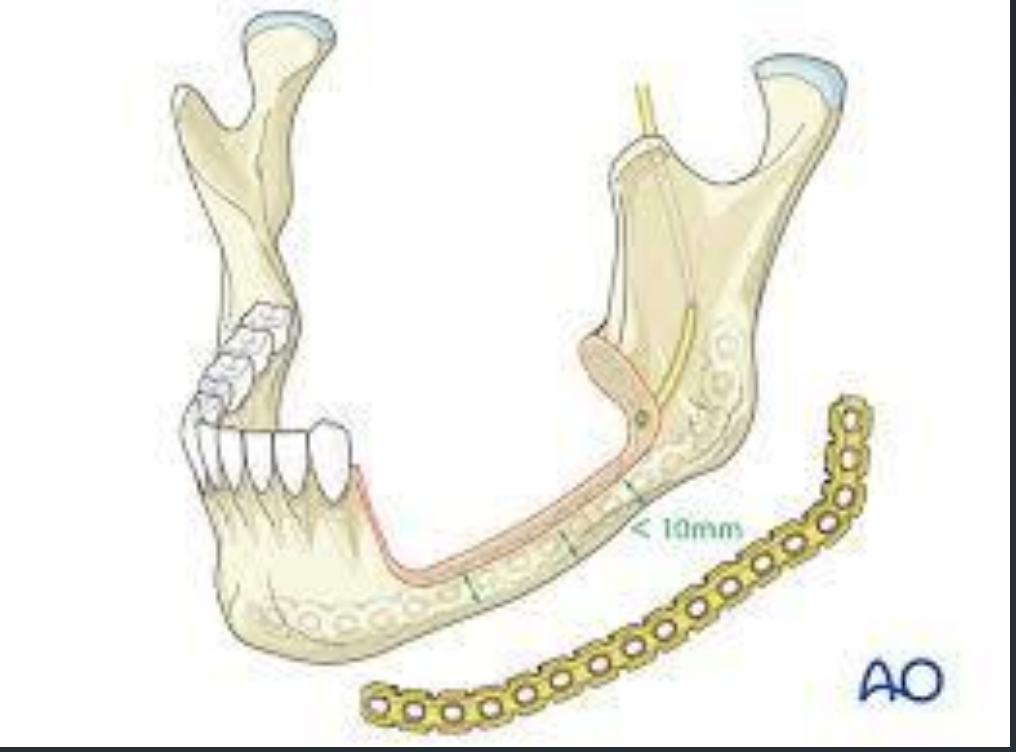
Management

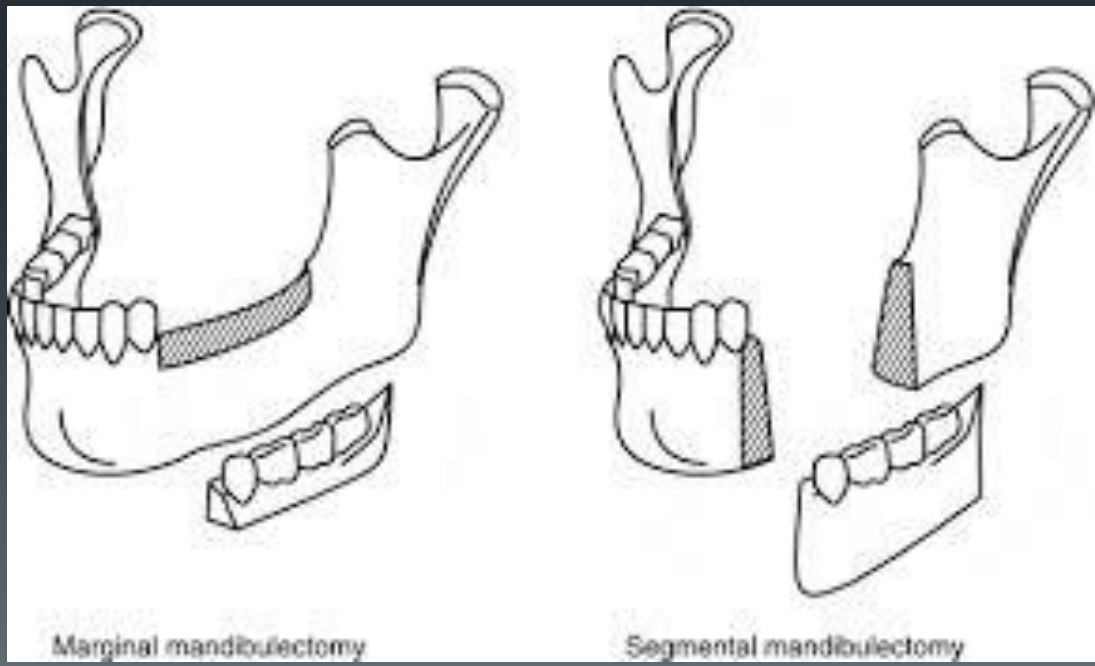
The objectives of the surgical management of odontogenic tumors are :

- Eradication of the lesion
- Preservation of normal tissue to the extent possible.
- Restoration of significant tissue loss, form, and function.

All excisions involving bone can best be described by the following designations:

- Enucleation
- Curettage
- Marsupialization
- Recontouring
- Resection without continuity defect
- Resection with continuity defect
- And disarticulation.


< 10mm
AO


Marginal mandibulectomy
Segmental mandibulectomy

Odontoma

- Odontoma is a benign tumor of mixed odontogenic origins consisting of both odontogenic hard and soft tissue.
- The odontoma is seen predominantly in the second and third decade of life and hasa slight female predilection. There are 2 main types: compound and complex.

Clinical features

- Odontomas are slow-growing, expanding, and painless intrabony lesions.
- Pain and
- Inflammation may, however, result from secondary infection.
- The 2 types of Odontomas are complex and compound odontoma.
- The distinction between these 2 types is based on either the appearance of tooth-like structures or disorganized mass of dental tissue.

- Complex odontomas are located in the posterior mandible
- Compound odontomas are located in the anterior maxillae and identified based on well-organized, multiple tooth-like structures.

Diagnostic modalities

The radiologic appearance depends on the stage of the lesion:

- The first stage is characterized by a radiolucent appearance due to lack of calcification.
- Second or intermediate stage Partial calcification or radiopacity are seen.
- The third stage is characterized by predominance of radiopaque masses of dental hard tissues with a thin radiolucent zone.

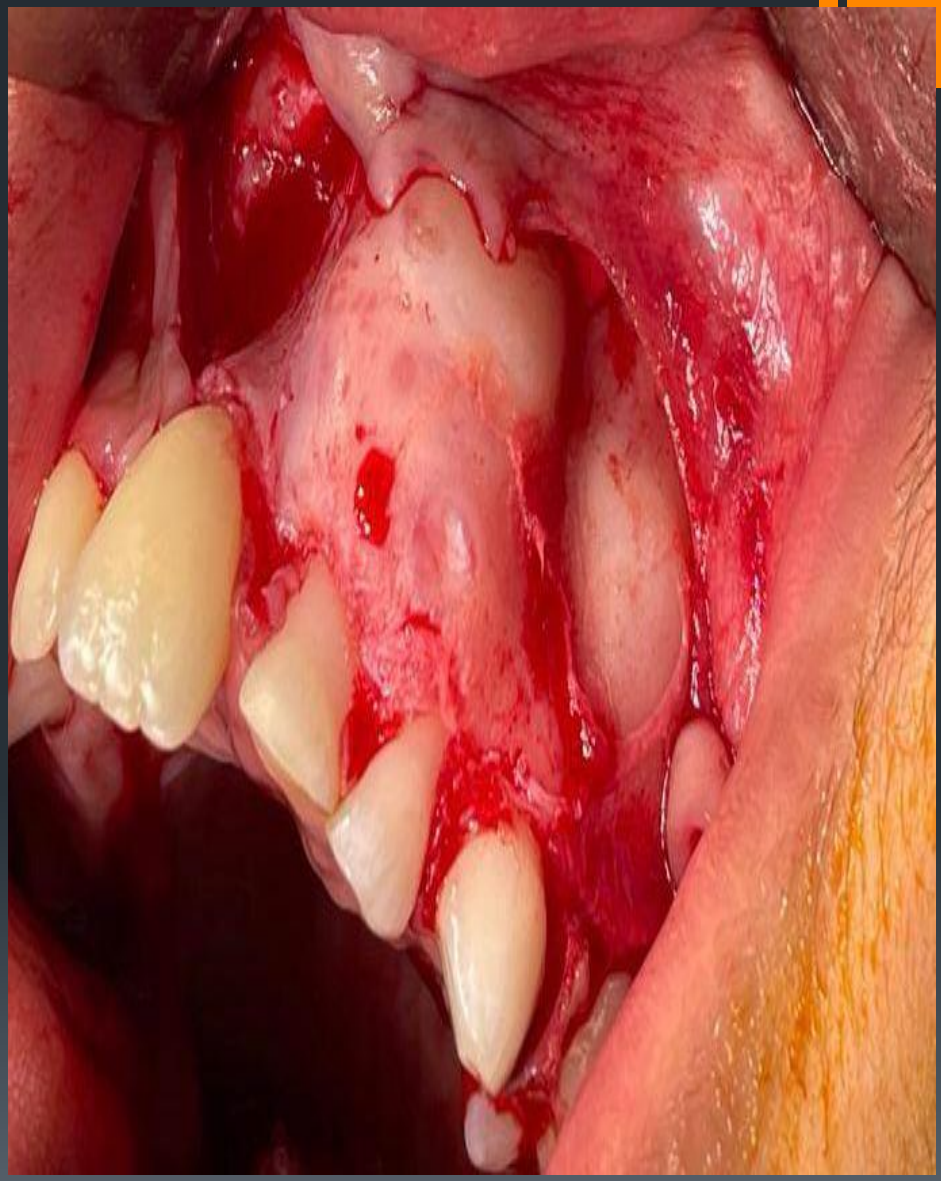
Differential diagnosis

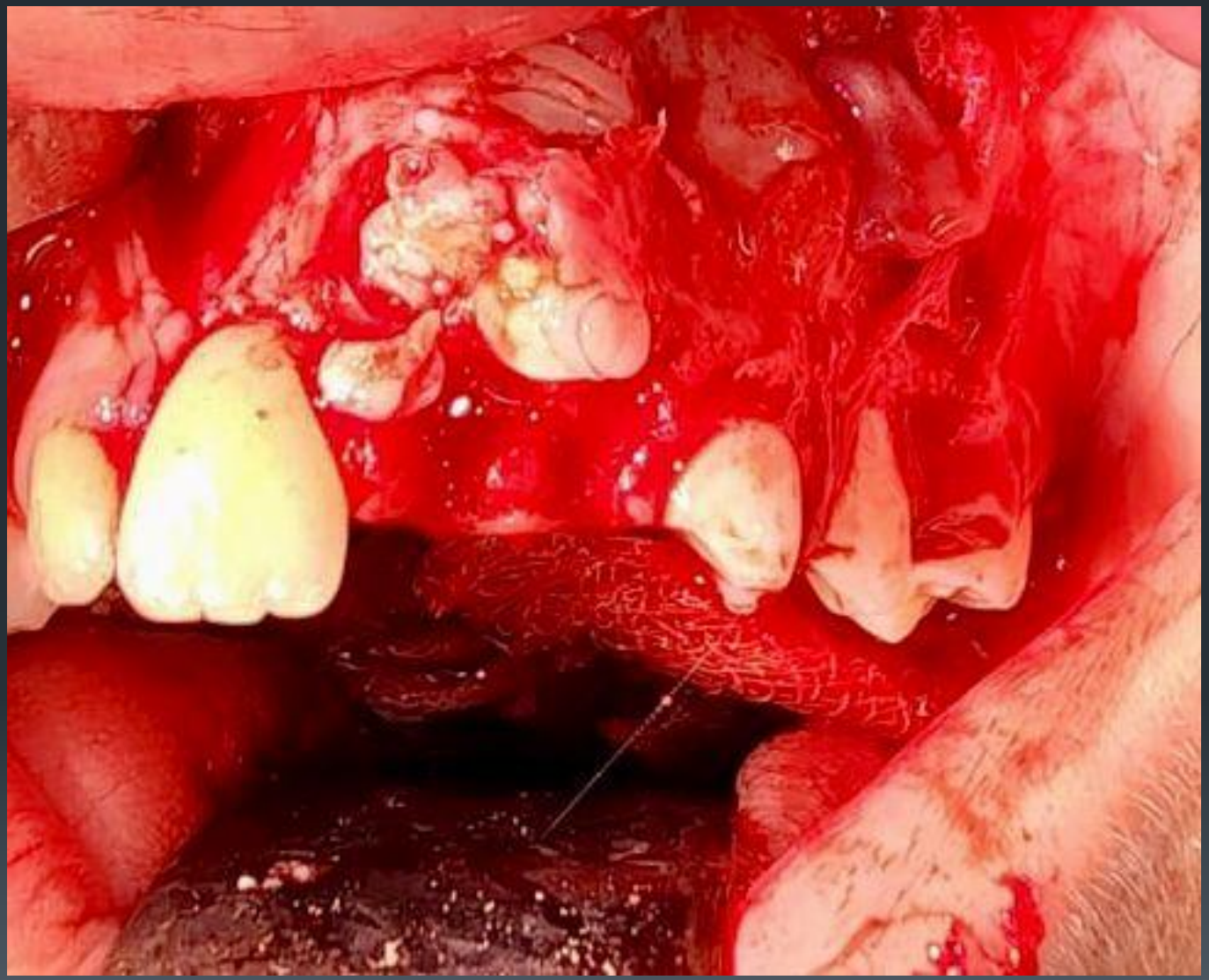
- Supernumerary tooth
- AFO
- And osteomas.

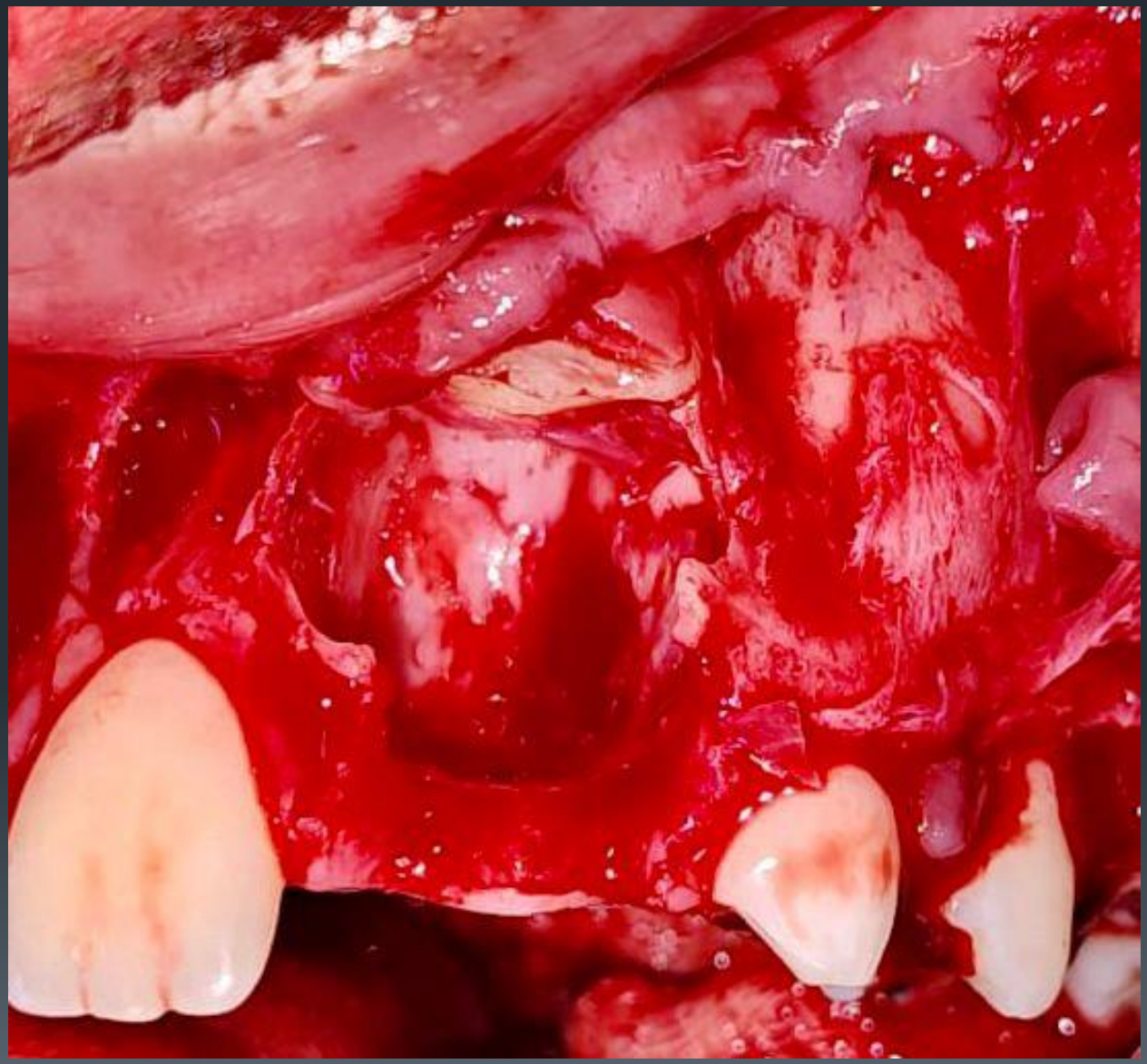
Management

- Odontomas are managed with conservative surgical excision.
- The prognosis of the condition is usually excellent with minimal to no recurrence.


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Ameloblastoma

Ameloblastomas are the second most common benign odontogenic tumor. They are potentially aggressive, locally invasive, slow-growing benign tumors that may originate from cell rests of dental lamina, epithelium from the enamel organ,epithelial lining of odontogenic cyst (ie, dentigerous cyst), and basal cell layer of oral mucosa.

Based on clinical, radiologic, histologic, and prognosis aspects, ameloblastomas are classified as:

1) Conventional(classic)/solid/multicystic ameloblastomas,
2) Unicystic type
3) Peripheral,and
4) Desmoplastic ameloblastoma.

Clinical features

- Uncommon among children and is predominantly seen in third and fourth decades of life.
- The mandible is the favored site over the maxilla by about a 4.5:1 ratio
- The posterior mandible is the most commonly affected site (70% found in angle of mandible).
- Asymptomatic and remains undiscovered until lesional growth produces intraoral and/or external jaw swelling.
- Tooth and dental occlusion disturbances, or incidental radiographic examination reveals a lesion
- Paresthesia is an uncommon symptom and pain is rarely a presenting symptom

- Peripheral ameloblastomas present as painless, slow growing gingival swelling that may produce shallow depression in the underlying bone rather than infiltration.

A well-defined, small or large radiolucent area in the bone gives the appearance of **honeycomb** or **soap bubble** appearance. The destructive changes of the jaw bone may be either confined to alveolar bone or half the mandible.

Differential diagnosis

Differential diagnosis of ameloblastoma can be categorized into radiolucency with and without mineralization changes.

Differential diagnosis of uni-/multilocular

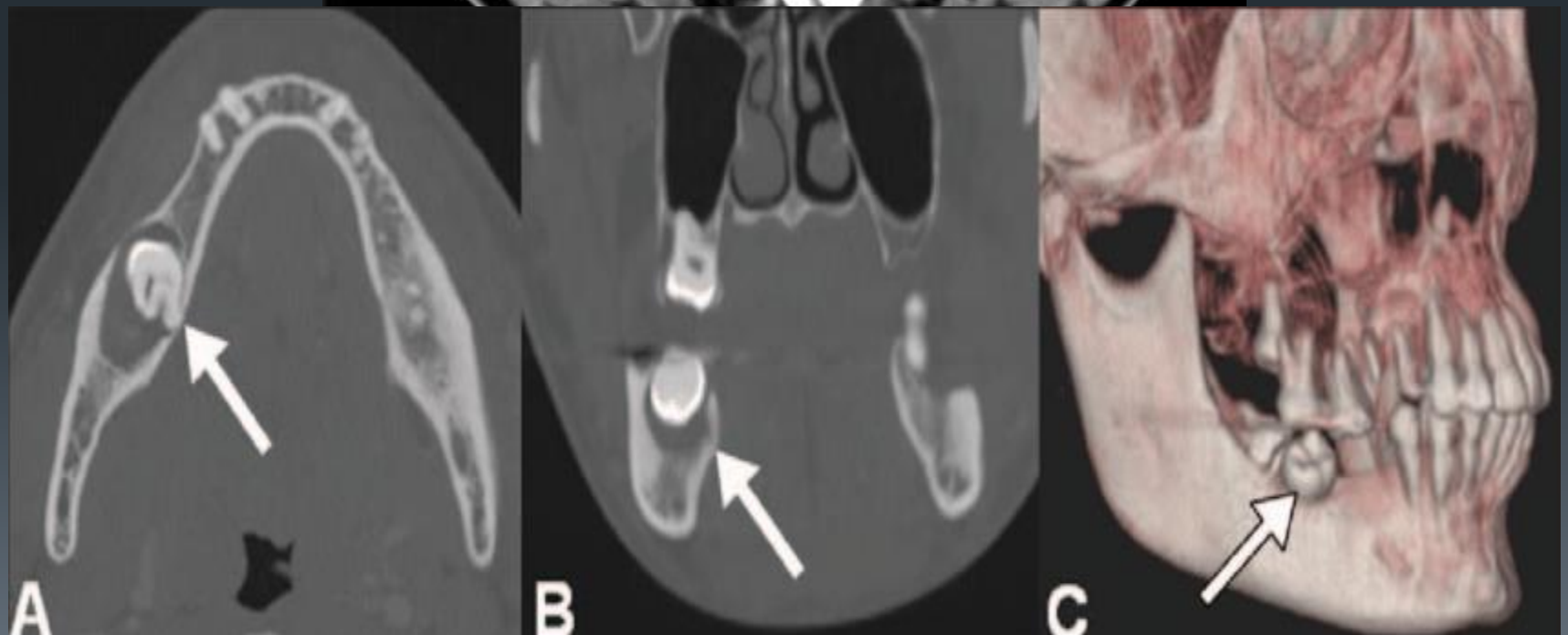
radiolucency without mineralization includes:

- Odontogenic keratocyst.
- Central giant cell granuloma.
- And dentigerous cyst.

Differential diagnosis panel of uni- /multilocular radiolucency with mineralization includes :

- Odontogenic myxoma
- Calcifying odontogenic cyst
- And calcifying epithelial odontogenic tumor.




A
B
C

One must look for size, location, and presence/absence of mineralization while formulating differential diagnosis.

Unicystic Ameloblastoma

- A unicystic ameloblastoma may form de novo or develop secondarily in an odontogenic keratocyst or dentigerous cyst.
- These have the best prognosis, and a lower recurrence rate.

The unicystic ameloblastoma exhibits two other notable clinical differences from the multicystic, solid, and peripheral forms :

First, the lesion usually occurs in adolescents, teenagers, and young adults.

Second the lesion exhibits peripheral-encompassing connective tissue wall of varying thickness.

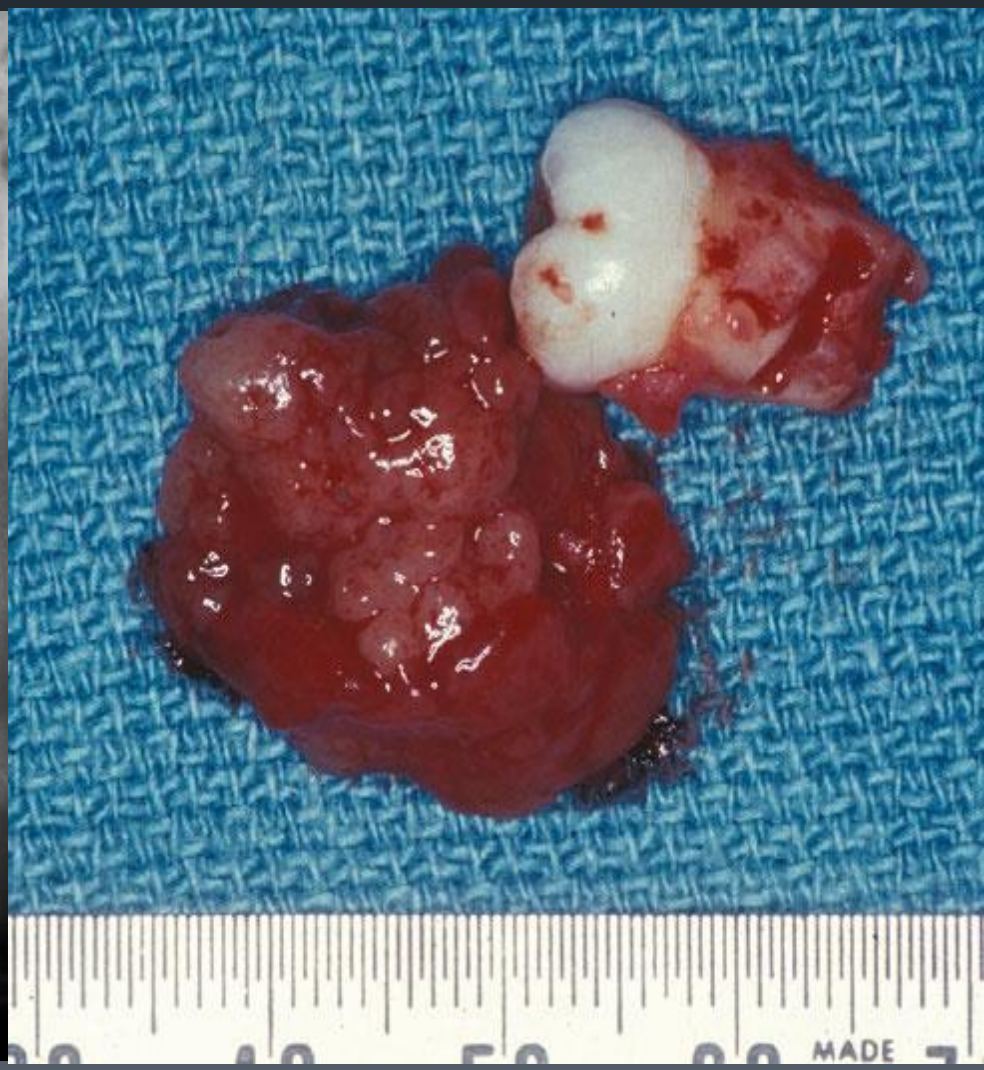
(intraluminal)

(luminal)

(mural)

- Management of luminal or intraluminal subtype is usually enucleation, whereas mural subtypes are managed by resection with a 1.5cm margin.

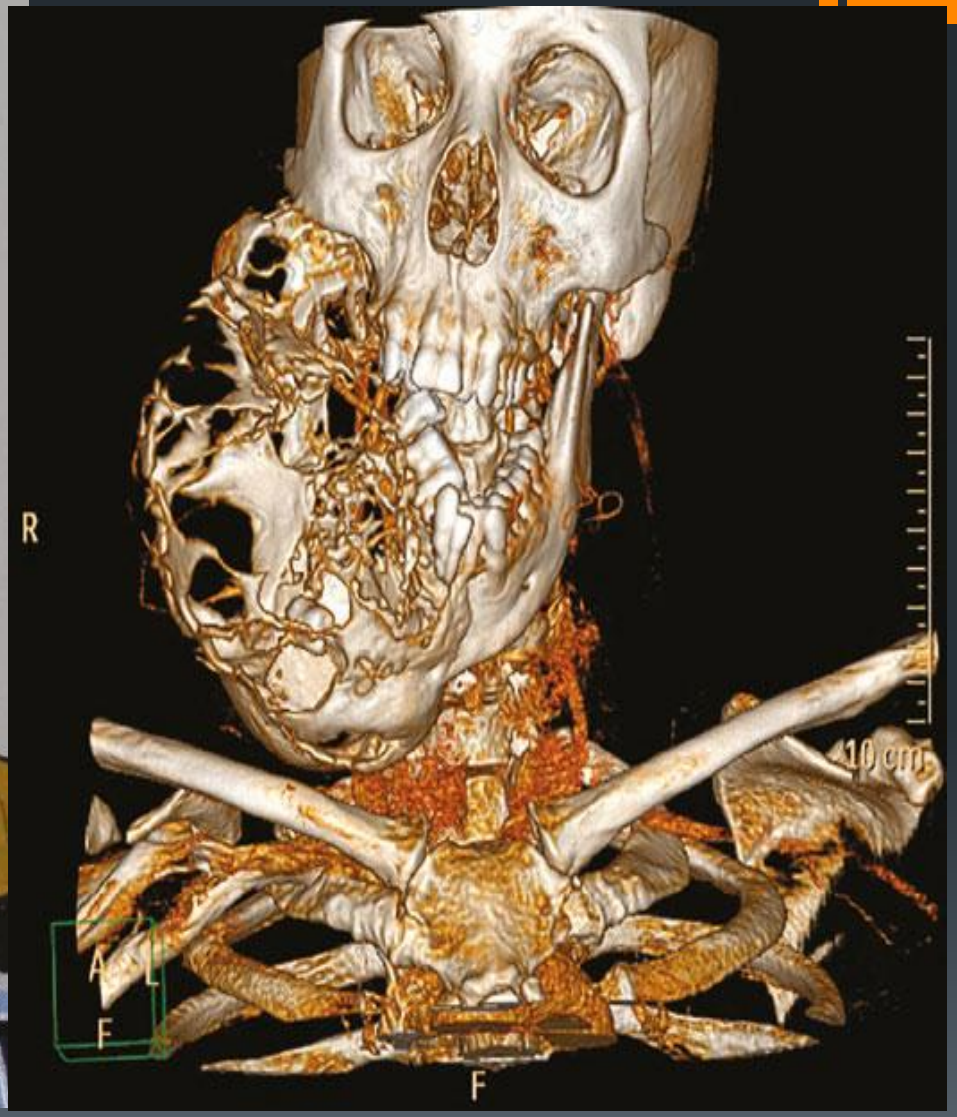



MADE

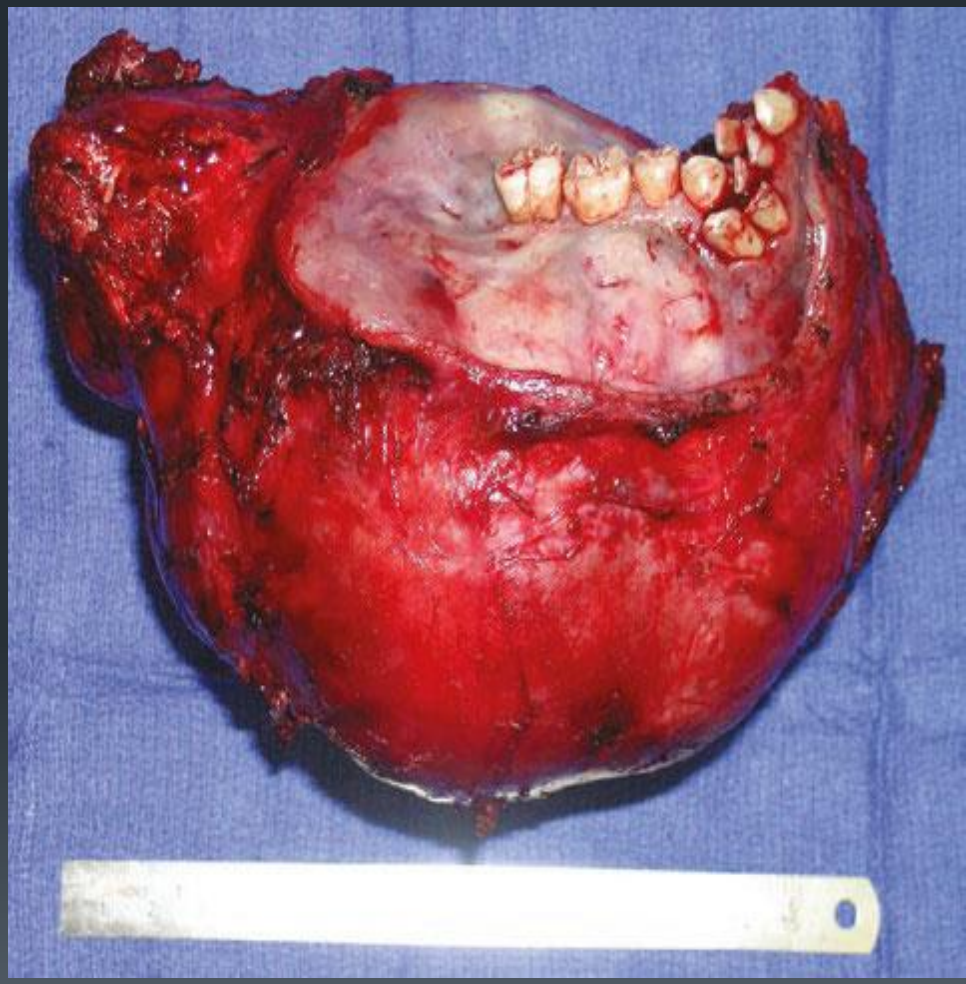
Conventional (Solid and Multicystic) Ameloblastomas

These are the most common type. They are usually radiolucent on radiography and clinically are partially or completely solid. Management is **resection with a 1.5cm margin**.




R
A
L
F
F







Peripheral /ExtraosseousAmeloblastoma

- Arise from the gingivae rather than tooth
- Most common in premolar area of mandible, then tuberosity of the maxilla.
- A radiograph should be taken to exclude a perforating intraosseous ameloblastoma.
- Management is conservative excision. Long term follow is required.
- These have a good prognosis.

Malignant (Metastasising) Ameloblastoma and Ameloblastic Carcinoma