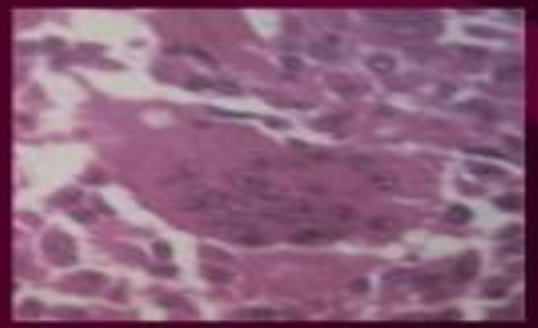
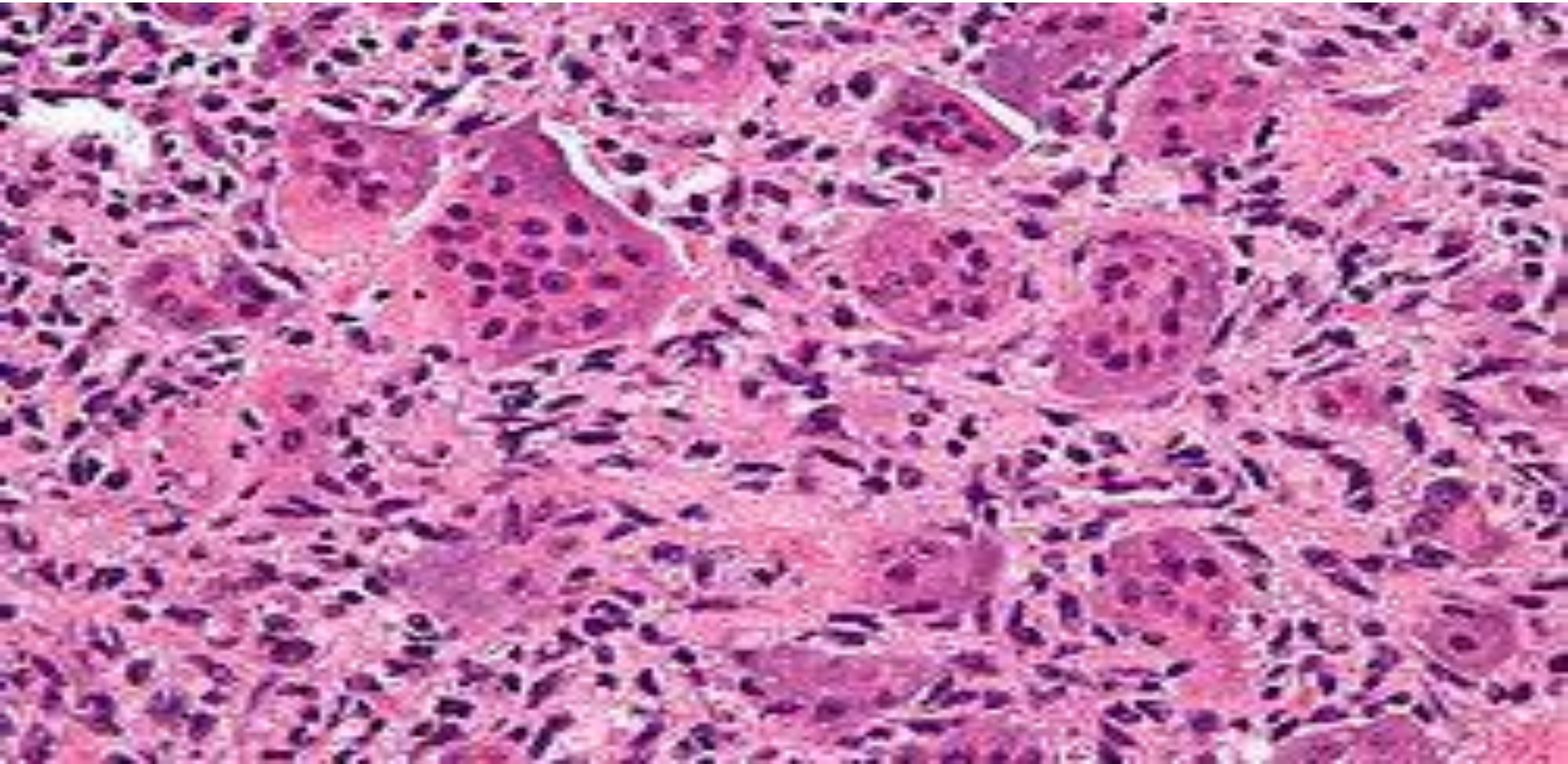
Giant cell lesions

DEFINITION

Giant cells are very large, multinucleate, modified macrophages which may be formed by coalescence of mononuclear cells or by nuclear division without cytoplasmic division of monocytes, particularly in response to the presence of a foreign body.



Giant cell lesions



- Monocytes invade areas of damage & inflammation, where they differentiate into macrophages.
- When the macrophages fail to deal with particles to be removed they fuse together to form multinucleated giant cells.

Giant cell lesions

1-Giant cell granuloma (central-peripheral)

2-Giant cell tumor (osteoclastoma)

3-Aneurysmal bone cyst

4-Cherubism

5-brown tumor of hyperparathyroidism

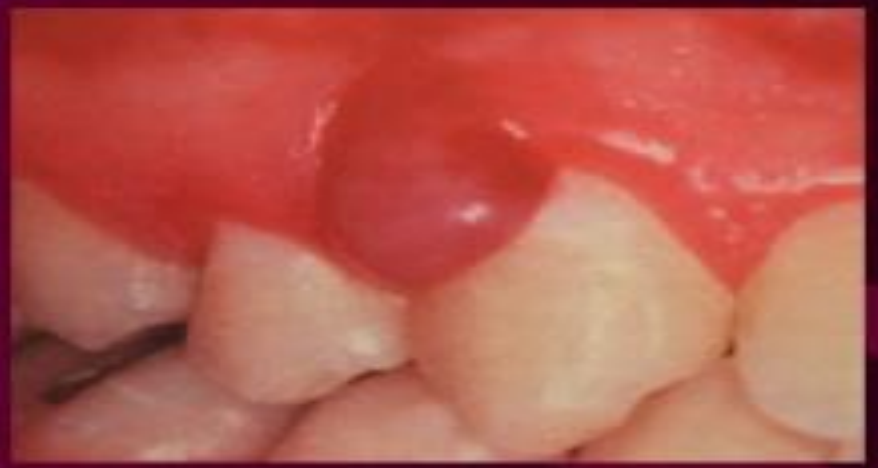
PERIPHERAL GIANT CELL GRANULOMA

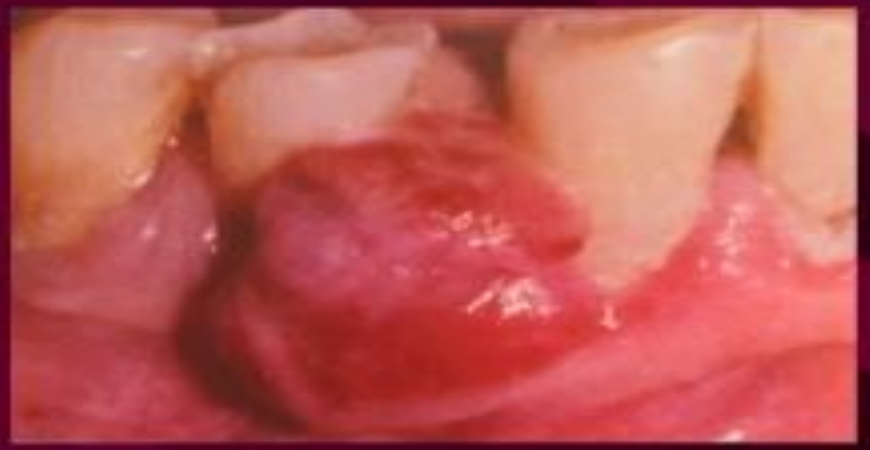
- Common tumor like growth in the oral cavity.
- Does not represent a true neoplasm but a reactive lesion.
- Arising from periosteum or PDL membrane.
- Often called as peripheral giant cell reparative granuloma.

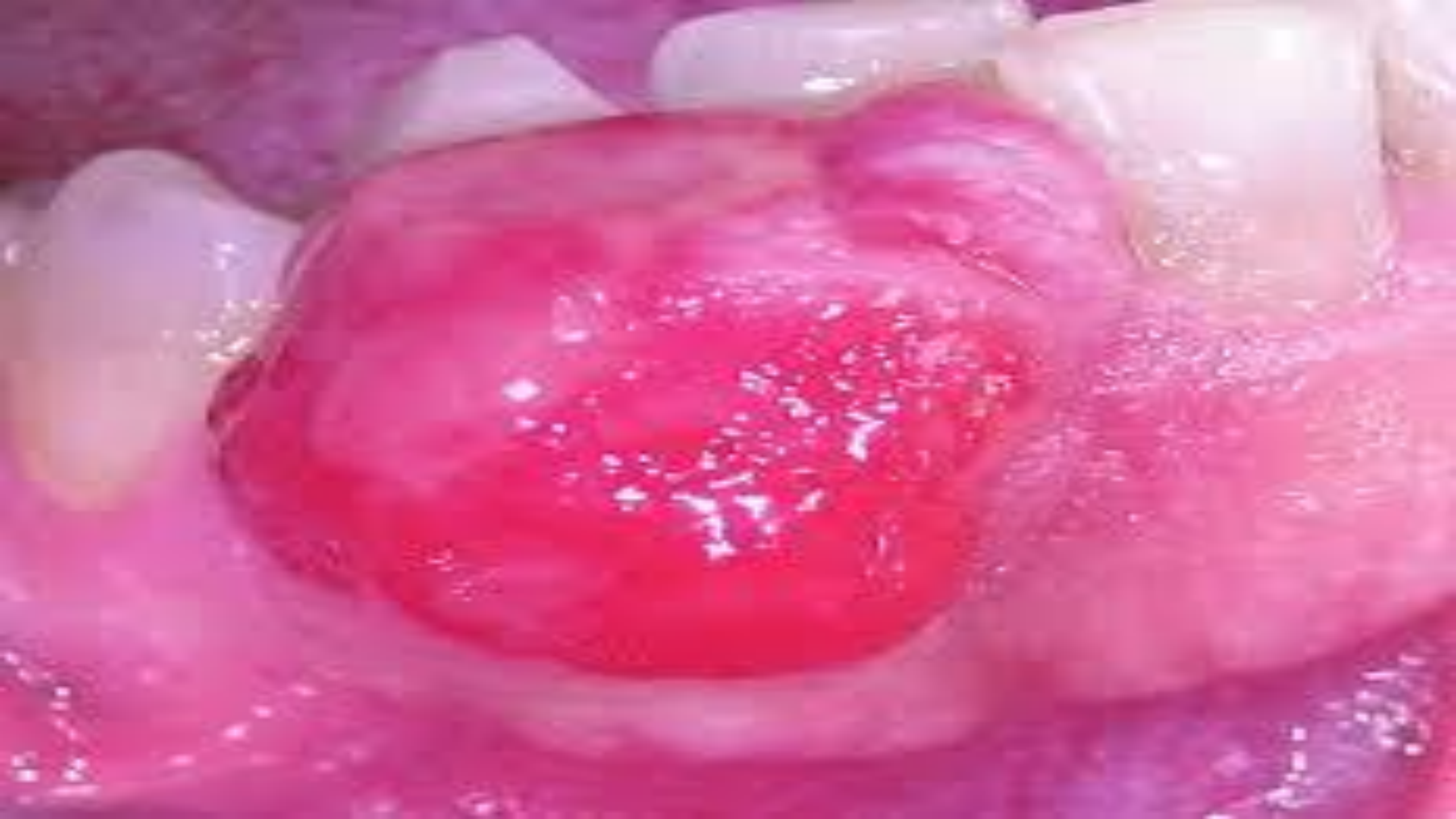
C/F:

- Age: 5th 0r 6th decade of life.
- Common in females.
- Mandible is affected more often.

- Occurs exclusively on gingiva, edentulous alveolar ridge.
- Reddish or bluish nodule, most lesions smaller than 2cm in diameter.
- May be ulcerated due to trauma.







H/F:

- Fibroblast are the basic element.
- Giant cells are scattered throughout the stroma.
- Foci of hemorrhage, liberation of hemosiderin pigment.

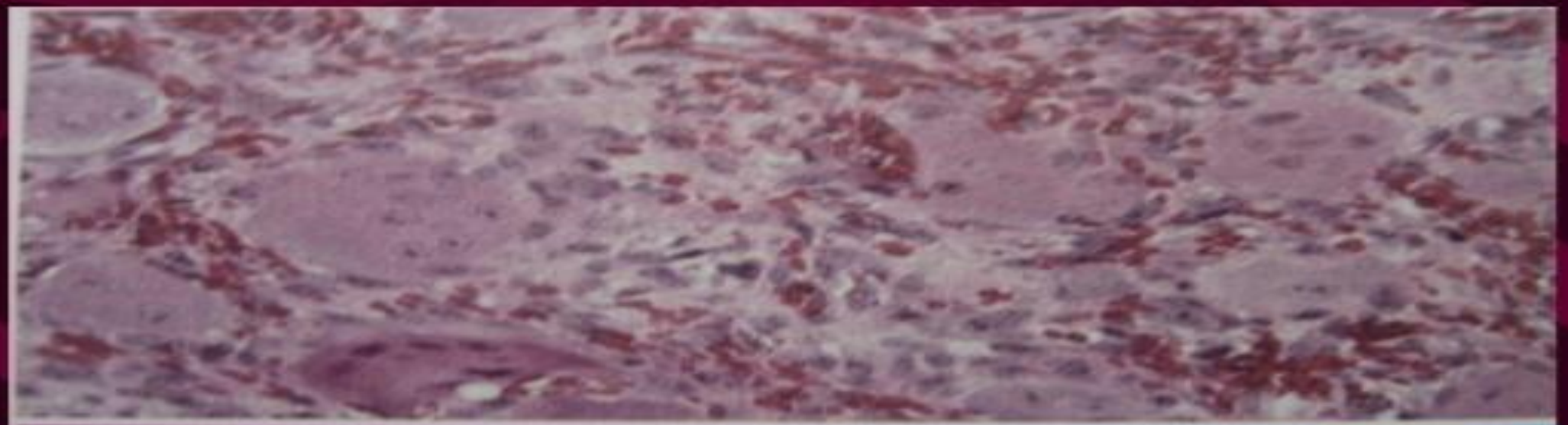


Figure 12-40 - **Peripheral giant cell granuloma.** High-power view showing scattered multinucleated giant cells within a hemorrhagic background of ovoid and spindle-shaped mesenchymal cells

R/F:

- May or may not be present
- Larger lesion may exhibit superficial erosion of the cortical bone
- May demonstrate widening of adjacent PDL spaces

Treatment:

Local surgical excision down to the underlying bone

CENTRAL GIANT CELL GRANULOMA

- Was 1st described in jaws by Jaffe (1953).
- Designated as Giant Cell Reparative Granuloma.
- Waldron & Shafer (1966)

- Classified on the basis of biologic behavior as:

  Non-aggressive & Aggressive.

Etiology:

- Reactive lesion
- Trauma
- Origin from odontoclasts

Clinical Features:

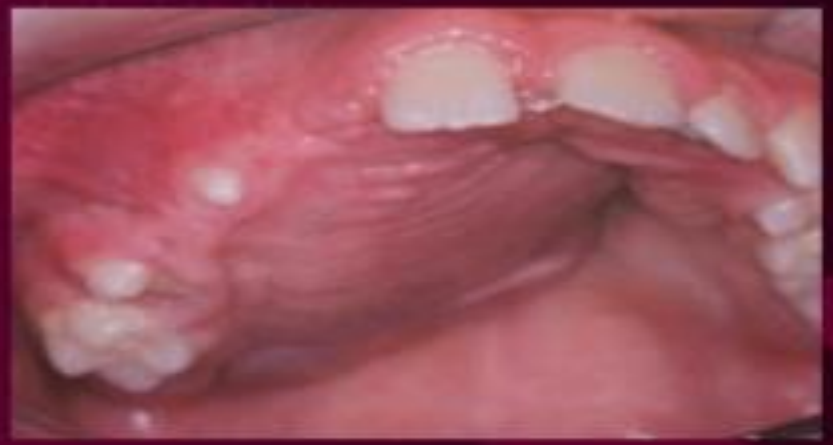
- Male : female ratio of 1:2
- Age: 11-30yrs
- Present almost exclusively in jaws
- Mandible > maxilla
- Frequent site in mandible is the ant. region not crossing midline.

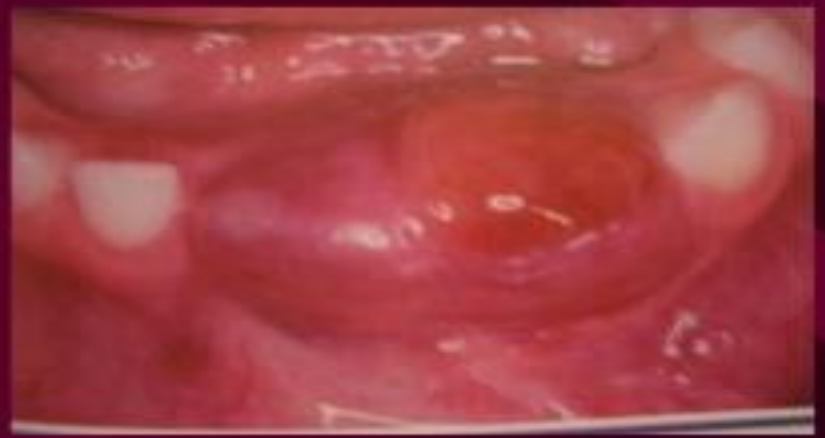
- Non-aggressive type:

  Asymptomatic, slow expansion of the affected bone.

- Aggressive type:

  Painful, rapid growth, root resorption, perforation of cortical bone, paraesthesia.





Radiographic Features:

- Solitary unicystic radiolucency, as it grows it becomes multilocular with soap-bubble appearance.
- Multilocular > unilocular
- Root displacement / resorption
- Loss of lamina dura
- Expansion of cortical plate

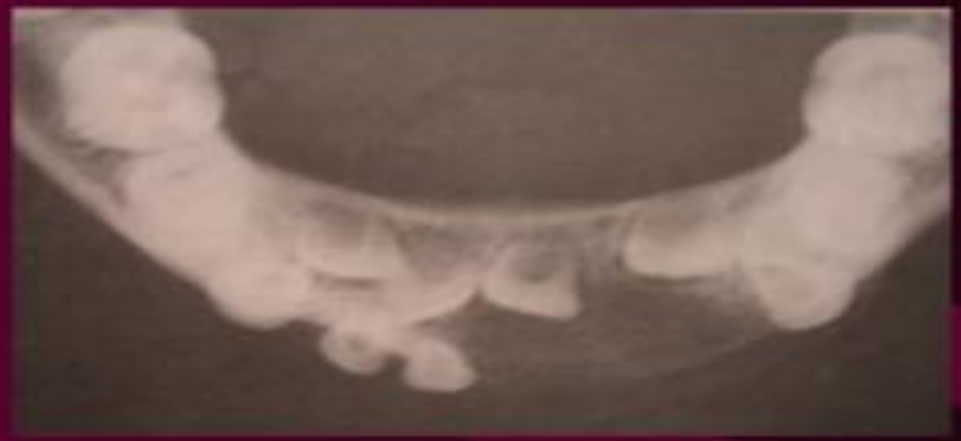
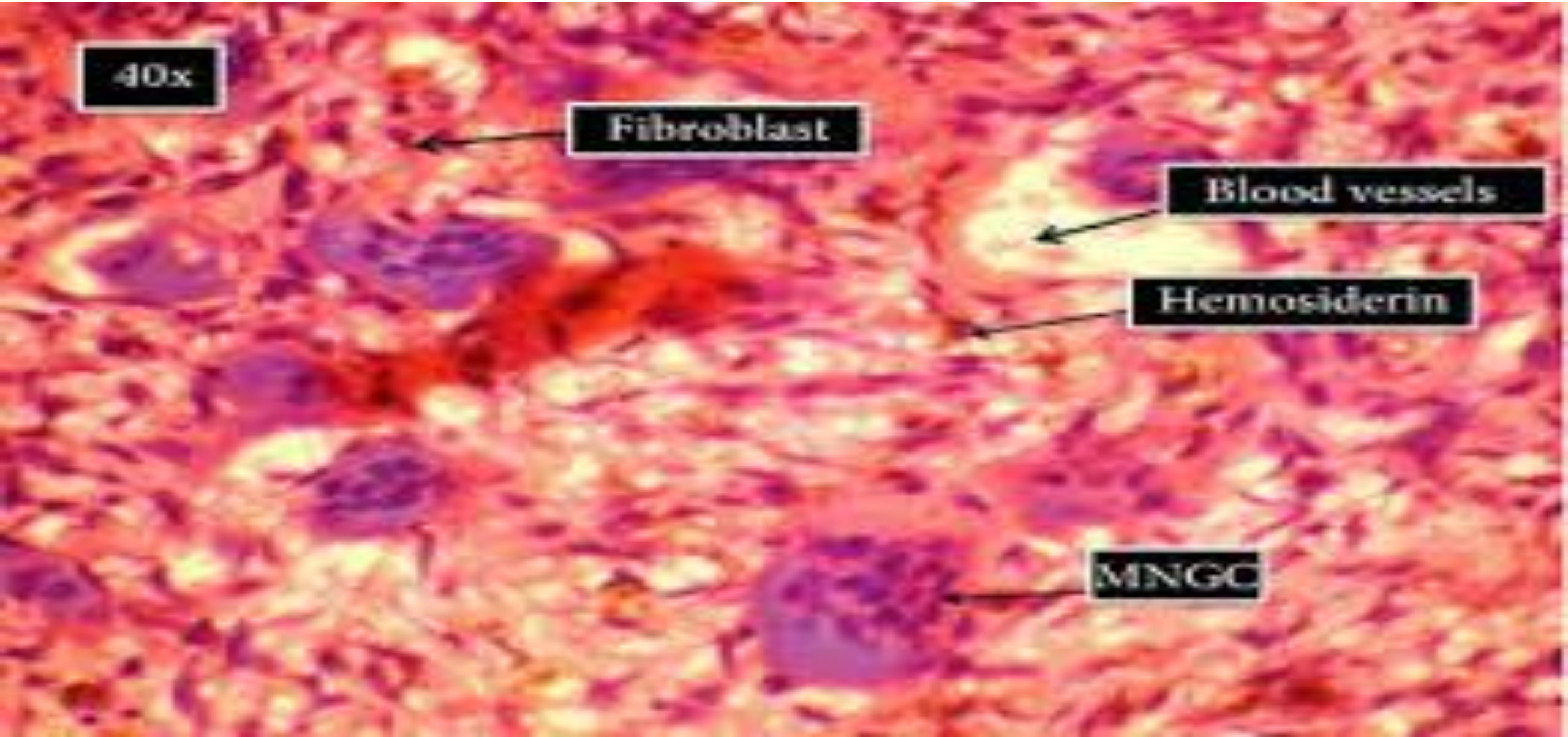


FIGURE 31-19 *A central giant cell granuloma of the left angle region of the mandible, appearing as an ill-defined multilocular radiolucency, causing resorption of the distal root of the first molar (unusual).*

Histologic Features:

- Proliferation of spindle cells in collagenous stroma.
- Numerous small vascular channels.
- Giant cells with 15-20 nuclei present throughout the stroma, adjacent to capillaries.

Central giant cell granuloma



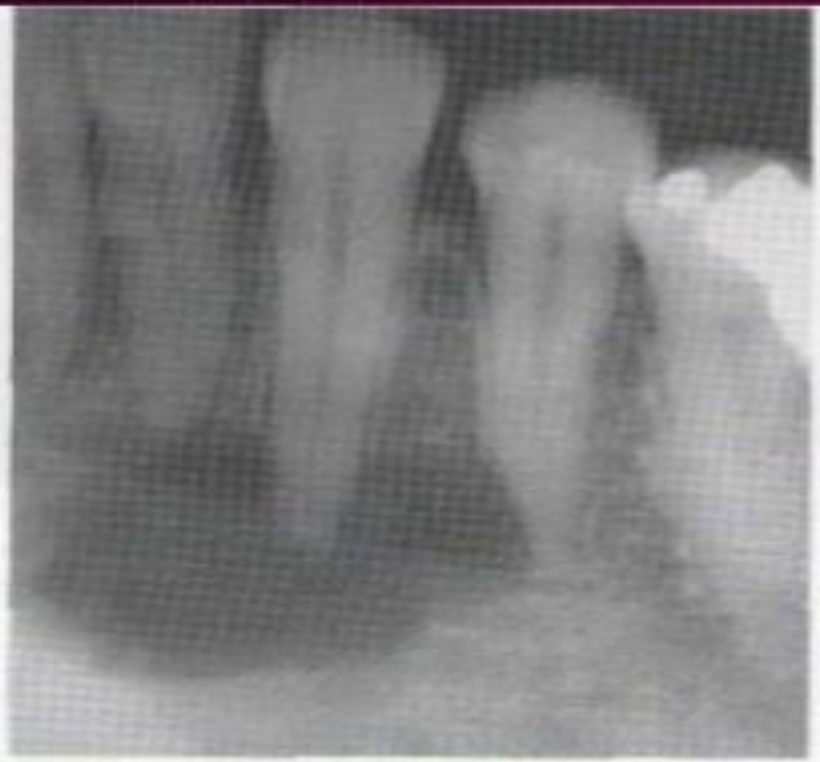


Figure 12-18 **Central giant cell granuloma** of the anterior mandible.

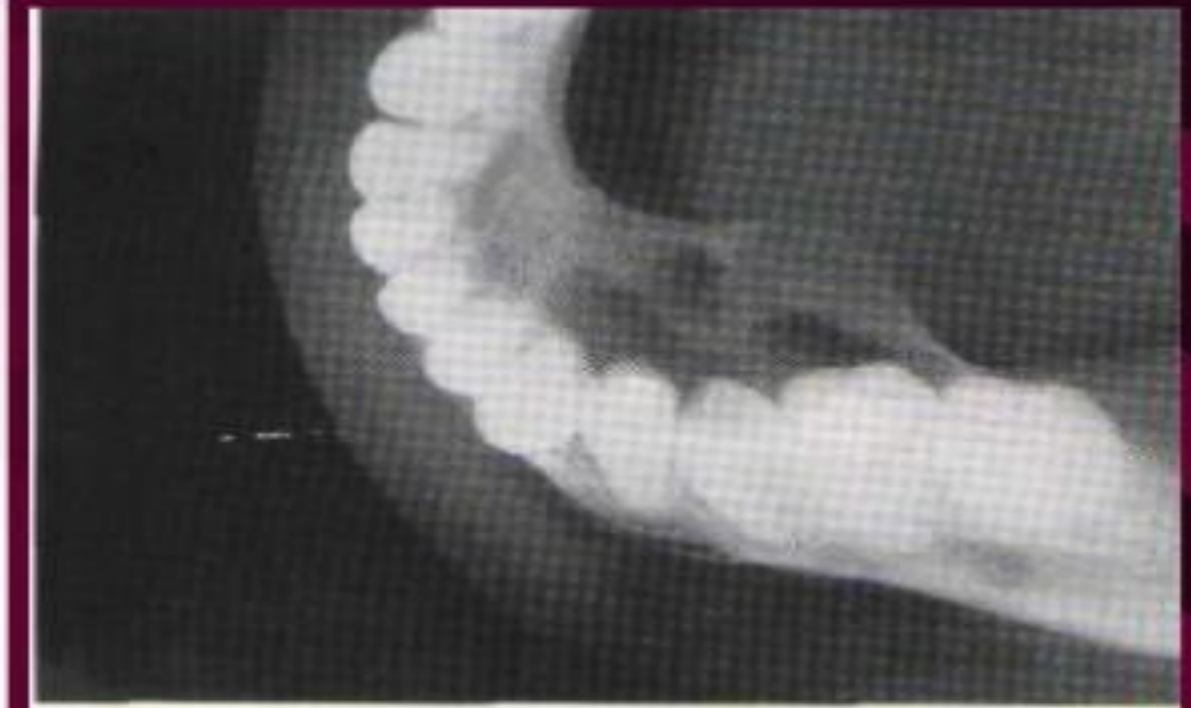


Figure 12-19 **Central giant cell granuloma** showing loculations and cortical expansion.

Treatment:

Intralesional steroids:

- Triamcinolone – 20 mg/cc once per wk for 6 wks
- Suppresses inflammatory component of lesion

Calcitonin – s.c. inj.:

- Dose – 20 IU O.D.
- Antagonizes bone resorption by inhibiting Giant cells.

α-Interferon – s.c. inj.:

- Dose – 30 lac IU O.D.
- Suppresses angiogenic component of lesion.

Surgical:

- Curettage
- Enucleation

GIANT CELL TUMOR

- Very rarely found in jaws.
- Aggressive – variant of low grade osteosarcoma
- H/F: similar to CGCG, except that the giant cells are larger with more nuclei and are more evenly spread.
- Treatment: Resection (high recurrence rate)

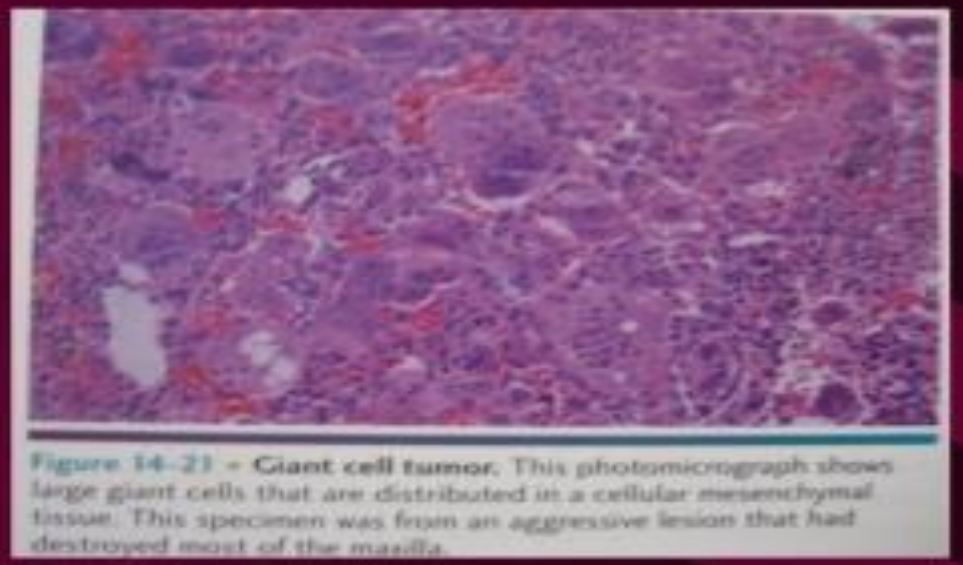
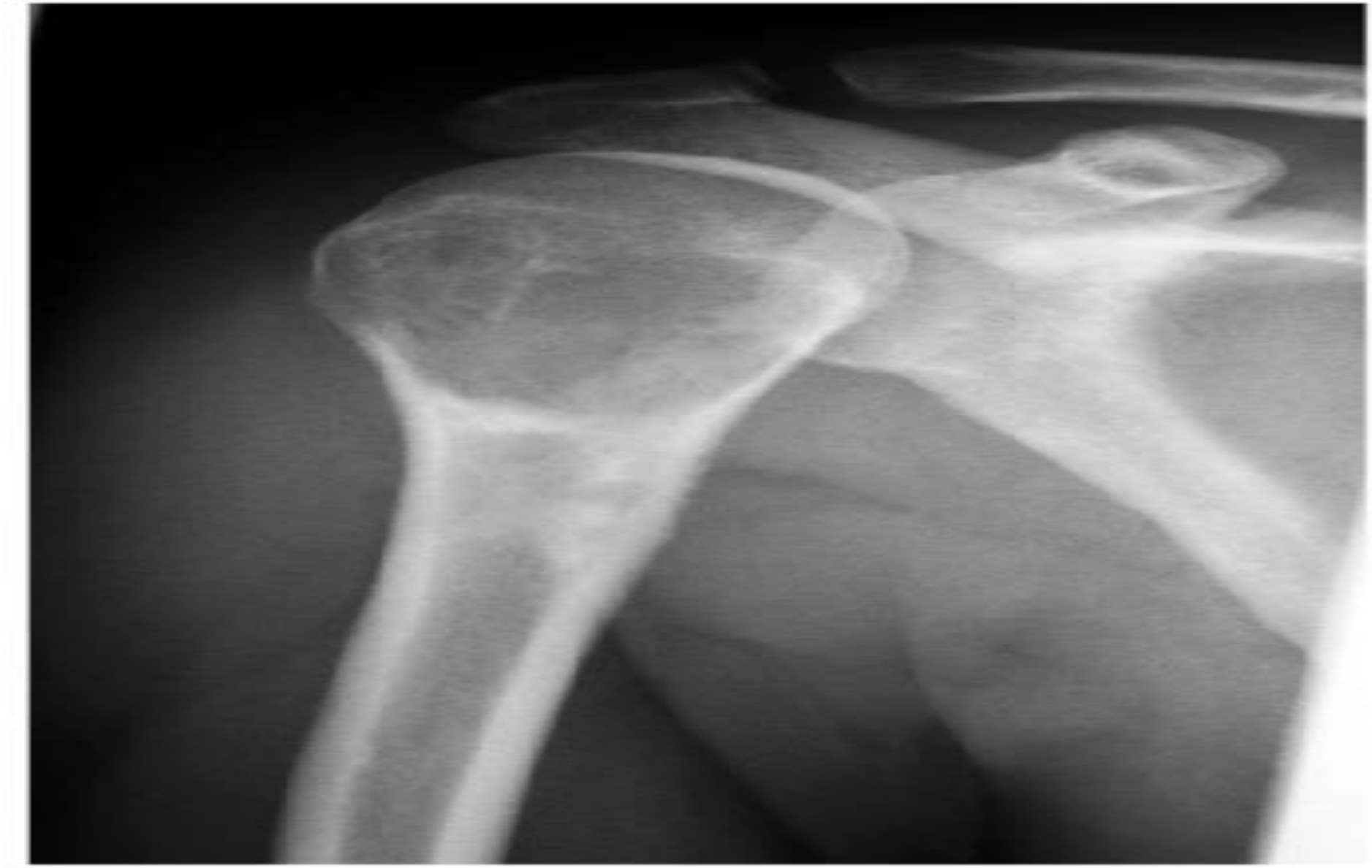


Figure 14–21 • **Giant cell tumor.** This photomicrograph shows large giant cells that are distributed in a cellular mesenchymal tissue. This specimen was from an aggressive lesion that had destroyed most of the maxilla.

Giant cell tumor



ANEURYSMAL BONE CYST

- First described by Jaffe & Lichtenstein in 1942.
- First case in jaw was reported by Bhaskar & Bernier in 1958.
- Is a non-neoplastic, reactive lesion of bone generally consisting of several cavities filled with blood and deprived of an endothelial lining.
- Not a true cyst, sinusoidal blood filled space.

- Word "Aneurysm" was used to describe the blown out appearance of the contour of the affected area.
- Exist in two clinico-pathologic forms:

1. Primary
2. Secondary – arising in other osseous conditions like Fibrous Dysplasia, Ossifying Fibroma, CGCG, Osteoblastoma, Osteosarcoma, Ameloblastoma

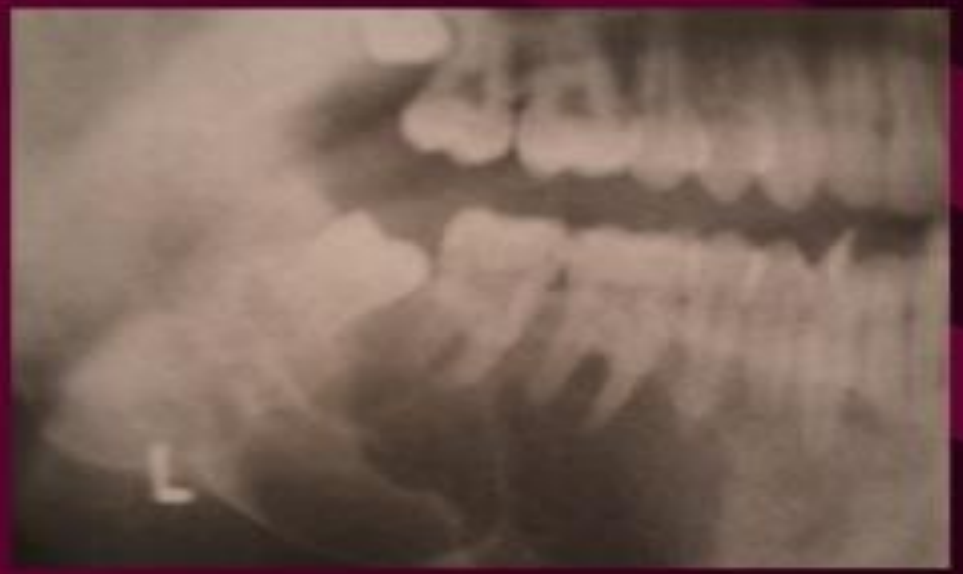
C/F:

- Occurs below 20 yrs of age.
- Predilection towards female.
- Mandible > maxilla, molar region is the most common site.
- Slow growing, may expand the cortical plate, does not destroy them.
- Aggressive lesions may perforate cortical plate with soft tissue extension.

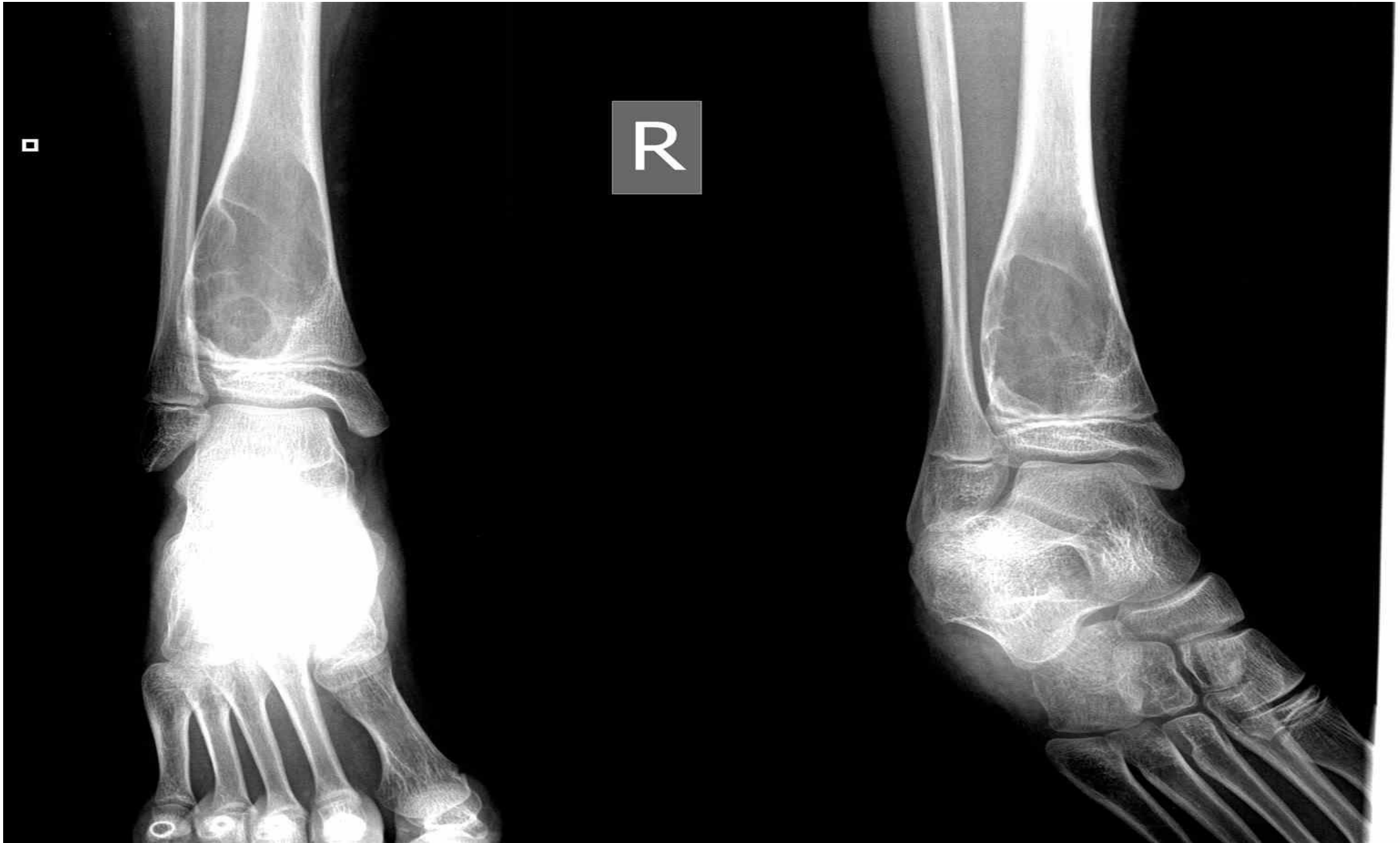
- Teeth may be tender, missing or displaced.
- Pain is occasional complaint.
- On palpation: egg-shell crackling, non-pulsatile.
- On surgical exploration: ‘welling up’ of blood.
- Gross examination: blood-soaked sponge.

R/F:

- Well defined radiolucency
- Extreme expansion of cortical plates - honey - comb or soap - bubble appearance
- Can displace teeth
- Cortex may be destroyed



Aneurysmal bone cyst



H/F:

- Consist of a fibrous connective tissue stroma containing of many sinusoidal blood filled spaces.
- Fibroblast are numerous as well multinucleated giant cells.
- Vascular spaces lack any endothelial lining, and giant cells form part of their walls.

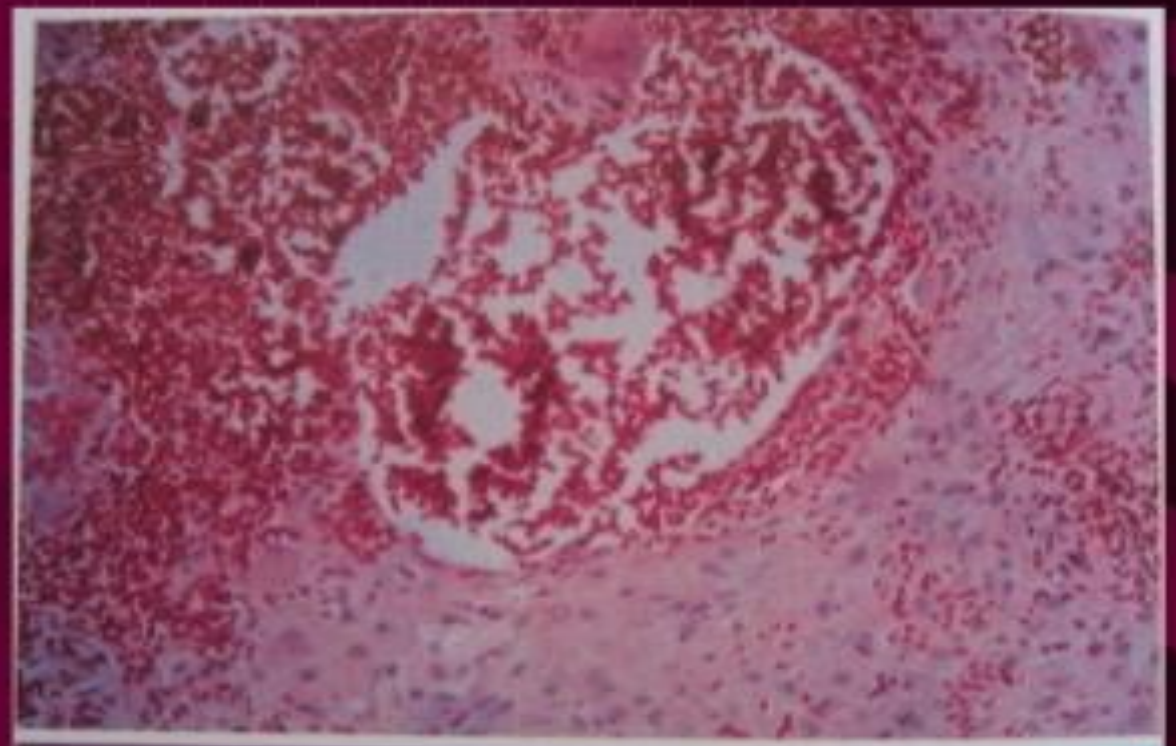


Figure 14-30 • **Aneurysmal bone cyst.** Photomicrograph showing a blood-filled space surrounded by fibroblastic connective tissue. Scattered multinucleated giant cells are seen adjacent to the vascular space.

CHERUBISM

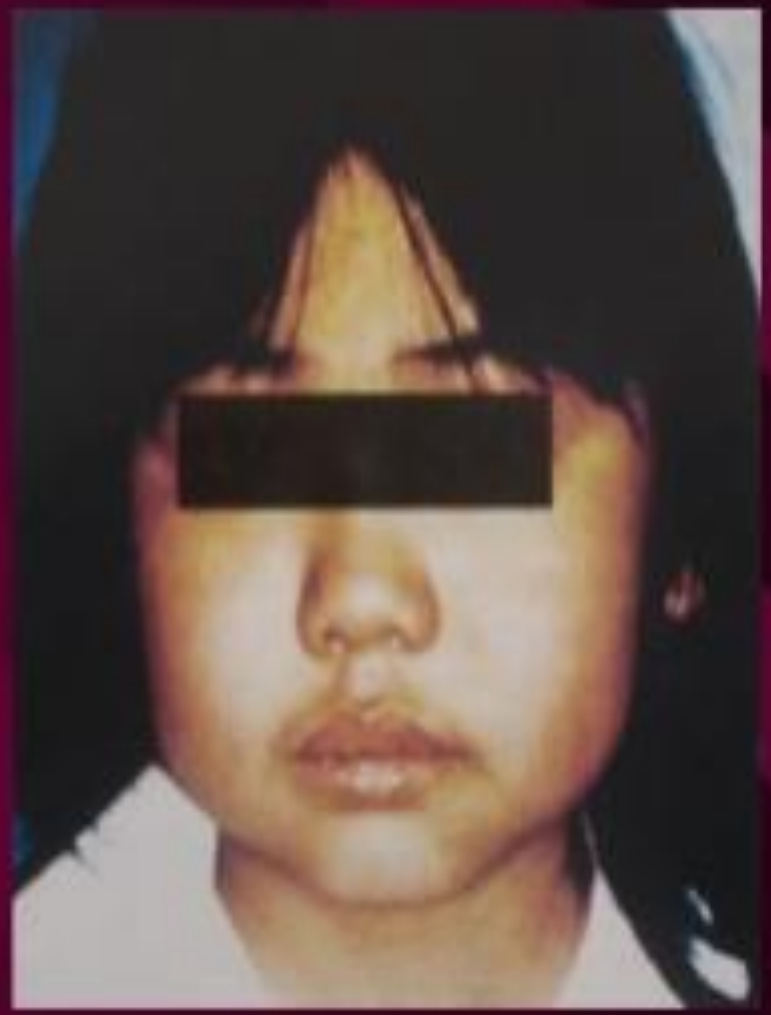
- Rare developmental jaw condition.
- The condition is named due to the facial appearance -plump cheeked little angels with upward directed look depicted in renaissance painting.

Etiology:

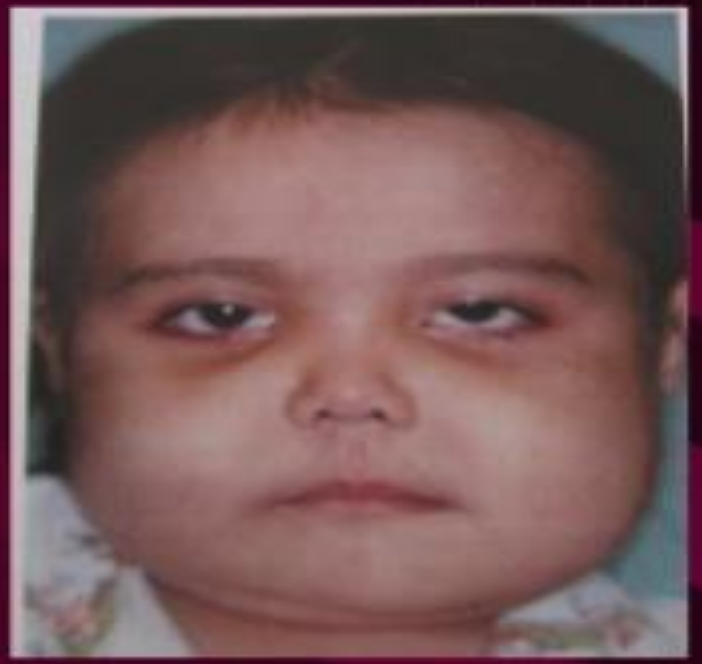
- Inherited as an autosomal dominant trait.
- Gene for cherubism present on chromosome 4p16.3.

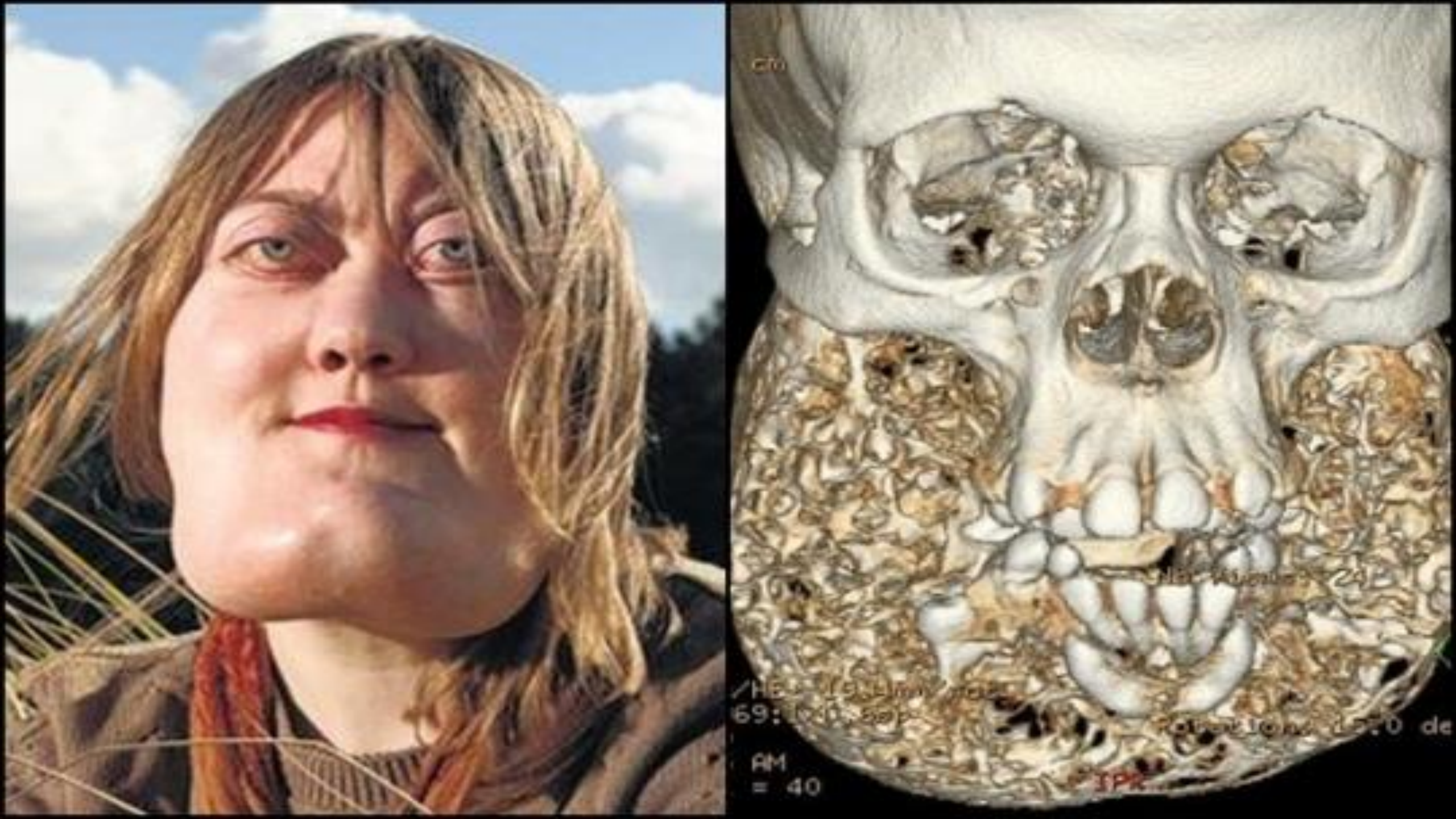
C/F:

- Occurs between the age of 2-5yrs.
- Progressive, painless, symmetric swelling of the jaws- mandible or maxilla.



- Cherub like facies arise from bilateral involvement of posterior mandible that tends to include the angles & rami region - angelic chubby cheeks.
- Eyes '*up turned to heaven*' appearance – due to b/l maxillary involvement.

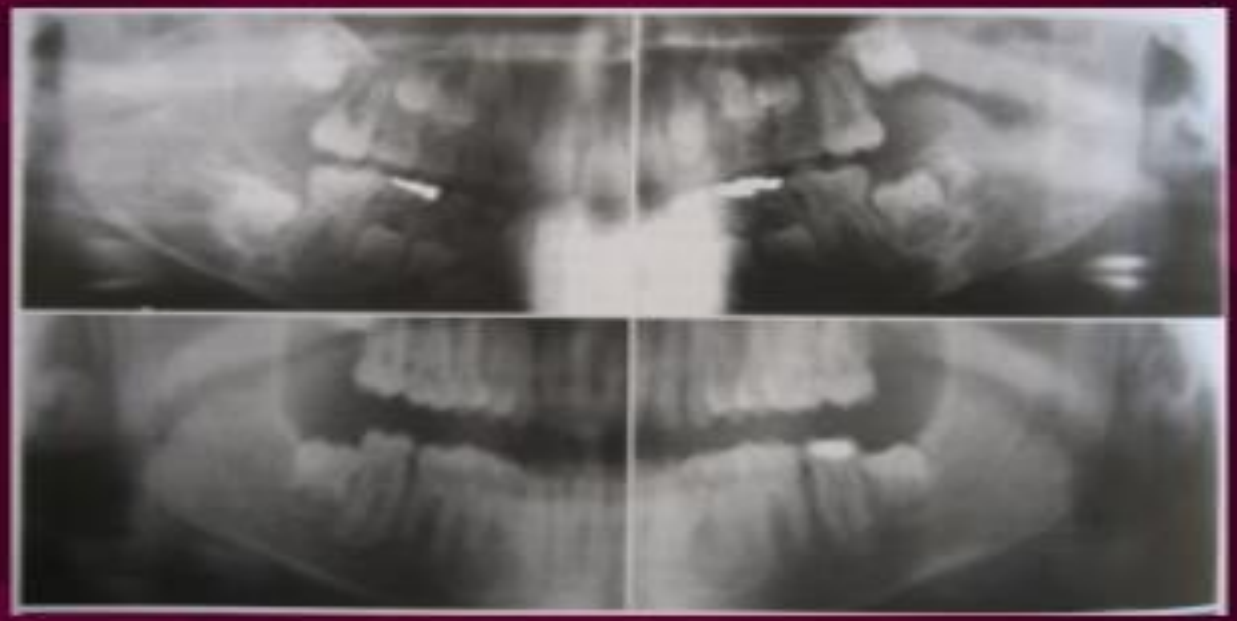



CT
AM
= 40

- Lesion grows slowly but no perforation of cortex.
- Marked cervical lymphadenopathy.
- Premature shedding of deciduous teeth.
- Permanent dentition – teeth missing, failure of teeth eruption, teeth displacement.
- Speech difficulty.
- Bony lesions regresses after puberty.

R/F:

- B/L expansion & thinning of cortical plates.
- Multilocular cystic appearance – teeth *floating* in spaces.
- Numerous unerupted & displaced teeth.



H/F:

- Consists variable number of multinucleated giant cells.
- Foci of extravasated blood are commonly present.
- Cuff like deposits surrounding small blood vessels throughout the lesion.

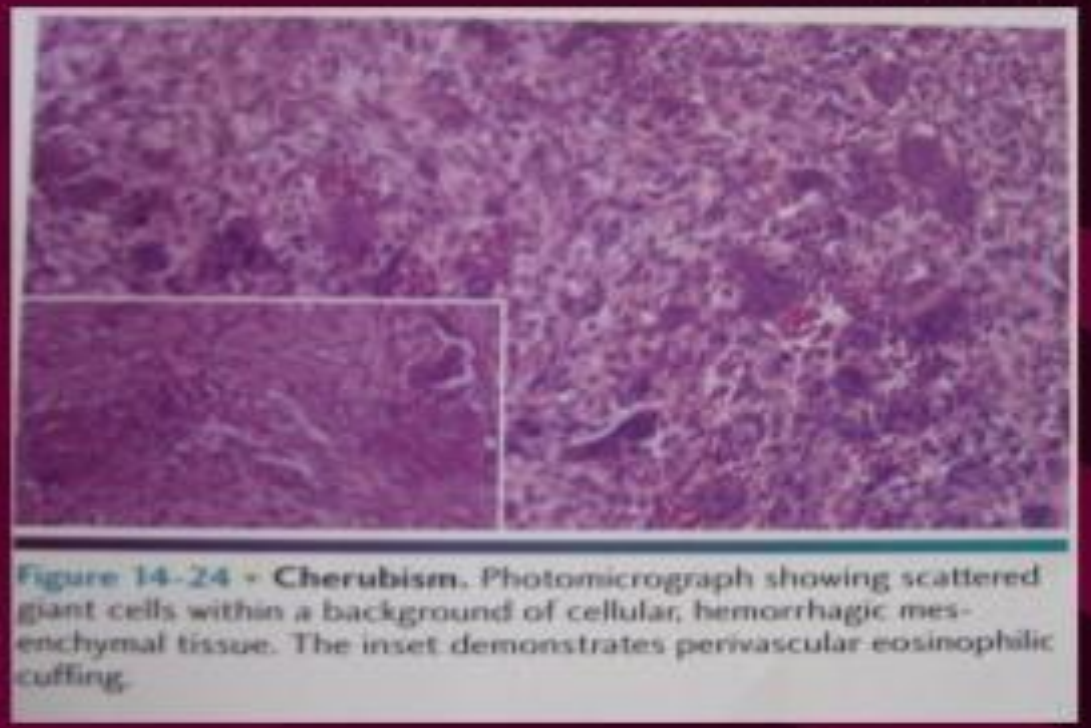


Figure 14-24 • **Cherubism.** Photomicrograph showing scattered giant cells within a background of cellular, hemorrhagic mesenchymal tissue. The inset demonstrates perivascular eosinophilic cuffing.

Treatment:

- The lesions tend to show varying degree of remission after puberty.
- By 4th decade facial feature approach normalcy.
- Early surgical intervention for cosmesis has given good results.
- Some studies showed the use of calcitonin, but still not proved.

BROWN TUMOR OF HYPERPARATHYROIDISM

- Parathormone (PTH) is normally produced by parathyroid glands, which regulates the Ca+ metabolism.
- Excessive production of PTH results in a condition known as Hyperparathyroidism.
- It is an exaggerated form of **'Osteitis fibrosa cystica'** discovered by von Recklinghausen in 1891.

Three types:

- Primary hyperparathyroidism
- Secondary hyperparathyroidism
- Tertiary hyperparathyroidism

C/F:

- Incidence: 1 in 500
- Predilection for females.
- Describes the features - *'Stones , Bones, Abdominal Groans & Psychic Moans'*
- Metastatic calcifications - Nephrocalcinosis, blood vessels.

- Jaw - not as frequent as in long bones and skull.
- Vague aches, severe bone pain, tenderness following fractures.
- Swelling develops, firm in consistency, tender.
- Mobility of teeth.

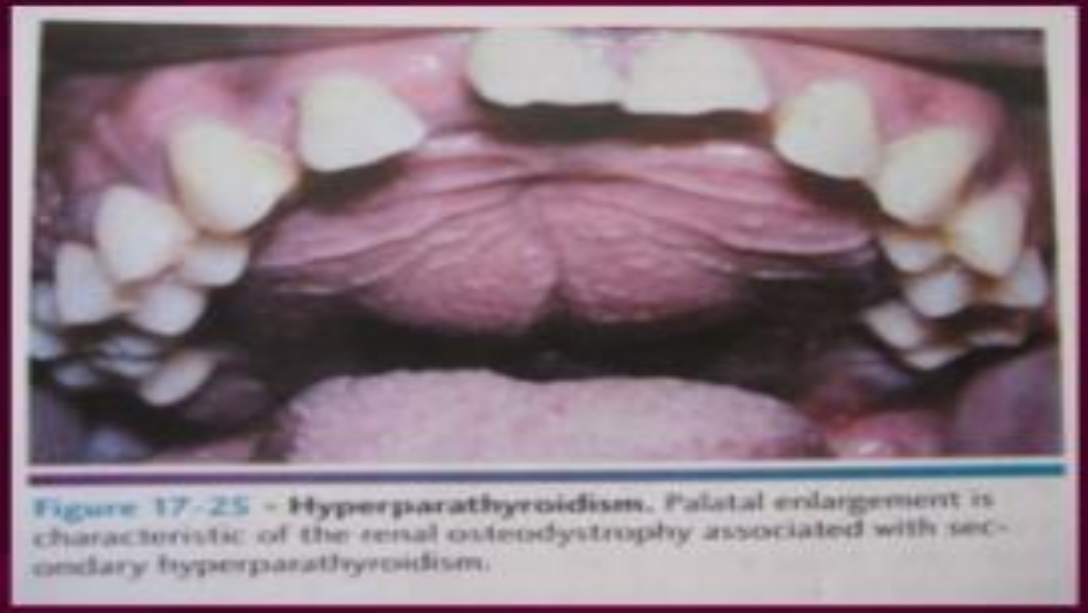
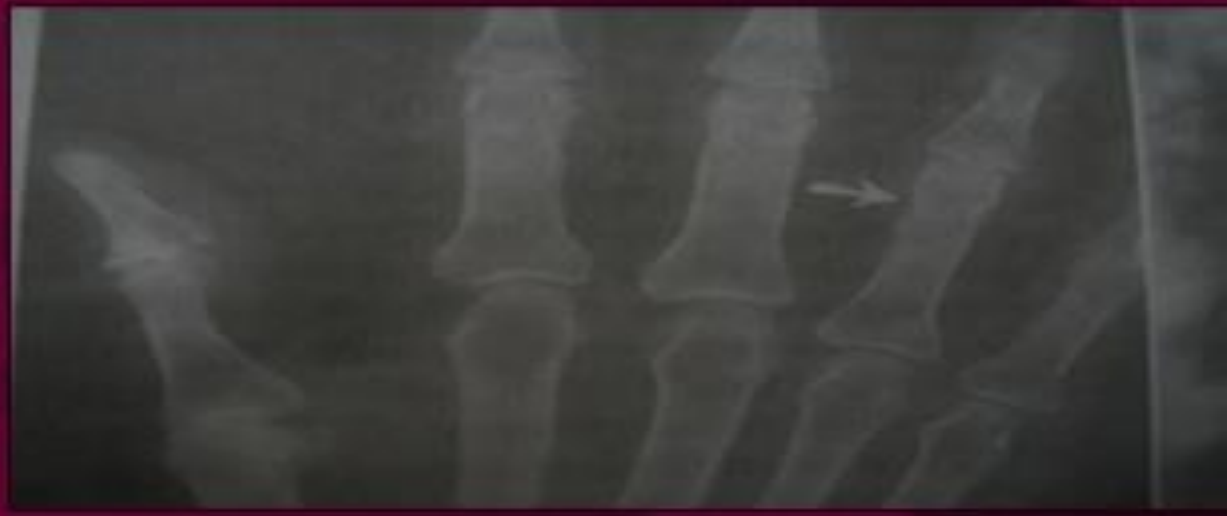


Figure 17-25 - **Hyperparathyroidism.** Palatal enlargement is characteristic of the renal osteodystrophy associated with secondary hyperparathyroidism.

R/F:

- Sub-periosteal erosion of middle phalanges is the hallmark.
- Very rarely jaw affected first.
- Generalized loss of lamina dura.
- Ground glass appearance.



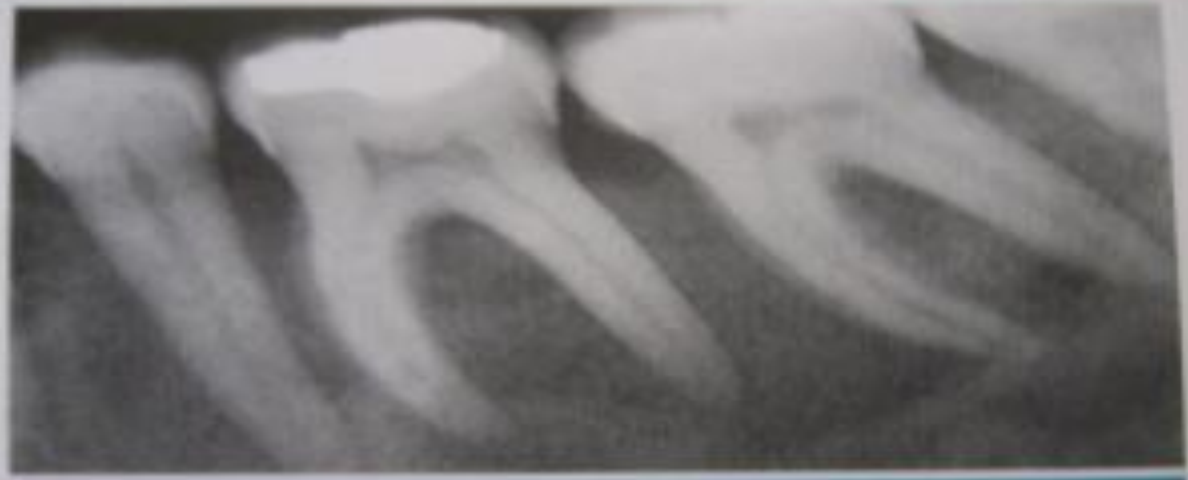
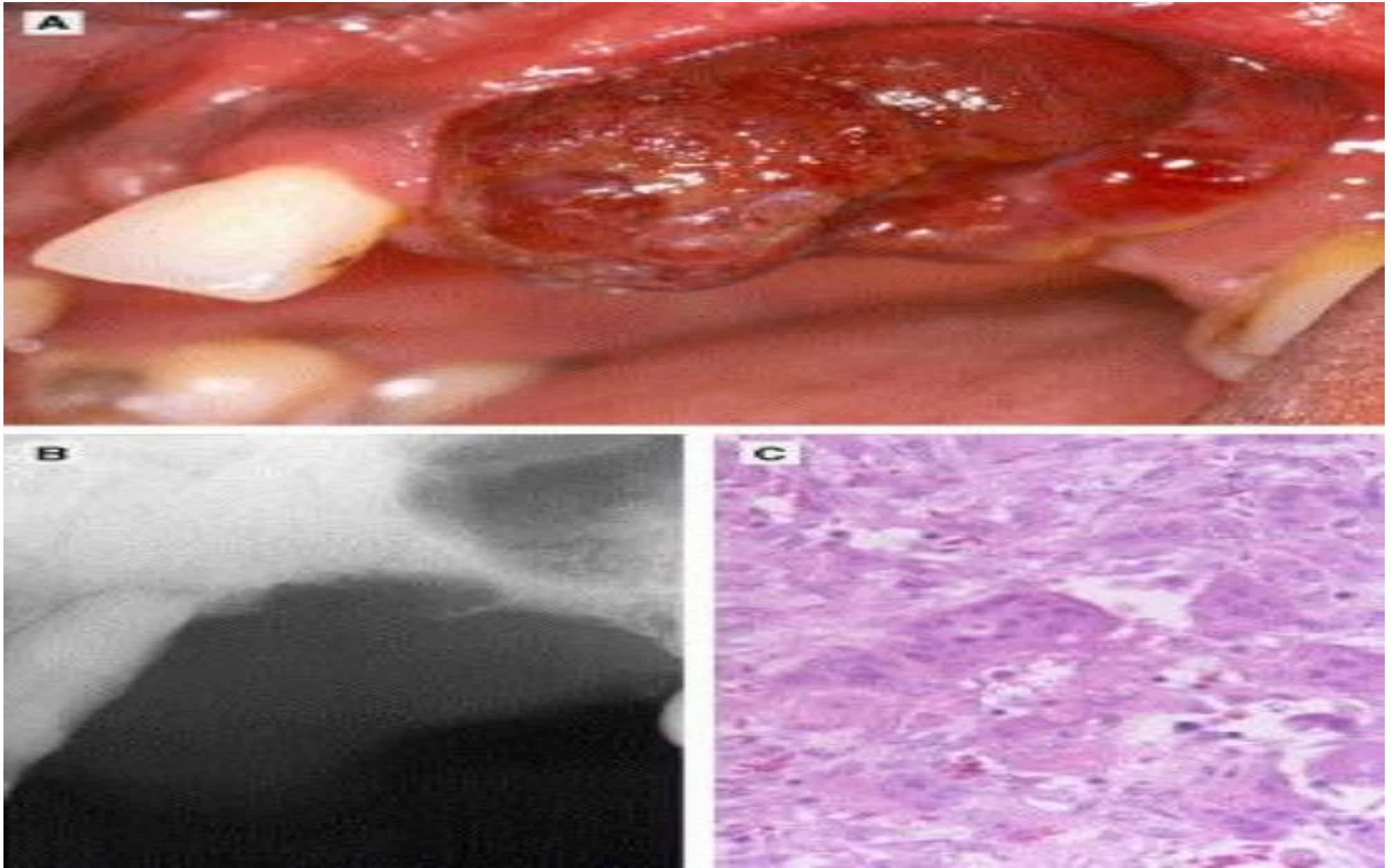


Figure 17-23 • **Hyperparathyroidism.** This periapical radiograph reveals the "ground glass" appearance of the trabeculae and loss of lamina dura in a patient with secondary hyperparathyroidism. (Courtesy of Dr. Randy Anderson.)

- Cortical plate may be thinned or lost.
- There is a cystic type of radiolucency.

- On gross examination- Vascularity, hemorrhage & deposits of haemosidrin imparts a dark reddish brown color to the lesion –**"Brown Tumor"**

Brown tumor of hyperparathyroidism



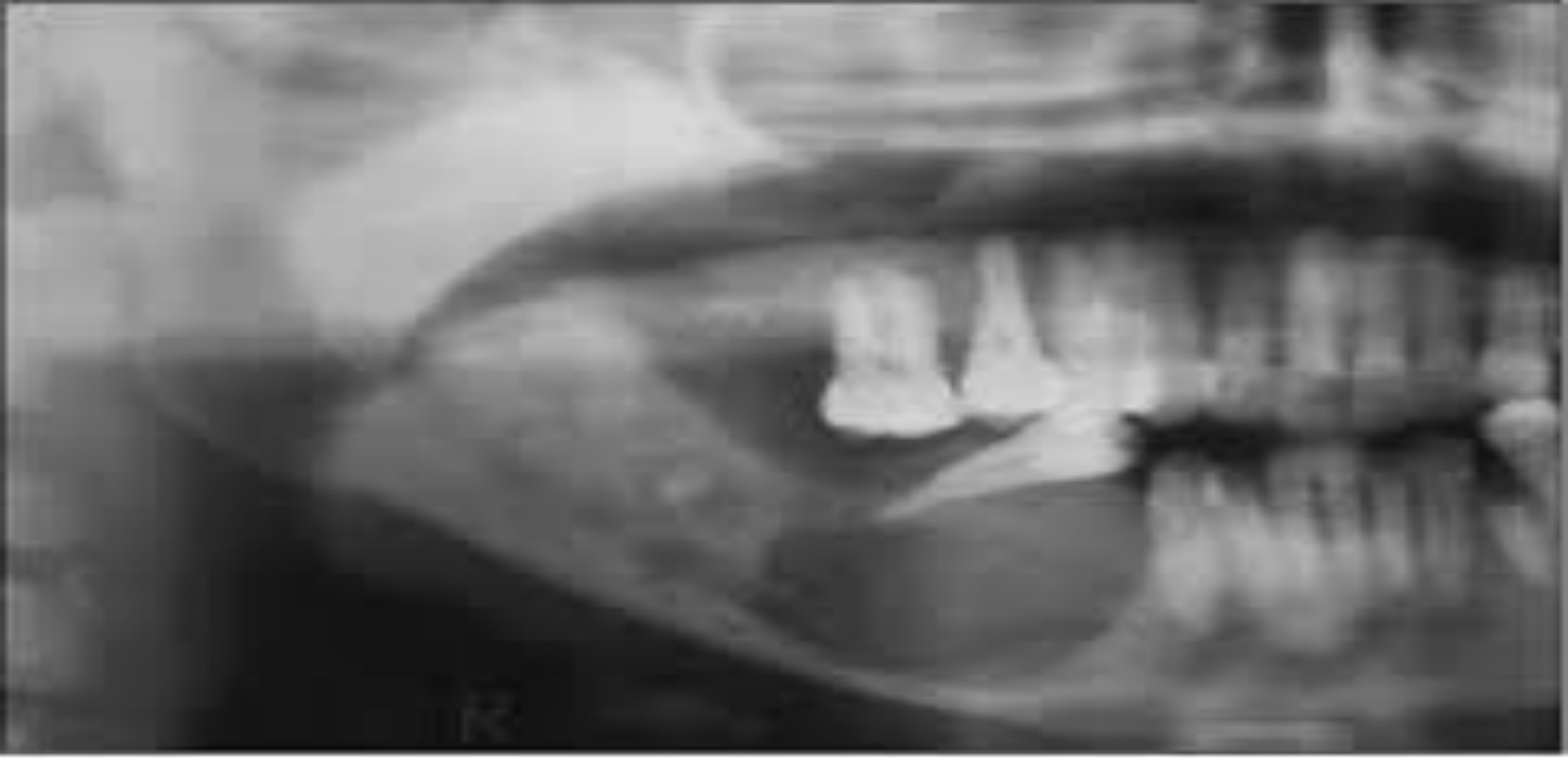
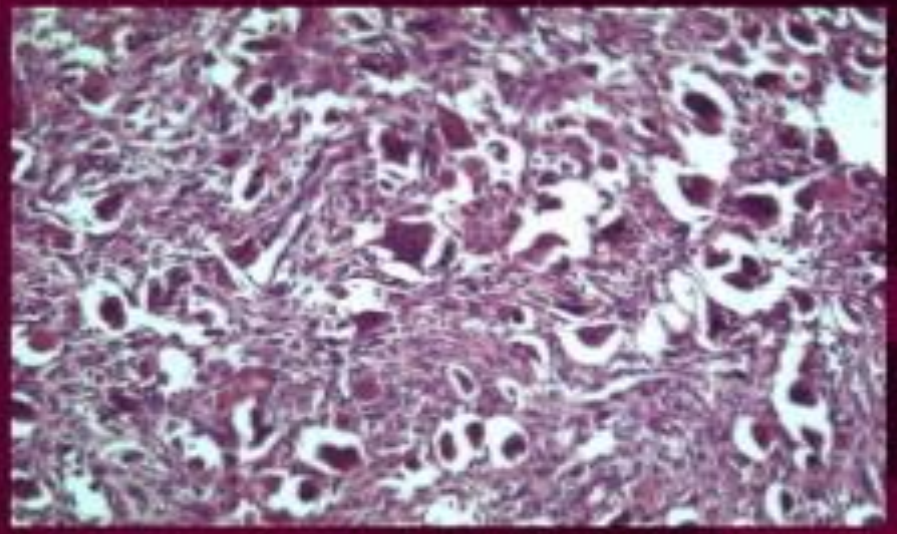


Figure 4. Brown tumor of hyperparathyroidism (group B) in right mandibular corpus, showing up as a well-delimited, unilocular radiolucent image, causing displacement of the first right lower premolar.

H/F:

- Giant cells of osteoclastic origin scattered over the fibrovascular stroma in which foci of hemosiderin are present.



Lab. investigations:

- Serum calcium level, alkaline phosphatase & PTH level will be raised