Bone Diseases
DENT 5322 part II

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Benign cemento-osseous lesions:

Fibrous dysplasia

Cemento-osseous dysplasias
- Subtypes: periapical cemental
  - focal cemento-osseous
  - florid cemento-osseous

Cemento-ossifying fibroma
- Subtypes: conventional
  - juvenile active

Fibrous Dysplasia

Fibrous Dysplasia

- Benign disorder of bone
- Non-neoplastic tumor-like lesion
- Developmental defect in bone formation
- Fibrous proliferation
- Disorderly malformed woven bone
- Enlarged deformed bones
- Structurally weak

Fibrous Dysplasia

- Sites:
  - ribs, femur, tibia, pelvis, craniofacial
- Age: onset in childhood – adolescence
- Single or multiple bony lesions
- Slow growing
- Painless
- Often quiesces at puberty
- Genetics: GNAS I gene chromosome 20q13.1-2

Fibrous Dysplasia

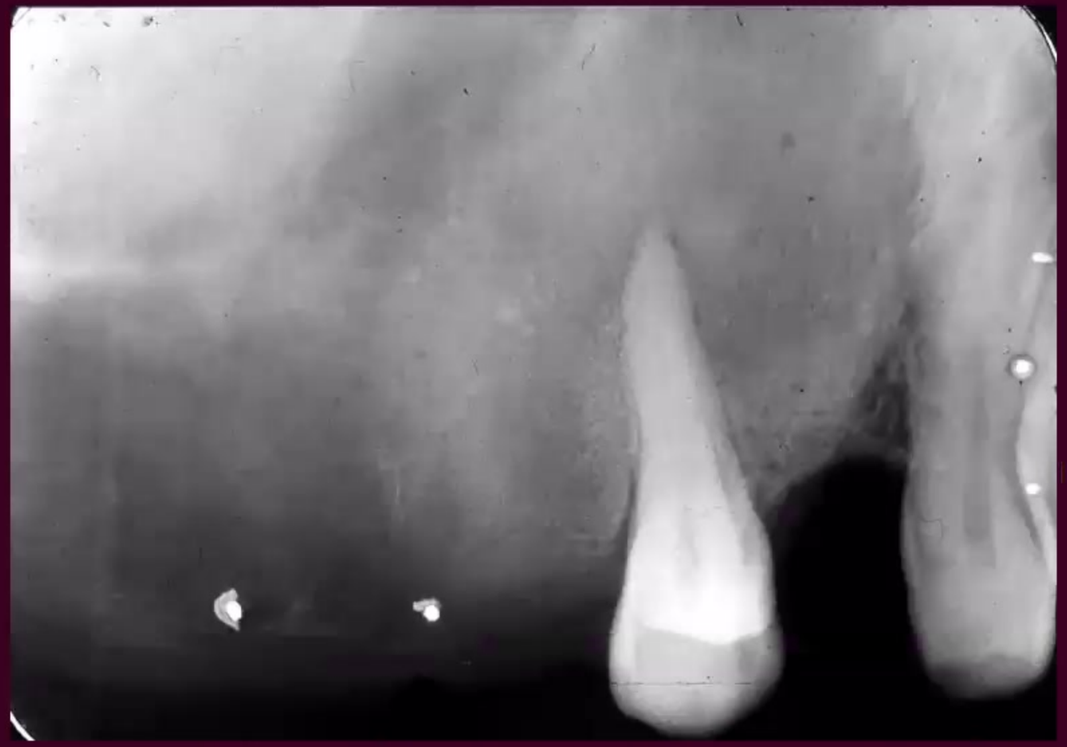
- Monostotic
  - 70%
  - craniofacial – (25%)
- Polyostotic
  - 25%
  - craniofacial – (50%)
- McCune-Albright Syndrome
  - 3%
  - endocrine abnormalities

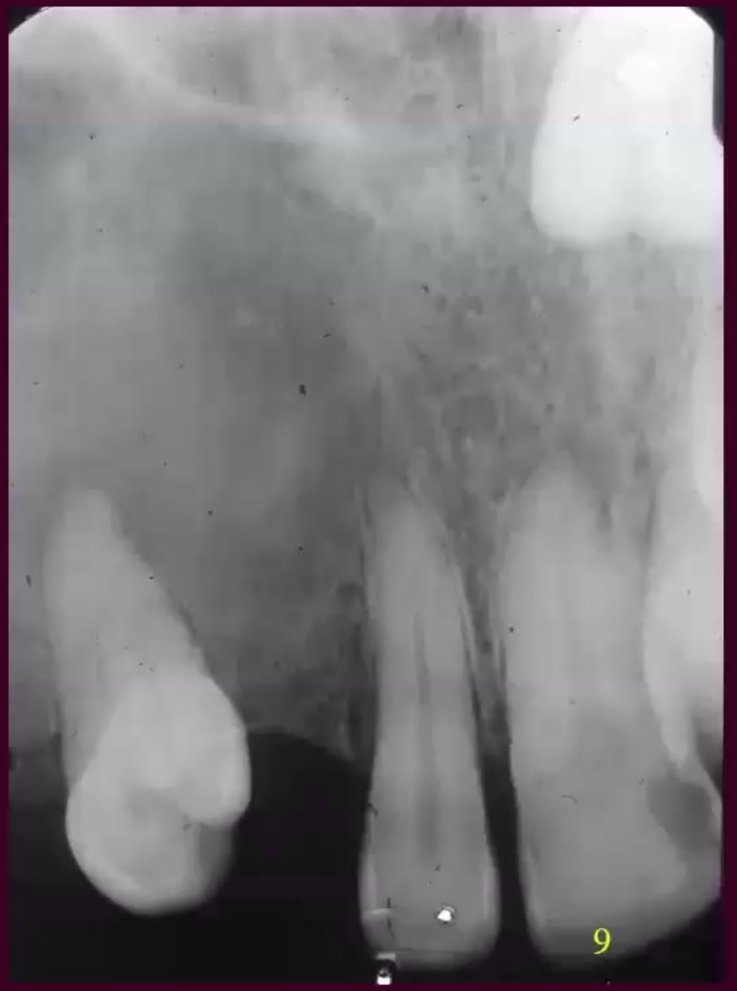
Fibrous Dysplasia
Oral & Maxillofacial Manifestations:

- Painless swelling
- Facial asymmetry
- Malocclusion – displaced teeth
- Headache
- Hearing loss
- Clinical labs: elevated alkaline phosphatase

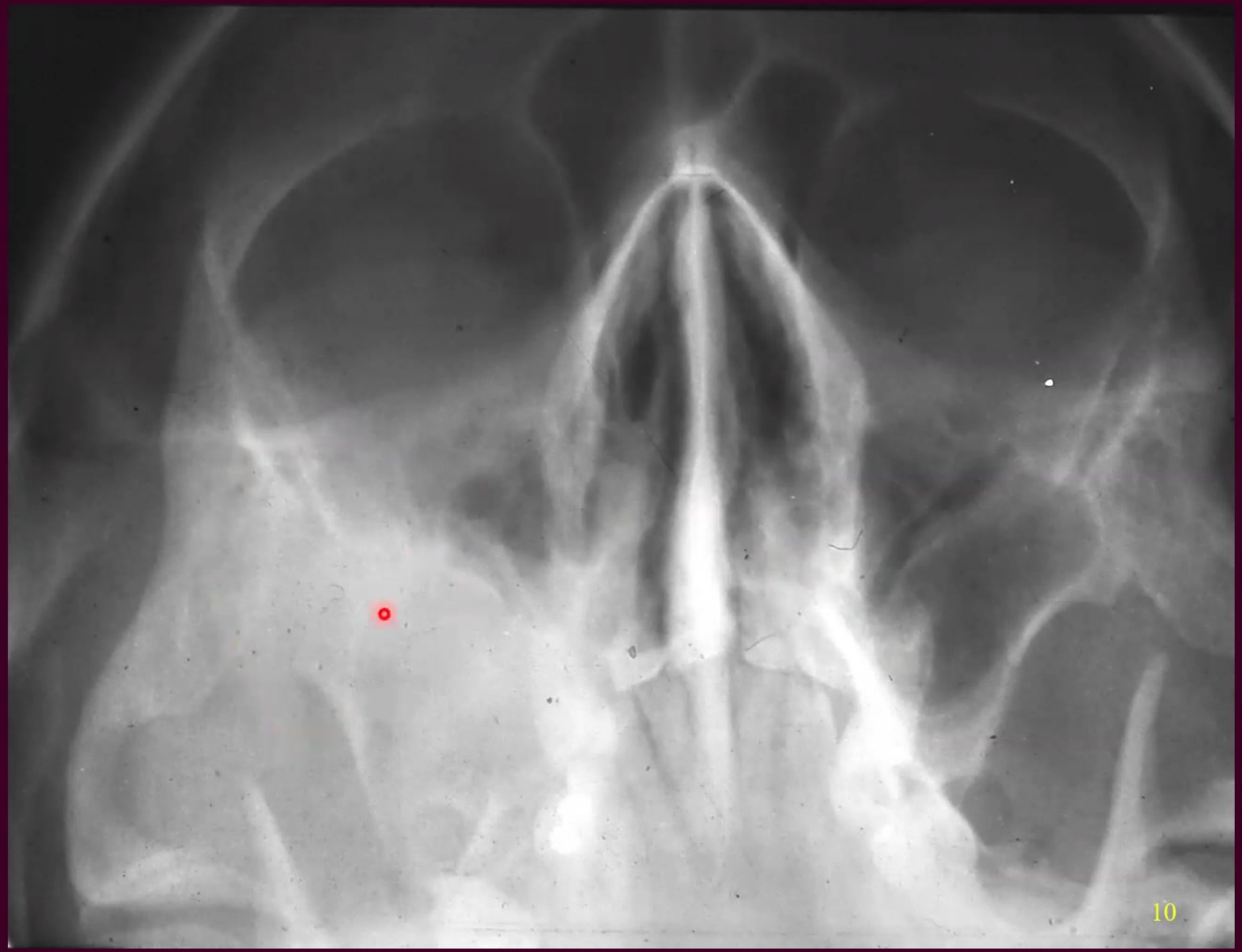
Radiographic Features:

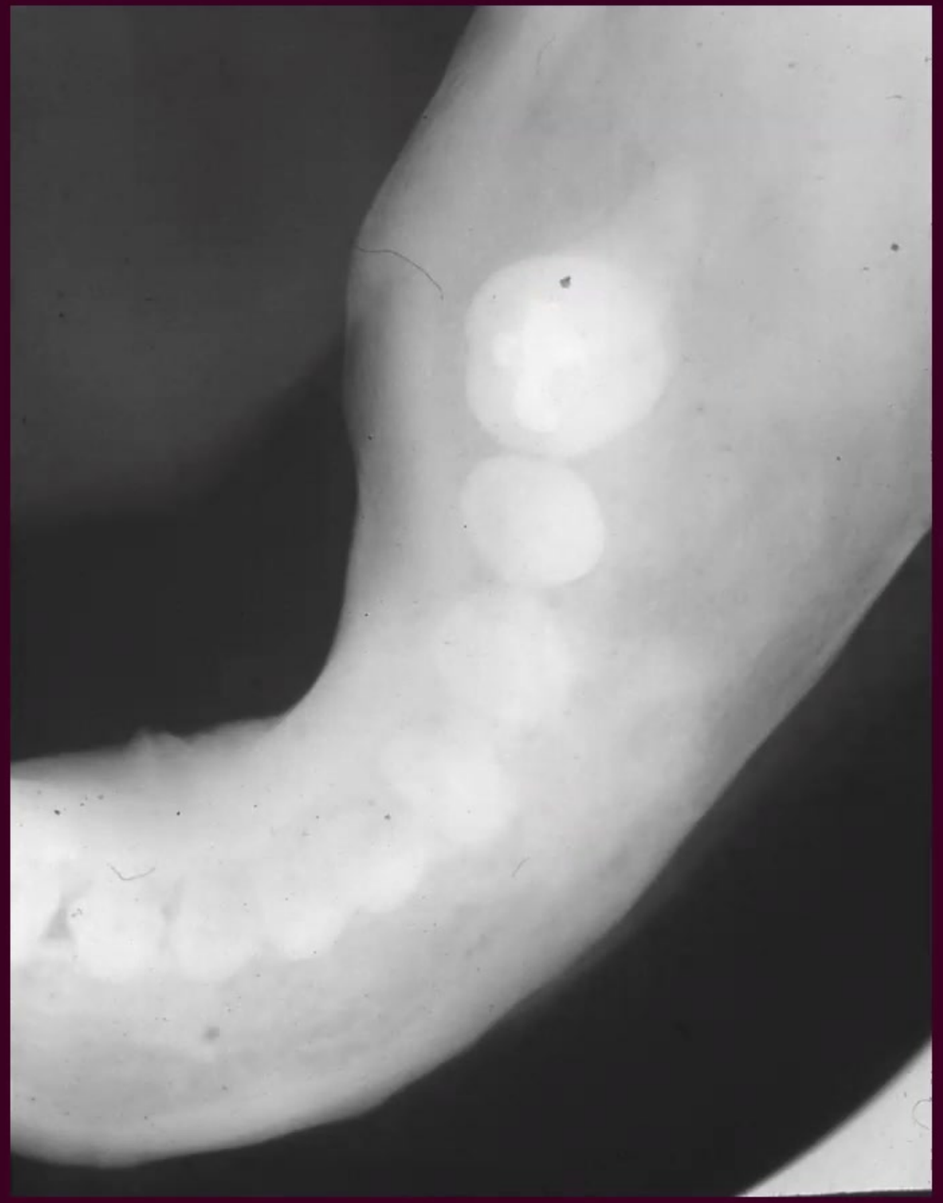
- “Ground glass” opacification
- Diffuse – poorly delineated
- Cortical expansion – fusiform enlargement
- Narrow periodontal ligament
- Obscure lamina dura
- Early lesions – radiolucent/mottled

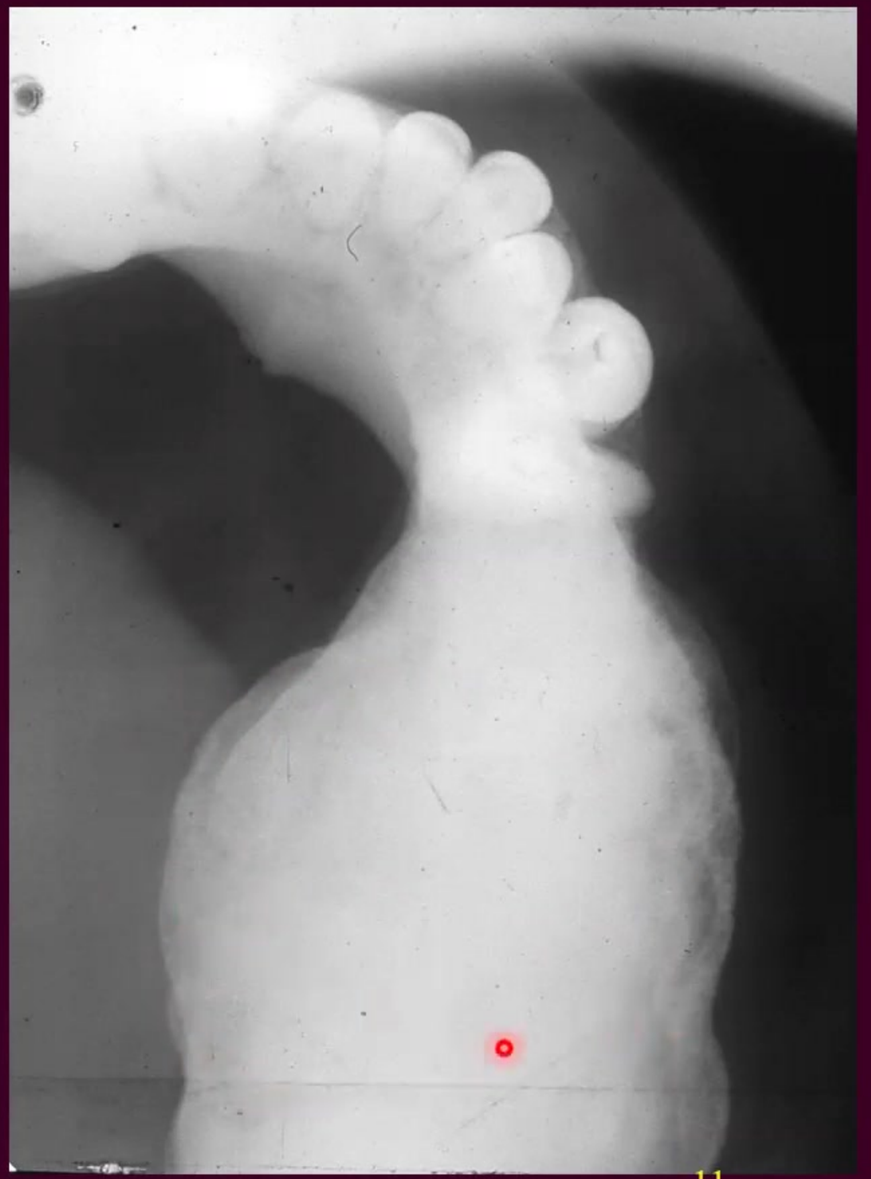




Fibrous dysplasia

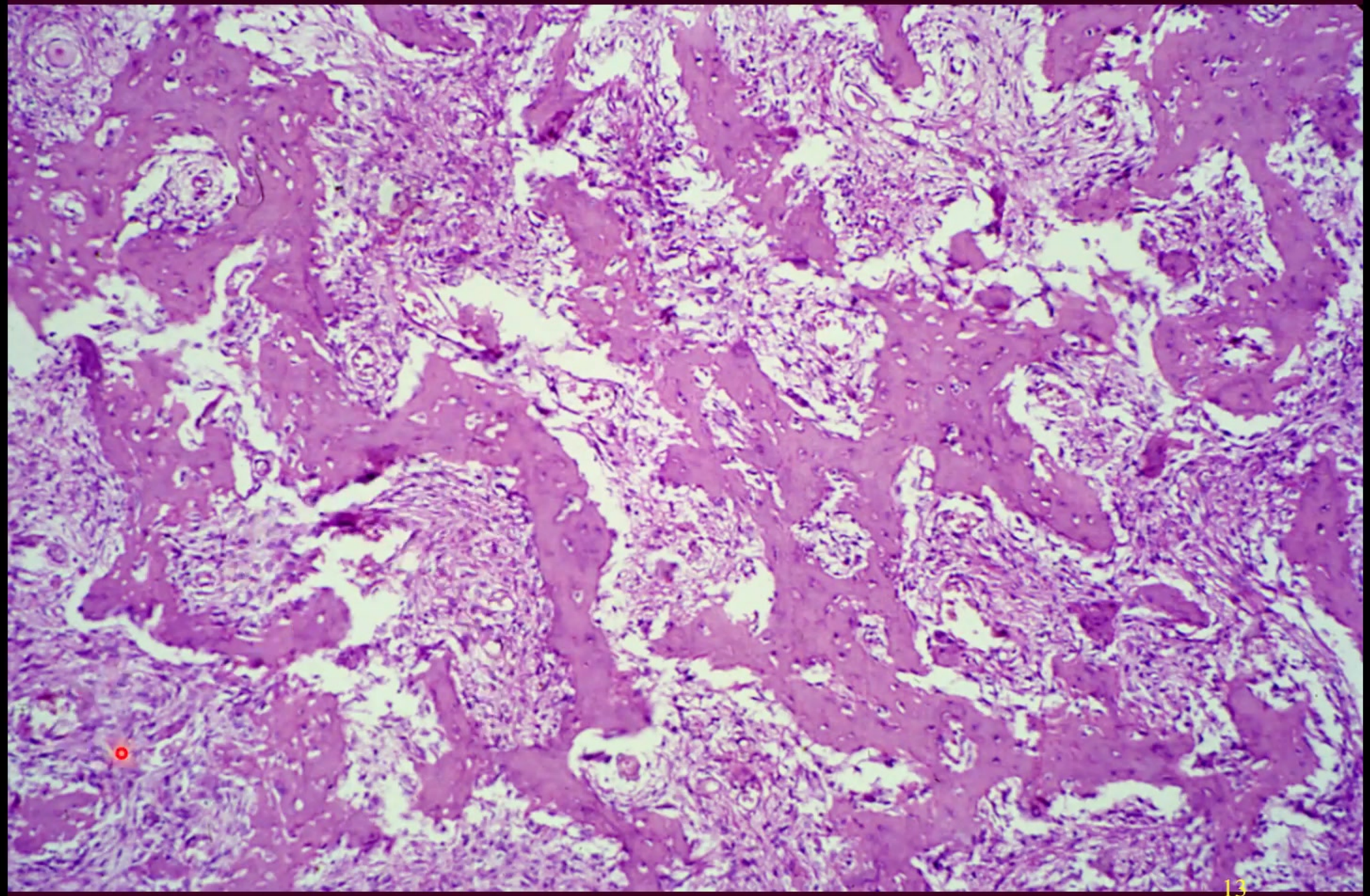


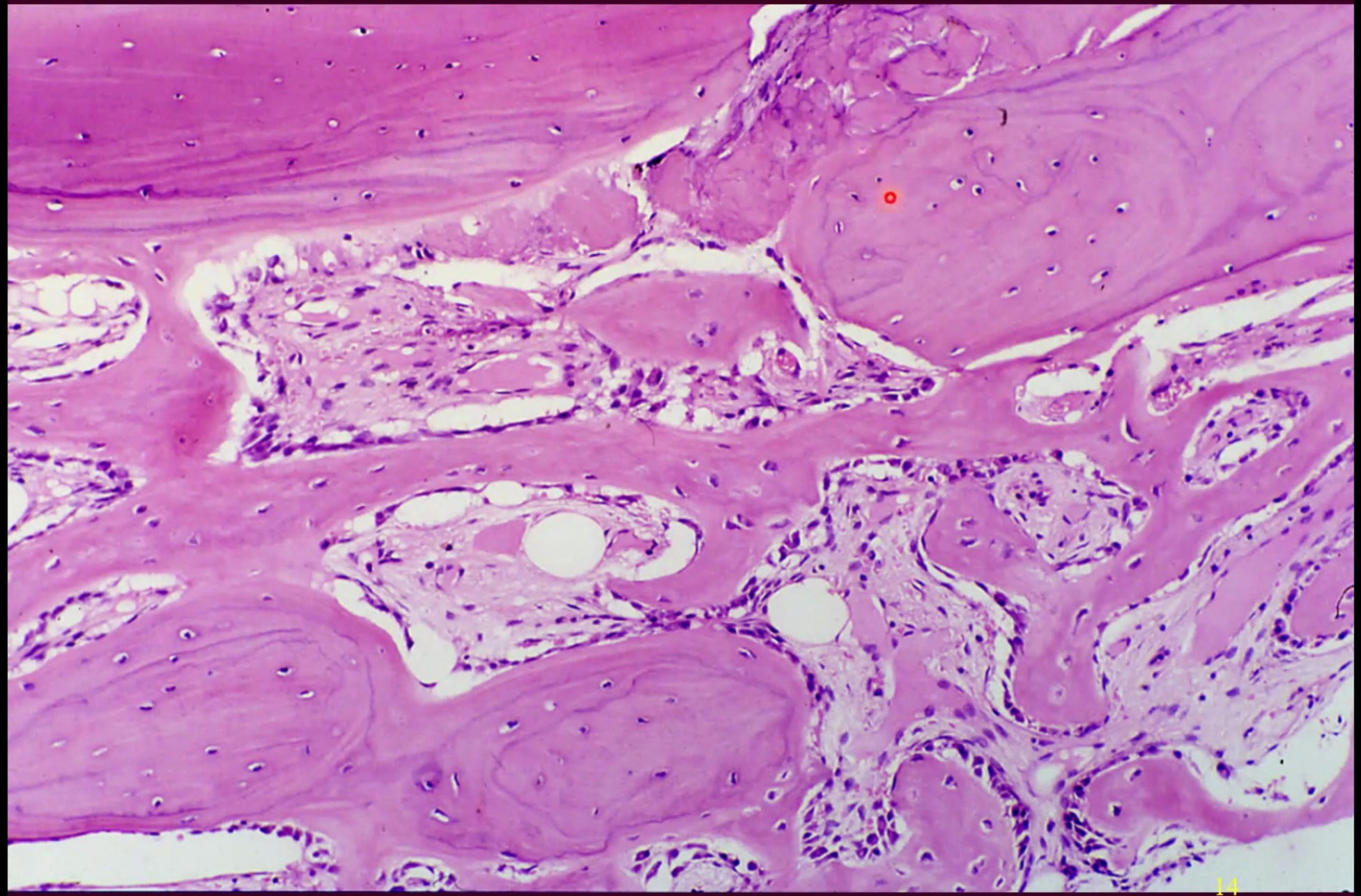


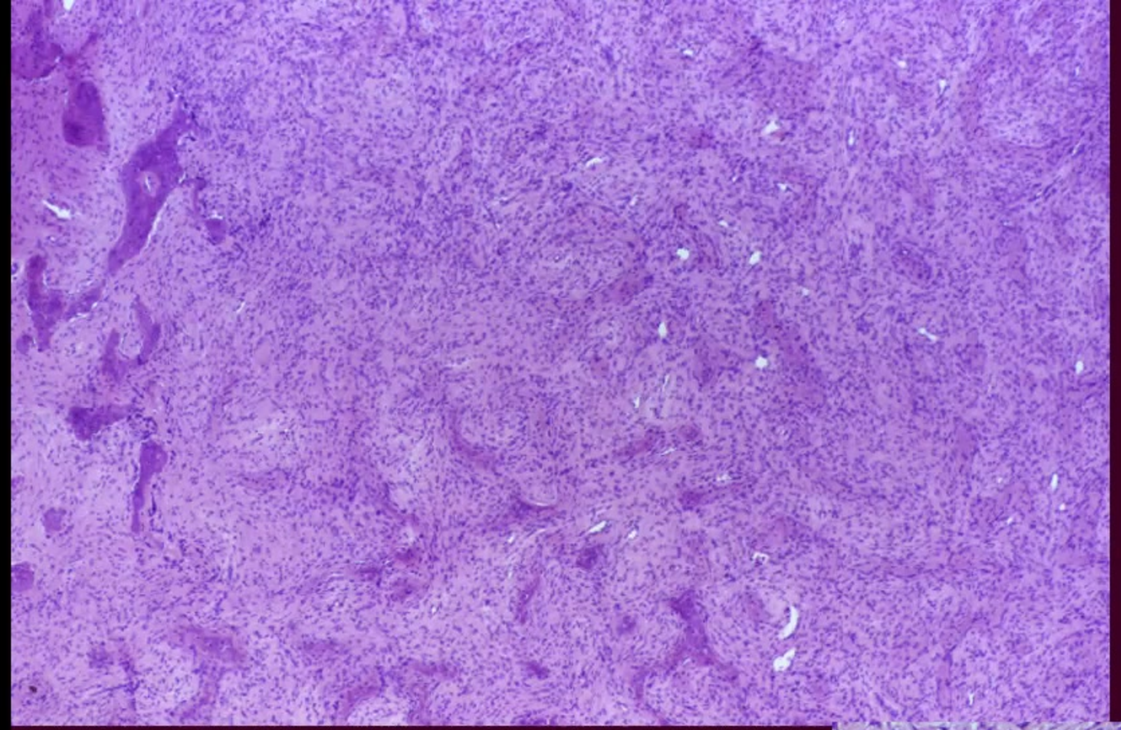


Histology

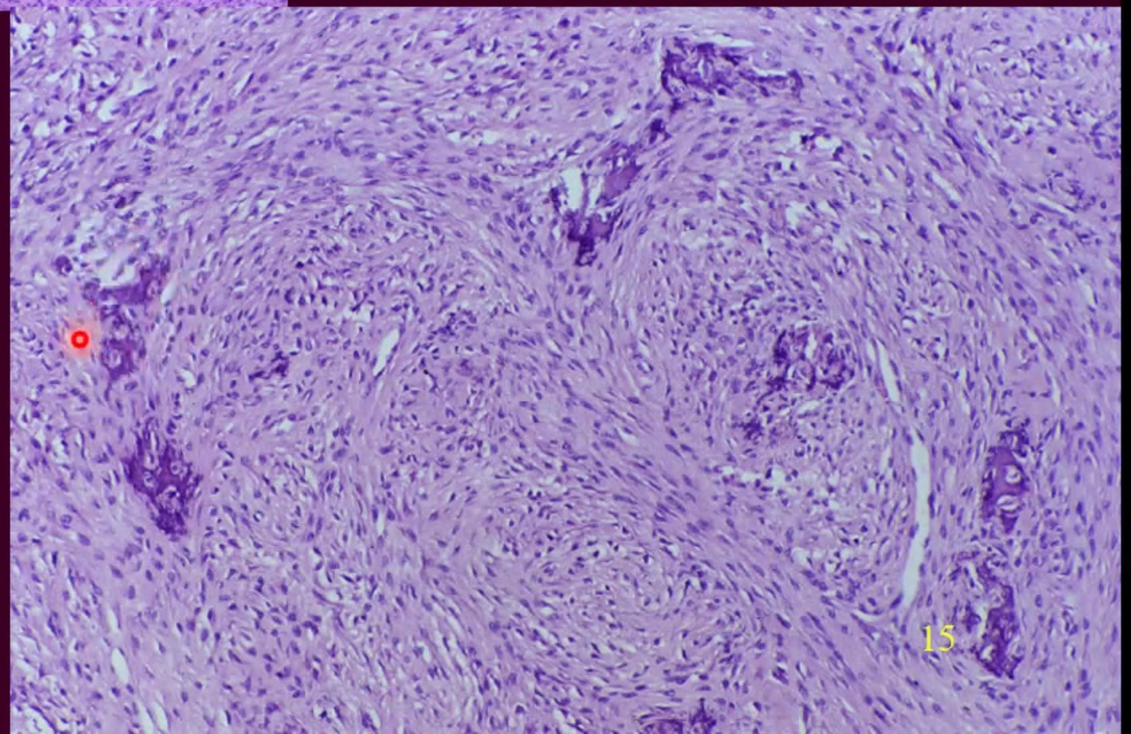
- Woven bone
- Irregular trabeculae "Chinese Characters"
- Fibrous stroma
- No osteoblastic lining
- Blends into normal bone – no capsule
- Maturation into lamellar bone

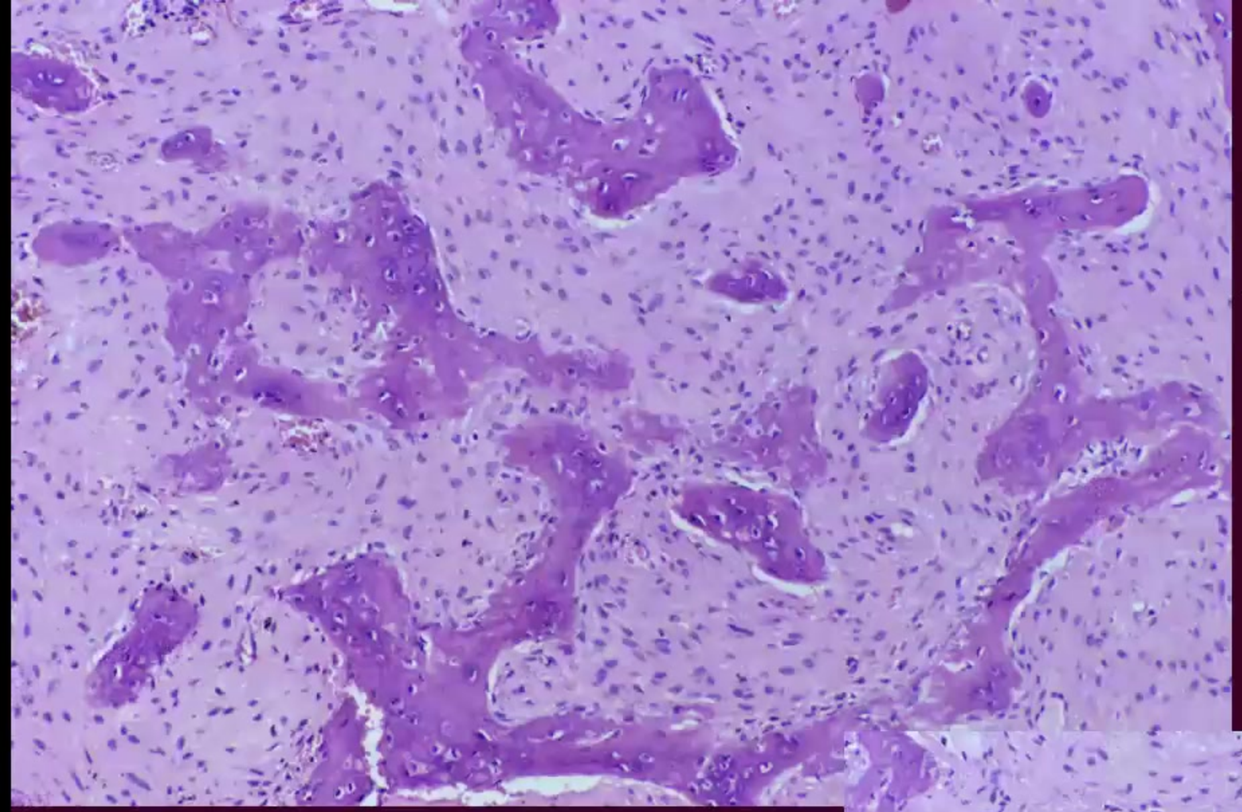




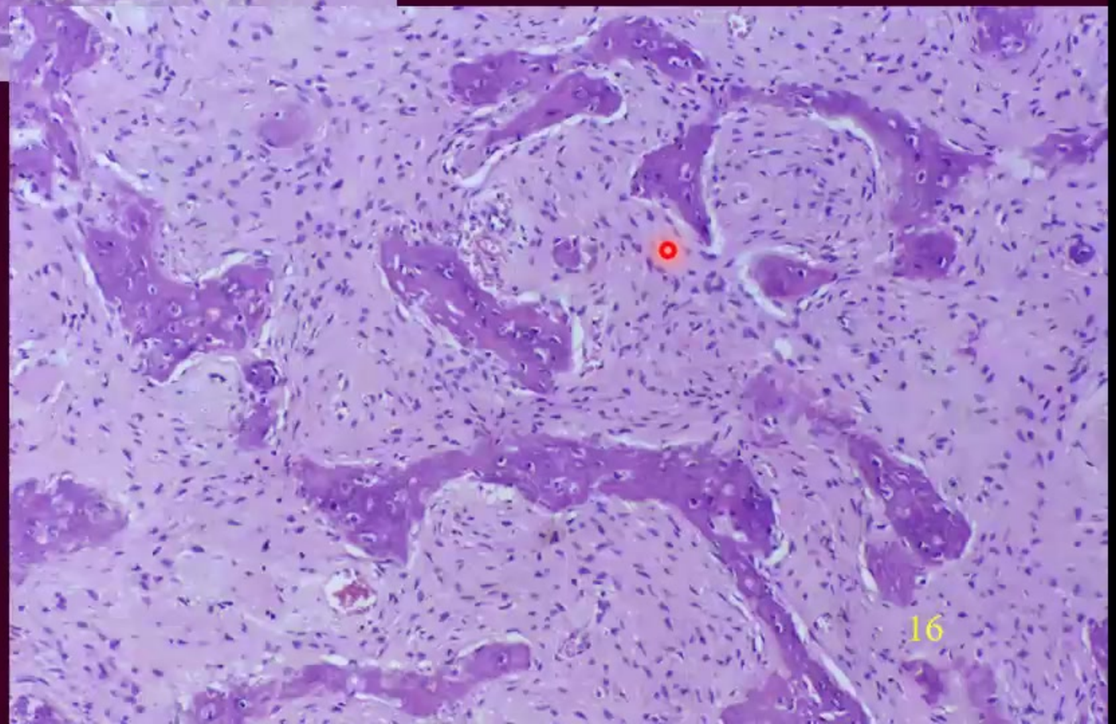


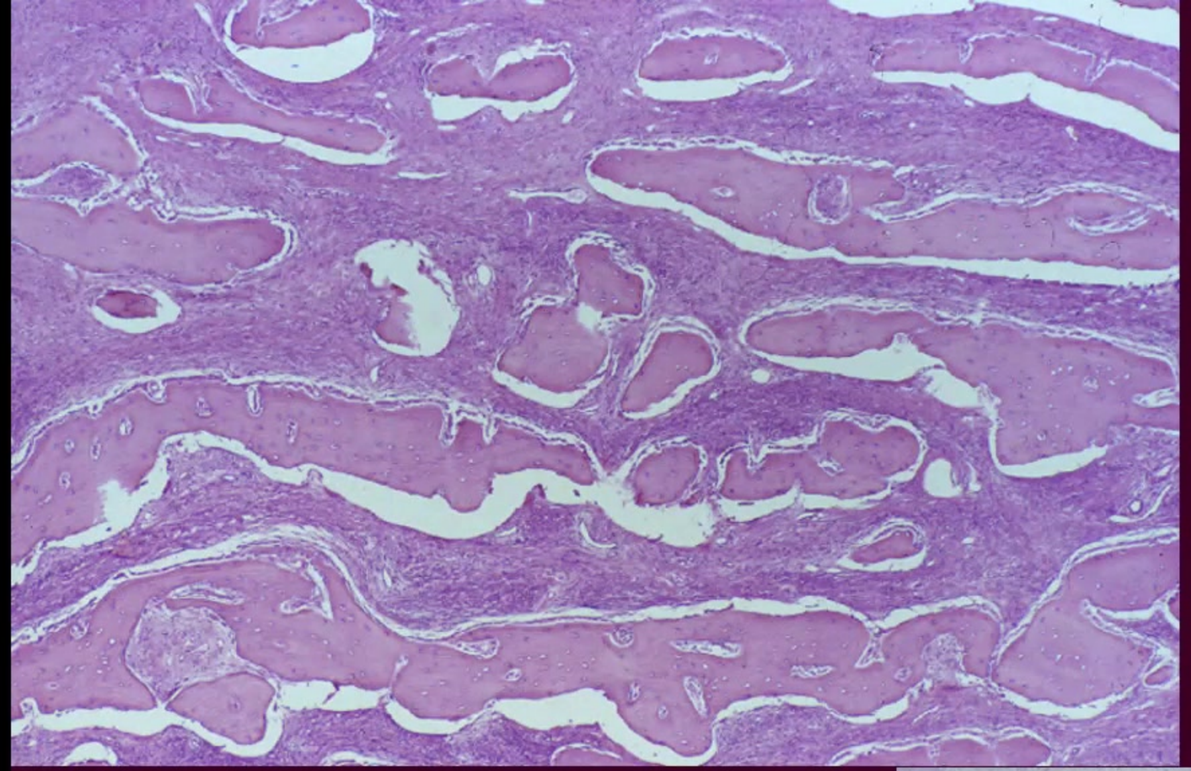
Cellular - growing





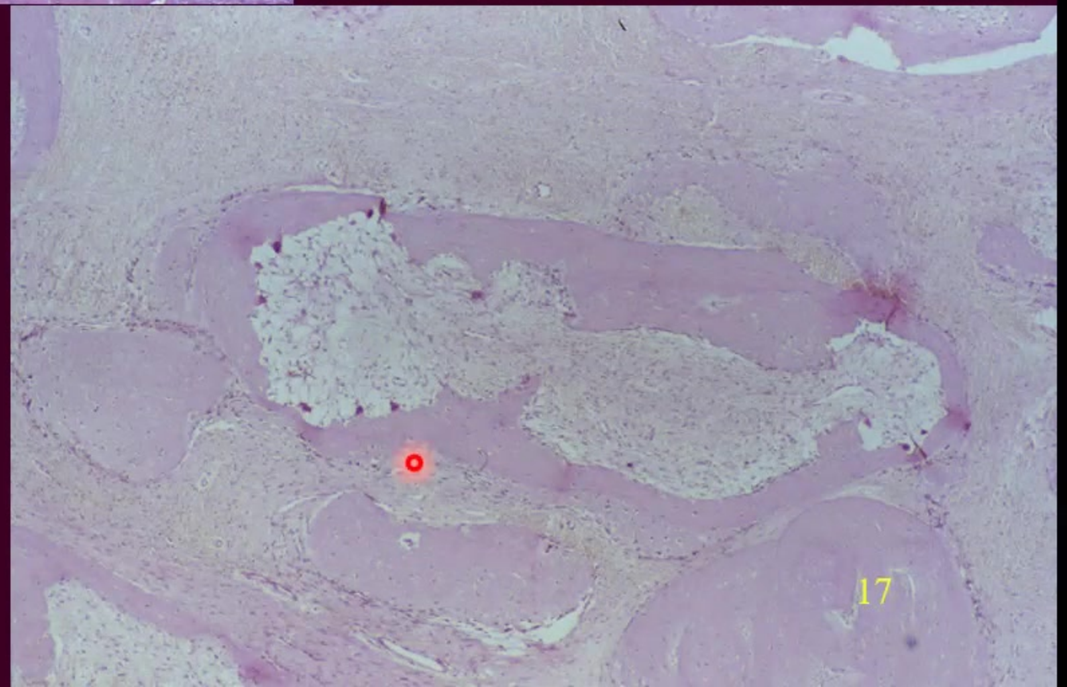
Late - still woven bone





Old fibrous dysplasia

Reactivated area



Fibrous Dysplasia - Complications

- Debilitating deformities
- Esthetic/psychosocial concerns
- Malocclusion
- Pathologic fractures
- Cranial nerve and orbital involvement
- Malignant degeneration:
  - rare (< 1%)
  - osteosarcoma
  - avoid radiation therapy

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Fibrous Dysplasia - Management:

- May not require treatment
- Conservative management
- Stabilizes with skeletal maturity
- Diffuse involvement precludes excision
- Cosmetic and functional deformity
- Surgical recontouring/decompression
- Regrowth (25-50% - younger patients)

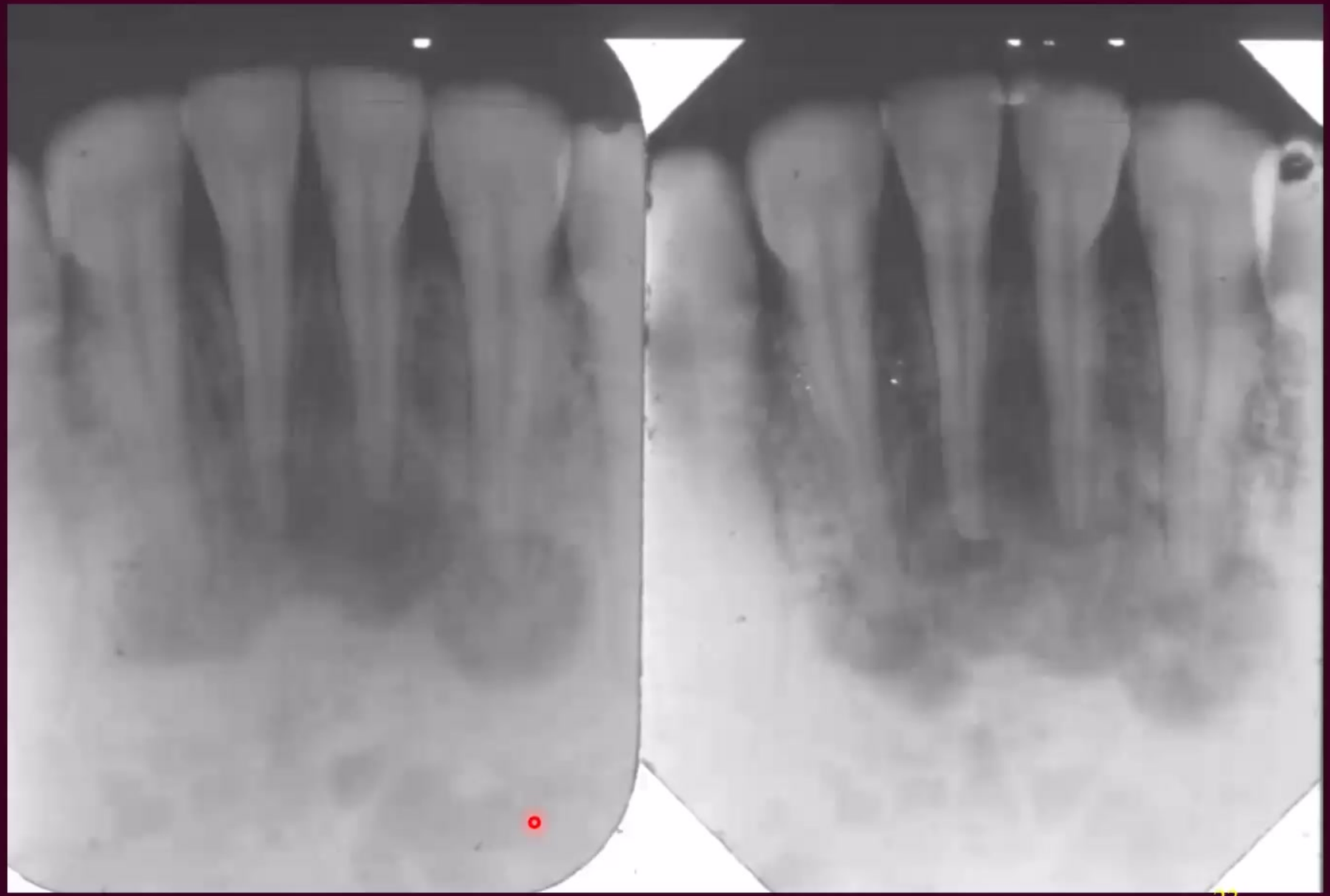
Periapical Cemento-Osseous Dysplasia

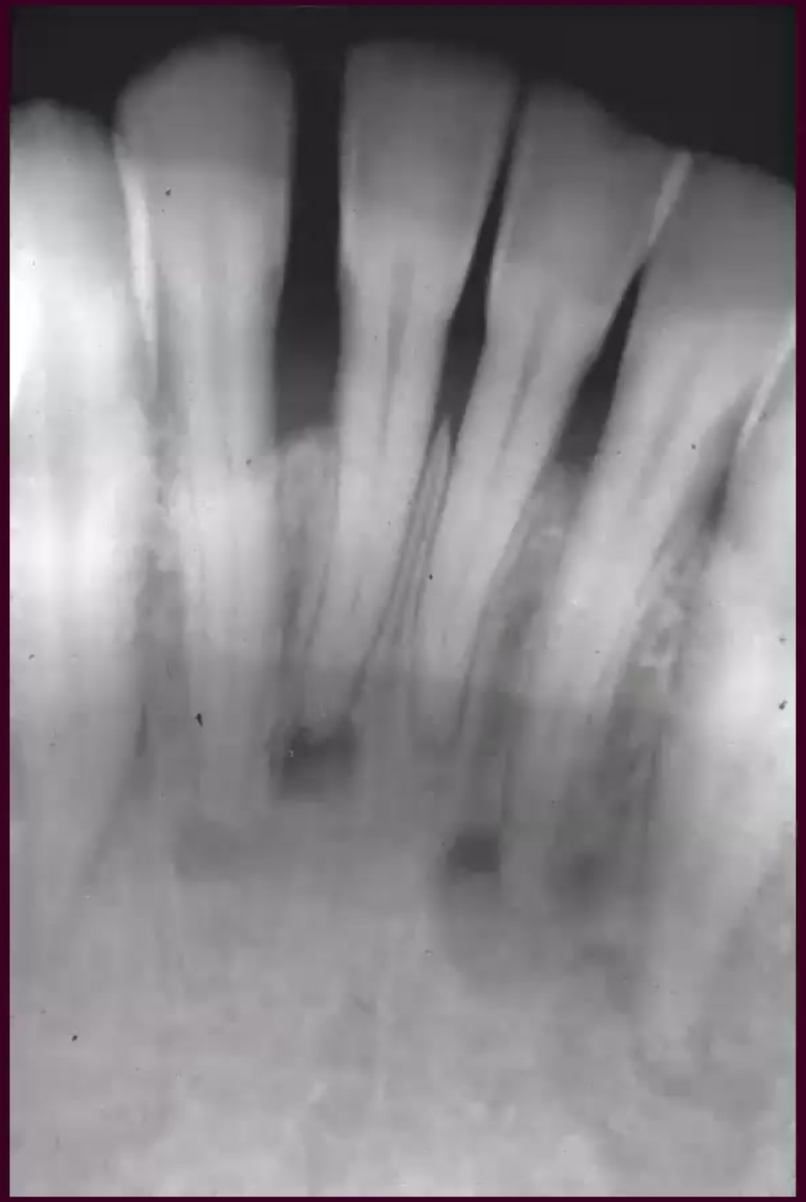
Periapical Cemento-Osseous Dysplasia
Clinical:

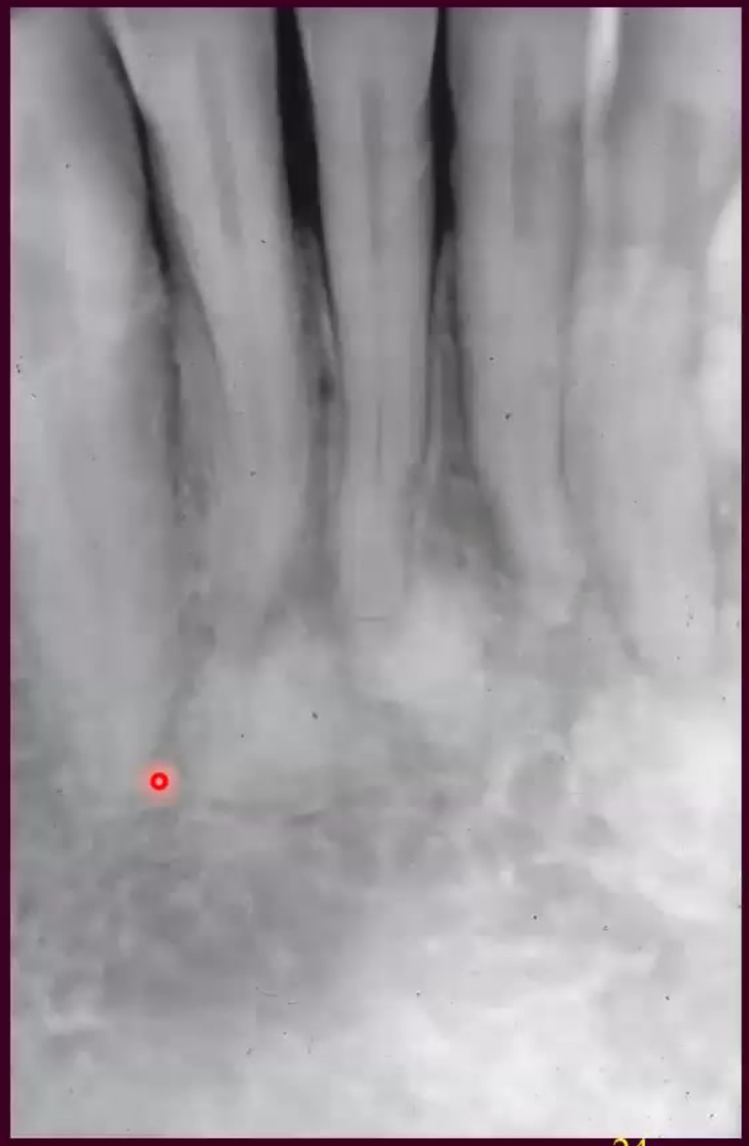
- Benign non-neoplastic dysplastic process
- Incidence: relatively common
- Age: middle age (30 – 50 years)
- Gender: female > male (14:1)
- Race: black
- Site: mandibular anterior – periapical area
- Asymptomatic, vital teeth, non-expansile

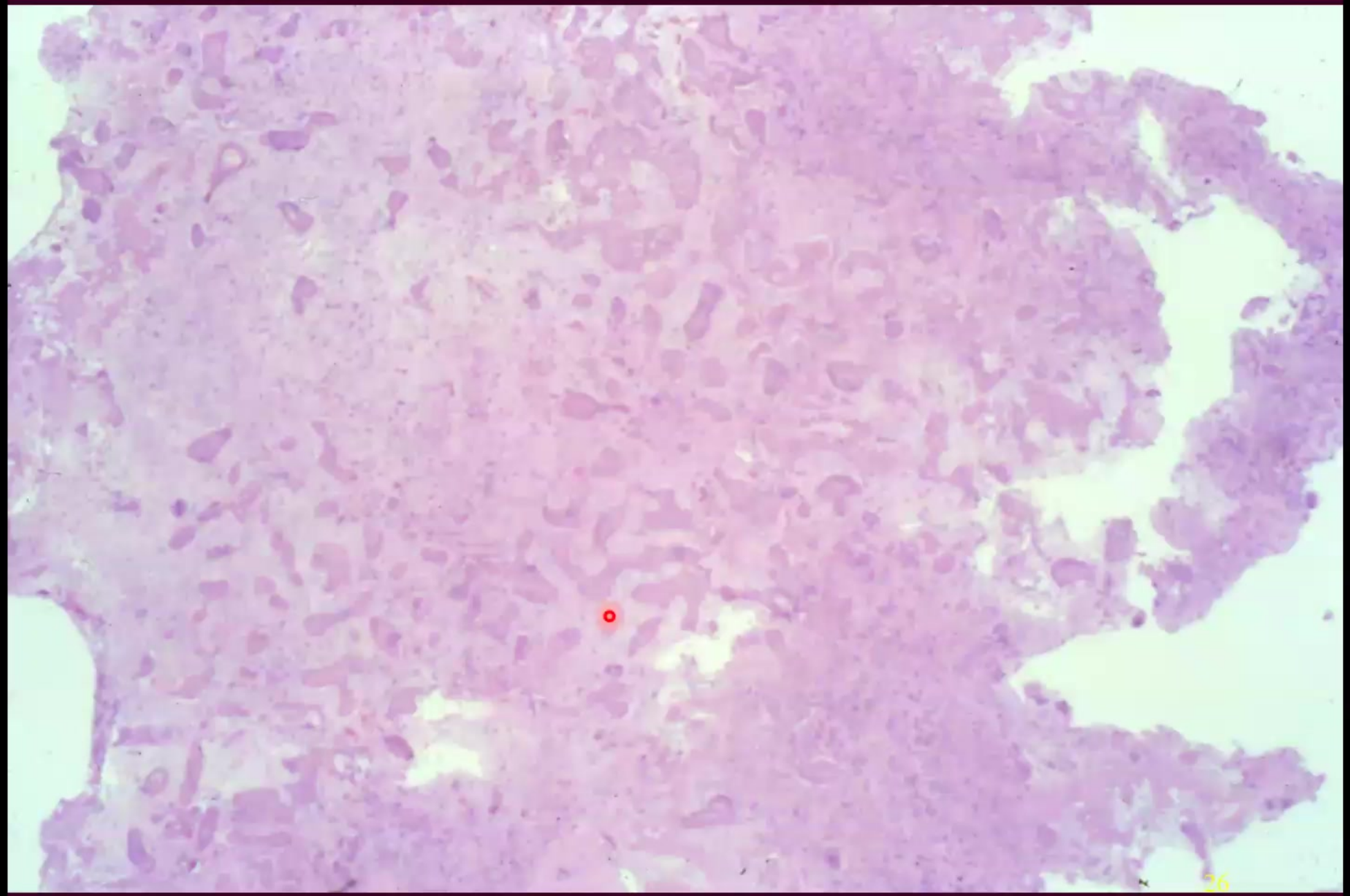
Periapical Cemento-Osseous Dysplasia Radiographic Findings:

- Multiple
- Circumscribed apical radiolucency
- Variable radiopacity - maturation
- Size: < 1.0 cm
- Non-expansile
- Vital teeth





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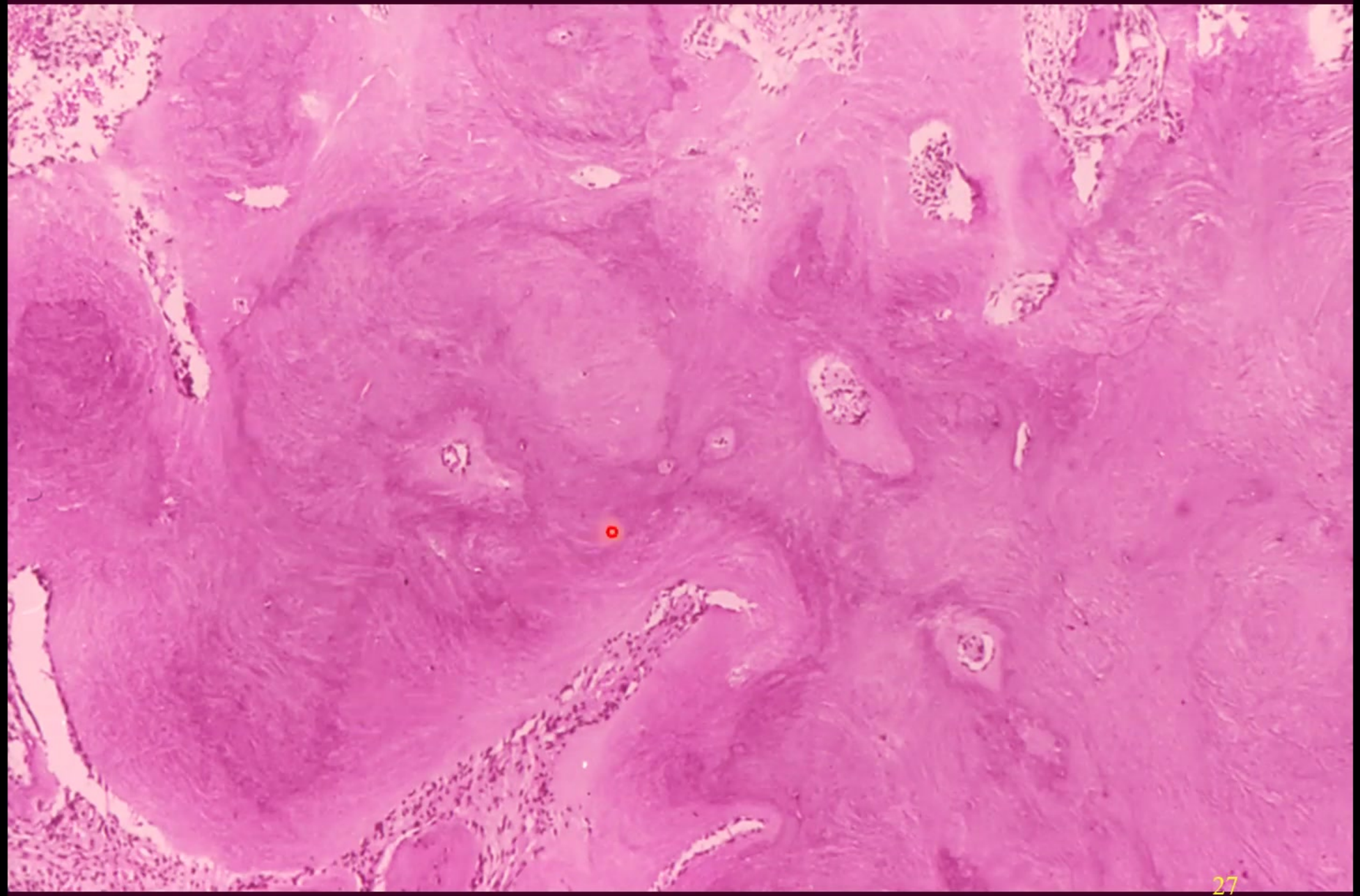


Periapical Cemento-Osseous Dysplasia Management:

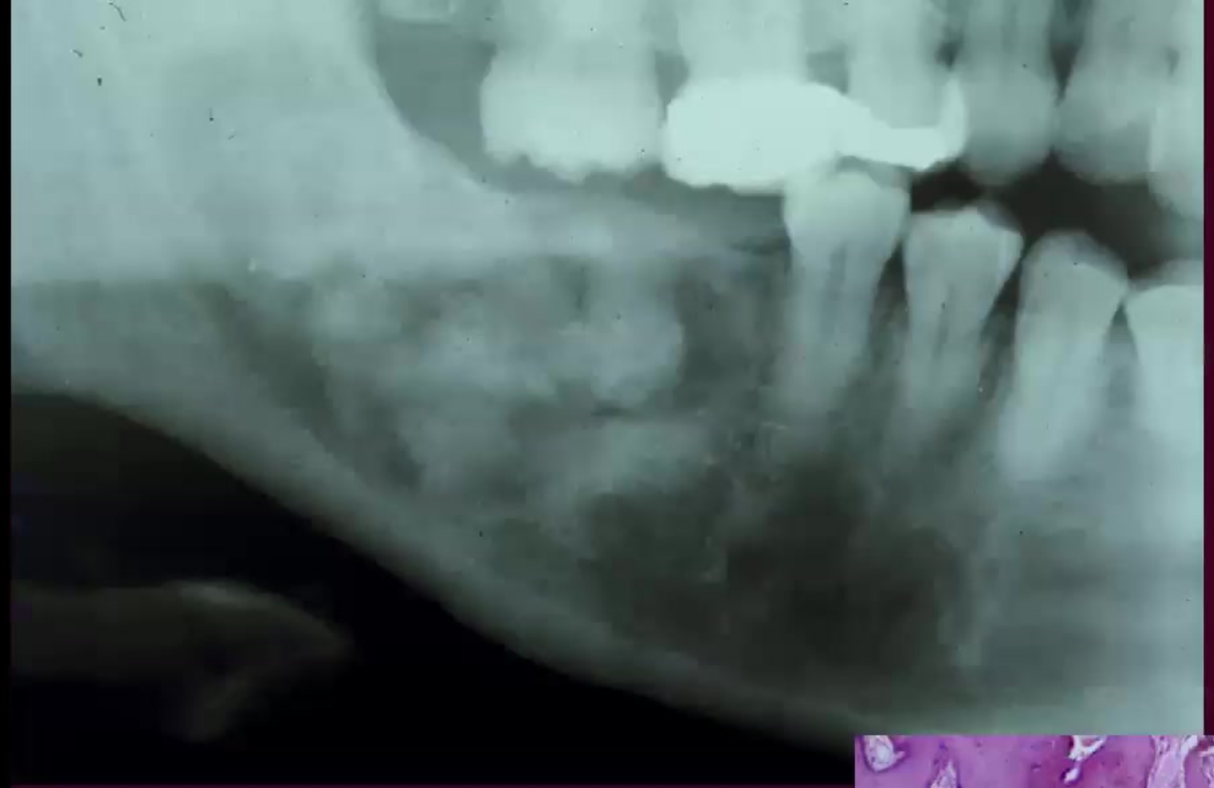
- Clinical – radiographic diagnosis
- Benign self limiting process
- No progressive growth
- No treatment required
- Prognosis: excellent
- Avoid unnecessary endodontic therapy, surgery or extractions

Focal Cemento-Osseous Dysplasia Clinical:

- Etiology: non-neoplastic – disordered growth of cementum and bone
- Incidence: most common benign fibro-osseous lesion
- Age: 4-5th decade
- Gender: female (80%)
- Race: caucasian

Focal Cemento-Osseous Dysplasia Clinical:

- Site: posterior mandible
- Asymptomatic
- Solitary
- Edentulous areas
- Size: < 1.5 cm
- Radiographic: mixed radiolucent – opaque, well defined or irregular borders



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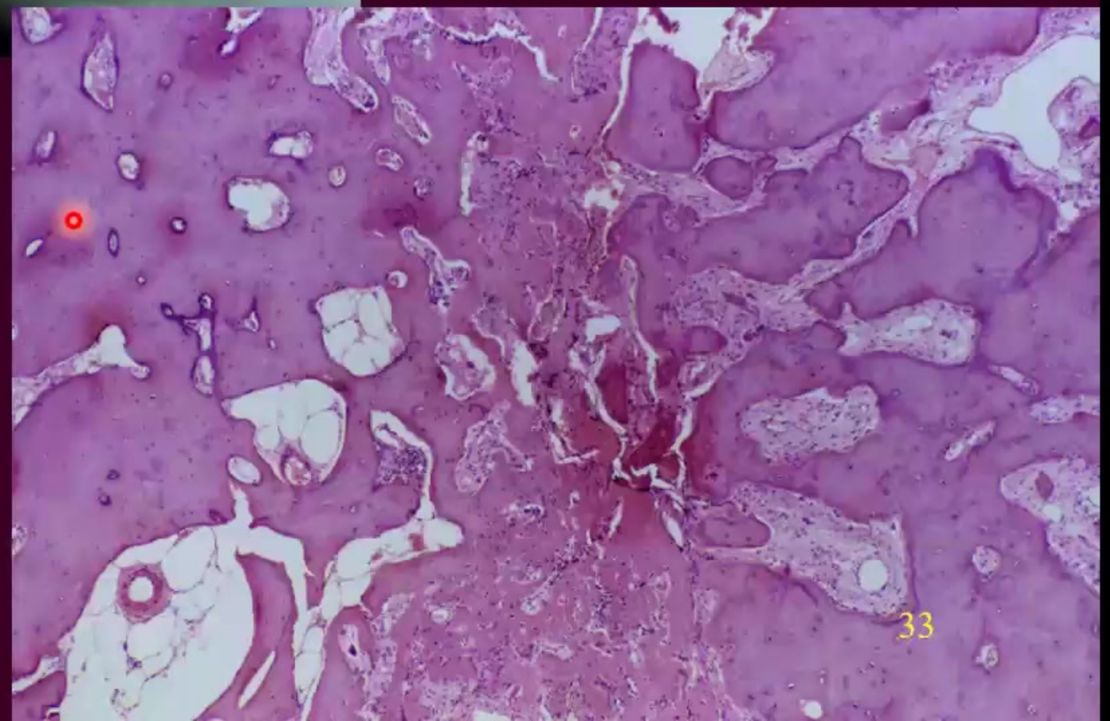
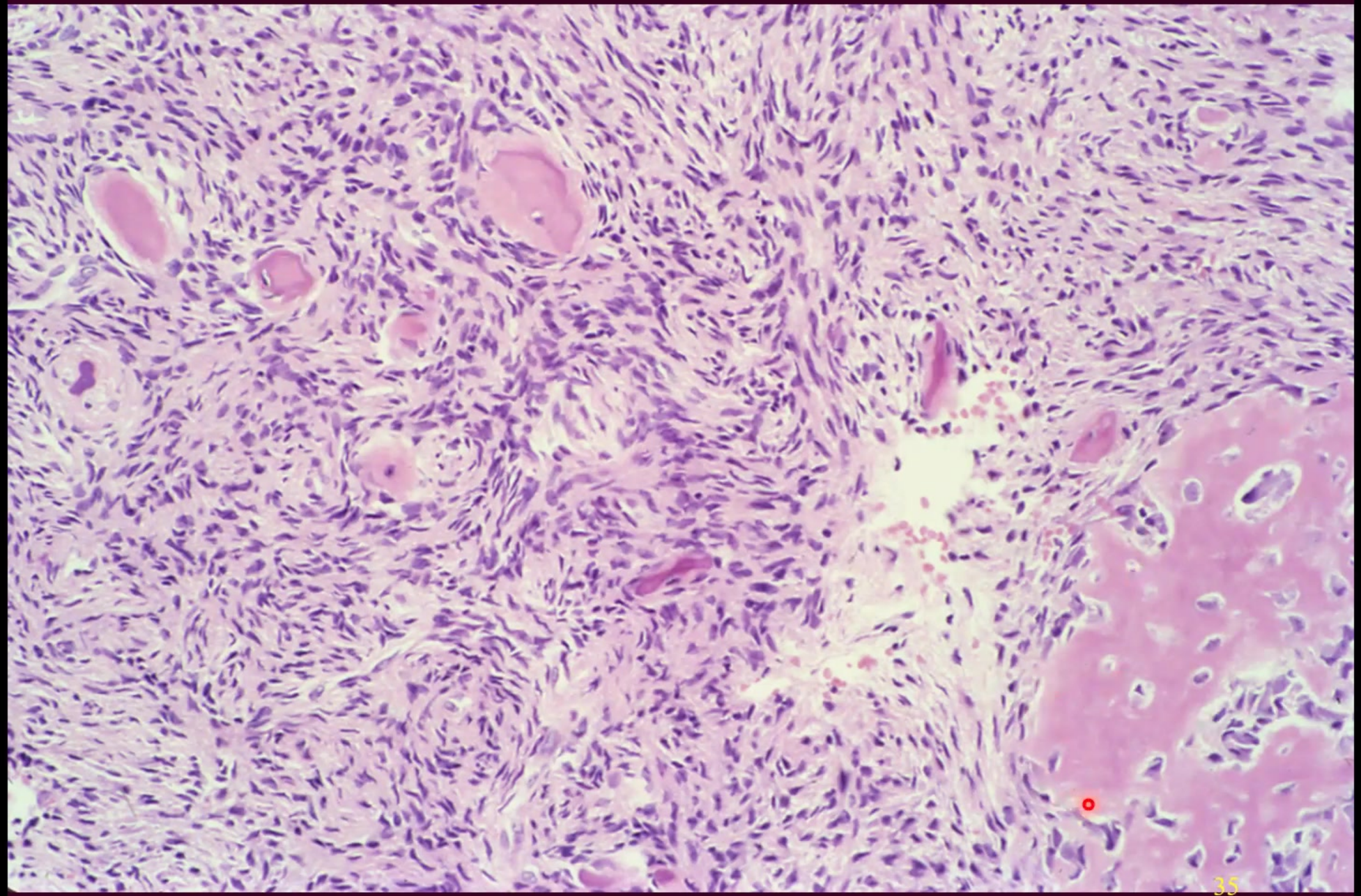


Focal Cemento-Osseous Dysplasia Histology:

- Benign fibro-osseous lesion
- Cellular spindled fibroblasts
- Collagen fibers
- Globular cementum matrix material
- Woven osseous matrix material
- Vascular channels



Focal Cemento-Osseous Dysplasia Treatment – Prognosis:

- Curettage – biopsy
- Prognosis: excellent
- Limited growth potential
- Periodic follow-up

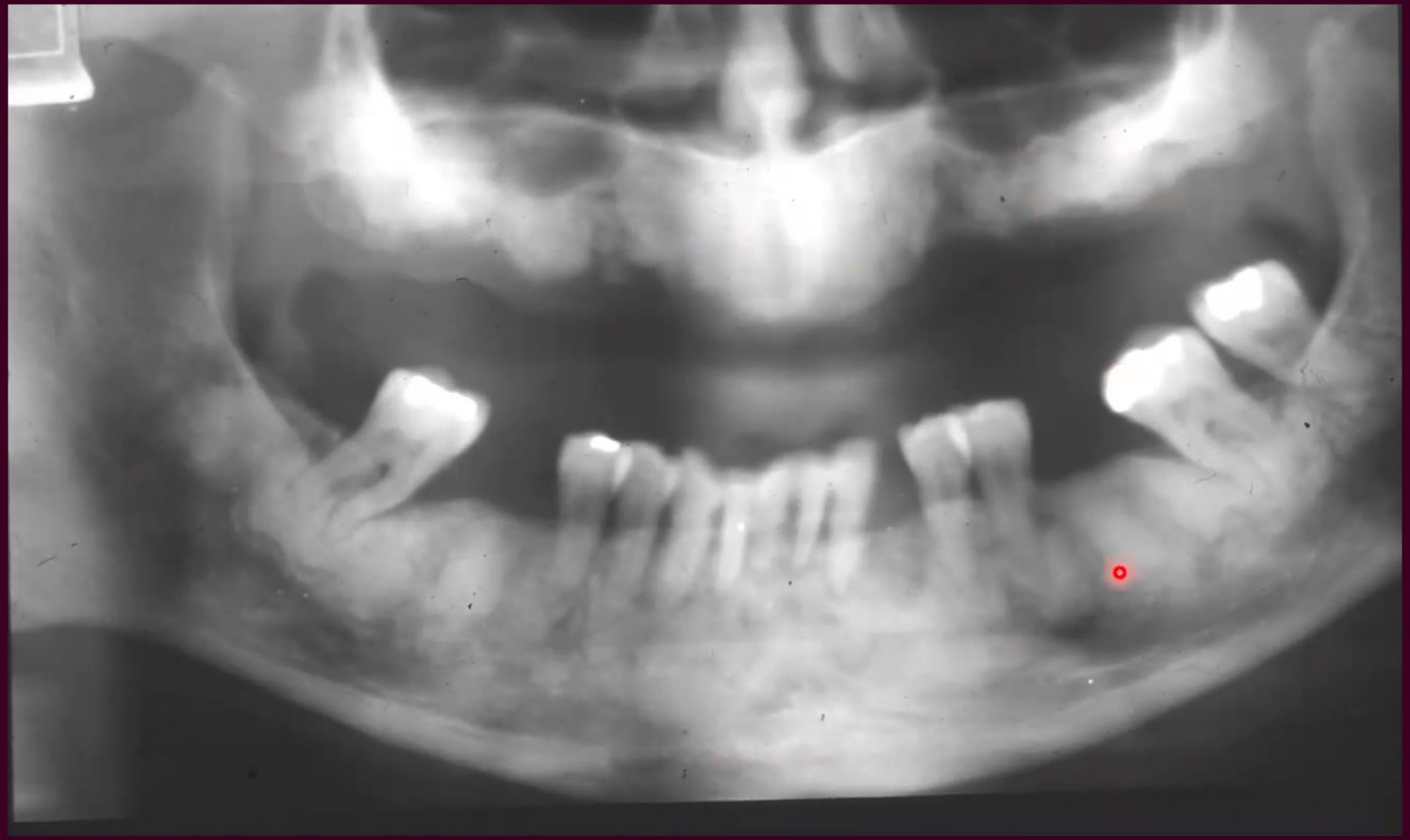
Florid Cemento-Osseous Dysplasia

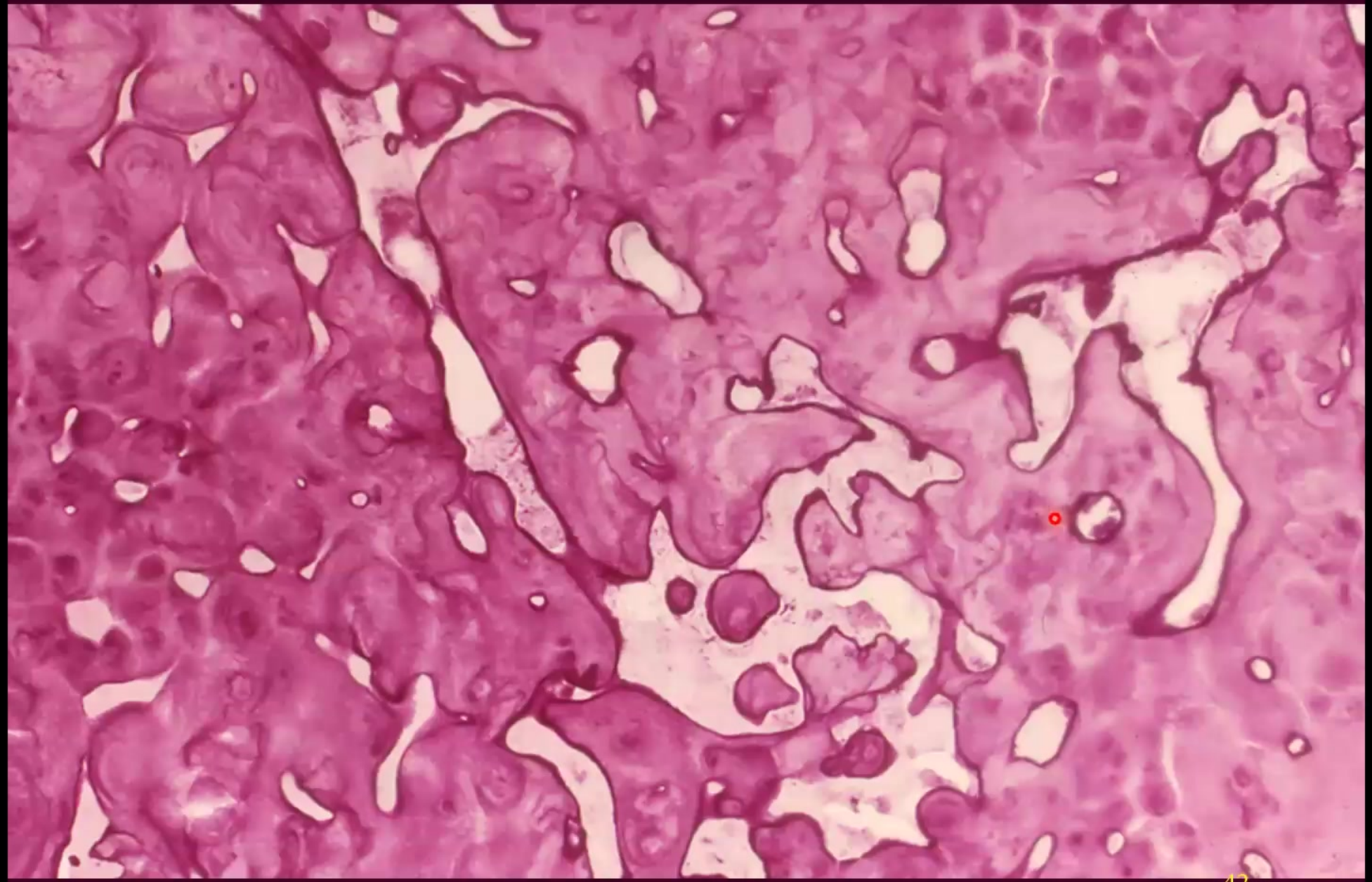
Florid Cemento-Osseous Dysplasia Clinical:

- Benign non-neoplastic dysplastic process
- Incidence: relatively rare
- Age: middle age adults
- Gender: female > male
- Race: black (90%)
- Site: diffuse involvement of jaws
- Asymptomatic, expansion, secondary infection

Florid Cemento-Osseous Dysplasia Radiographic Findings:

- Irregular lobular dense radiopacities
- Mixed radiolucent and radiopaque areas
- Diffuse involvement of maxilla and mandible
- Bilateral
- Symmetrical





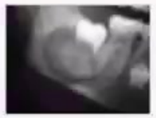
Management:

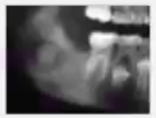
- Benign self-limiting process
- No treatment required
- Potential for significant complications
- Avoid exposure of calcific masses
- Maintenance of dentition
- Chronic osteomyelitis
  – pain, fistulae, dehiscence, sequestration
- Traumatic bone cysts

Benign cementoblastoma

Benign cementoblastoma

Figures and tables



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Case report

An Unusual Recurrent Cementoblastoma Associated With a Developing Lower Second Molar Tooth: A Case Report

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Cementoblastoma is a benign ectomesenchymal odontogenic neoplasm that forms a mass of cementum or cementum-like tissue continuous with the tooth root, usually a mandibular premolar or first molar.[1] It has been considered analogous to osteoblastoma and can be very destructive of tissue.[2] This lesion clinically presents as a tender, sometimes painful swelling at the buccal and lingual/palatal aspect of the alveolus.[1] It generally affects persons under age 30 years and has a higher prevalence in males (1.2:1). Radiographically, it appears as a radiopaque mass with a thin radiolucent rim attached to the roots of a tooth. The mass may be rounded or irregular in shape and mottled in texture.[3] Several cases of tooth resorption, loss of root outline, and obliteration of the periodontal ligament space have been reported.[1] Histologically, the lesion is composed predominantly of sheets or trabeculae of cementum-like calcified tissue with variably prominent reversal lines, sometimes with a pagetoid appearance.[1] Cells including cementoblasts and cementoclasts are enclosed within the hard tissue or around the periphery of the trabeculae.

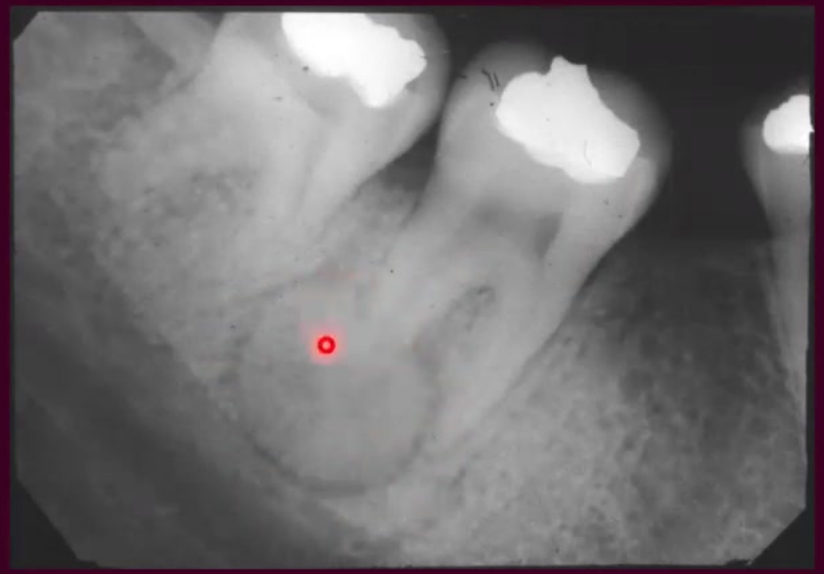
Cementoblastoma was previously thought to be an innocuous entity, because available data were limited to case reports with little follow-up. Thus, it is usually managed by conservative surgical enucleation. This case report describes the clinical and histopathologic features of an unusual, rapidly growing, recurrent cementoblastoma.

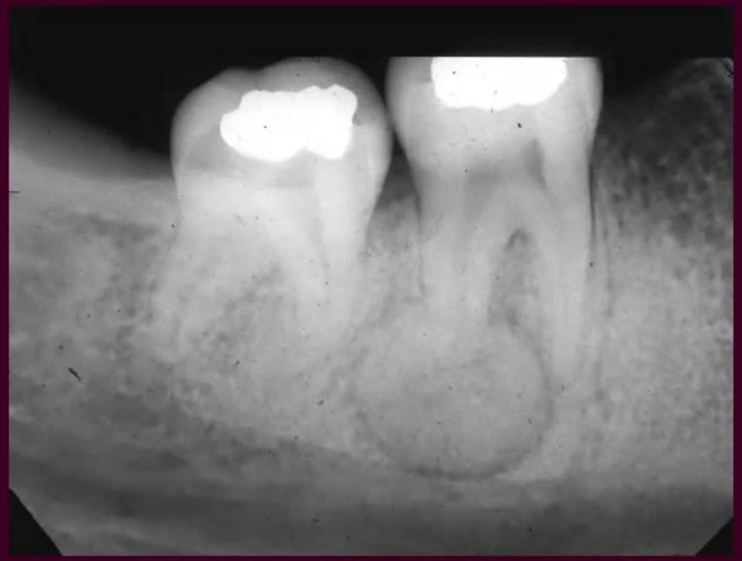
Cementoblastoma- Clinical

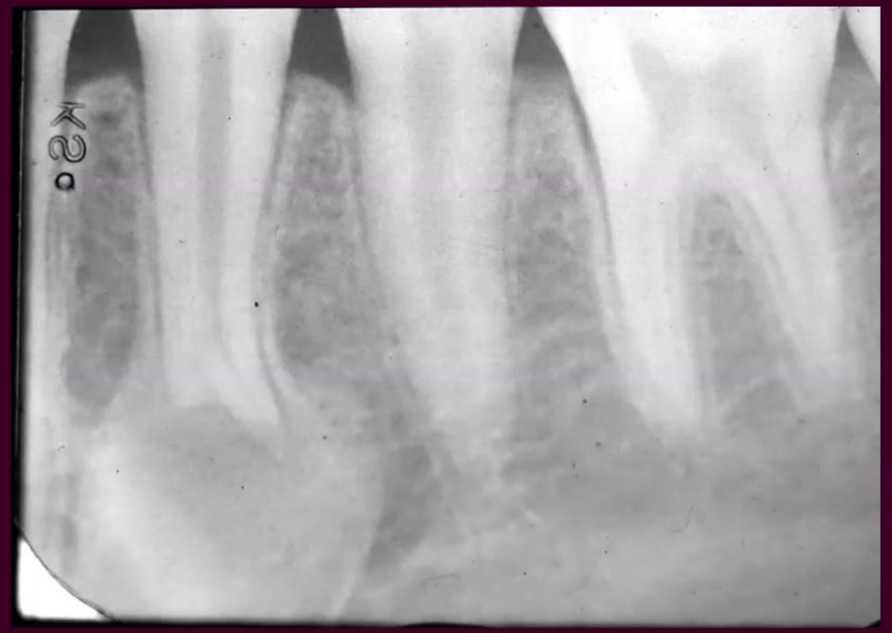
- tender, sometimes painful swelling
- the buccal and lingual/palatal aspect of the alveolus
- under age 30 years
- prevalence in males (1.2:1)
- Mandible (80%) 1st molar

Cementoblastoma- Radiological

- radiopaque mass with a thin radiolucent rim attached to the roots of a tooth
- tooth resorption, loss of root outline, and obliteration of the periodontal ligament space



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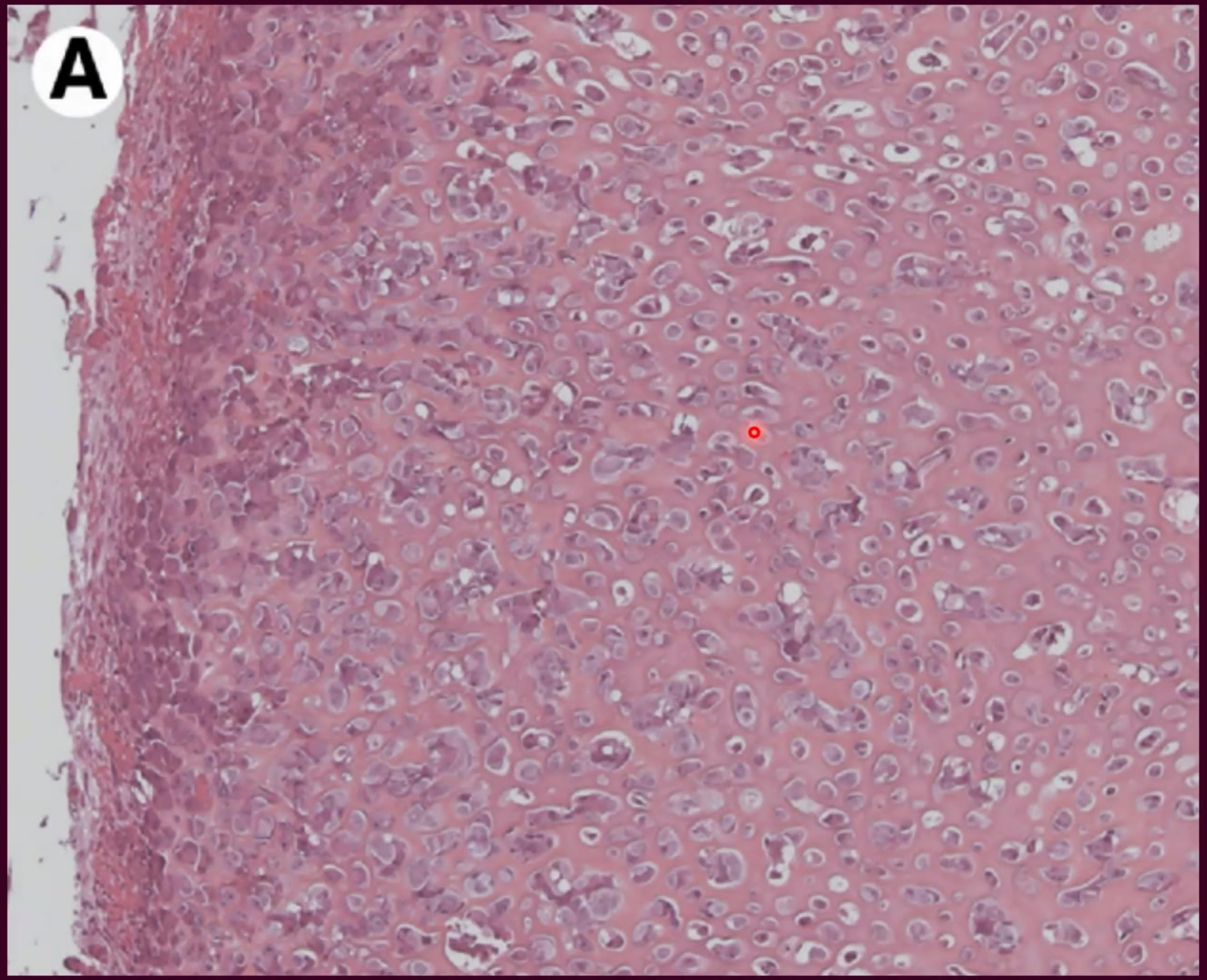
Cementoblastoma- Histological

- sheets or trabeculae of cementum-like calcified tissue with variably prominent reversal lines, sometimes with a pagetoid appearance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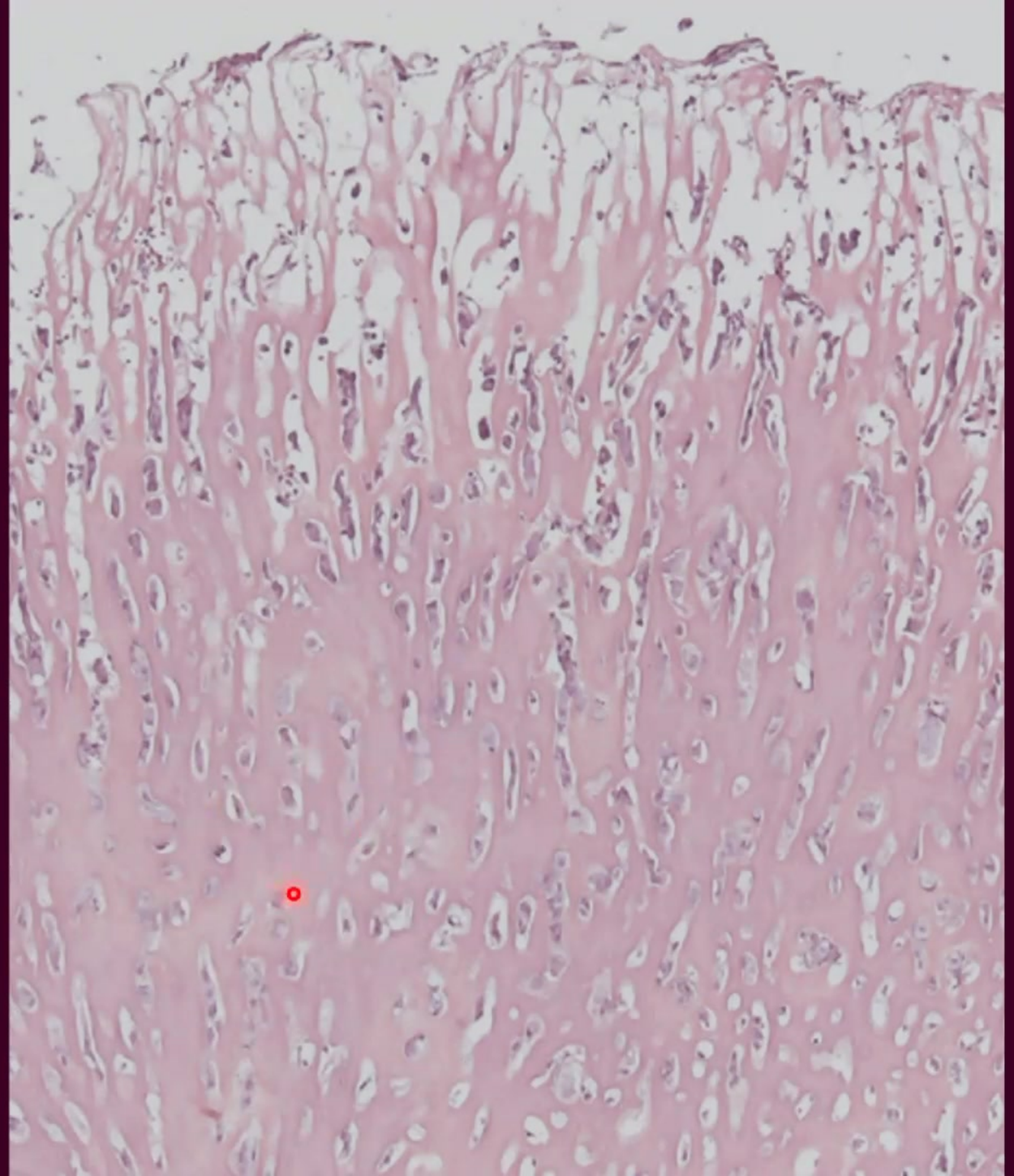


Cementoblastoma-treatment

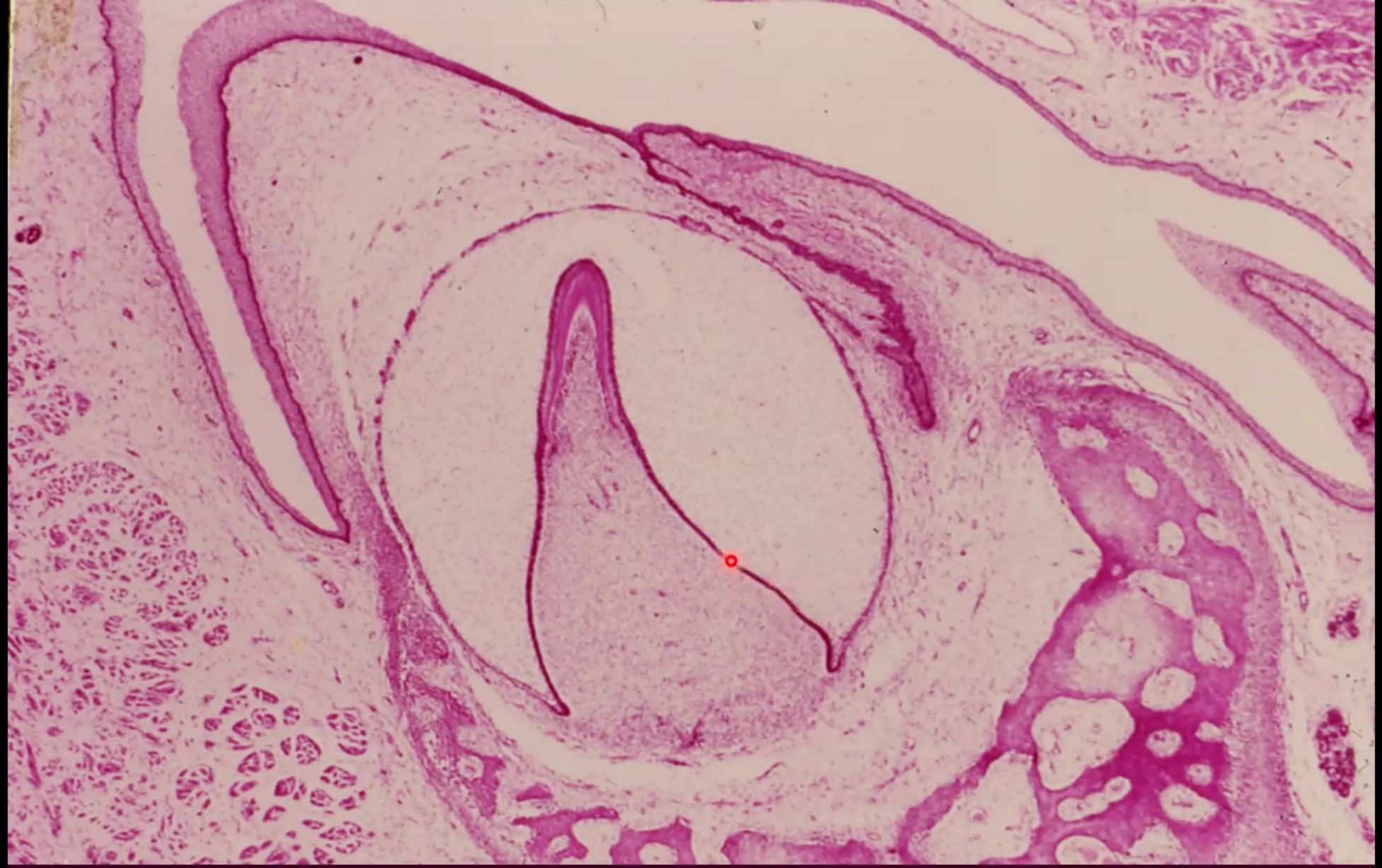
- Surgery
- Recurrence 35-60%

Classification of Benign Odontogenic Tumours

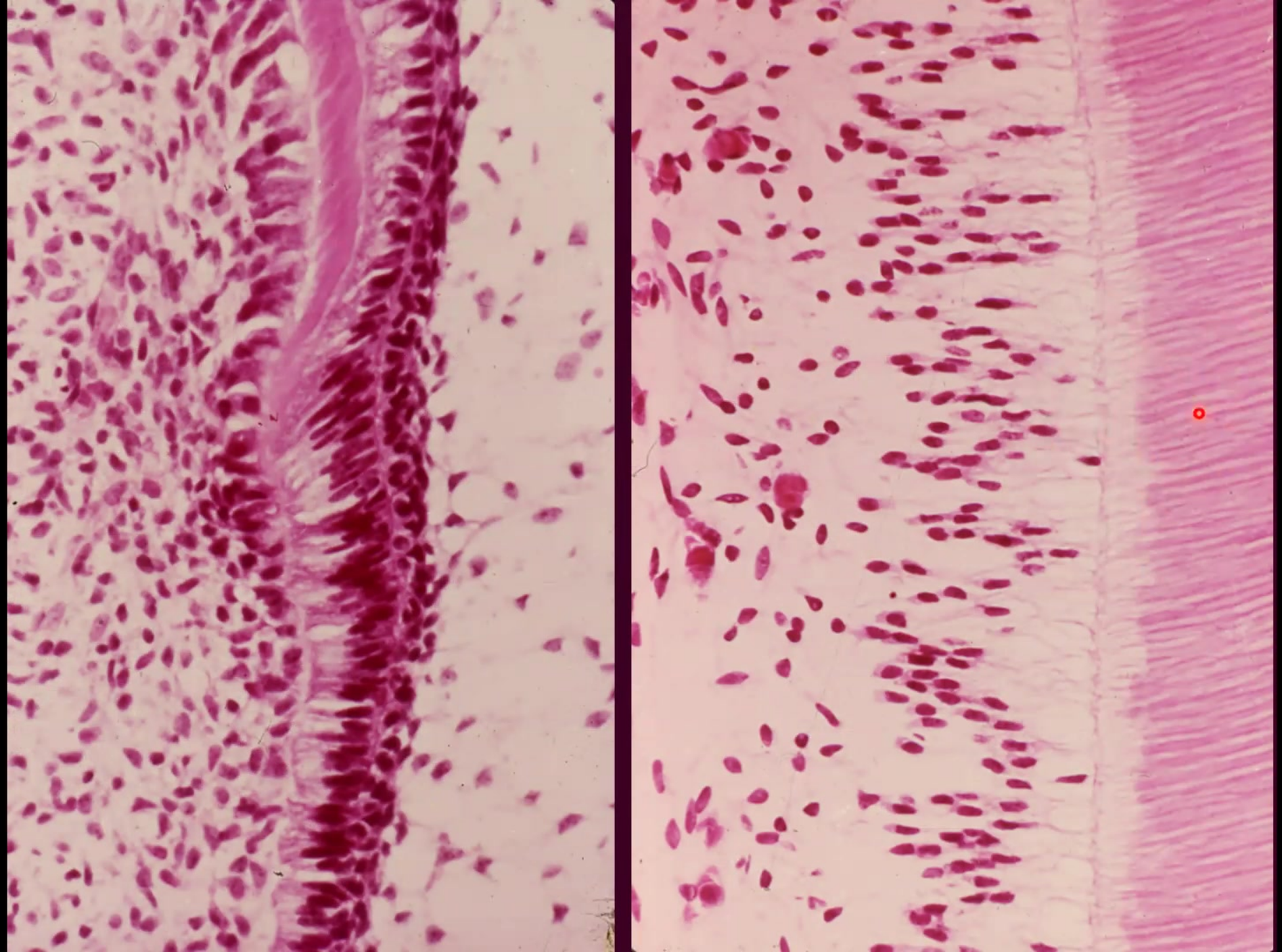
1. Odontogenic epithelium without odontogenic ectomesenchyme

2. Odontogenic epithelium with odontogenic ectomesenchyme, with or without dental hard tissue formation

3. Odontogenic ectomesenchyme with or without included odontogenic epithelium



Layers of the enamel organ



1. Odontogenic epithelium without odontogenic ectomesenchyme

- Ameloblastoma
- Squamous odontogenic tumour
- Calcifying epithelial odontogenic tumour (Pindborg Tumour)

2. Odontogenic epithelium with odontogenic ectomesenchyme with or without dental hard tissue

- Ameloblastic fibroma
- Ameloblastic fibro-dentinoma
- Ameloblastic fibro-odontome
- Adenomatoid odontogenic tumour
- Calcifying odontogenic cyst
- Complex odontome
- Compound odontome

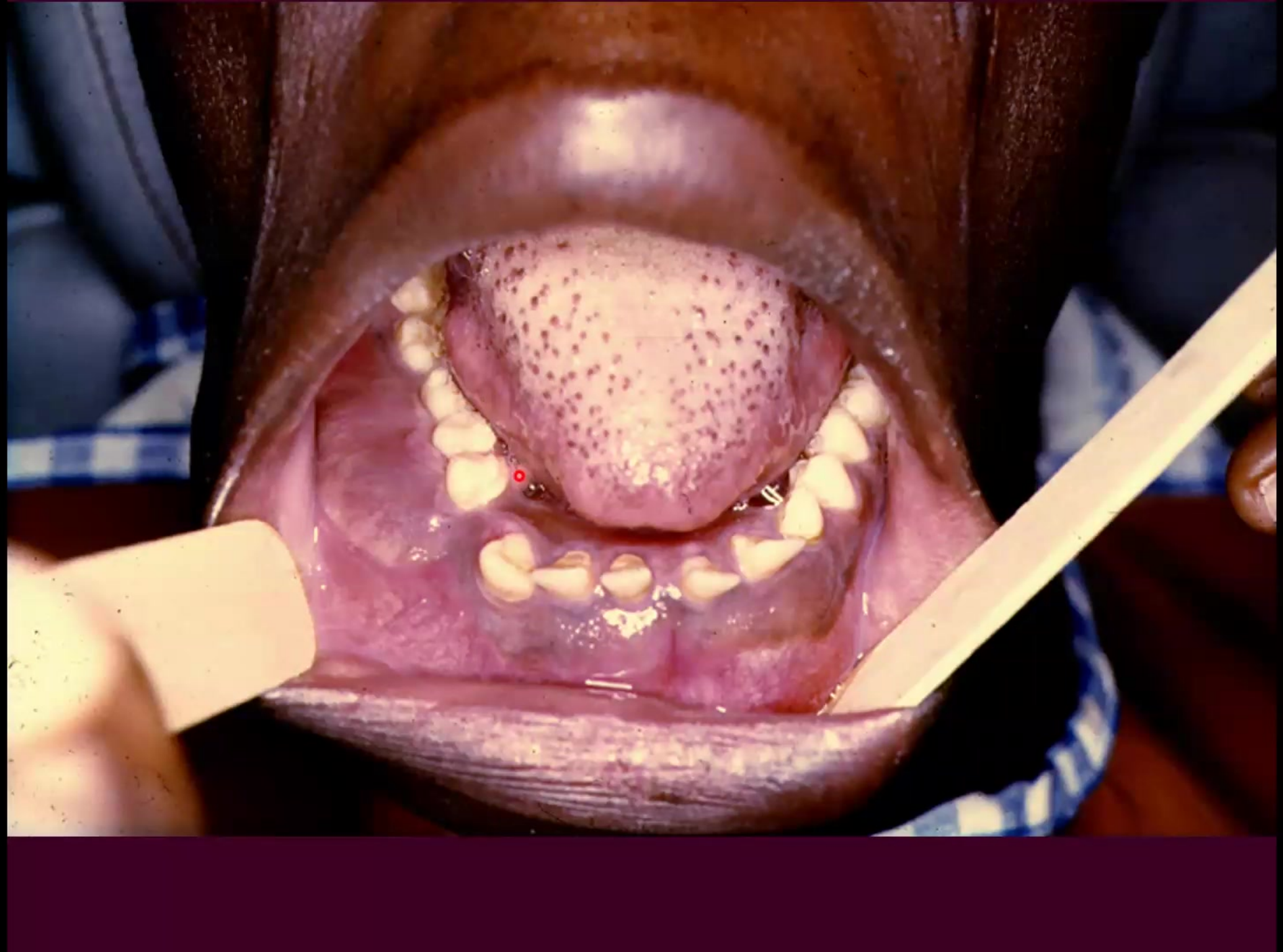
3. Odontogenic ectomesenchyme with or without included odontogenic epithelium

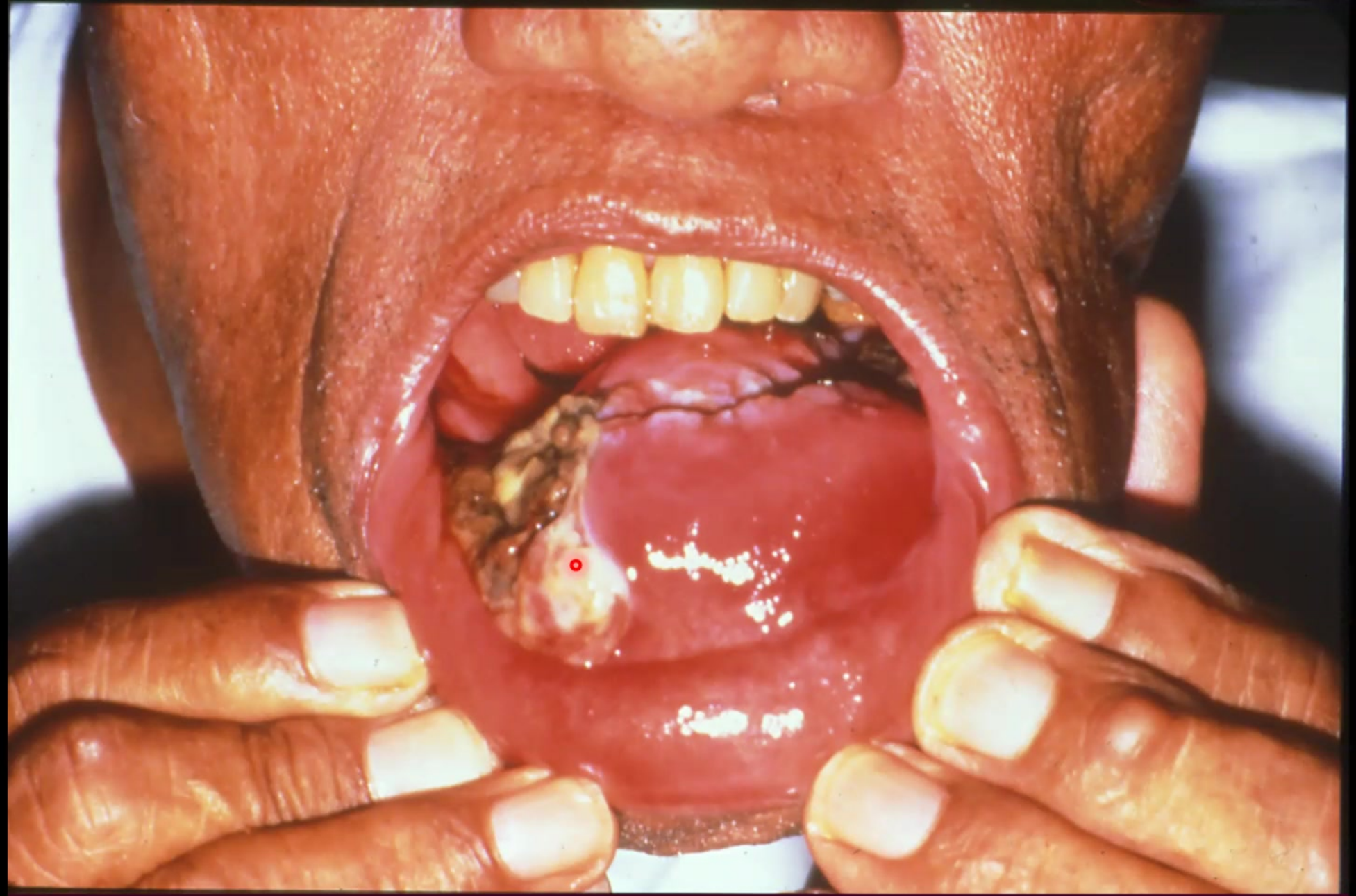
- Odontogenic fibroma
- Myxoma [myxofibroma]
- Benign cementoblastoma ('true' cementoma)

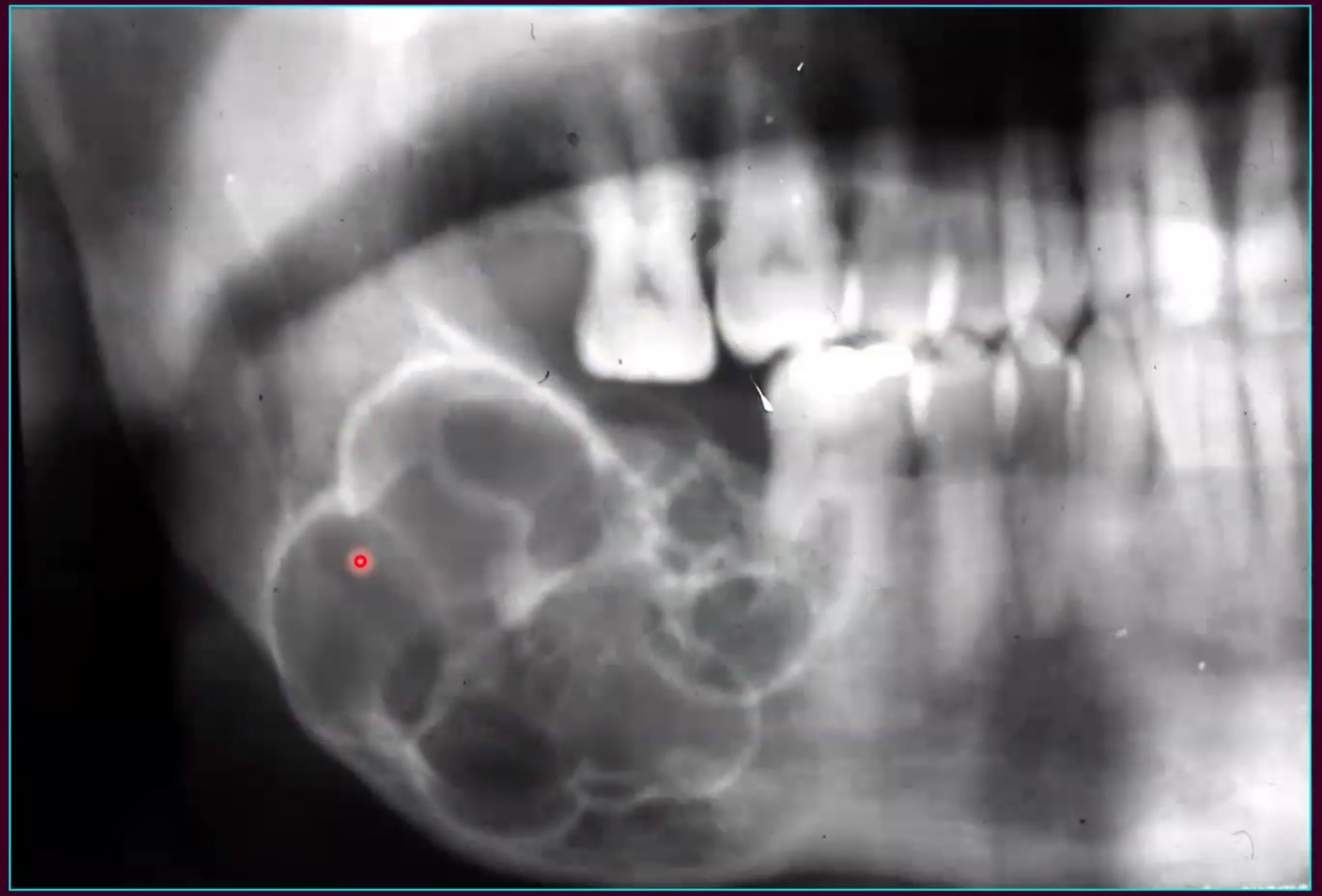
Malignant Odontogenic Tumours

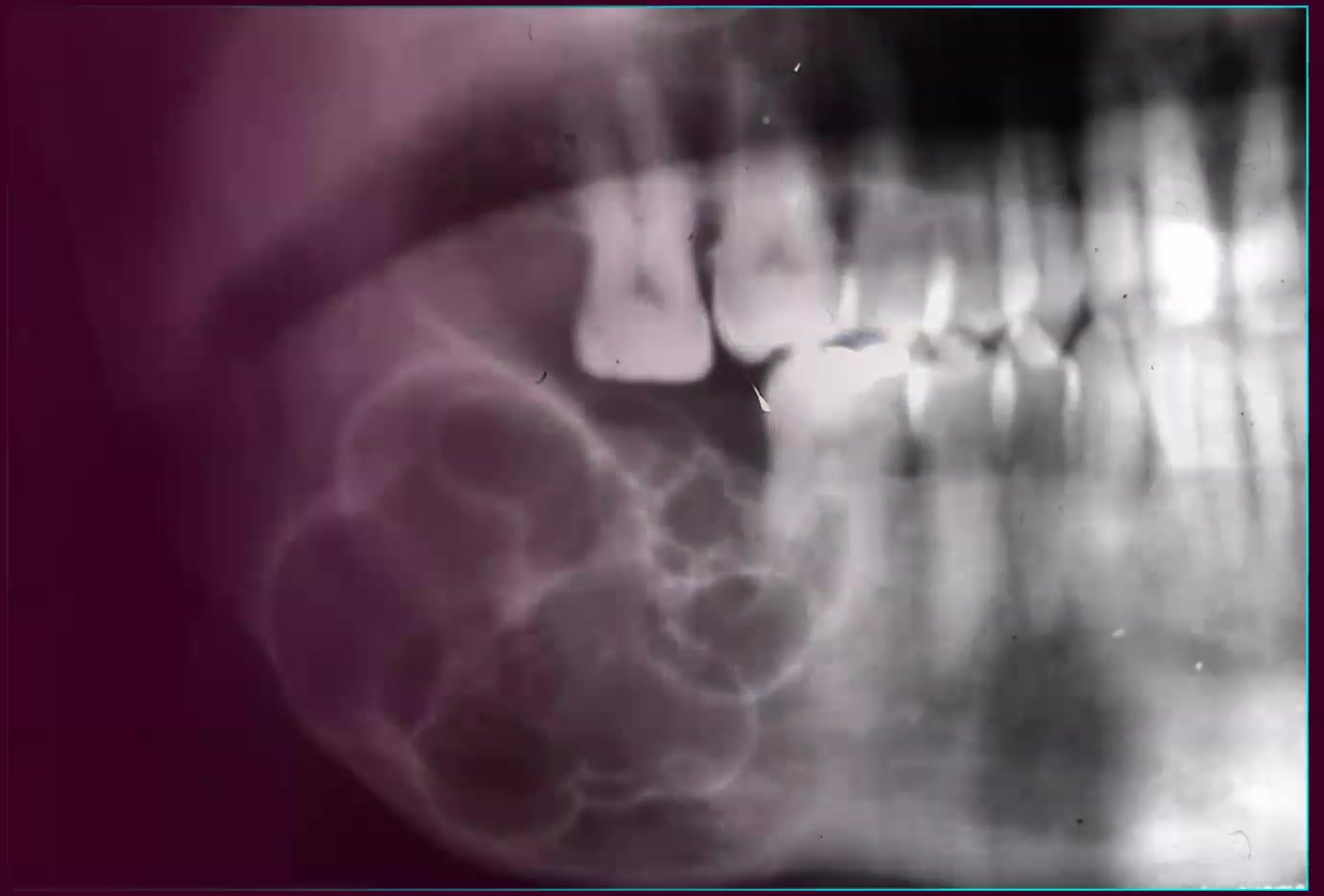
- 1. Clear cell odontogenic carcinoma
- 2. Malignant ameloblastoma
- 3. Primary intra-osseous carcinoma
- 4. Malignant variants of other odontogenic epithelial tumours
- 5. Malignant changes in odontogenic cysts

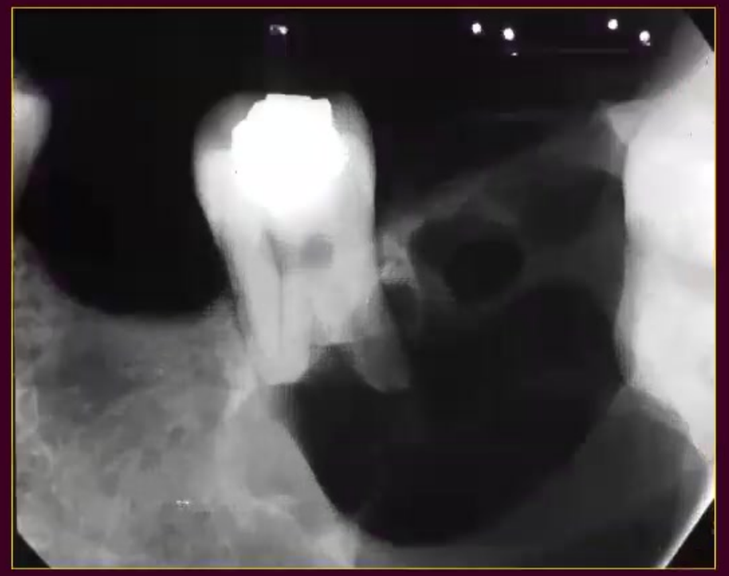
Ameloblastoma

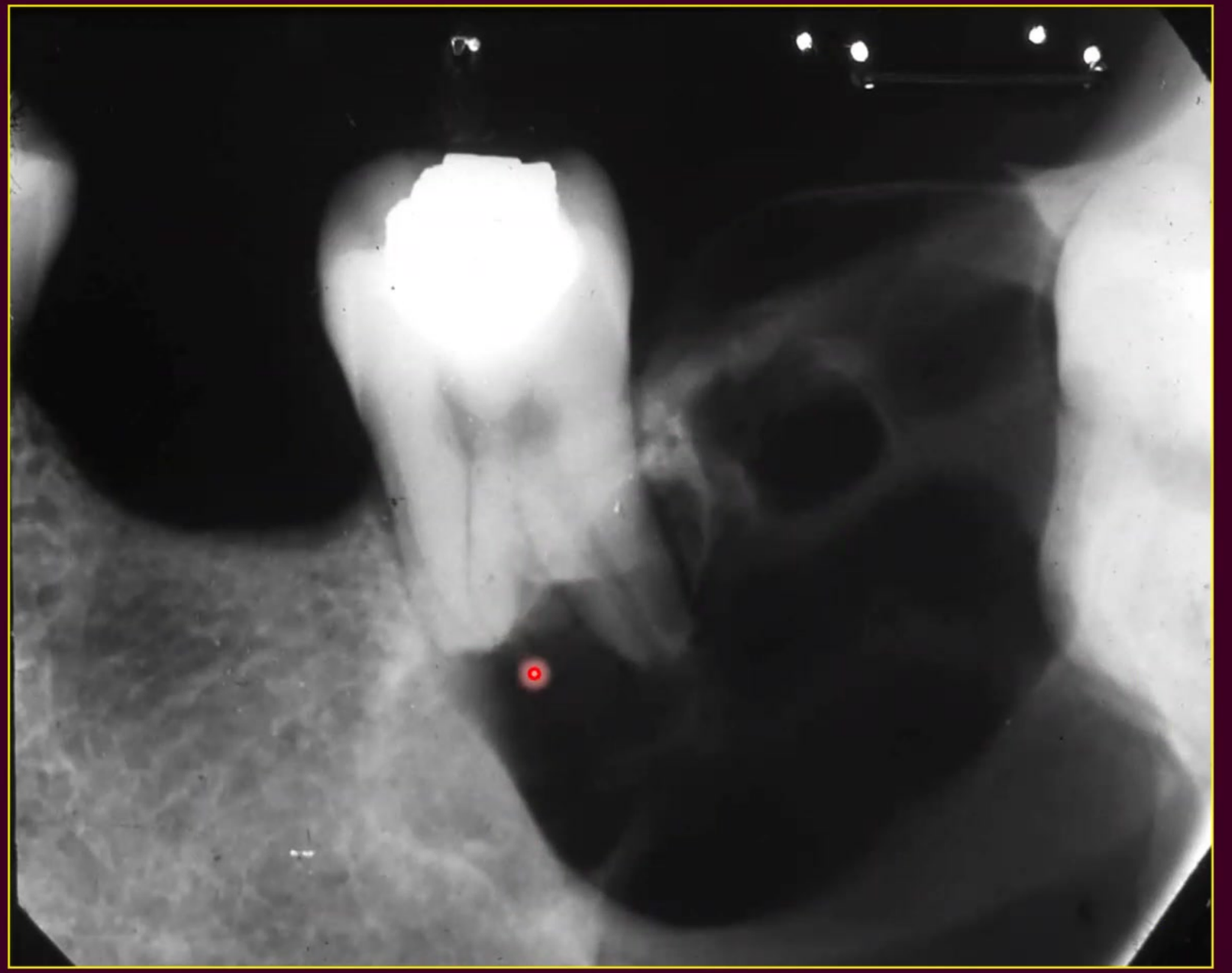


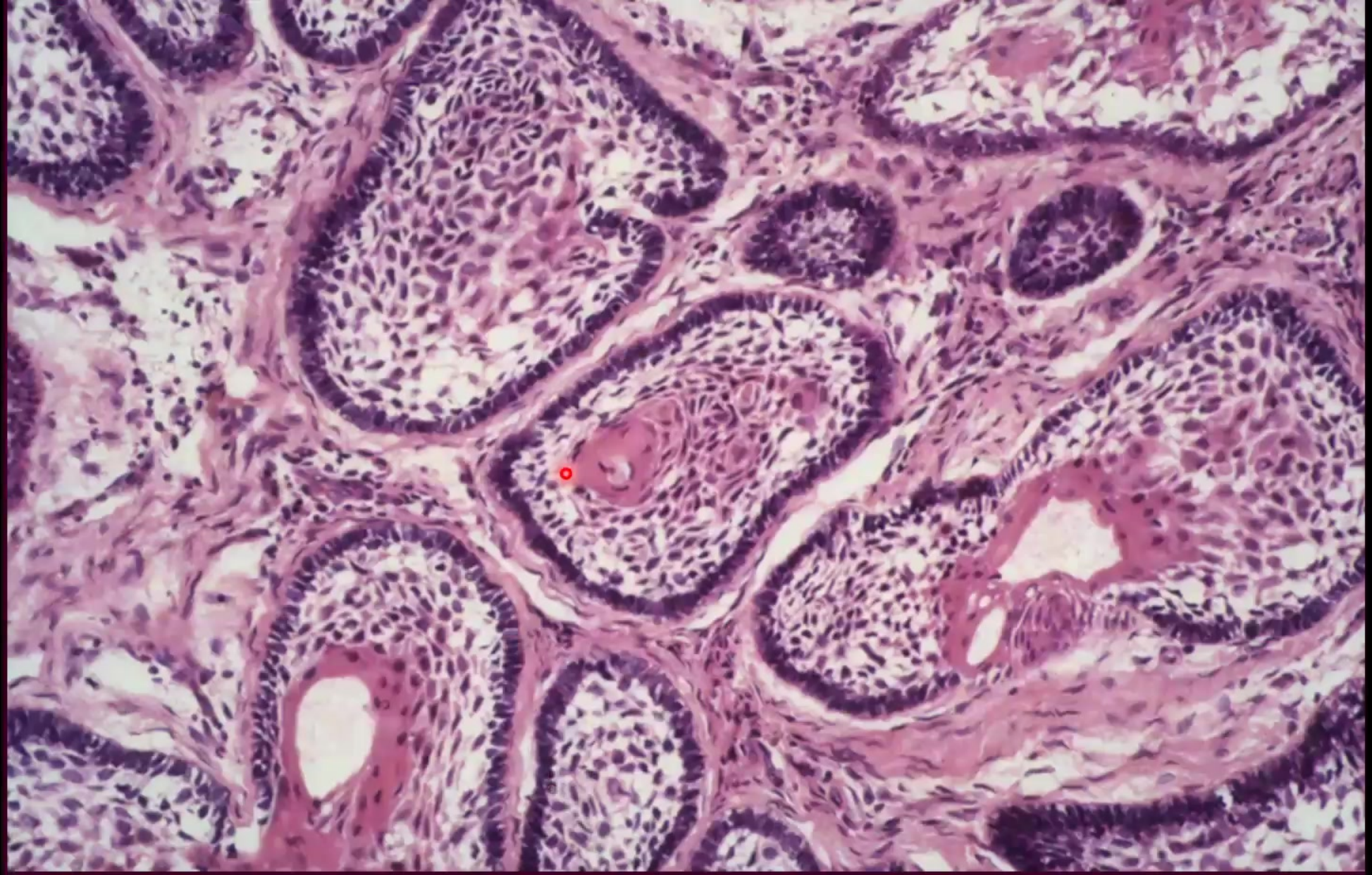




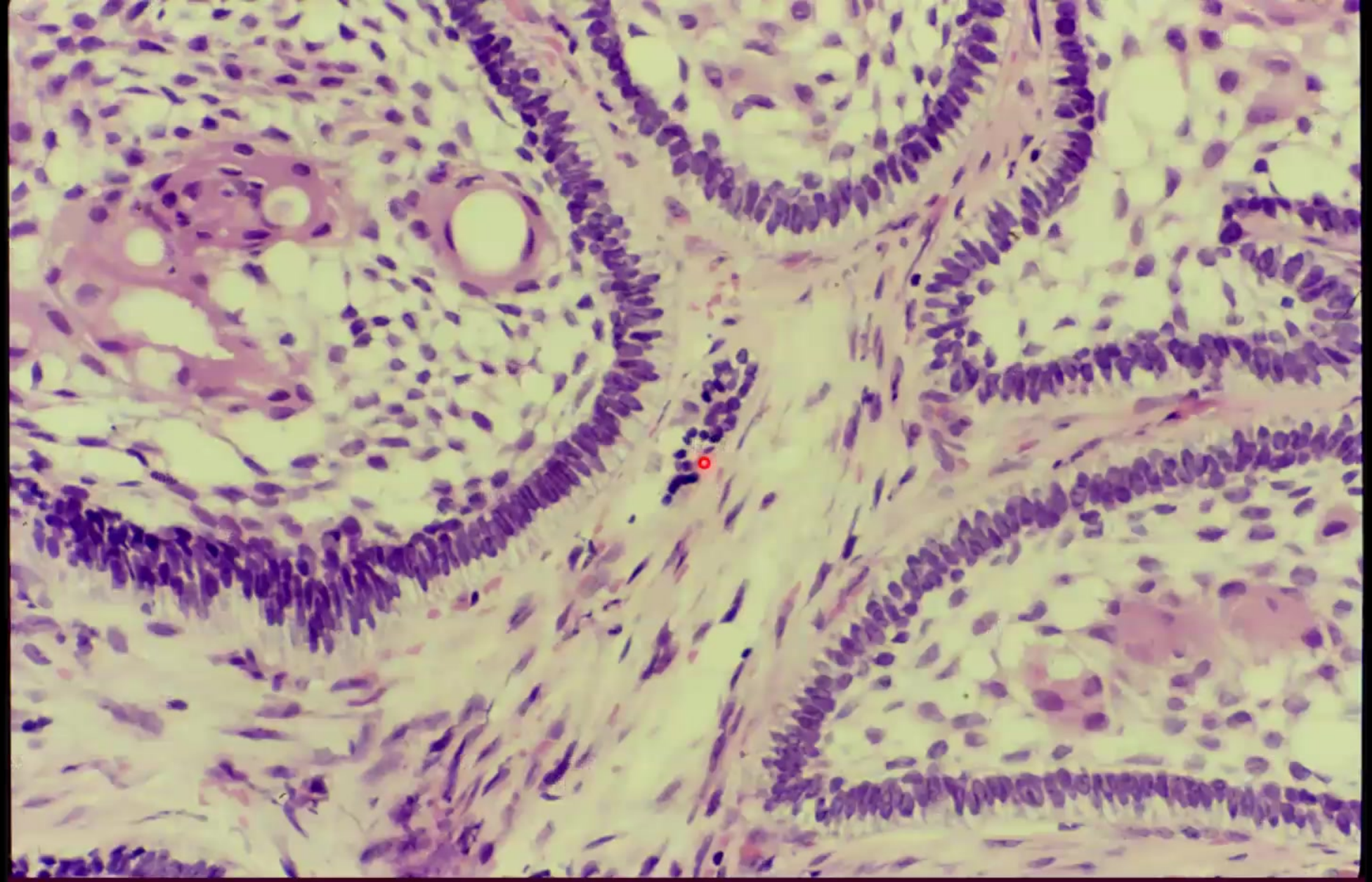


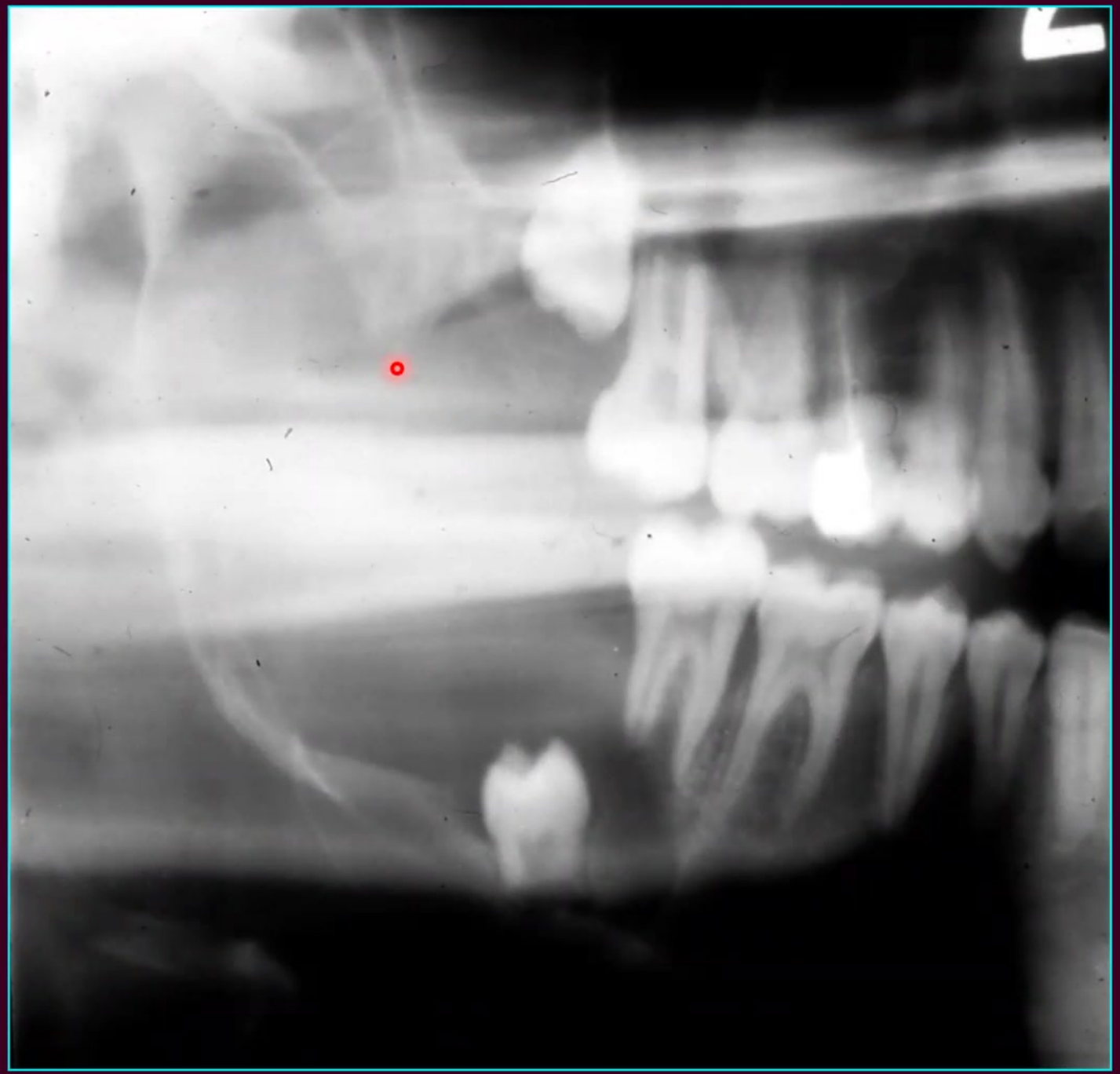






Ameloblastoma





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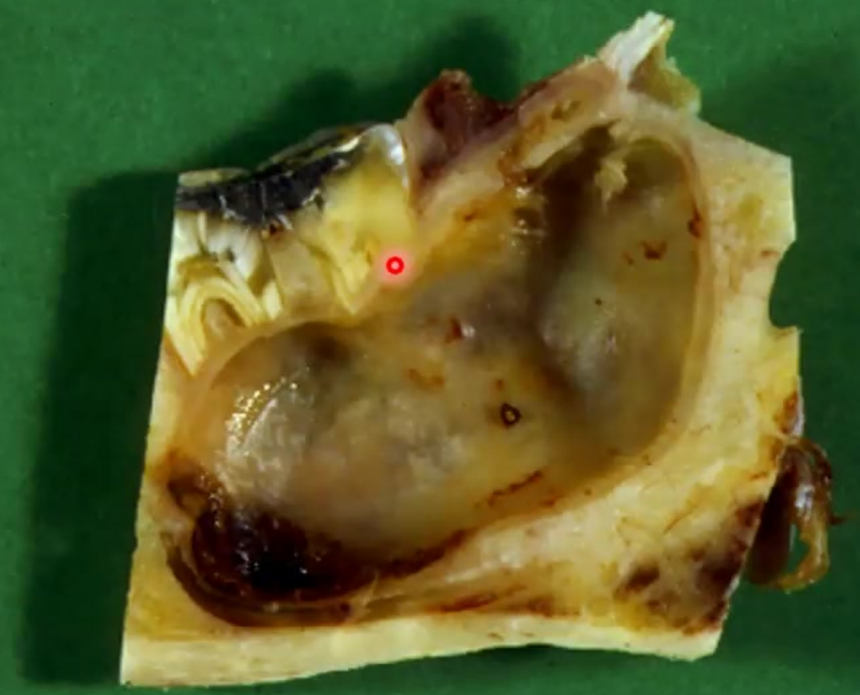
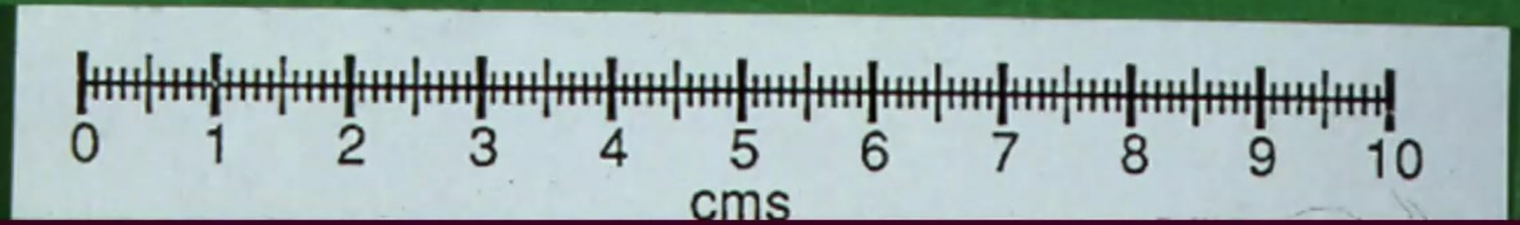
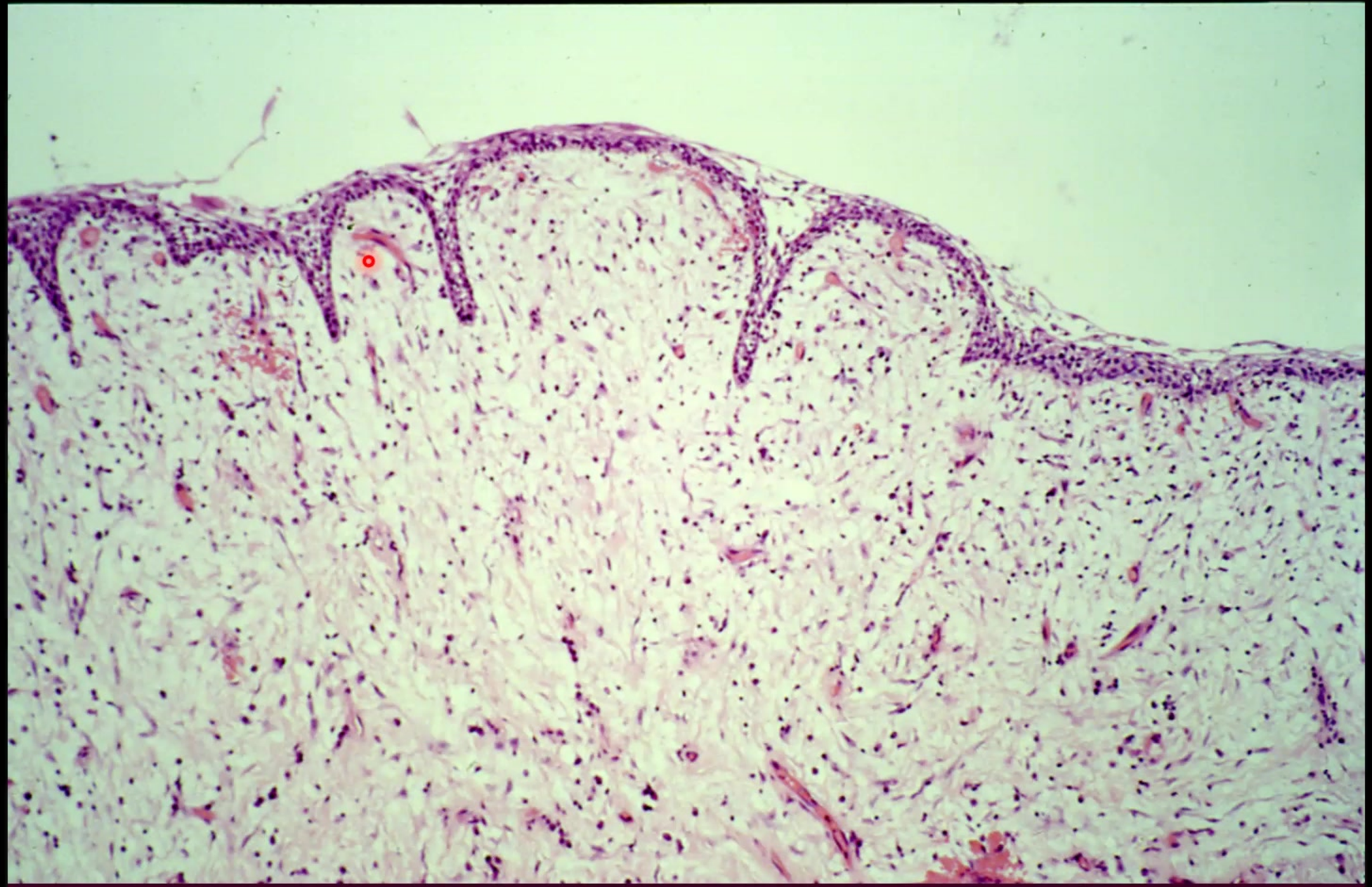
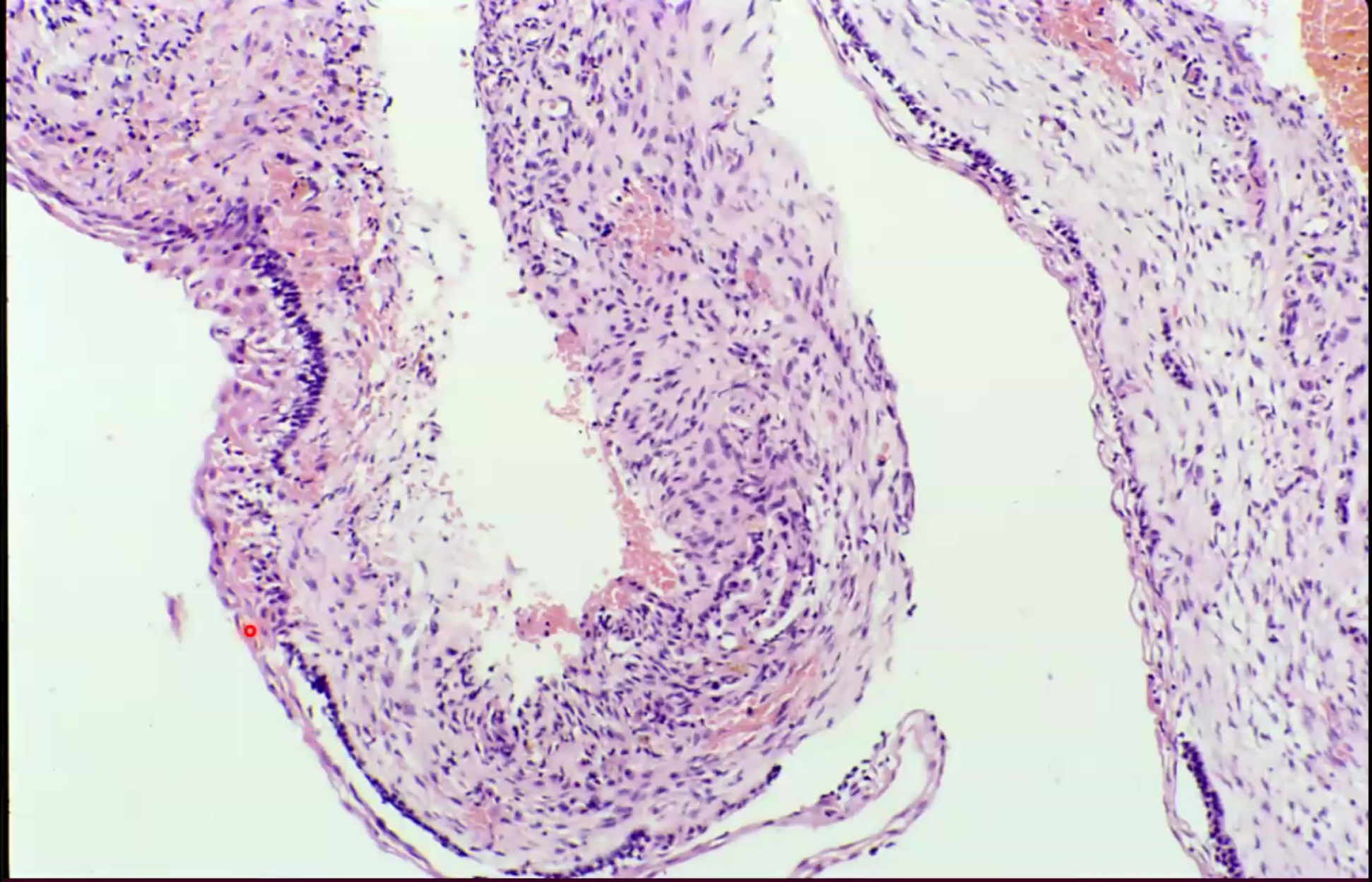






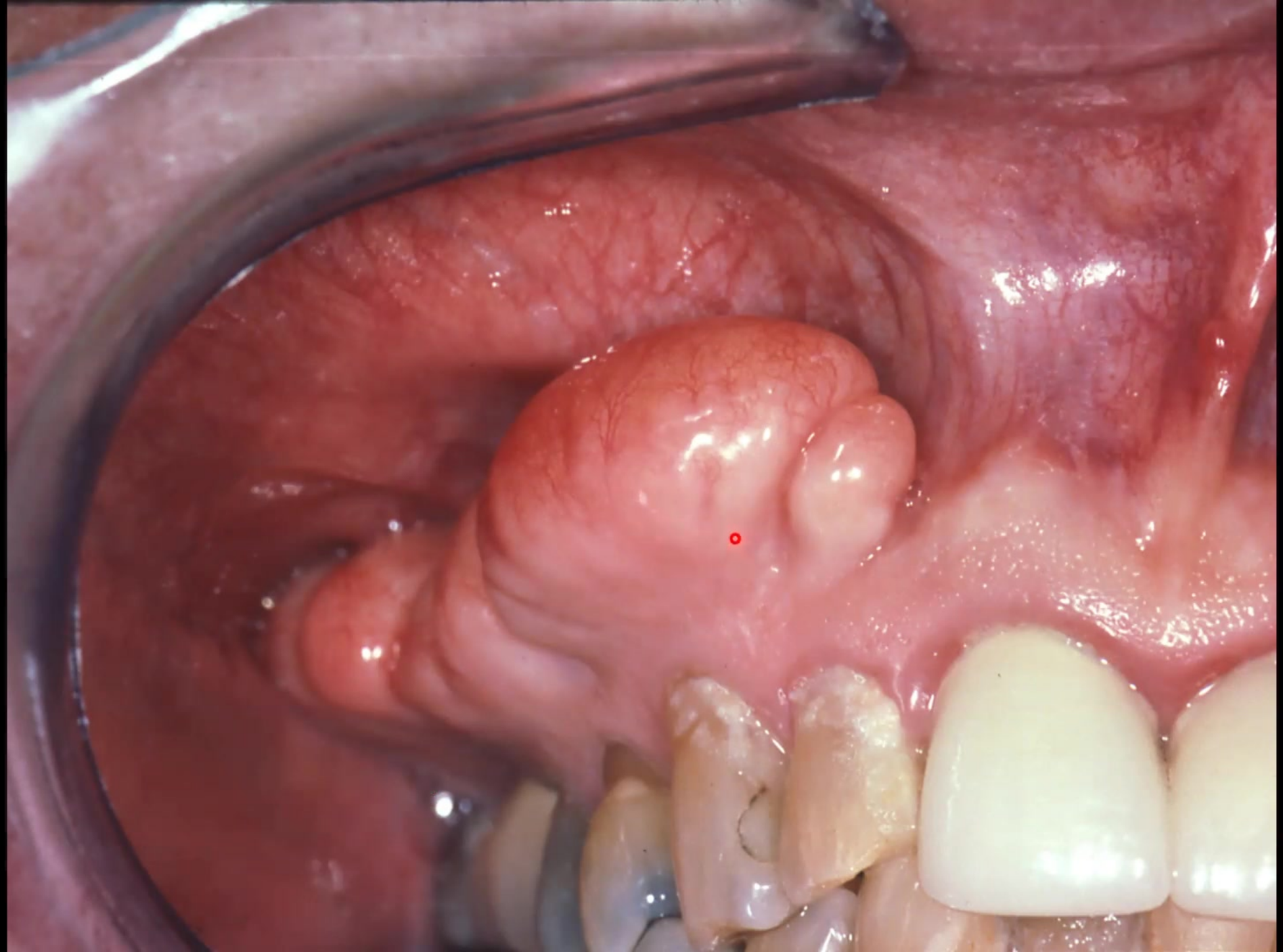
Unicystic ameloblastoma

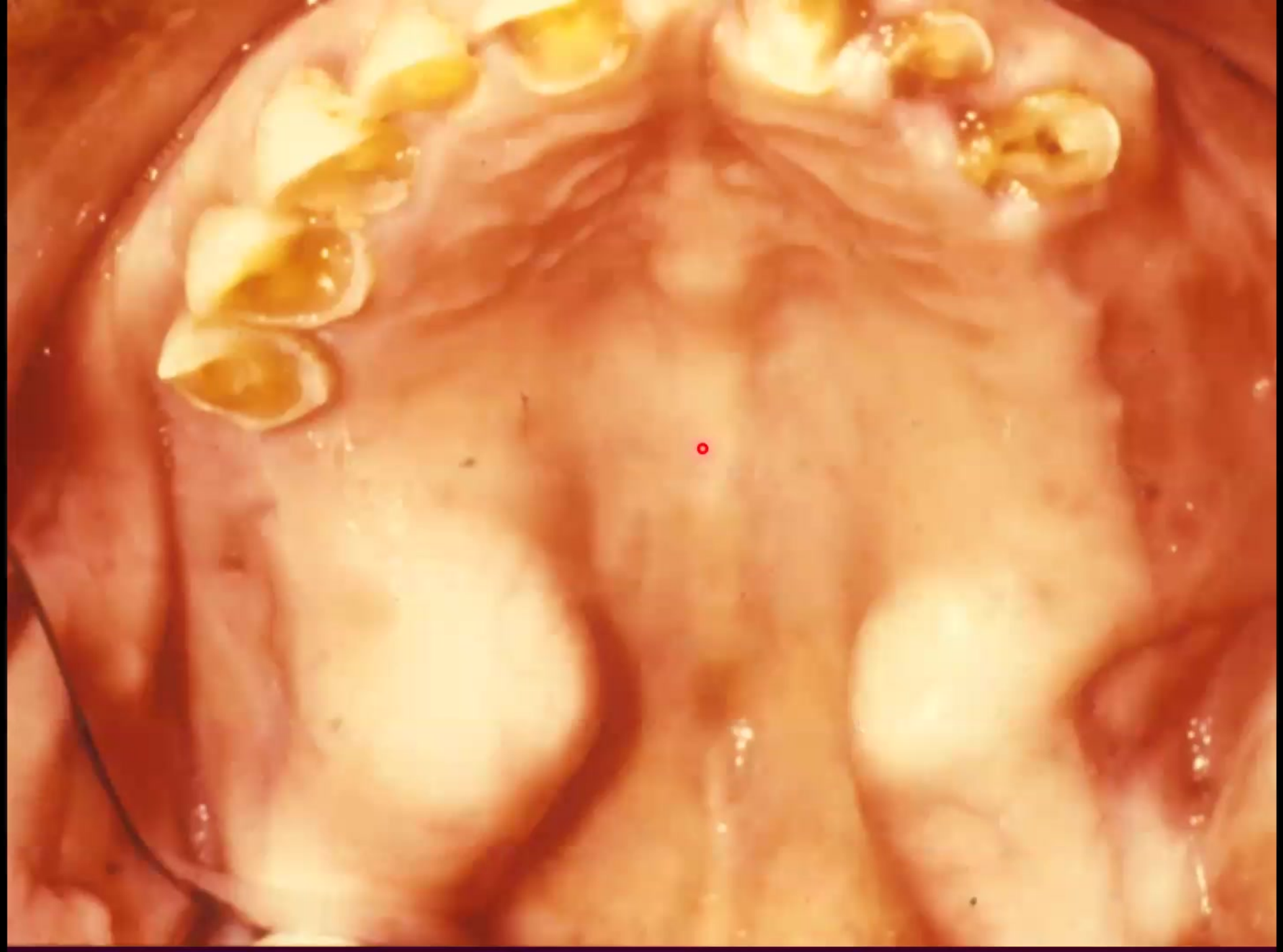


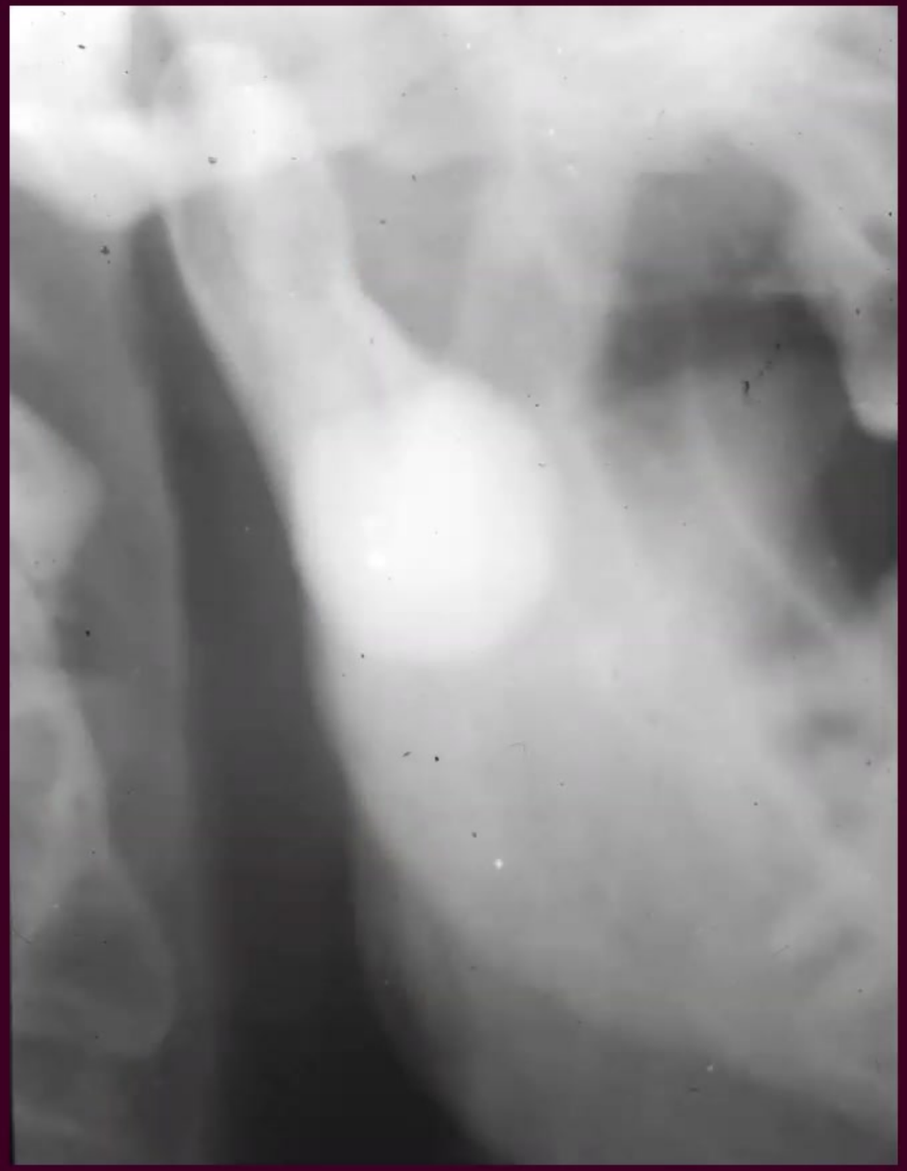
Unicystic ameloblastoma

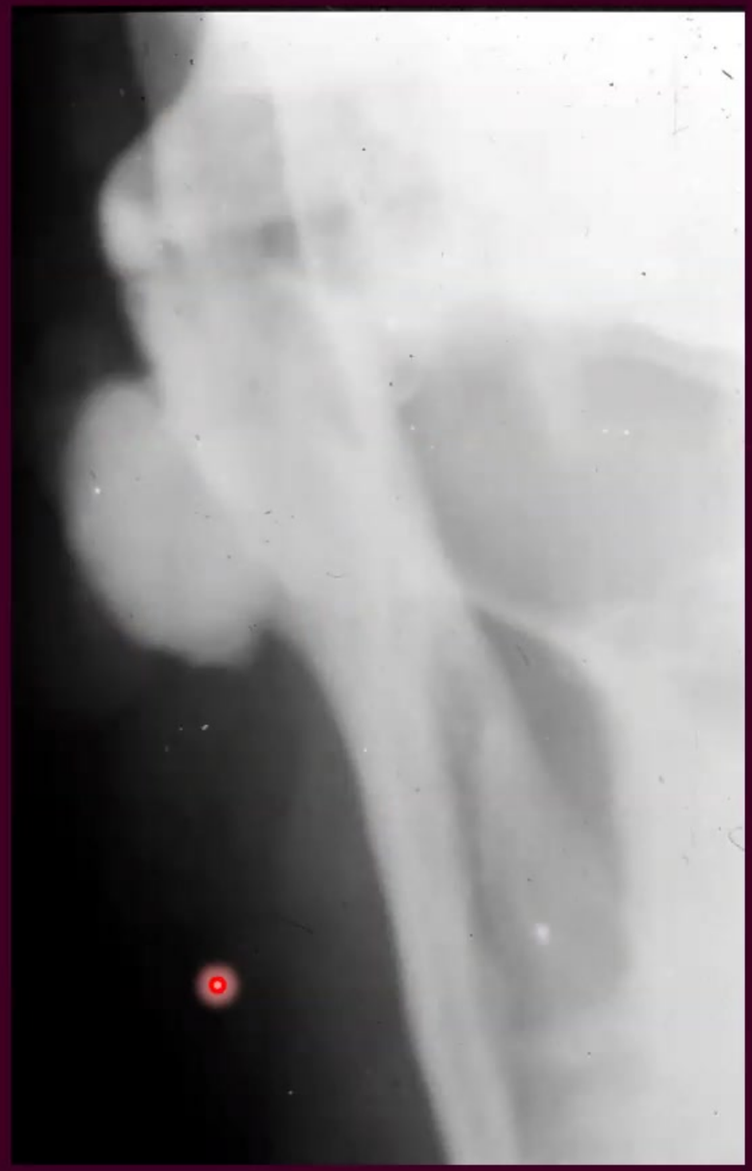
Osteoma

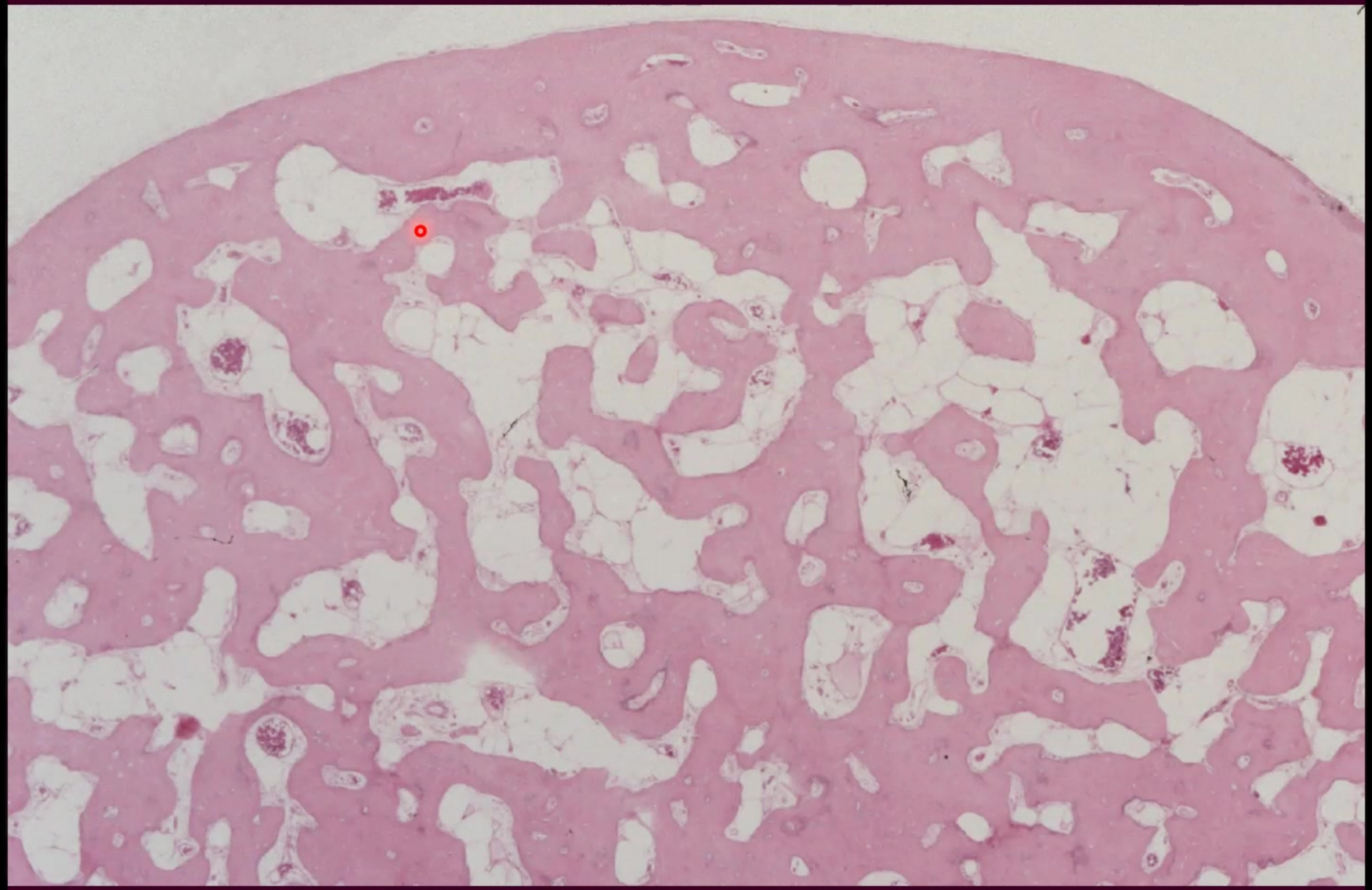
- Benign bone forming tumor
- Reactive – developmental (non-neoplastic)
- Site: craniofacial bones: skull, paranasal sinuses
- Solitary exophytic mass of dense bone arising from periosteal or endosteal surface
- Asymptomatic
- Non-aggressive, no malignant transformation

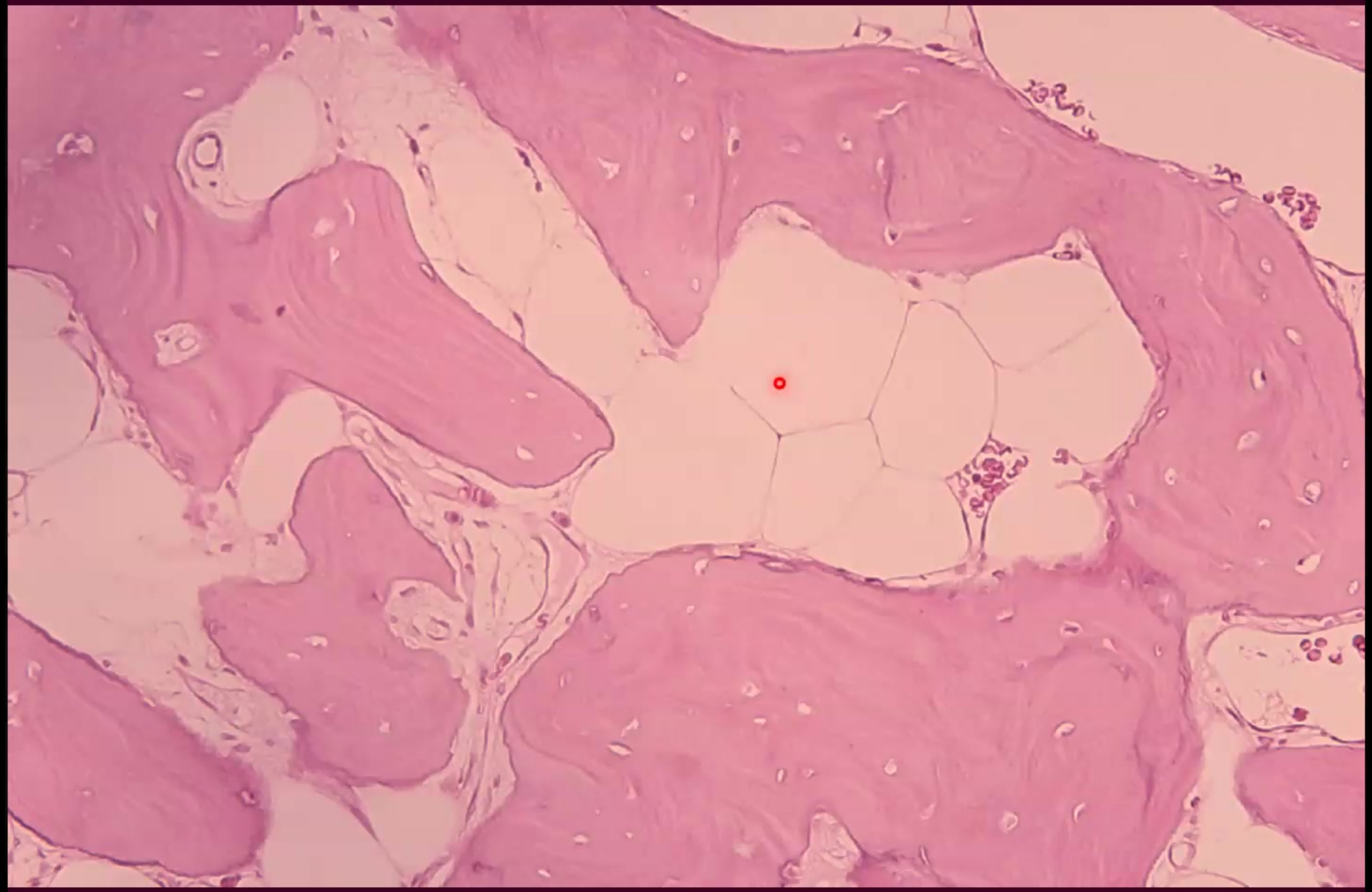












Bone Pathology

Osteosarcoma

Osteosarcoma

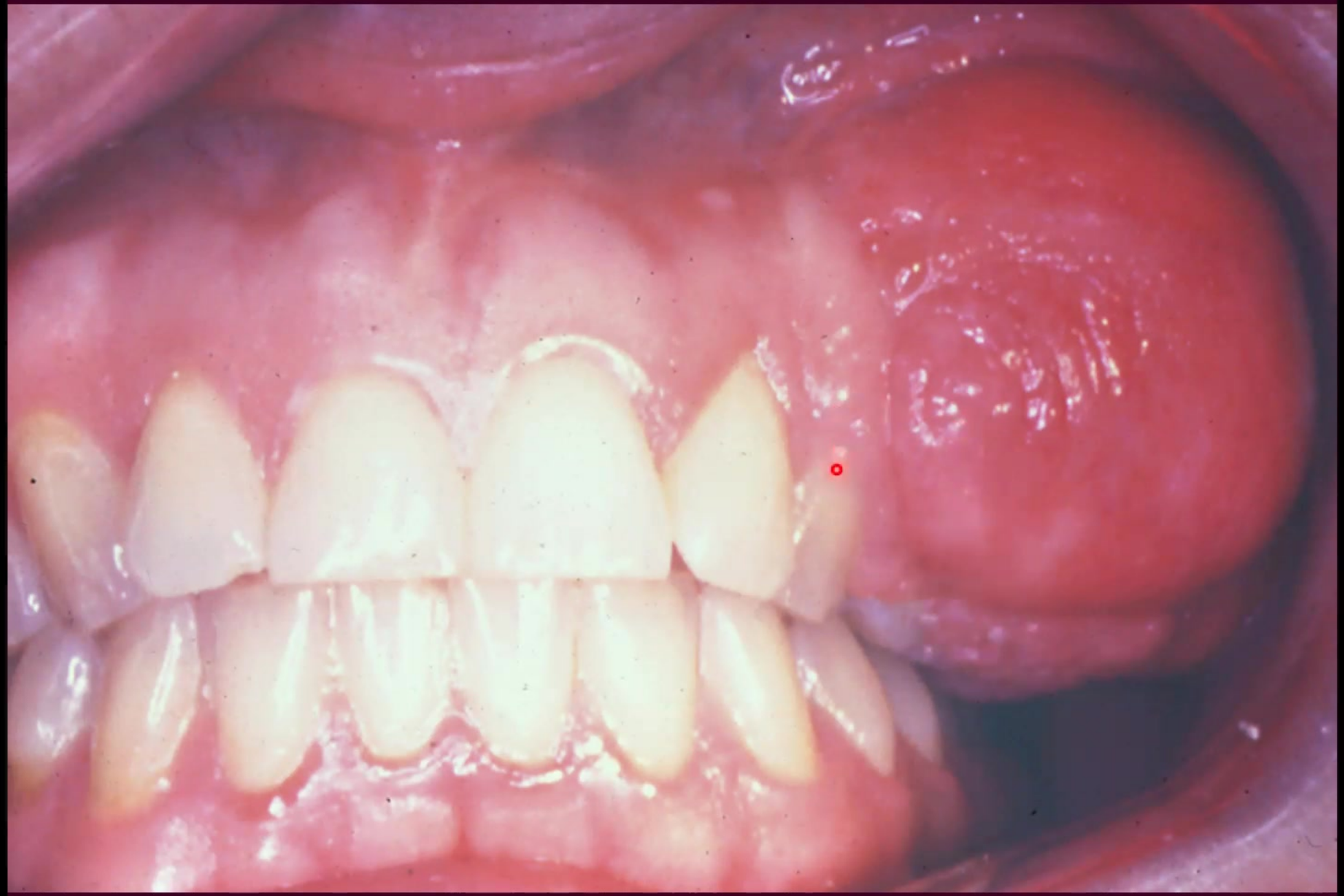
- Malignant mesenchymal neoplasm
- Osteoid production by tumor cells
- Most common primary bone malignancy
- Age: 2nd decade
- Gender: male > female (1.6:1)
- Site:
  - metaphysis of long bones
  - distal femur, proximal tibia, humerus

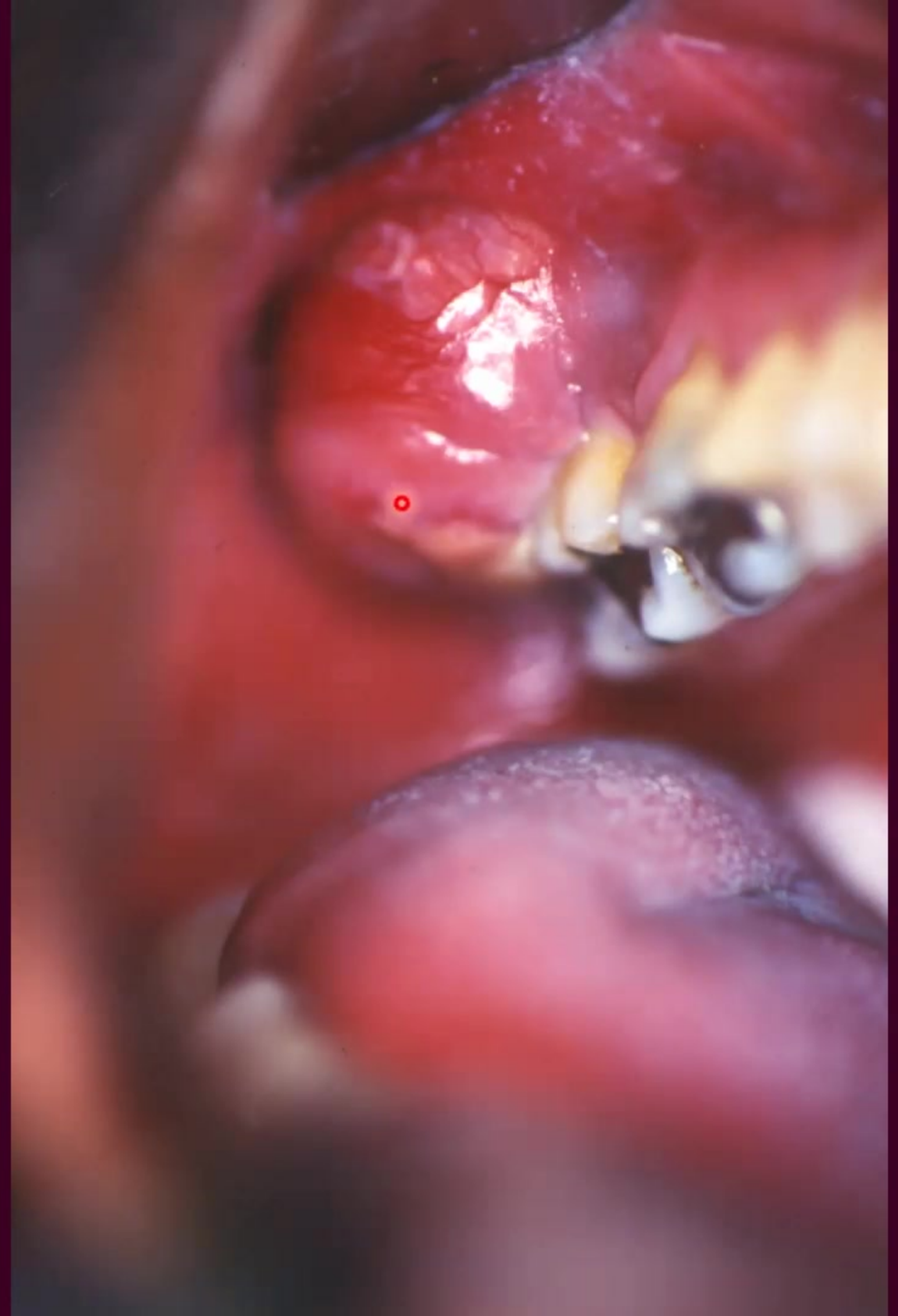
Secondary Osteosarcoma:

- Paget's disease of bone
- Fibrous dysplasia
- Irradiation
- Retinoblastoma
  – tumor suppressor gene (13q14)
- Osteochondromatosis
- Chronic osteomyelitis

Osteosarcoma of Head & Neck

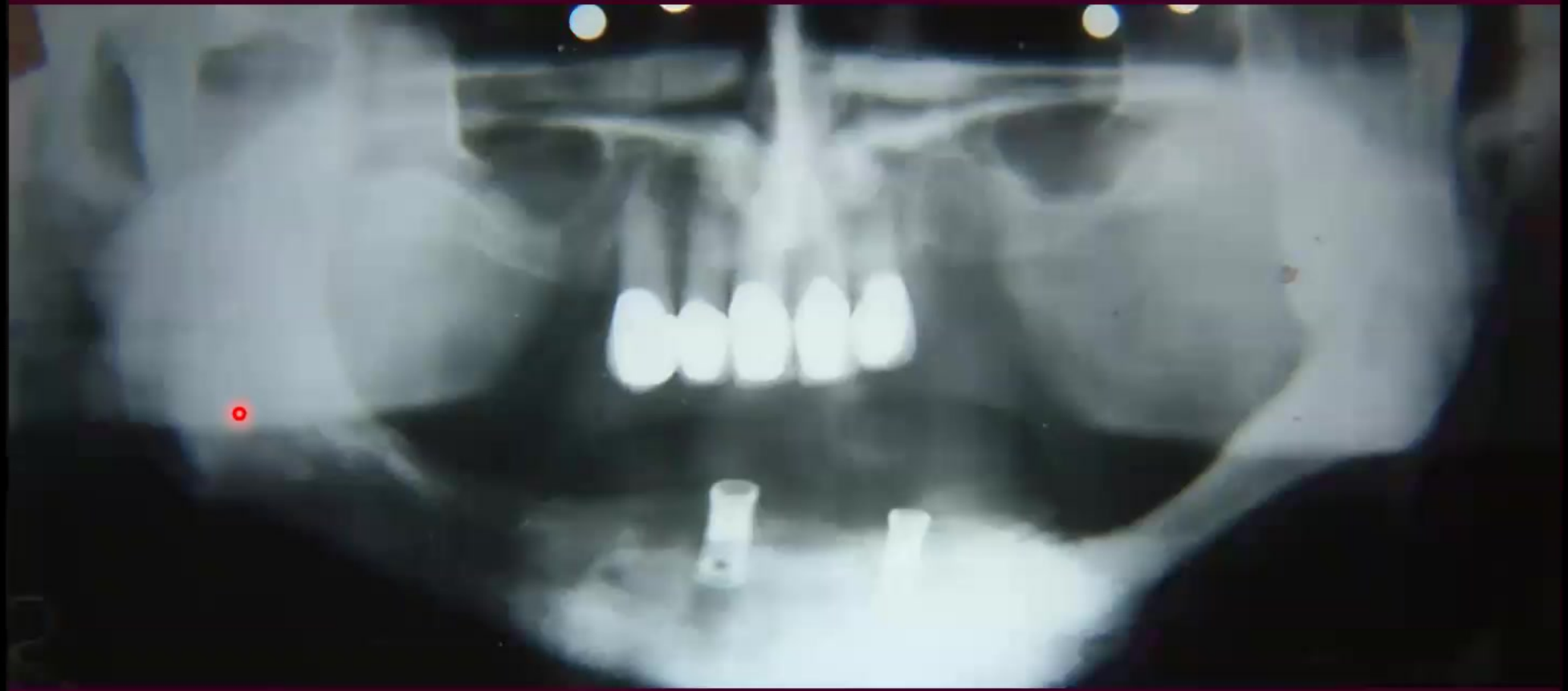
- Incidence: rare in the jaws
- 6-8% occur in gnathic skeleton
- Age: 3-4th decade (mean age 33 years)
- Gender: male > female
- Site:
  mandible = maxilla, paranasal sinuses, skull
- Symptoms:
  - painful swelling, paresthesia, loose teeth

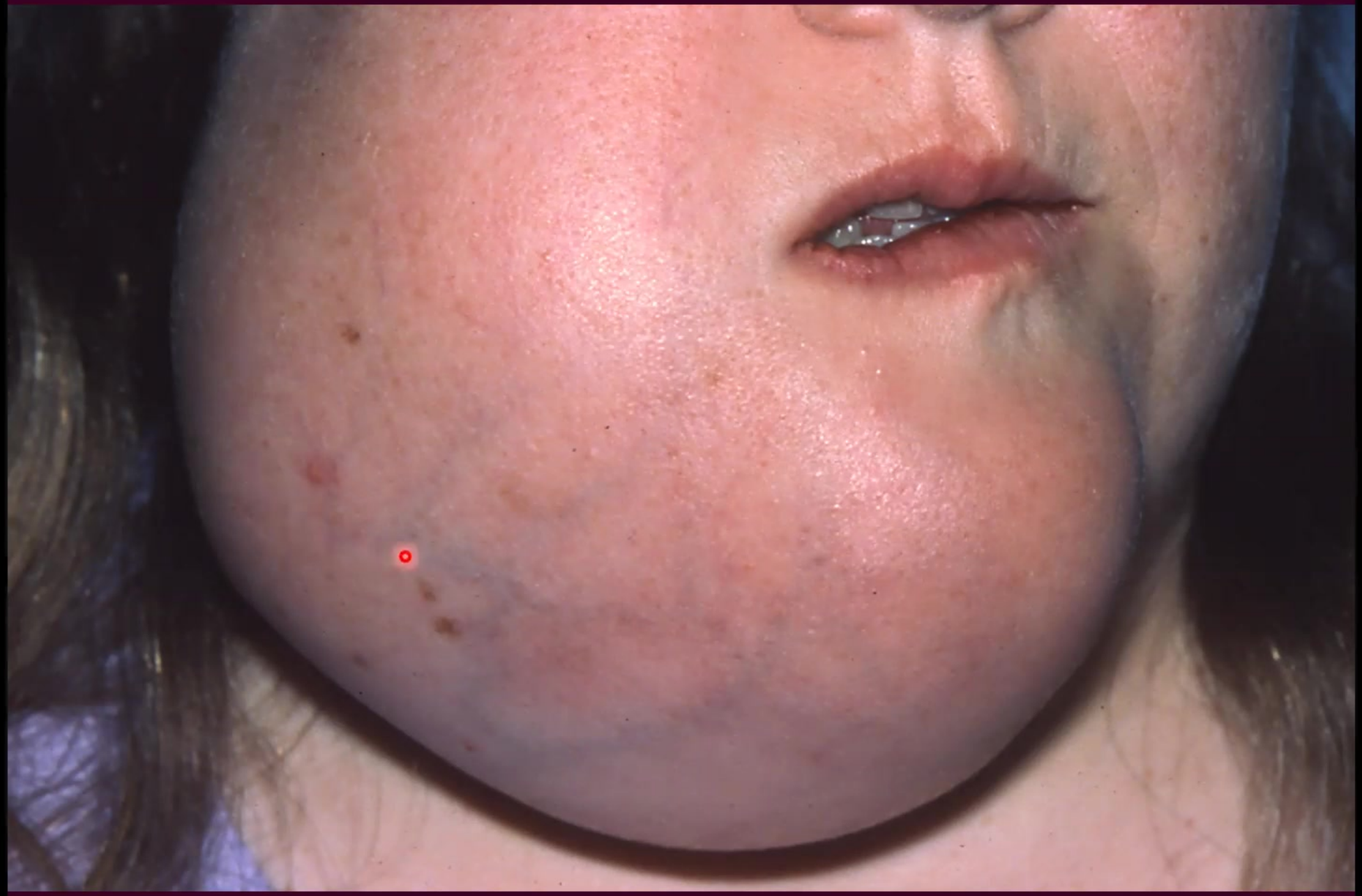




Osteosarcoma of Head & Neck Radiographic Findings:

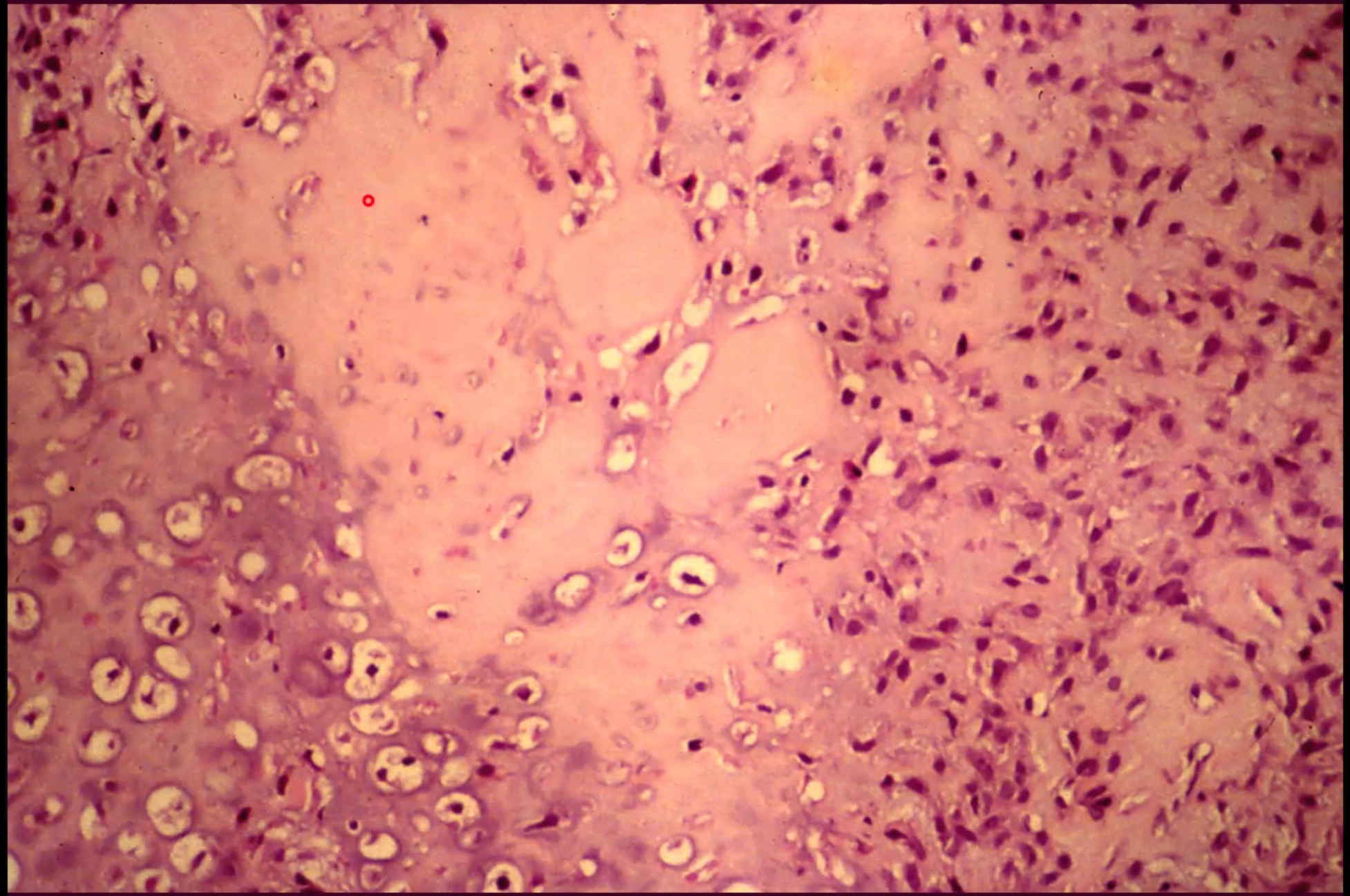
- Mixed radiolucent – radiopaque
- Destructive
- Poorly defined infiltrative borders
- Sunburst pattern (25%)
- Symmetric widening of periodontal ligament
- Calcification above level of alveolar crest
- Spiking root resorption

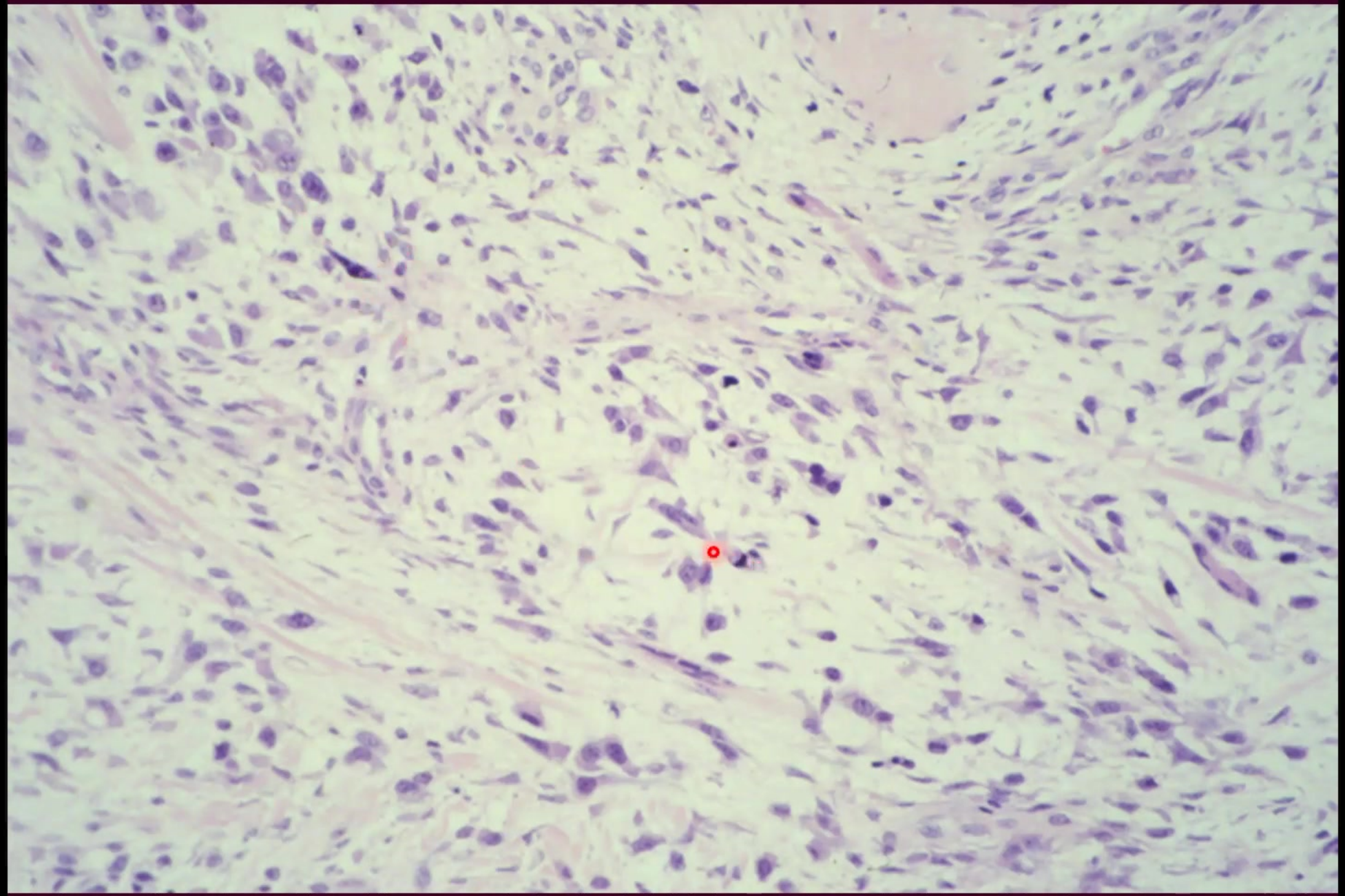


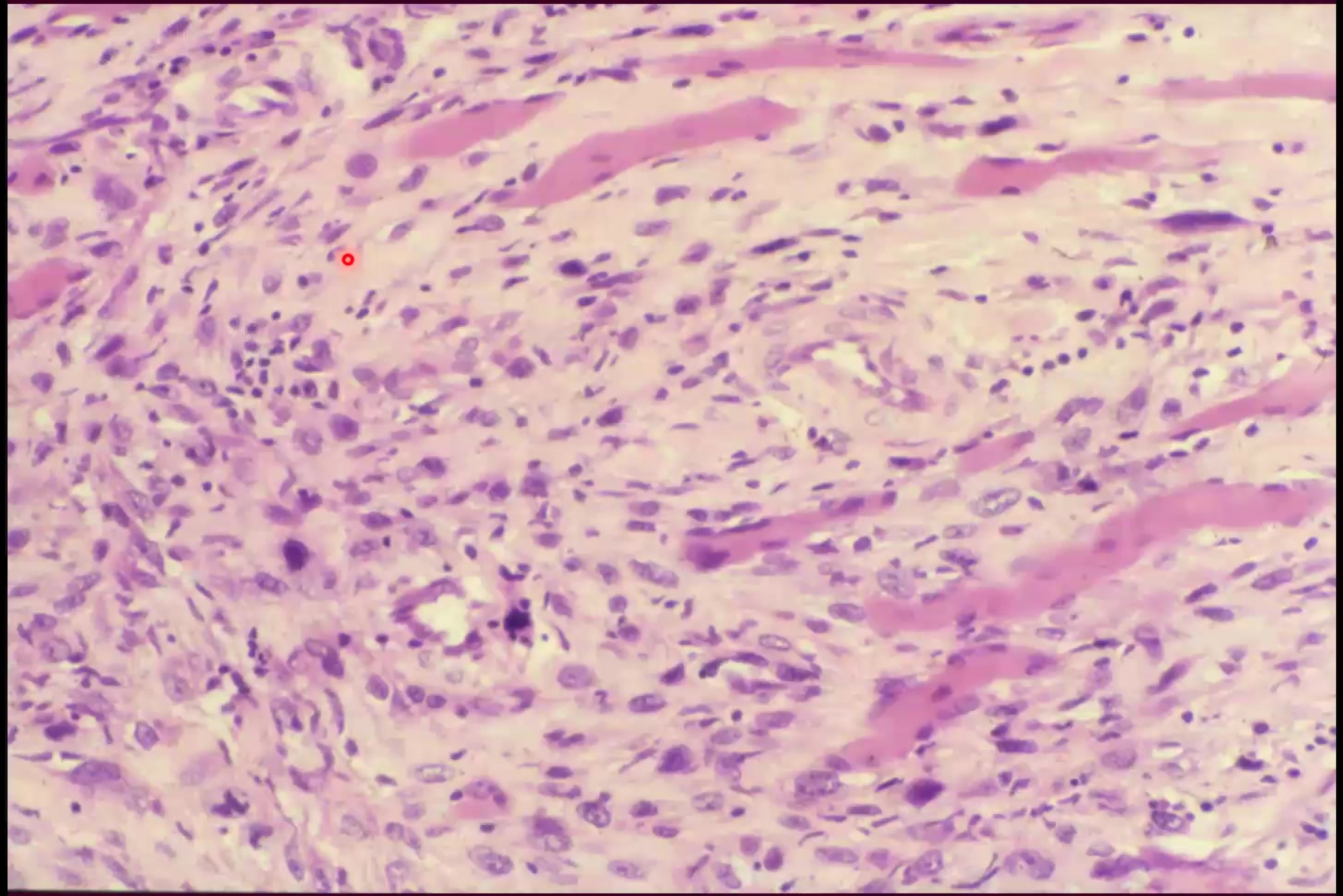


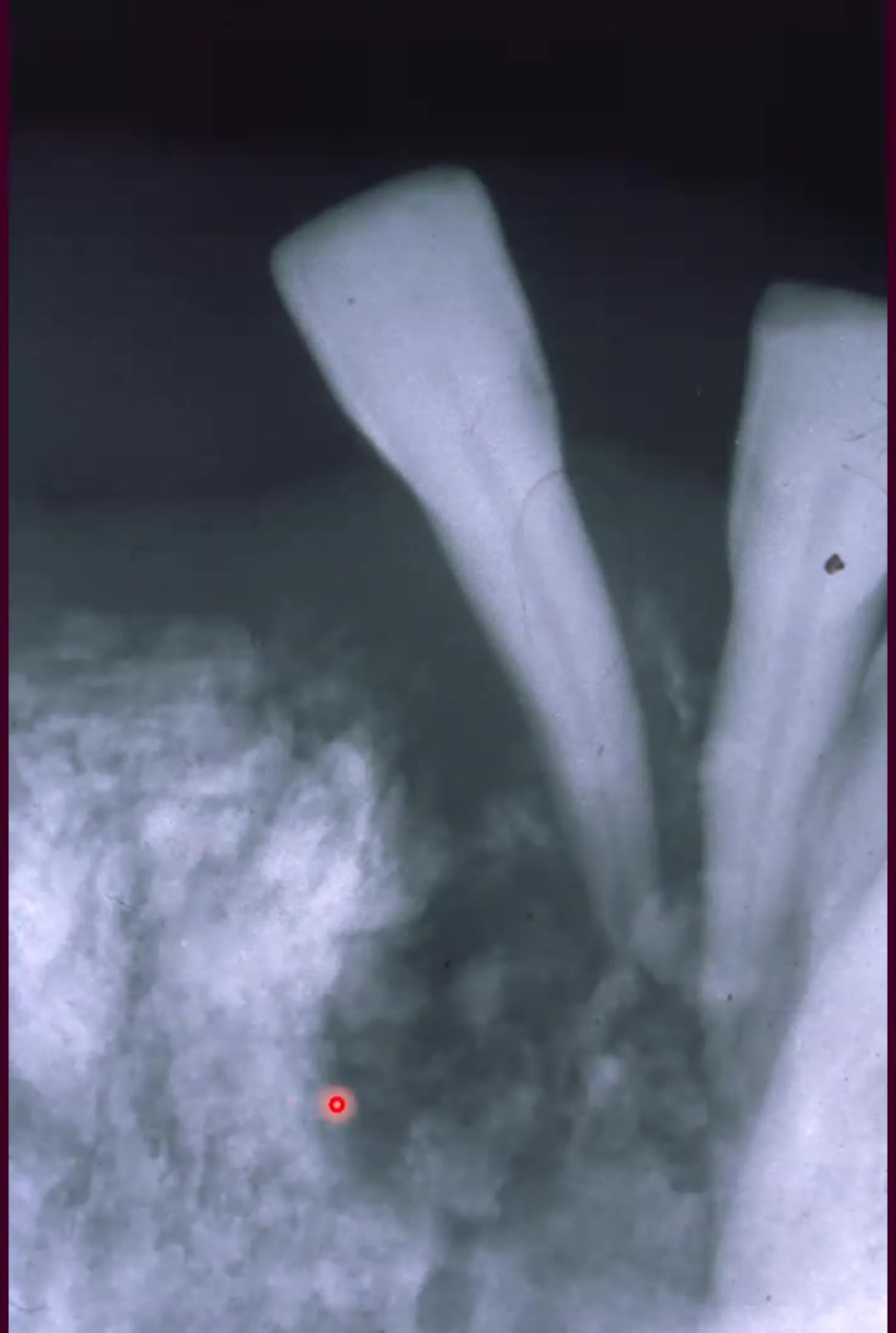
Osteosarcoma - Histology:

- Pleomorphic malignant mesenchymal cells
- Spindled to polygonal morphology
- Osteoid production
- Osteoblastic, chondroblastic, fibroblastic types
- Atypical mitotic figures
- Necrosis
- Gnathic tumors are better differentiated









Osteosarcoma of the Head & Neck

- Clinical labs: elevated alkaline phosphatase
- Treatment:
  - radical surgery
  - chemotherapy
  - radiation therapy

Osteosarcoma

- Prognosis:
  - aggressive neoplasm
  - 30-50% survival
  - local recurrence – 70%
  - metastasis (6-50%)
  - lung, brain, lymph nodes
  - mortality: persistent local/regional disease

Metastases to the jaws

Metastatic Tumors to Bone

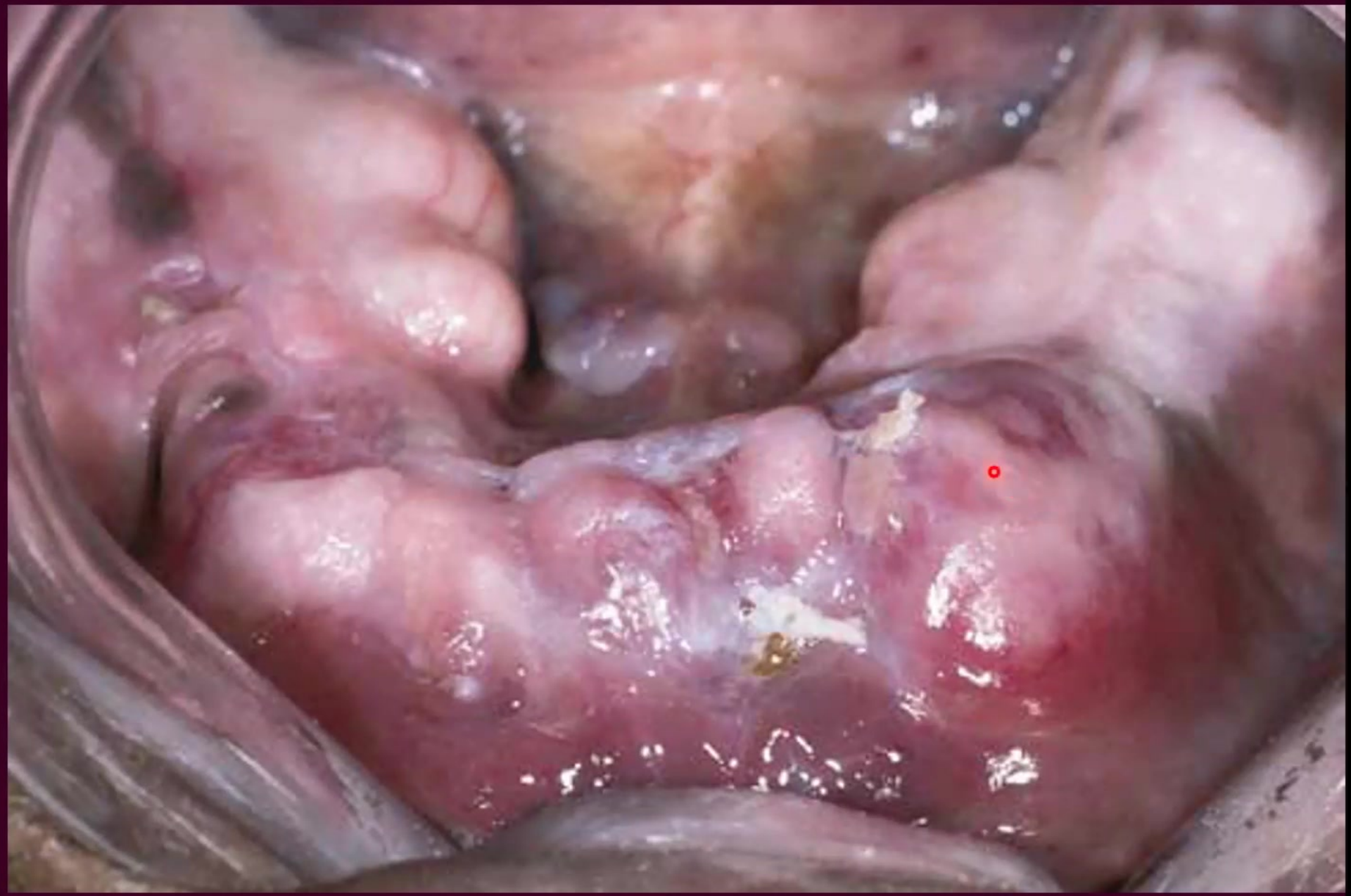
- Most common form of cancer involving bone
- Carcinomas
- Breast, prostate, lung, kidney, thyroid
- Site: vertebral column, pelvis, ribs, skull
- Hematogenous (Batson's venous plexus)
- Osteolytic or osteoblastic (cytokine mediated)
- Poor prognosis

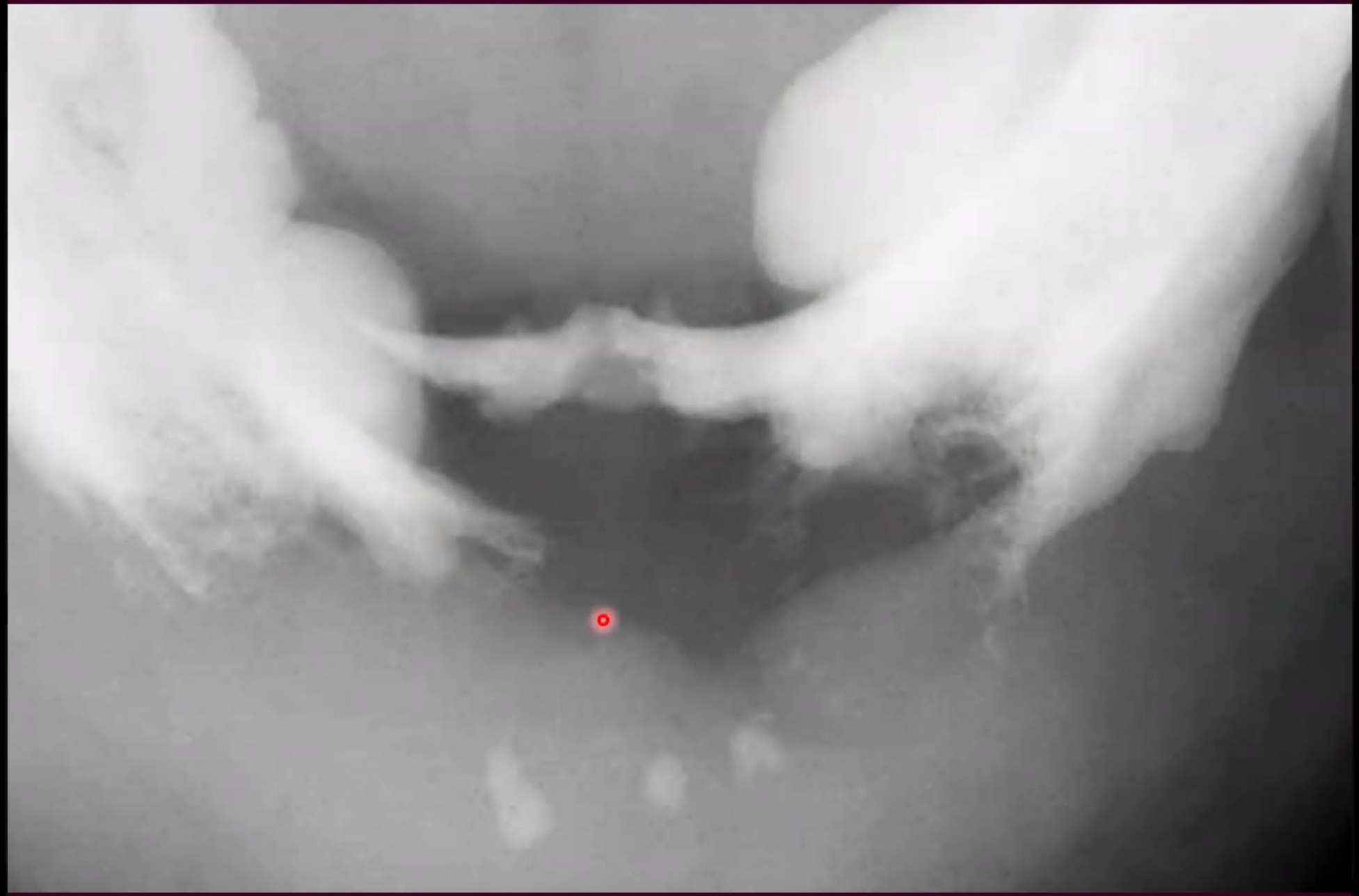
Metastatic Tumors to the Jaws

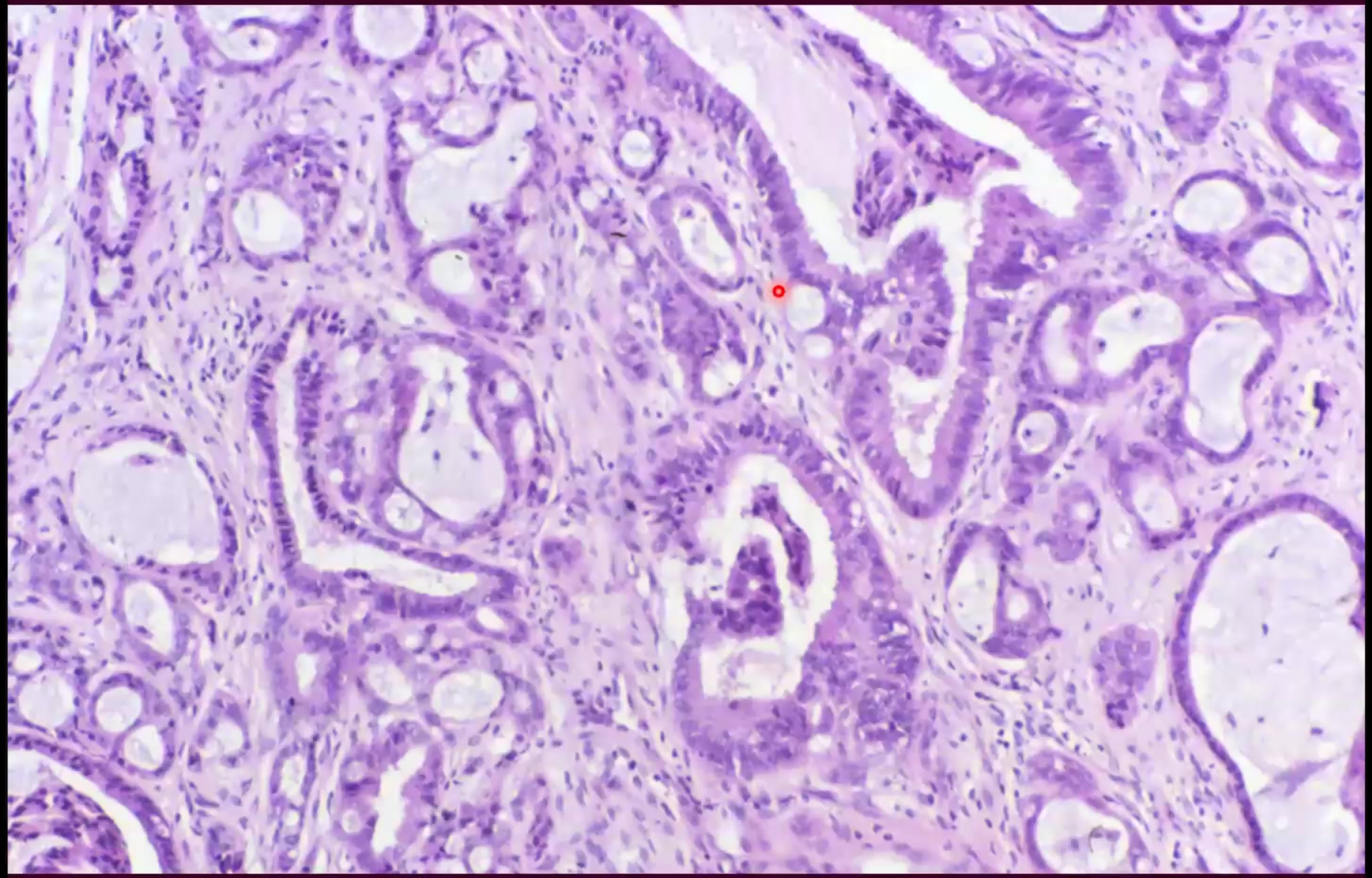
- Incidence: uncommon (16%)
- Site: mandible (80%)
- Age: older adults
- 50% metastasis is first evidence of malignancy
- Symptoms:
  - painful mass – swelling
  - loose teeth
  - paresthesia

Metastatic Tumors to the Jaws

- Radiographic features:
  - osteolytic: ill defined destructive radiolucency
  - osteoblastic: radiopaque or mixed lesion
- May simulate periapical or periodontal disease
- Histology: infiltrating nests and cords of pleomorphic epithelial cells with fibrous stroma
- Prognosis: poor, widely disseminated disease
- Survival: less than one year







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