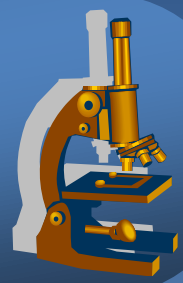
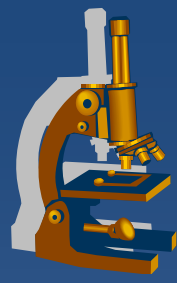
Soft tissue tumors and lesions. Bone pathology.



Oral pathology

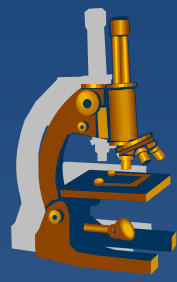
Shatokhina Tetiana

Soft tissue tumors and lesions



- mesenchymal tumor-like lesions
- true neoplasms
- majority are rare in oral cavity
- Diff. dg : hyperplastic lesions

Fibrous lesion of the oral mucosa



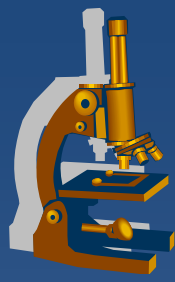
Hyperplastic lesions:

- epulides (fibrous, vascular, giant cell);
- pyogenic granuloma;
- fibroepithelial polyp;
- denture irritation and papillary hyperplasia

Neoplastic and neoplastic-like lesions:

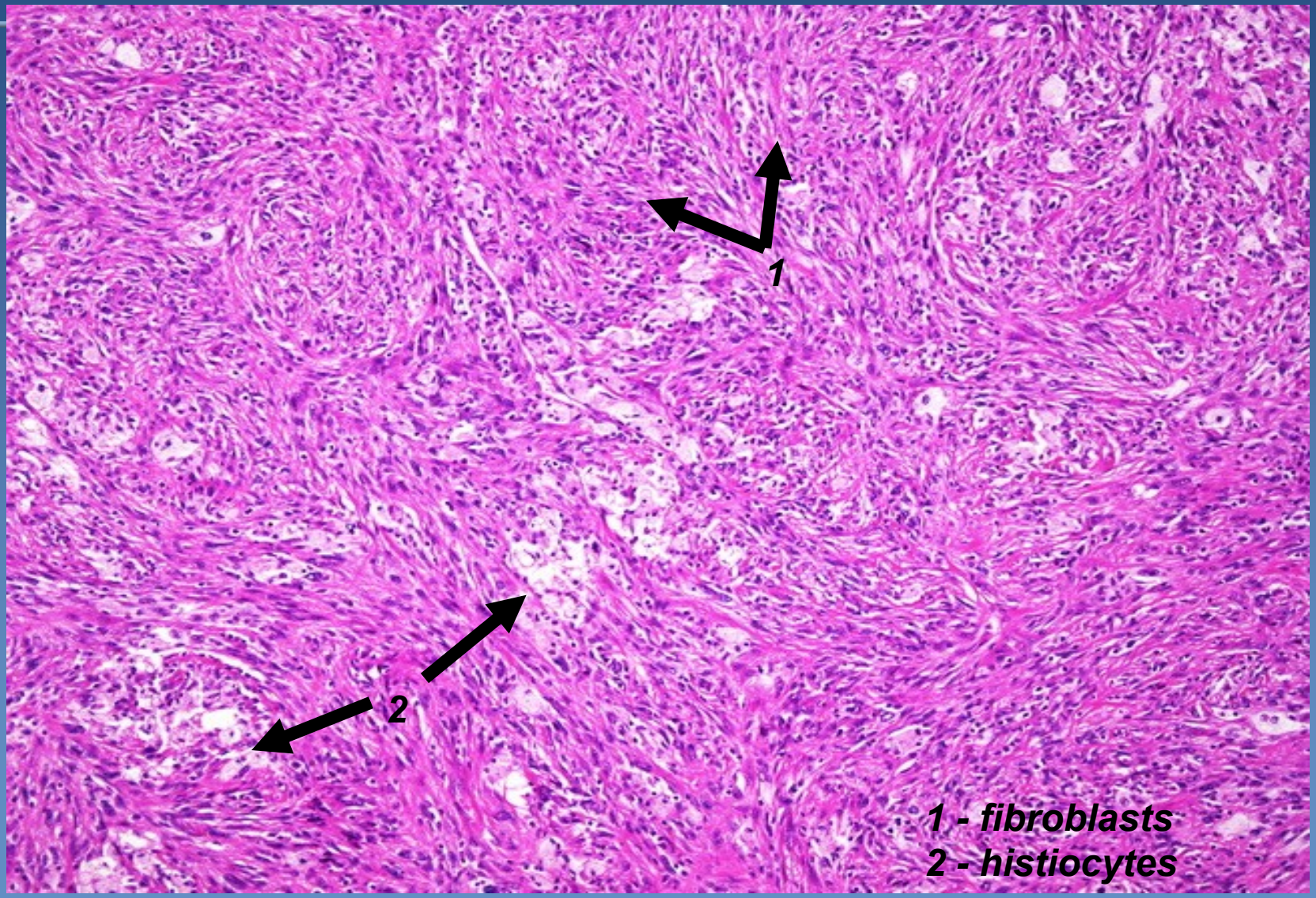
- peripheral odontogenic fibroma
- fibrosarcoma
- fibrous histiocytoma
- nodular fasciitis
- fibromatosis

Fibrous histiocytoma

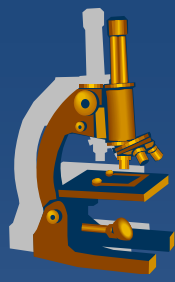


- show both fibroblastic + histiocytic differentiation
- middle-aged and older adult
- buccal mucosa and vestibule
- nodular mass vary in size

Fibrous histiocytoma

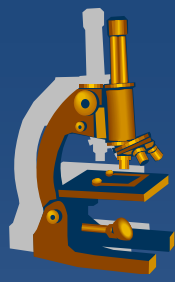


Nodular fasciitis



- rare in oral cavity
- reactive, non-neoplastic lesion
- cause unknown
- rapidly growing but self-limiting
- histologically may resemble fibrosarcoma

Fibromatosis



- non-neoplastic but infiltrative fibrous lesion

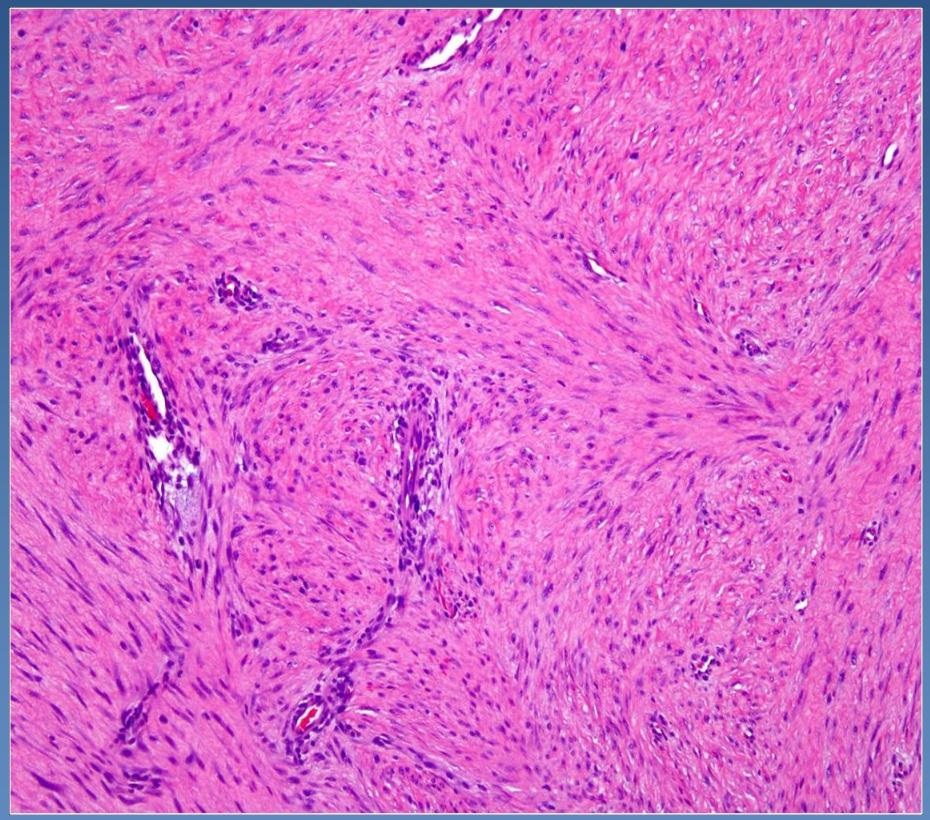
  do not metastasize!!!
- children or young adults (juvenile fibromatosis)
- paramandibular soft tissue region
- vary in size ⇨ facial disfigurement
- firm mass with rapid growth + destruction adjacent bone

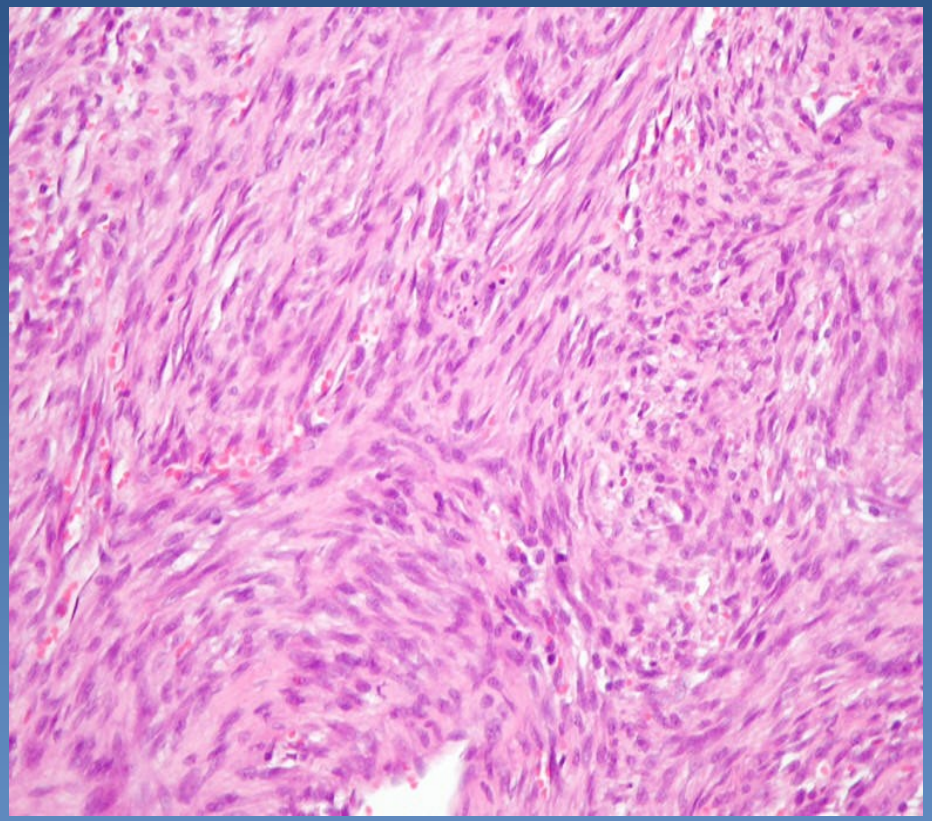
Micro: ***proliferation of spindle-shaped cells, no cytonuclear atypia***

Treatment: ***wild excision***

recurrence rate 23%

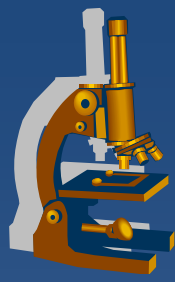
Fibromatosis





proliferation of spindle-shaped cells, without cytonuclear atypia

Fibrosarcoma



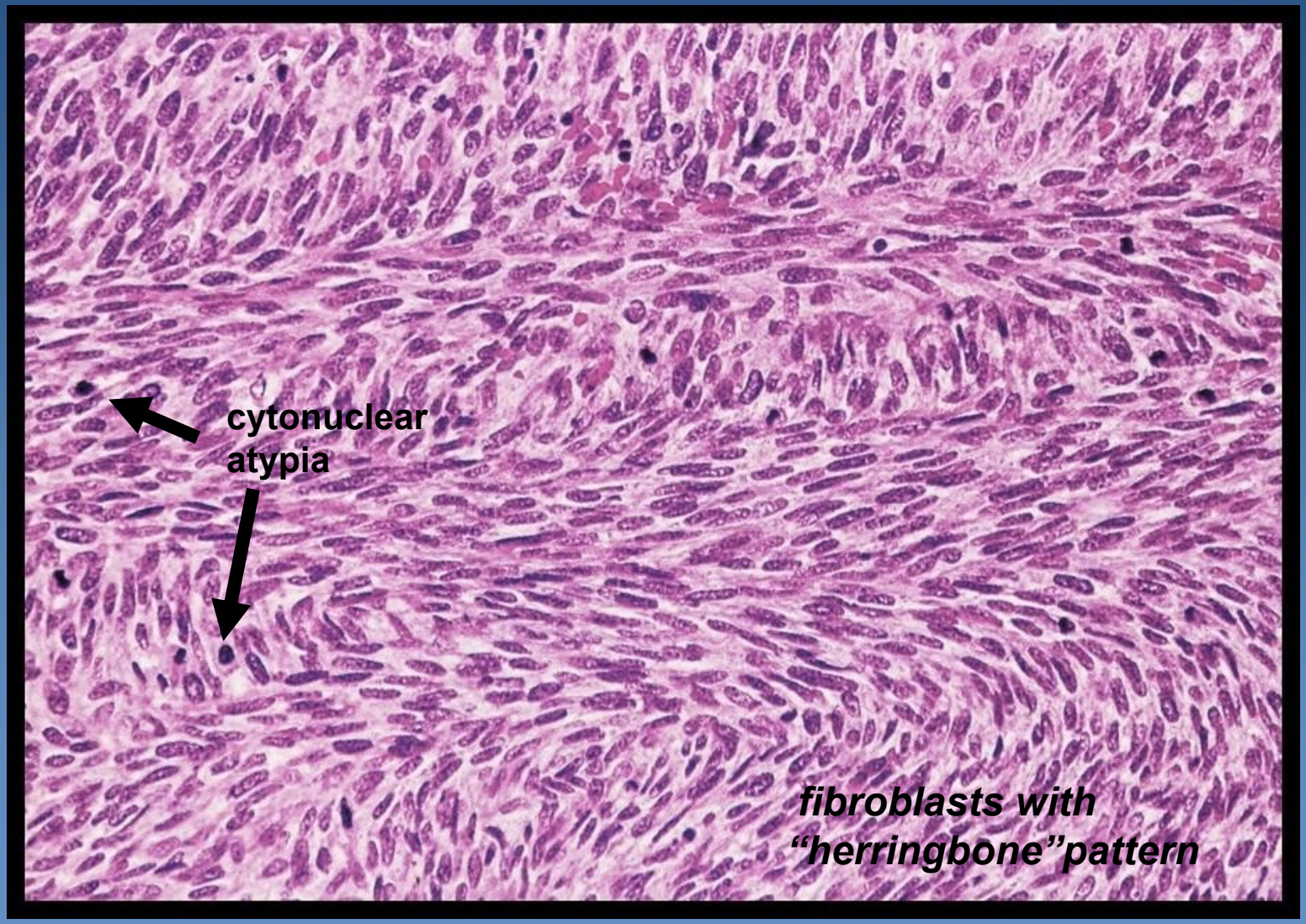
- malignant tumor of fibroblasts
- rare in oral cavity

  have good prognosis

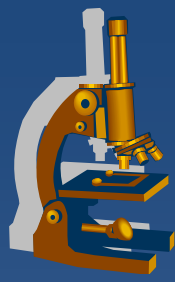
- young adults and children

Micro: ***fascicles of fibroblasts that forms "herringbone"pattern***

Fibrosarcoma



Tumors of adipose tissue



Lipoma – benign tumor of adipose tissue

- 40 yrs or older
- mucosa of cheeks and tongue

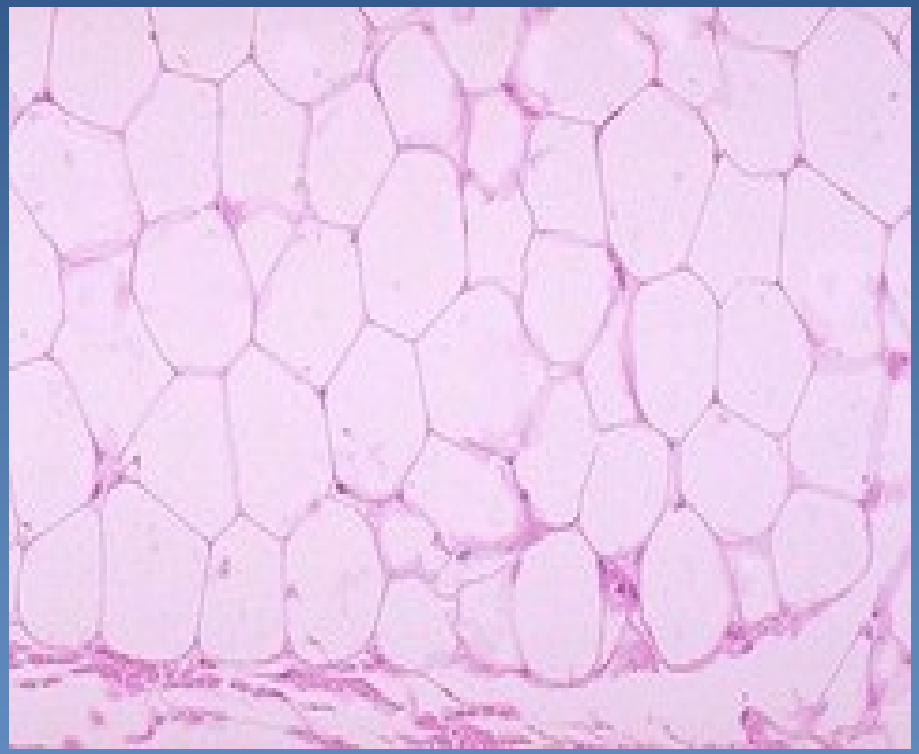
!!! ulcerated tumor-like masses of partly necrotic fat in very young children - the result of traumatic herniation of cheek's mucosa

Gross: ***soft, yellowish-colored swelling***

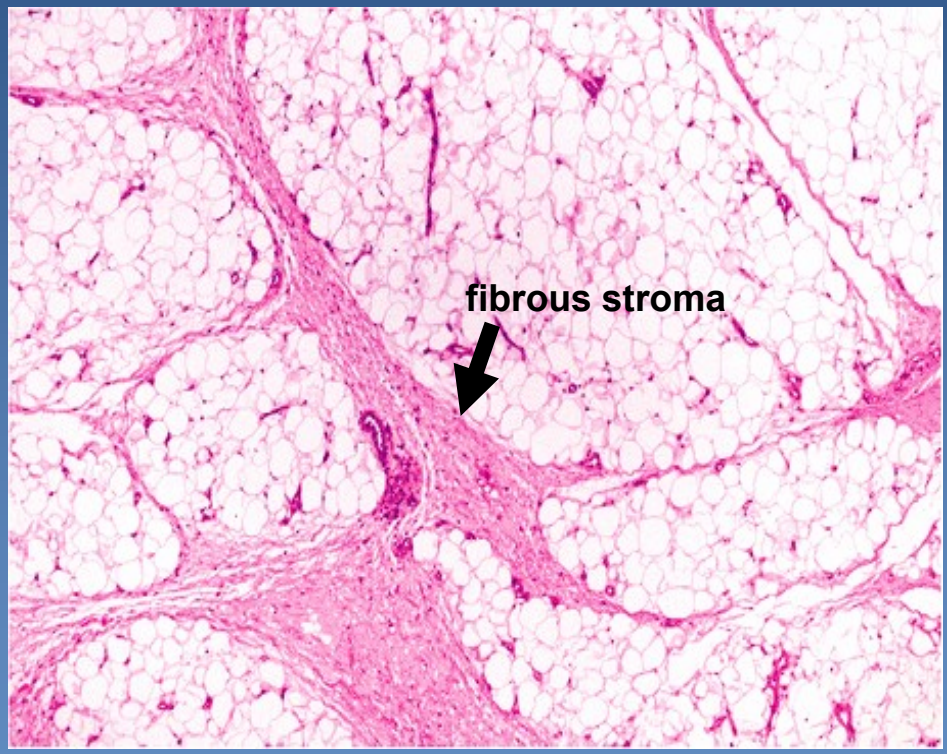
Micro: ***mature adipose tissue, thin fibrous capsule***

Fibrolipoma – ***lipoma with increasing amount of fibrous stroma***

Tumors of adipose tissue

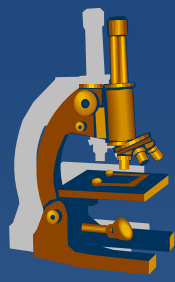


lipoma



fibrolipoma

Tumors of adipose tissue

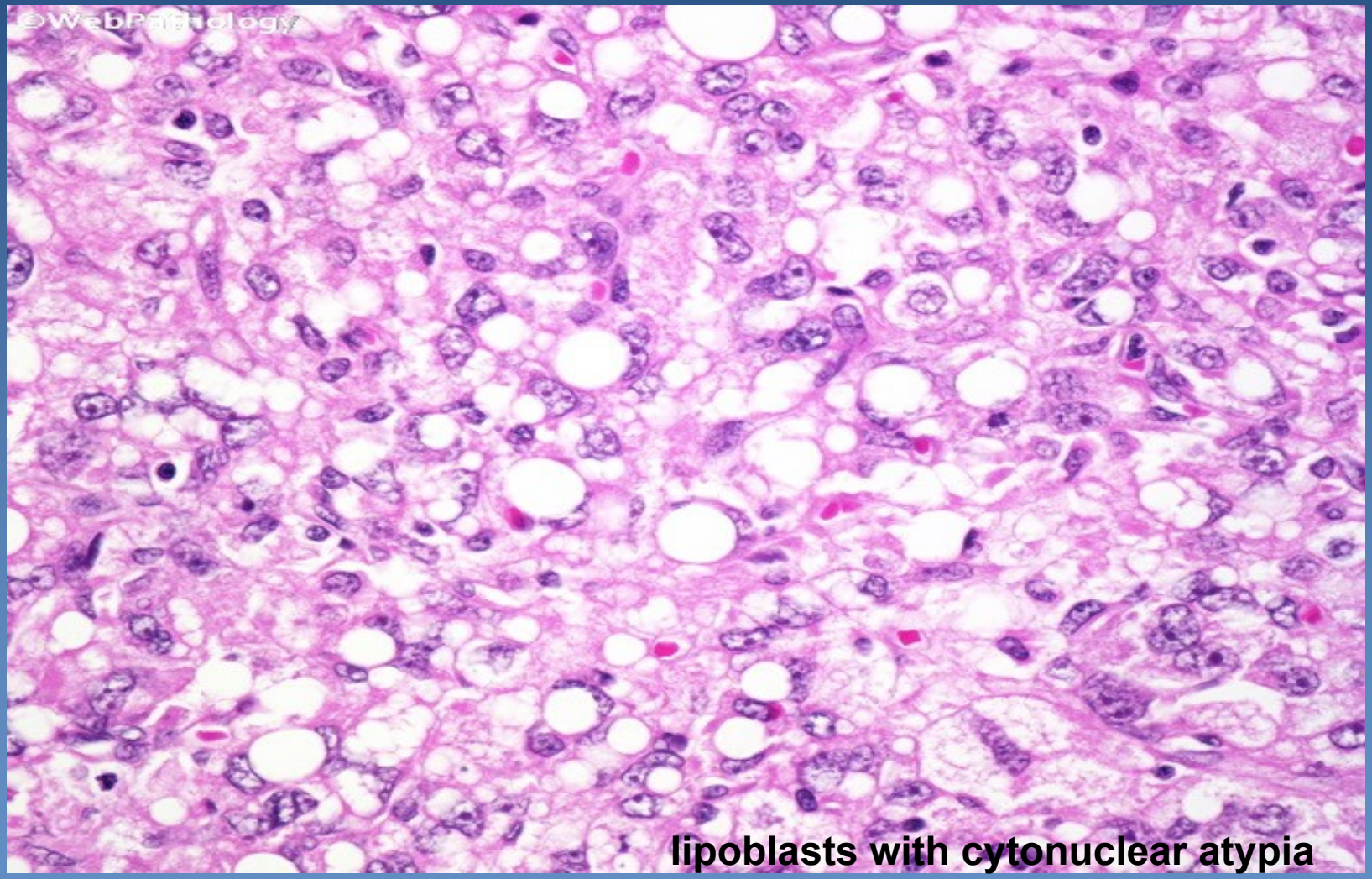


Liposarcoma – malignant tumor of adipose tissue

- peak 40-60 yrs
- cheeks, floor of the mouth, tongue
- resemble benign lipoma + atypical hyperchromatic nuclear
- ***myxoid, round-cell, well-differentiated, pleomorphic, dedifferentiated***

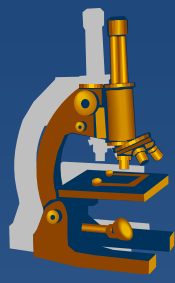
Have a good prognosis in oral cavity

Liposarcoma



lipoblasts with cytonuclear atypia

Tumors of vascular tissue



Hemangioma – benign hamartomatous tumor

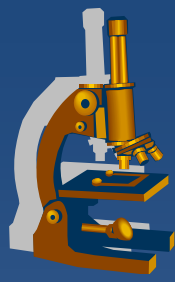
- 1-year-old children, F:M 3:1
- lips, tongue, cheeks or palate

Gross: ***solitary, flat or raised, dark reddish-purple in color typically blanch on pressure***

Hereditary haemorrhagic telangiectasia – ***AD, multiple telangiectases in skin, mucous membrane, internal organs***

Sturge-Weber syndrome – ***haemangiomatous lesions of the face (n. trigeminus) + heamangiomas and calcification of leptomeninges + limbs affecting***

Hemagioma



Histological types: ***capillary, cavernous, mixed***

Complications***: ulceration***

thrombosis

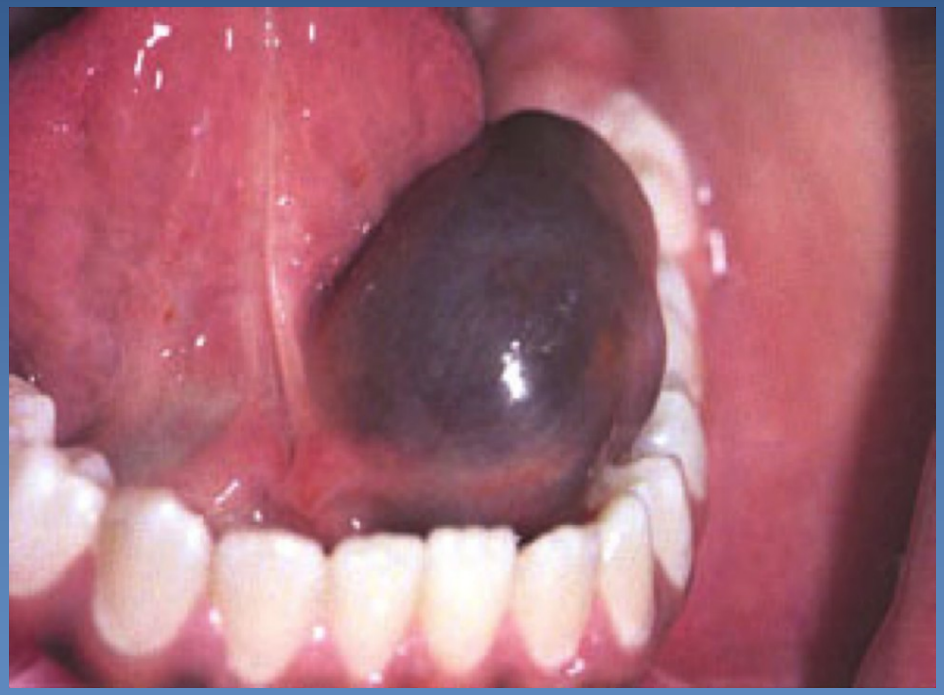
organization

calcification

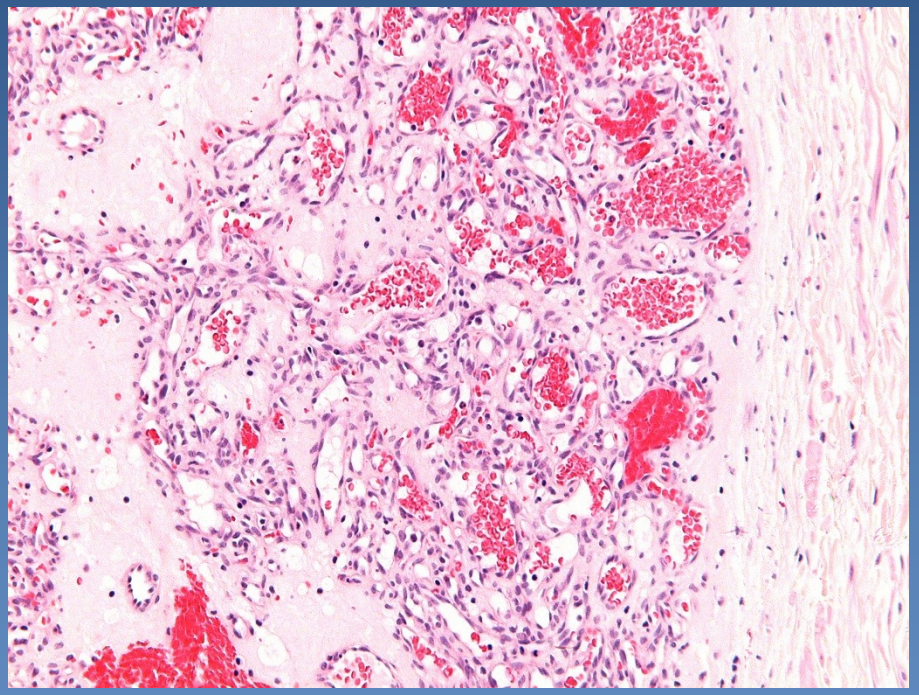
Treatment***: "watchful neglect", occur regression***

Sublingual varicosities - ***purplish venous ectasia on the ventral (undersurface) of the tongue after the age of fifty.***

Hemangioma

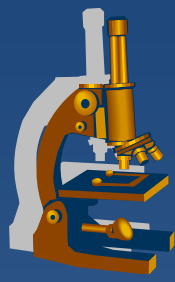


sublingual hemangioma



capillary type – proliferation of capillary-sized vessels

Tumors of vascular tissue



Lymphangioma - benign hamartomatous tumor lymphatic vessels

- early childhood
- anterior 2/3 of the tongue (macroglossia)

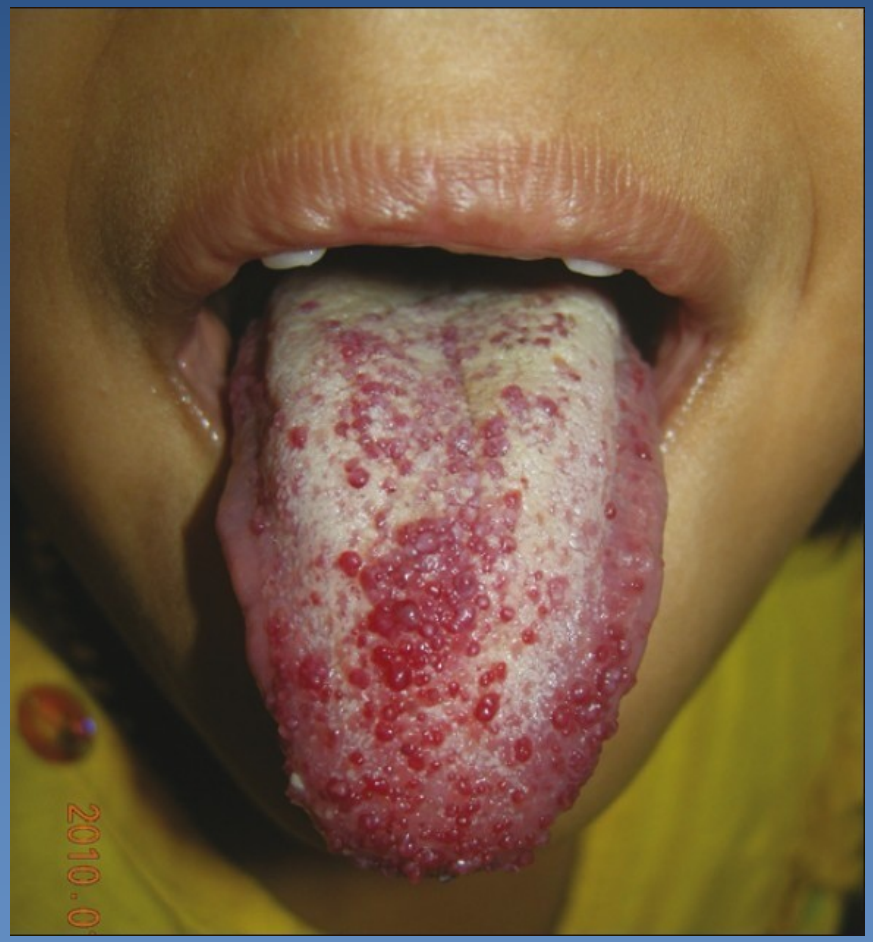
trauma ➡ sudden increase in size

Gross: ***pebbly surface***

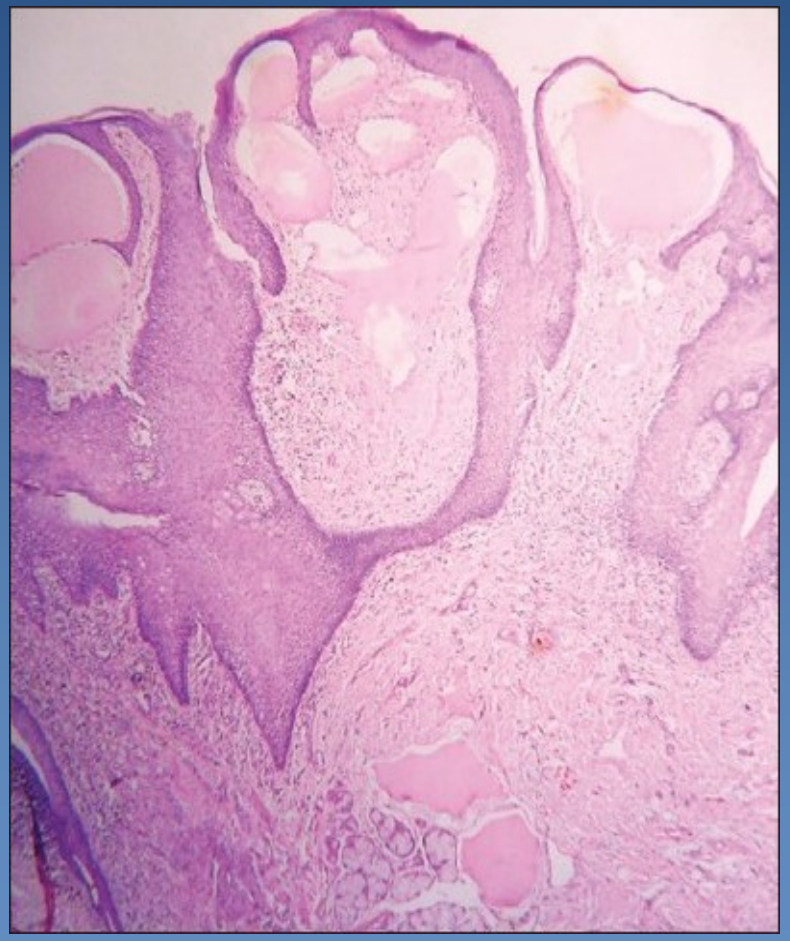
Micro: ***endothelial-lined spaces containing lymph***

Cystic hygroma ***– large, fluctuant swelling (>10 cm) of the head and neck region, may extend to oral cavity.***

Lymphangioma

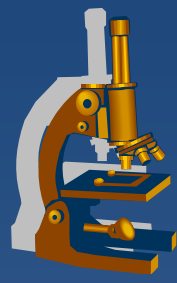


pebbly surface of the tongue



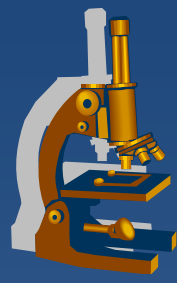
dilated lymphatic vessels beneath the epithelium

Tumors of peripheral nerves



1. Neurofibroma
   - solitary
   - multiple
2. Neurinoma (Schwannoma)
3. Multiple mucosal neuromas (MEN sy)
4. Traumatic neuroma
5. Granular cell tumor

Tumors of peripheral nerves



Neurofibroma – mixture proliferation of Schwann cell and fibroblasts

- young adults, children

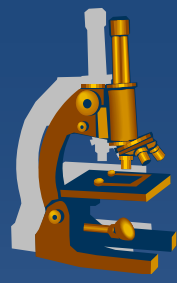
Solitary lesion – ***tongue, buccal mucosa, well-circumscribed nodules***

Multiple lesions associated with neurofibromatosis (von Recklinhause's disease of nerves) – AD, mutations in NF1 gene, located 17q11.2

skin pigmentation (coffee and milk) + involving of cutaneous nerves + axillary freckling + **oral lesions**

!!! May be associated with tumors of CNS, leukemia, RMS, WT…

Tumors of peripheral nerves



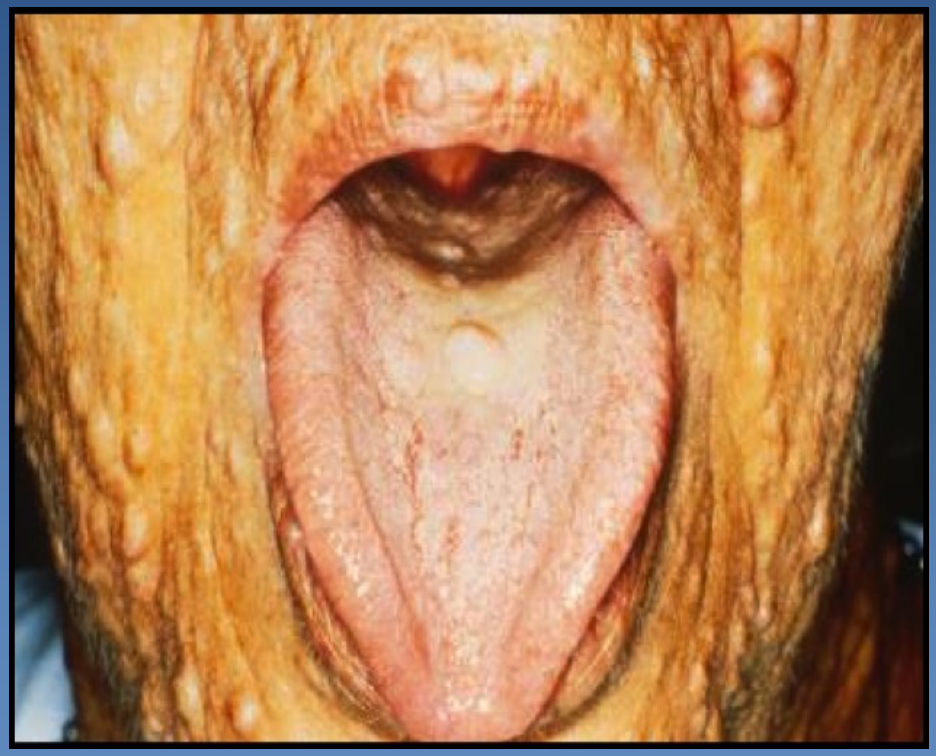
Oral lesions:

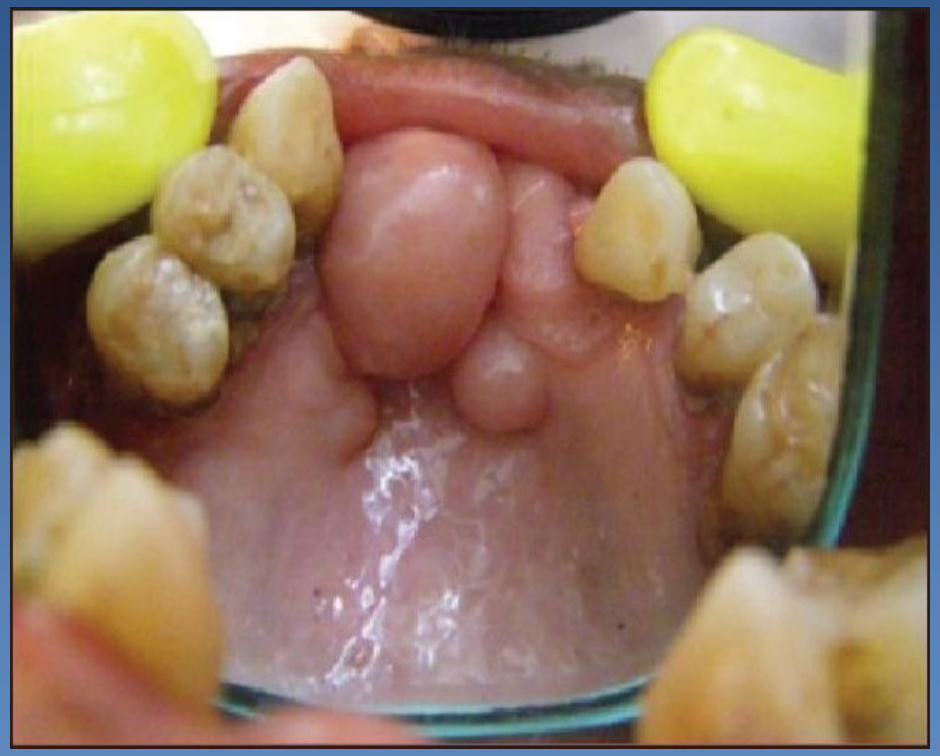
- mucosal swelling of the tongue, gingiva
- enlargement of the fungiform papilla
- enlargement of mandibular foramen
- increased bone density

Risk of malignization ⇨ MPNST (neurofibrosarcoma) 5-15%

Treatment: ***no specific therapy***

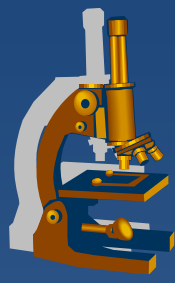
Neurofibromatosis





Involving of cutaneous nerves + mucous swelling of the tongue, gingiva

Tumors of peripheral nerves



Neurinoma (Schwannoma) - benign neoplasm of Schwann cell origin

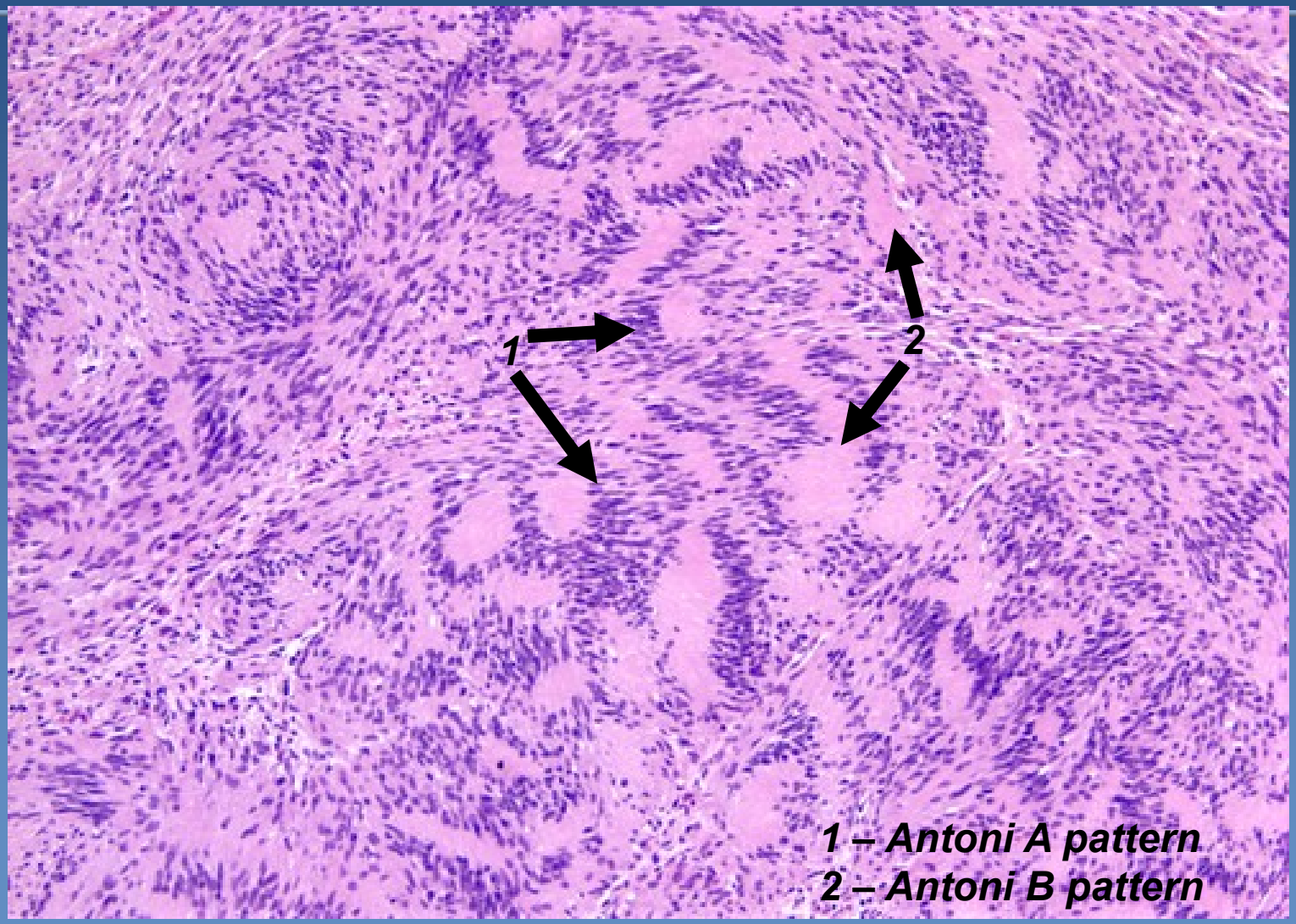
- young and middle-aged adults
- tongue, intraosseous in the posterior mandible

Gross: ***vary in size, encapsulated tumor***

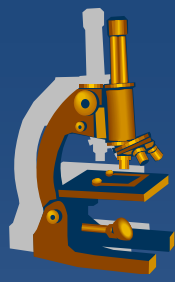
Micro: ***2 patterns – Antoni A (palisaded nuclei, Verocay bodies)***
Antoni B (less cellular fields)

Treatment: ***surgical excision***

Neurinoma (Schwannoma)



Traumatic neuroma



Traumatic neuroma (amputation neuroma) – tumor-like reactive proliferation of Schwann cells

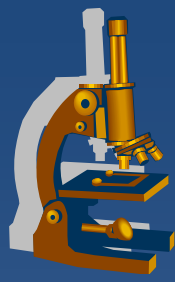
- cause: transection or other damage of a nerve bundle
- middle-age adults, F>M
- mental foramen area, tongue, lower lip
- painful lesion!!!

Gross: ***small nodule***

Micro: ***proliferation of mature nerve bundles, fibrotic stroma, mild chronic inflammation***

Treatment: ***surgical excision (incl. involved nerve bundle)***

Granular cell tumor



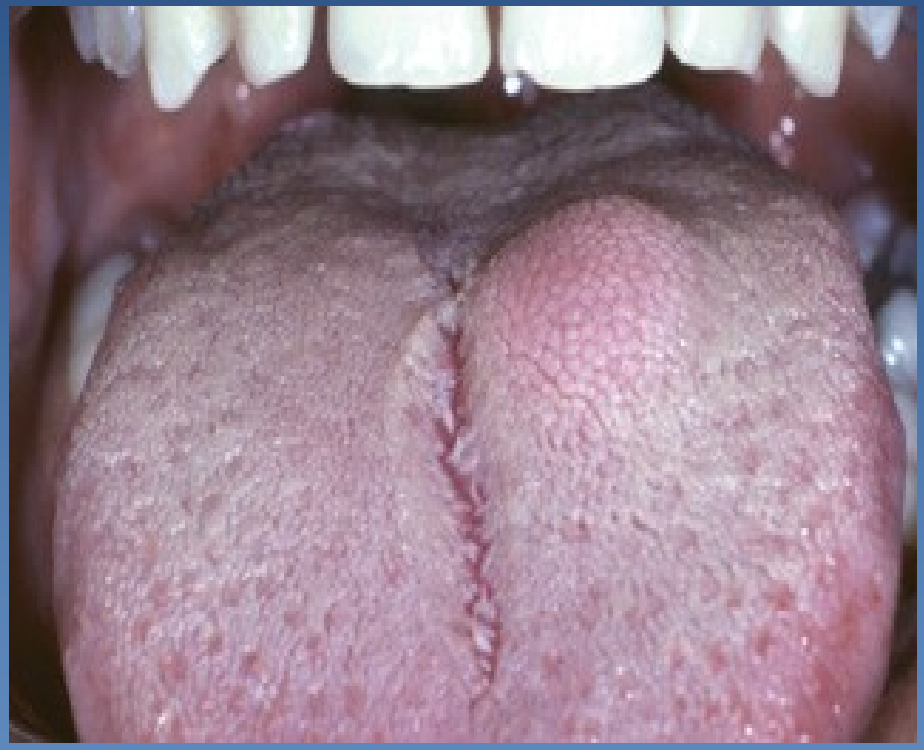
Granular cell tumor – tumor of unknown origin
(in the past was called the granular cell myoblastoma)

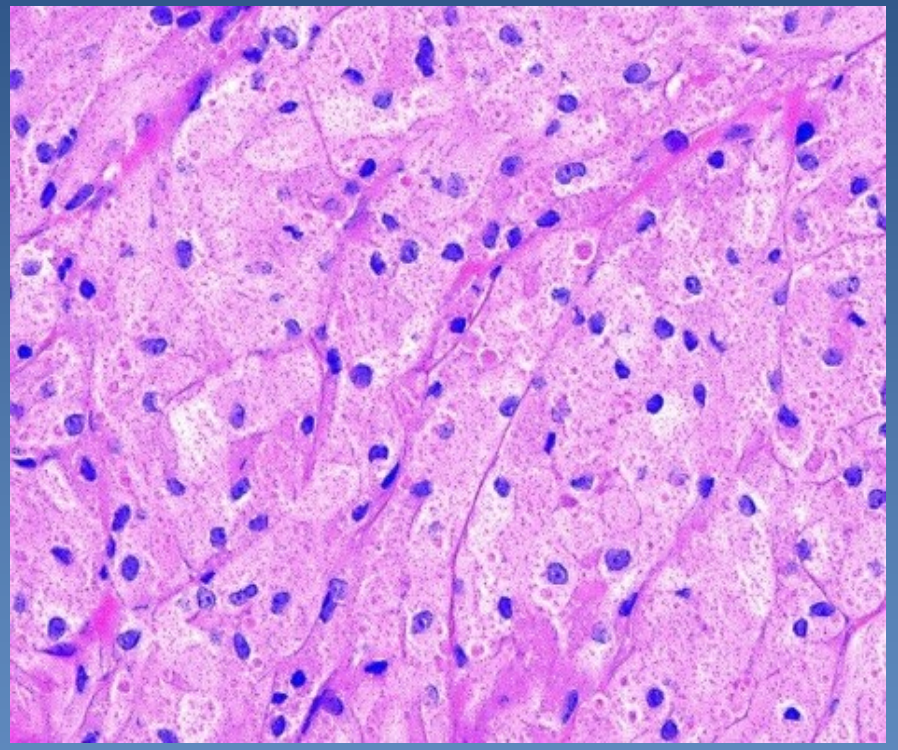
- wide age range
- dorsal surface of the tongue

Gross: ***non-encapsulated lesion***

Micro: ***large cells with granular cytoplasm,***
pseudoepitheliomatous hyperplasia of the overlying epithelium

Granular cell tumor

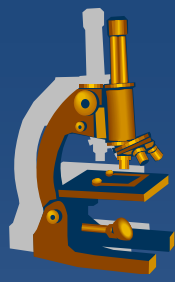




non-encapsulated lesion of tongue's mucosa

large cells with granular cytoplasm

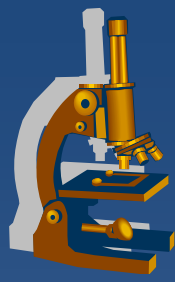
Tumors of muscle



Leiomyoma – benign smooth muscle tumors

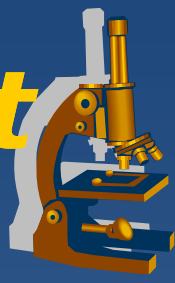
probably, ***leiomyomas of the oral cavity have their origin from vascular smooth muscle***

Leiomyosarcoma and rhabdomyosarcoma are both very rare in oral cavity



Bone pathology

Inherited and development disorders of bone

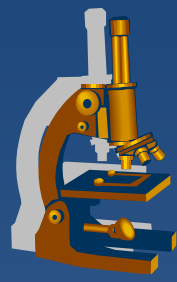


- 1. Osteogenesis imperfecta
- 2. Osteopetrosis
- 3. Cleidocranial dyspasia
- 4. Achondroplasia
- 5. Fibro-osseous lesions
- 6. Cherubism

Inherited disorders of bone

- uncommon diseases
- jaw involvement variable
- orofacial manifestations include:
  - abnormalities in number, form, structure of teeth
  - malocclusion
  - abnormal facial appearances

Osteogenesis imperfecta



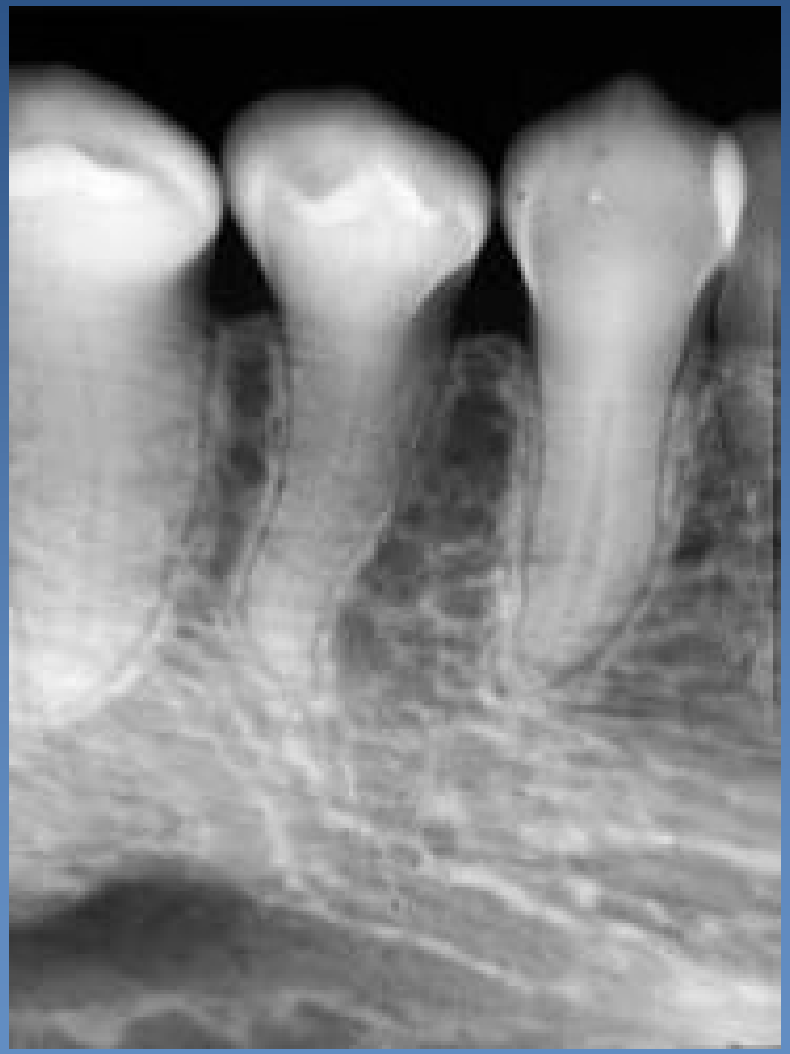
- AD, mutations in the genes that code for type-1 collagen (80-90%)
- generalized osteoporosis (slender bones)

Clinically 4 main type:

- Type I (classic type) – ***AD, blue sclera, deafness, +/- dentinogenesis imperfecta***
- Type II (perinatal lethal) – ***AD***
- Type III (progressively deforming) – ***AD/AR, severe osteoporosis, progressive deformities, dentinogenesis imperfecta***
- Type IV – ***AD, similar to type I, but more severe***

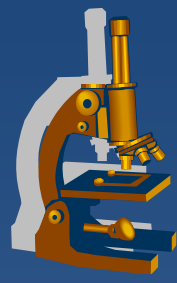
Micro: ***immature, woven bones of cortex***

Osteogenesis imperfecta



Dentinogenesis imperfecta:
note delicate bone trabeculae + obliteration of pulp chambers

Osteopetrosis (marble bone disease)

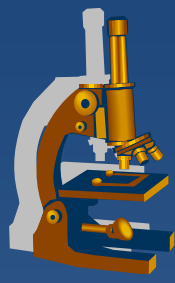


- excessive density of all bones
- obliteration of marrow cavities ⇨ secondary anemia
- defect in osteoclastic activity, failure in the remodeling of the developing bone
- bones mechanically week, common fractures!!!

Symptoms: ***delayed eruption of teeth, osteomyelitis (after tooth extraction)***

Radiography: ***mandible>>maxilla, invisible roots of the teeth***

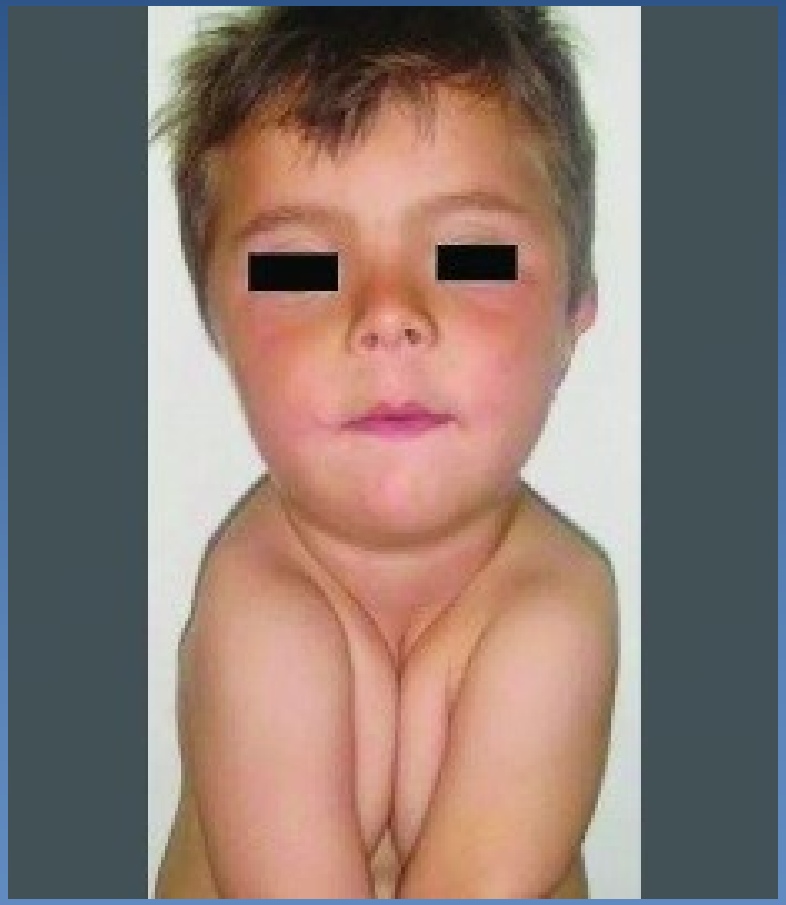
Cleidocranial dysplasia (cleidocranial dysostosis)



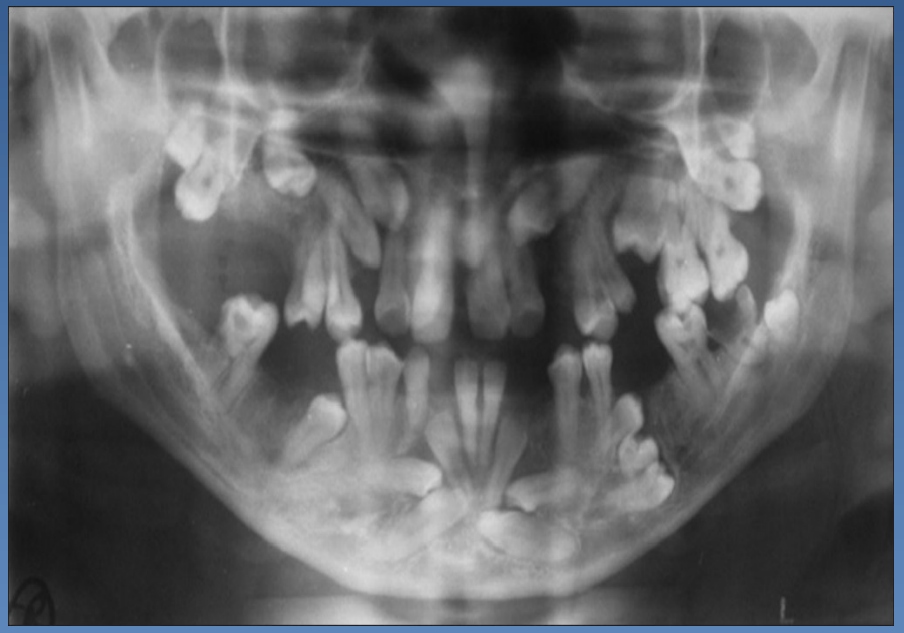
- AD, mutations to the RUNX2 gene
- disturbance of differentiation of osteoblasts from precursor cells
- abnormalities of the skull, jaws, clavicle (partial/complete absence)
- maxilla with a high, narrow arched palate
- delayed or non-eruption of the permanent dentition, supernumerary teeth

Radiography: ***thin teeth's roots***

Cleidocranial dysplasia

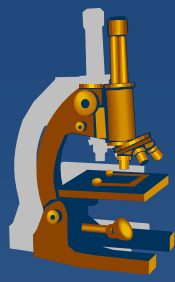


Complete absence of clavicles



Retention of deciduous teeth + multiple impactions of permanent teeth

Fibro-osseous lesions



Divided into:

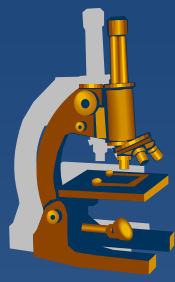
I. Osseous dysplasia

1. Fibrous dysplasia (monostotic/polyostotic)
2. Cemento-osseous dysplasia

II. Benign neoplasia (ossifying fibroma)

- replacement of normal bone by cellular fibrotic tissue
- contain woven bone + acellular islands of mineralized tissue develop

Fibrous dysplasia (FD)



- development disorder, but not inherited

Monostotic FD: *much more common!*

- childhood, adolescence

  reactivation of quiescent lesion during pregnancy

- affected 1 bone: limb, skull bones, **particularly the jaws**

  maxilla>>mandible

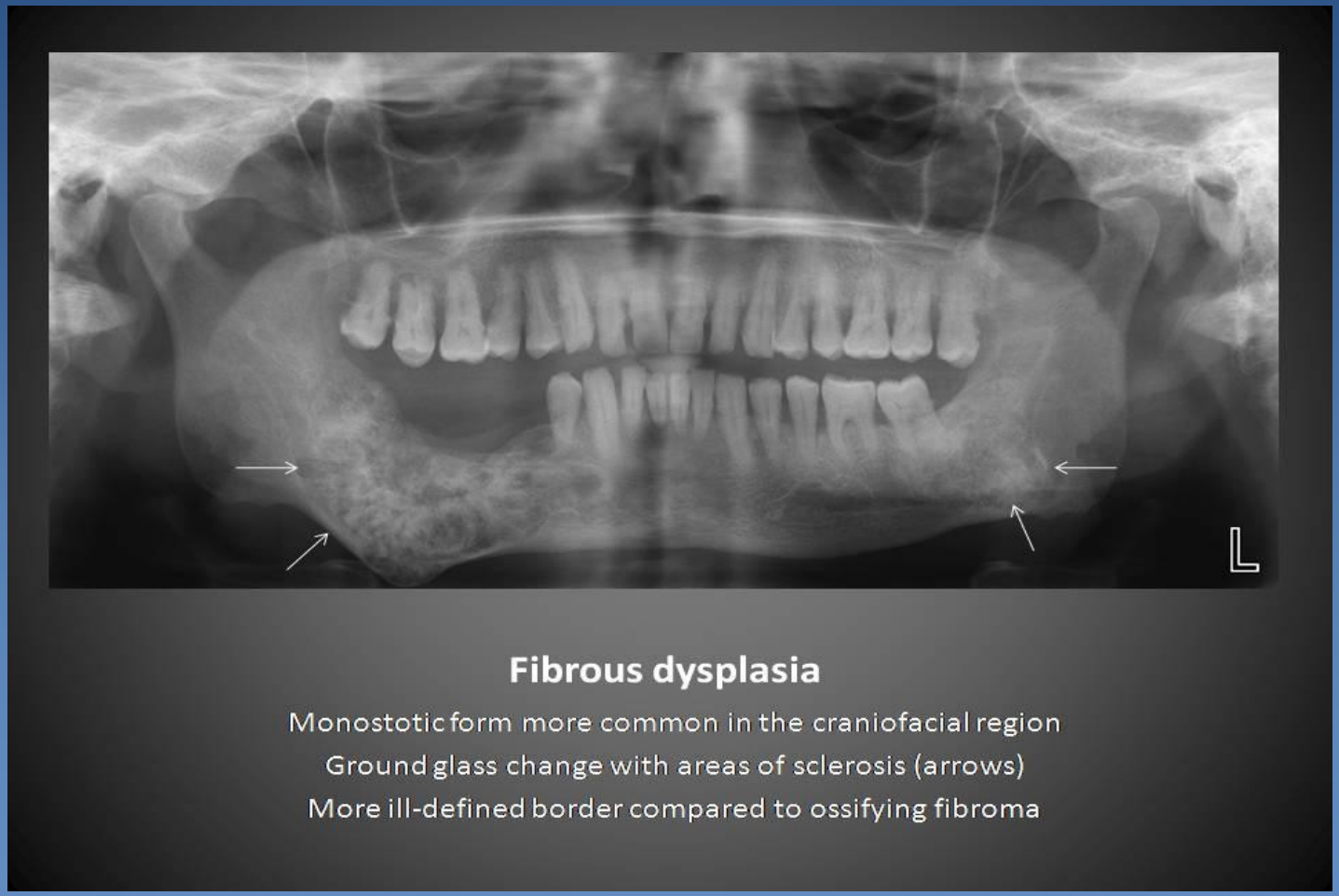
Craniofacial fibrous dysplasia – 1 bone is affected (maxilla) + involvement of adjacent bones

Symptoms: ***painless swelling of the maxilla (buccally)*** ⇨ ***facial asymmetry***
rapid and extensive growth ⇨ ***exophthalmos***
mandibular lesion ⇨ ***fusiform expansion + displacement of teeth***

Gross: ***ill-defined smooth enlargement***

Radiography: ***ground-glass/orange-peel-stippling effect***
displaced teeth, separated roots

Fibrous dysplasia (FD)



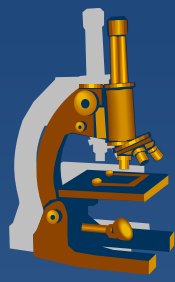
Fibrous dysplasia

Monostotic form more common in the craniofacial region

Ground glass change with areas of sclerosis (arrows)

More ill-defined border compared to ossifying fibroma

Fibrous dysplasia (FD)



Polyostotic FD

- affected several bones, segmentally lesions
- affected sites: limb (lower), **skull bones**, vertebrae, ribs, pelvis
- childhood, F:M 2-3:1

expansion usually stops with skeletal maturation

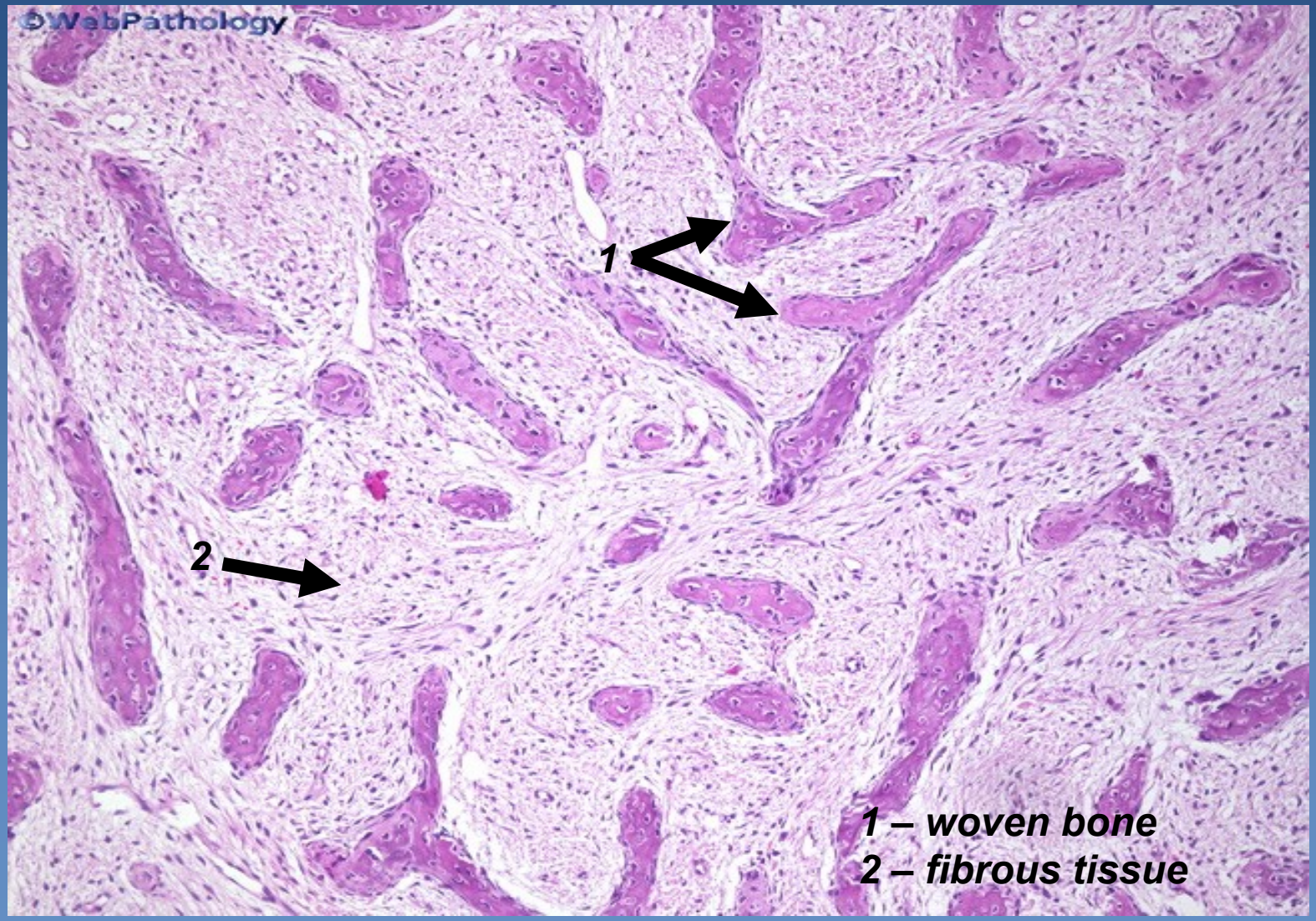
McCune-Albright syndrome – bone lesions are accompanied by skin pigmentation, sexual precocity, endocrine abnormalities

Micro: ***delicate trabeculae of woven bone + fibrous tissue***

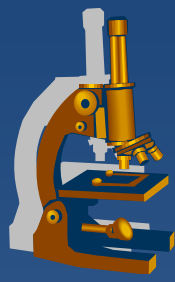
Remodelling of woven to lamellar bone may occur with increasing age!!!

Treatment: ***not radiosensitive !!!*** ***(risk of malignant transformation to fibrosarcoma)***

Fibrous dysplasia (FD)



Cemento-osseous dysplasia



- osseous dysplasia of jaws, which involves the tooth-bearing areas
- F>>M, over 30 yrs old, mandible>>maxilla

Based on the clinical and radiographic features:

periapical, focal and florid cemento-osseous dysplasia

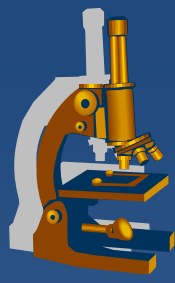
Clinically:

multiple and small <1 cm	multiple and large >1 cm
associated with apical areas of the mandibular incisors	involve 1 or more quadrants in one or both jaws

Micro: ***fibrous tissue + bone/calcified accelular tisue develop***

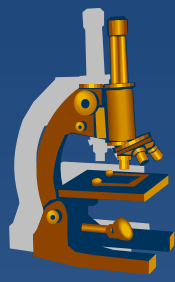
Radiography: ***radiolucent/mixed/radiopaque***

Inflammatory diseases of bone



- 1. Alveolar osteitis (dry socket)
- 2. Focal sclerosing (condensing) osteitis
- 3. Osteomyelitis
- 4. Chronic periostitis
- 5. Radiation injury and osteoradionecrosis

Osteomyelitis



- now is a rare disease
- polymicrobial infection

Predisposing factors:

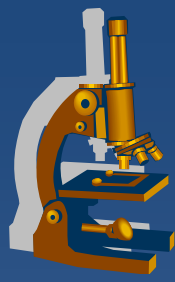
Local factors

- trauma
- radiation injury
- Paget's disease
- osteopetrosis
- major vessel disease

Systemic factors

- immune deficiency states
- immunosuppresson
- DM
- malnutrition
- extremes of ages

Suppurative osteomyelitis



- clinically: acute, chronic (>1 month)
- mandible>maxilla
- source of the infection – ***dental abscess, fractures, penetraiting wounds, extractions***

Symptoms:

acute lesion***- pain, swelling, pyrexia, malaise, mobility of teeth***

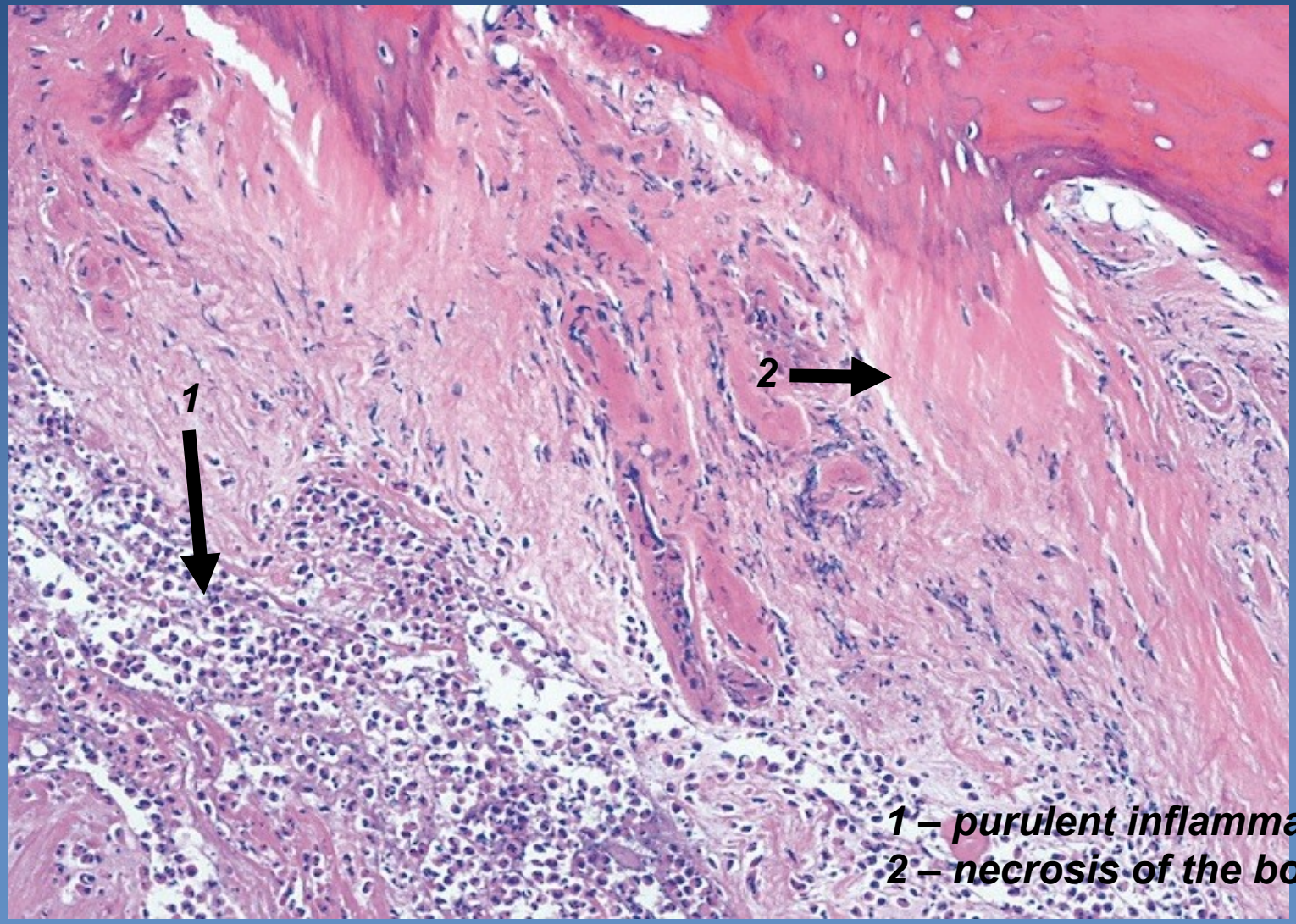
chronic ***– discharge of pus through 1 or more sinuses***

Micro***: suppurative inflammation, necrosis of the bones, pus within marrow spaces, vascular thrombosis***

Complication: ***sequestrum*** ***(exfoliated through a sinus)***

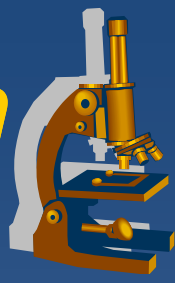
surgical removing

Suppurative osteomyelitis



1 – purulent inflammation
2 – necrosis of the bone

Chronic osteomyelitis with proliferative periostitis

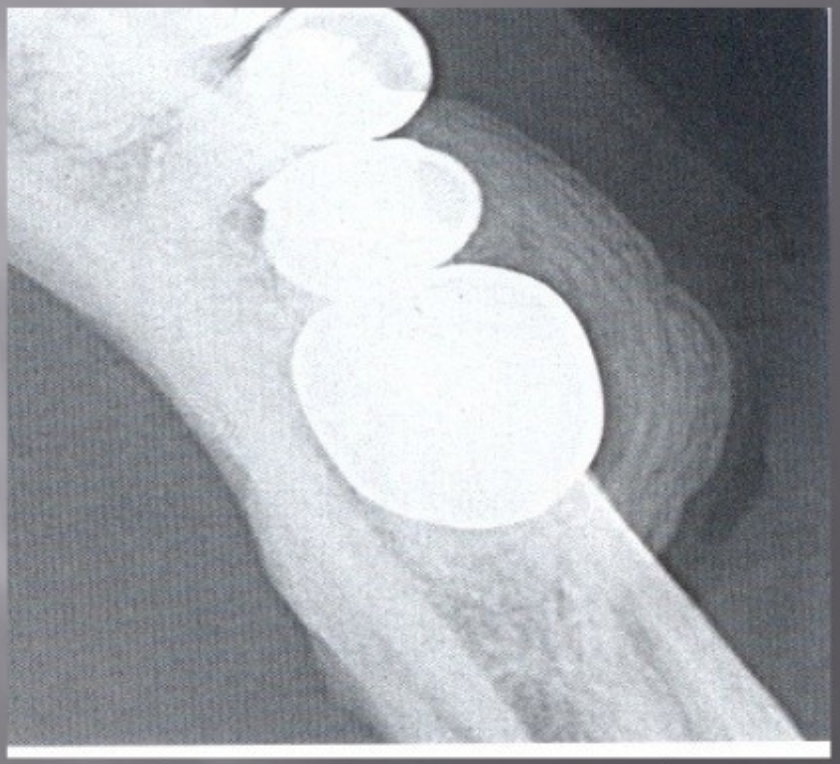


- syn. Garré's osteomyelitis, periostitis ossificans
- type of sclerosing osteomyelitis
- mandible, children and young adults

Gross: ***swelling on the outer surface of the mandible***

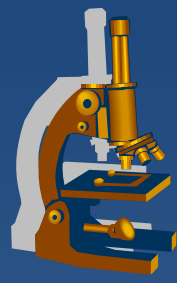
Micro: ***subperiosteal mass of trabeculae of woven bone + chronic inflammation in fibrous marrow***

Chronic osteomyelitis with proliferative periostitis



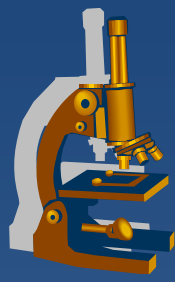
Subperiosteal mass in mandible

Metabolic and endocrine disorders of bone



- 1. Osteoporosis
- 2. Primary hyperparathyroidism
- 3. Secondary hyperparathyroidism
- 4. Rickets and osteomalacia
- 5. Acromegaly

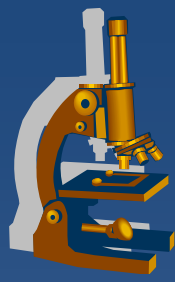
Osteoporosis



- excessive bone loss/when the apposition of bone is reduced
- F:M 2:1
- postmenopausal women (rate of bone's loss 1-8% per year)
- edentulous patients (mandible)
- accentuated in Cushing syndrome, thyrotoxicosis, primary hyperparathyroidism
- osteoporotic bone is reduced in quantity

Radiography: ***increased radiolucency, thin cortex***

Hyperparathyroidism



Primary

- ↑ secretion of parathormone (adenoma/Ca, hyperplasia PG)
- hypercalciemia, hypercalciuria + pathological metastatic calcification

Micro: ***brown tumor (haemosiderin + fibrotic tissue + multinucleated, osteoclast-like giant cells)***

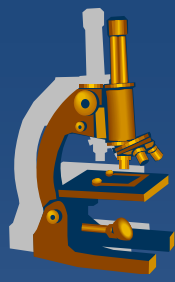
Secondary

- response to chronic hypocalciemia (CRI)
- may associated with rickets and osteomalacia

Micro: ***uncalcified osteoid + brown tumor***

may affect jaws

Paget's disease of bone



- form of osteodystrophy, disorganized formation and remodeling of bone
- aetiology - unclear

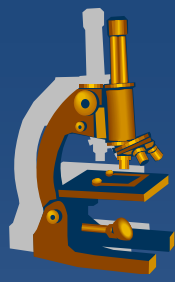
  genetic and environmental factors, paramyxovirus infection

- >40 yrs, more common in maxilla

Phases:

1. Osteolytic
2. Mixed osteolytic and osteogenesis
3. Osteoblastic

Paget's disease of bone

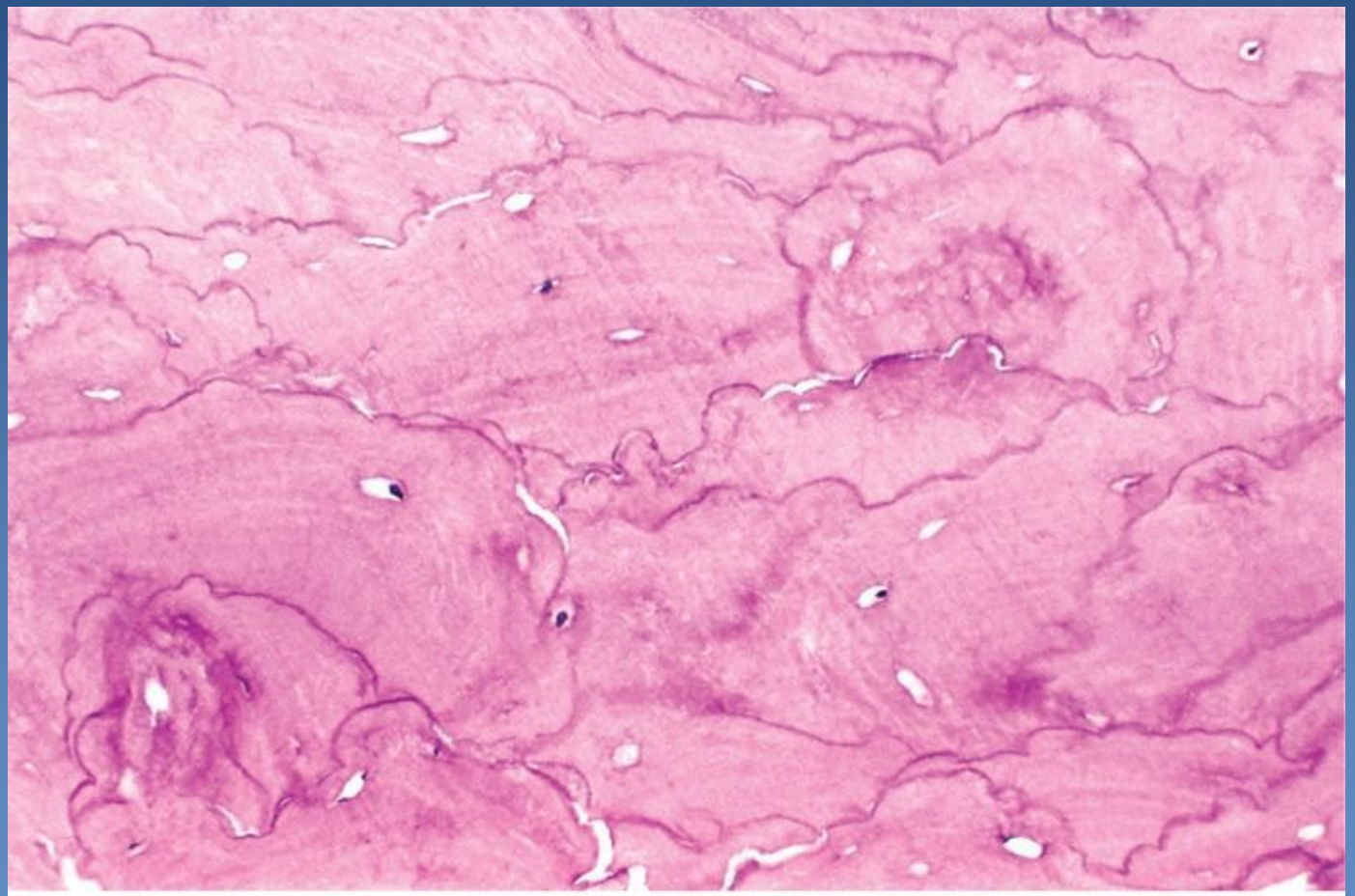


Symptoms: ***bone pain, cranial nerve compression, facial deformity, difficulties in wearing dentures***
hypercementosis, ankylosis ⇨ ***difficulty in extraction***
root resorption (1 phase)
increased alkaline phosphatase

Micro: ***criss-crossing reversal lines, mosaic bone***

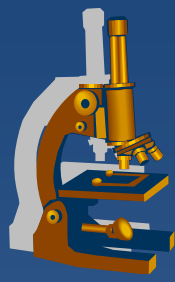
Complication: ***risk of malignant transformation (osteosarcoma)***

Paget's disease of bone



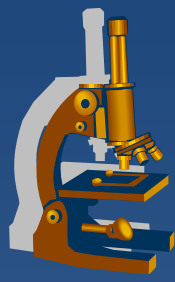
criss-crossing reversal lines, mosaic bone

Tumors of bone



1. **Bone-forming tumors**
   - Benign: Osteoma, Osteoblastoma
   - Malignant: Osteosarcoma
2. **Cartilage-forming tumors**
   - Benign: Chondroma
   - Malignant: Chondrosarcoma
3. **Marrow tumors**: Myeloma
4. **Histiocytic and dendritic cell neoplasms** Langerhans cell histiocytosis
5. **Vascular tumors**: Haemangioma of bone
6. **Fibrous tumors**: Ossifying (cemento-ossifying) fibroma
7. **Metastatic tumors**

Bone-forming tumors



Osteoma – benign, slow-growing tumor

- adults, mandible>maxilla

Gross: ***solitary, well-circumscribe lesion***

multiple osteomas of the jaws occur as a feature of Gardner sy

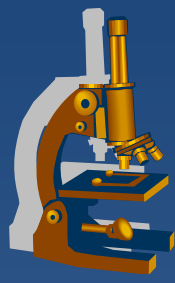
Micro: ***compact type: dense lamellar bone***

cancellous type: interconnecting trabeculae + fibrous marrow

Osteoblastoma – rare tumor in the jaws

Micro: ***cementoblastoma (!!!not related to the roots of the teeth)***

Bone-forming tumors



Osteosarcoma – primary malignant Tu of bone

- 30 yrs and older
- relatively rare in jaws

Intramedullary type - ***arise centrally within the jaws***

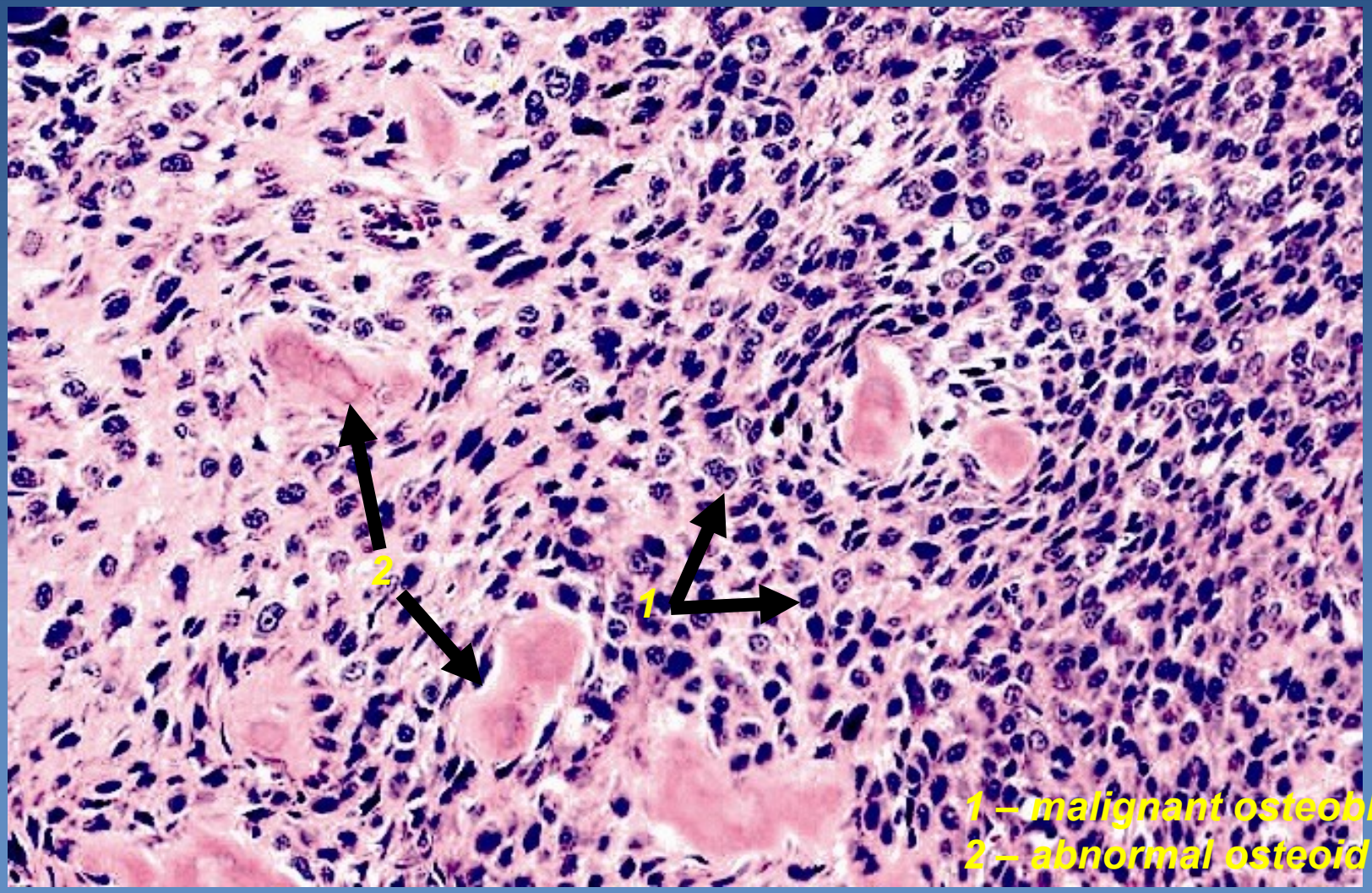
Juxtacortical type – ***peripherally in the relation to the periosteum, better prognosis***

Micro: ***malignant osteoblasts + abnormal osteoid***

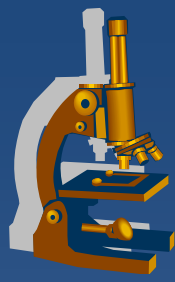
Metastasis: ***RLN, lungs, brain***

Treatment: ***neoadjuvant CT+ surgical removal + adjuvant CT***

Osteosarcoma



Cartilage-forming tumors



Chondroma – rare benign Tu in the jaws

- 3-4 decades
- Mandible ***(condylar process, posterior part)***

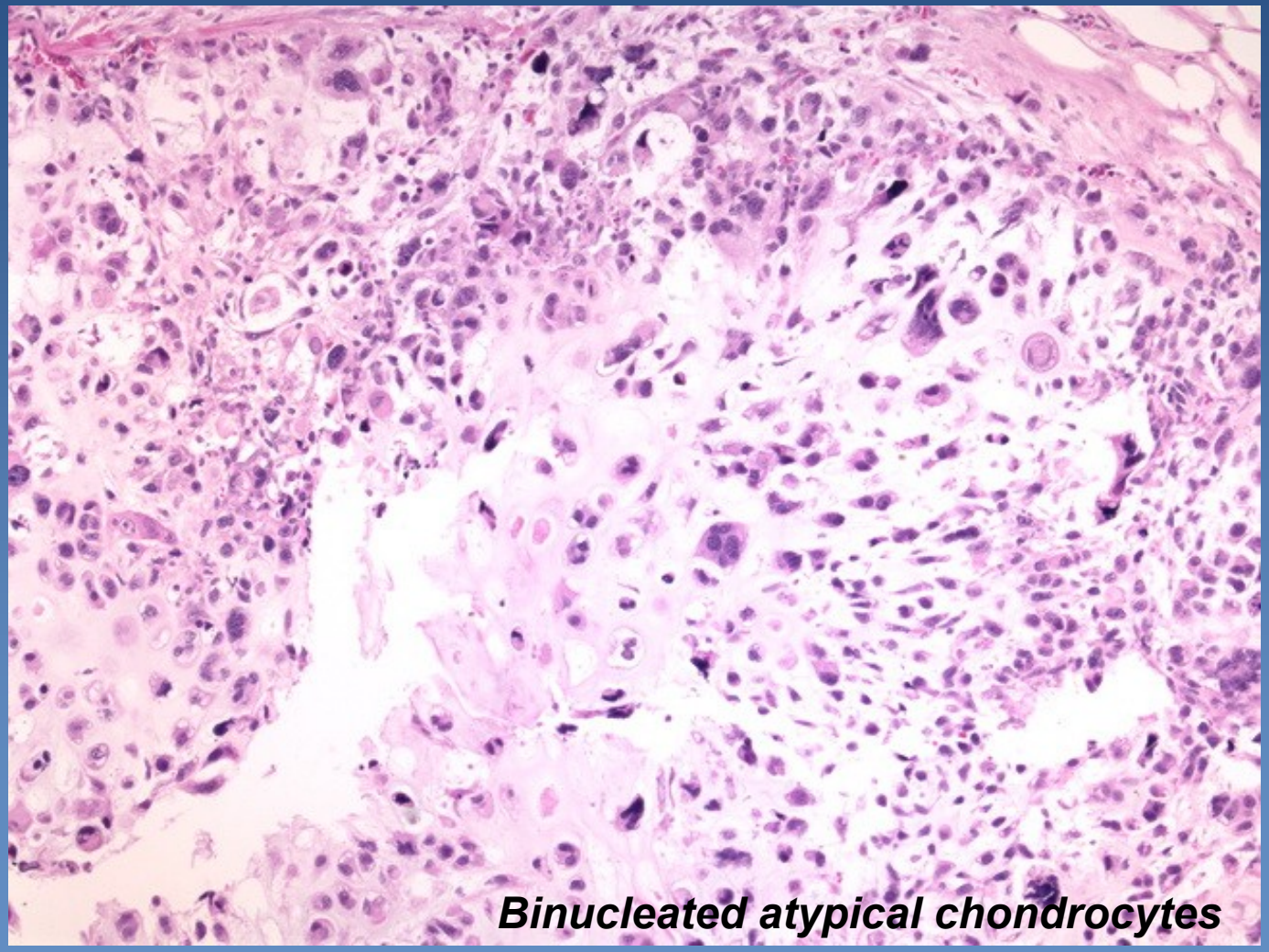
  Maxilla ***(anterior part)***

Micro: ***circumscribed mass of mature hyaline cartilage***

⇧ ***cellularity, binucleated cells*** ⇨ ***susp well-differentiate chondrosarcoma !!!***

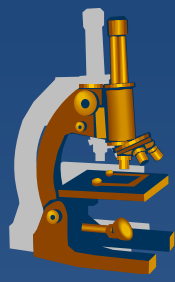
Prognosis: ***better for mandibular lesions***

Chondrosarcoma



Binucleated atypical chondrocytes

Marrow tumors



Myeloma – plasma cells neoplasm

Multiple myeloma – ***disseminated disease involving many bones***

Solitary myeloma (plasmocytoma) – ***solitary lesion***

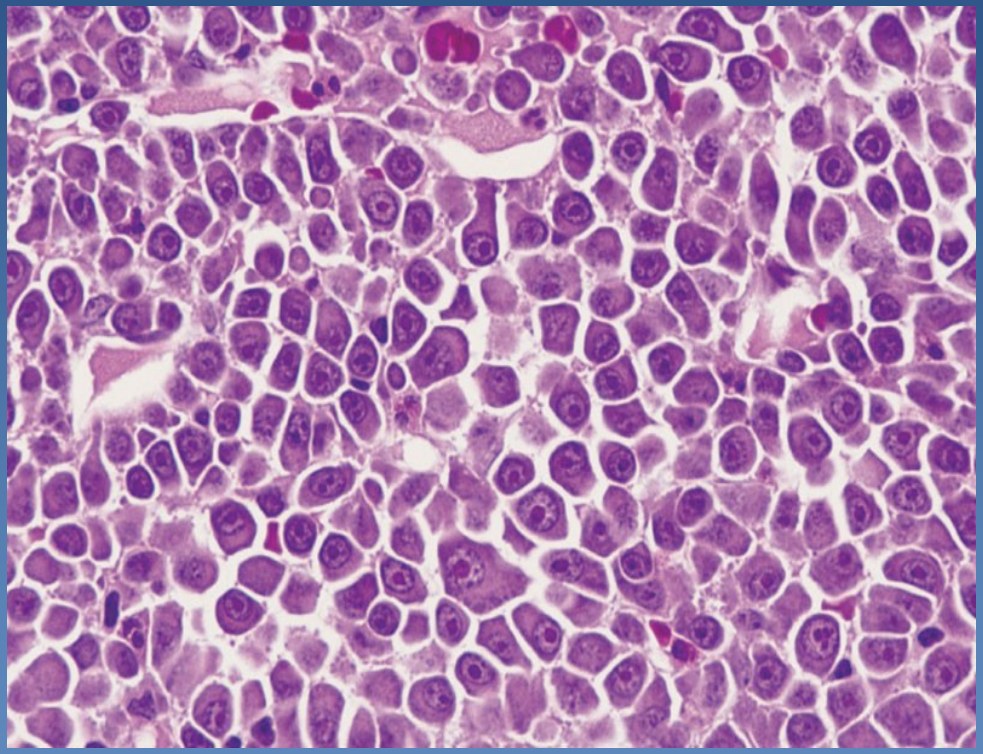
- 50-70 yrs
- **skull**, vertebrae, sternum…(sites with red marrow)
- abnormally high levels of single homogenous type ***Ig*** in serum (paraprotein)

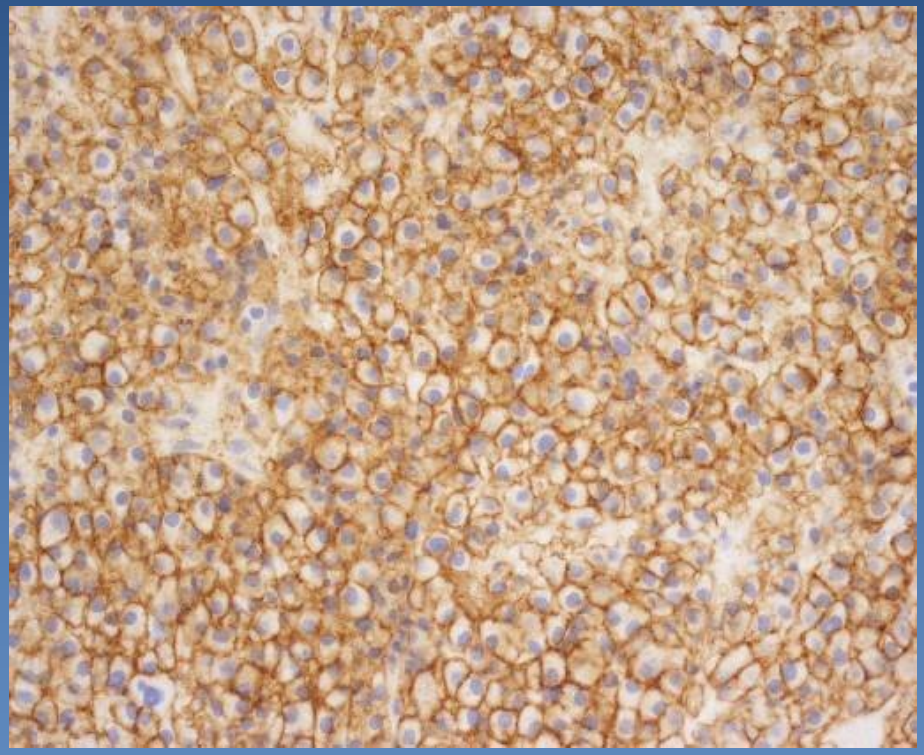
Radiography: ***osteolytic lesions (punched-out radiolucencies)***

Micro: ***cellular sheets of Tu cells resemblance to plasma cells***

IHC***: positivity of CD20, CD138, kappa, lambda***

Myeloma

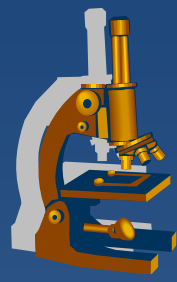




Tumour's cells resemblance to plasma cells

IHC: positivity of CD138

Histiocytic and dendritic cell neoplasms



Langerhans cell histiocytosis – clonal proliferation of Langerhans-type cells

Solitary lesion in bone (unifocal eosinophilic granuloma)

Multifocal eosinophilic granuloma (bone + other organs)

Disseminated multiorgan disease (Litterer-Siwe disease)

Unifocal/multifocal eosinophilic granulomas:

- <20 yrs, M:F 2:1
- cranuim and jaws (mandible)

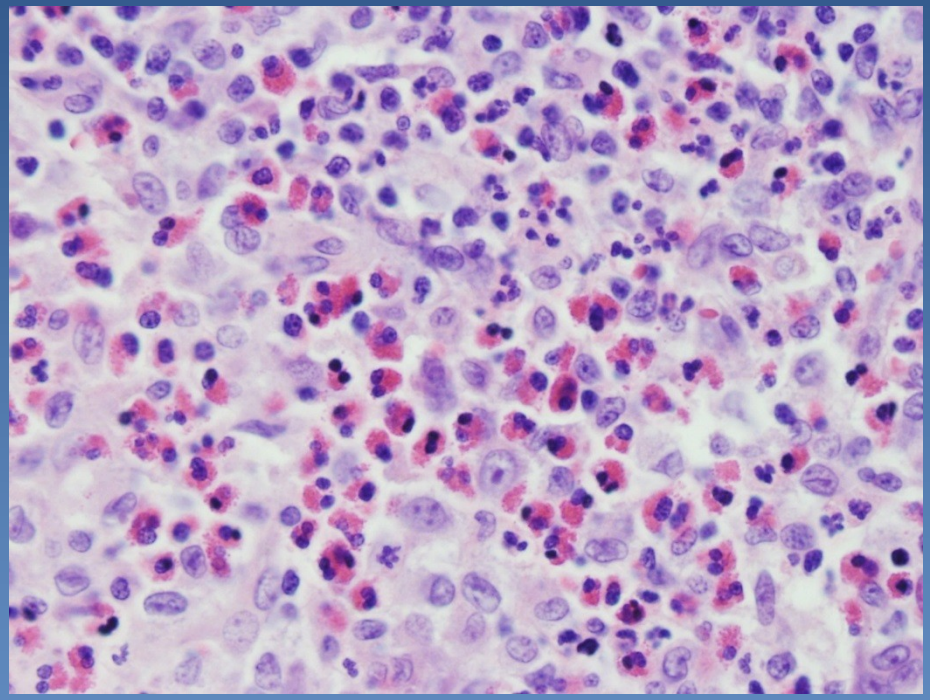
Radiography: ***solitary/multiple osteolytic lesions***

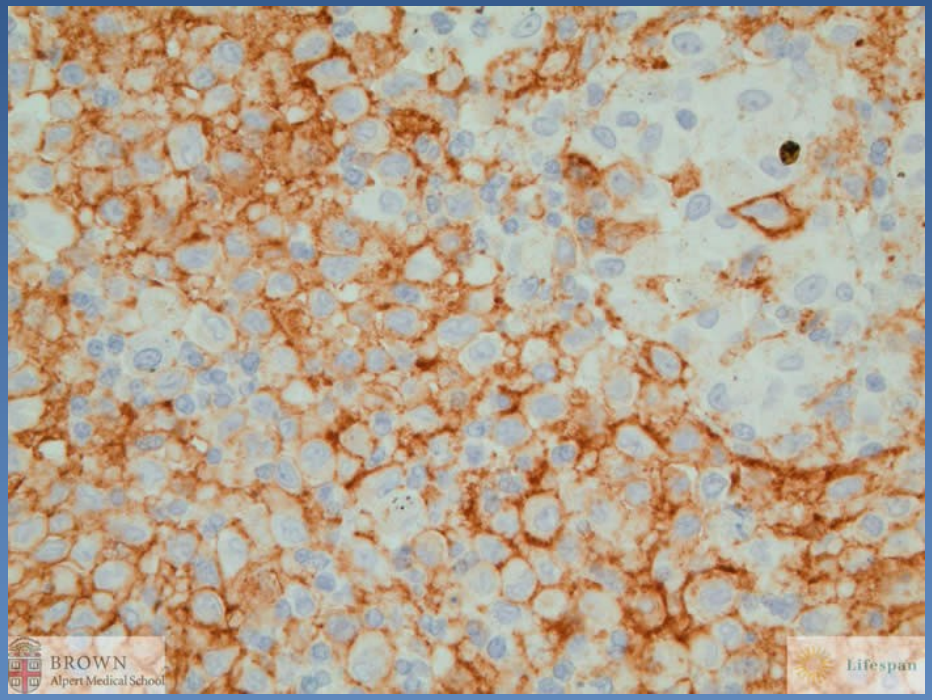
Micro: ***histiocytes + variable numbers of eosinophils***

EM: ***Birback granules***

IHC: ***positivity of CD1α, S100***

Langerhans cell histiocytosis

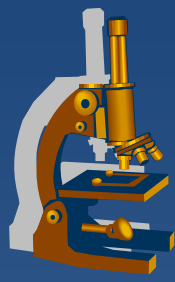




Histiocytes + variable numbers of eosinophils

IHC: positivity of CD1a

Fibrous tumors



Ossifying (cemento-ossifying) fibroma – benign well-demarcated !!! neoplasm

- wide age range, F>M

rapid growth in children/adolescence - juvenile ossifying fibroma

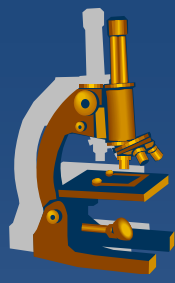
Micro: ***well circumscribed cellular fibrous tissue + trabeculae of bone***

Diff.dg***: fibrous dysplasia***

Juvenile ossifying fibroma – ***richly cellular + high mitotic activity + immature-looking woven bone (recc. rate 30-60%)***

Diff. dg: ***osteosarcoma***

Metastatic tumors



- 1% of malignant Tu of oral cavity
- Mandible>>maxilla
  gingiva, alveolar mucosa, tongue
- Ca of breast, bronchus, kidney…
- Mts may cause: osteolytic changes
  osteoblastic changes


Thank you
for your attention...