Soft tissue tumours

DR LALIMA TIWARI

BDSC (UWA), DCLINDENT (ORALMED) (UWA), MRACDS (ORALMED), FOMAA

ORAL MEDICINE SPECIALIST

CLINICAL SENIOR LECTURER

Learning Outcomes

Knowledge of soft tissue (mesenchymal) tumours including developmental, reactive and neoplastic lesions.

1. Describe the aetiology, pathogenesis, the clinical and histopathologic features and the diagnosis and treatment of the following developmental and reactive lesions:

- Vascular malformations
- Fibro-epithelial polyps
- Fibrous epulides
- Denture hyperplasia
- Inflammatory papillary hyperplasia
- Pyogenic granuloma

Mesenchymal tumours

Tumours originating from mesodermal-derived precursor cells

- Bone
- Cartilage
- Blood vessels
- Adipose tissue
- Smooth muscle
- Fibroblasts

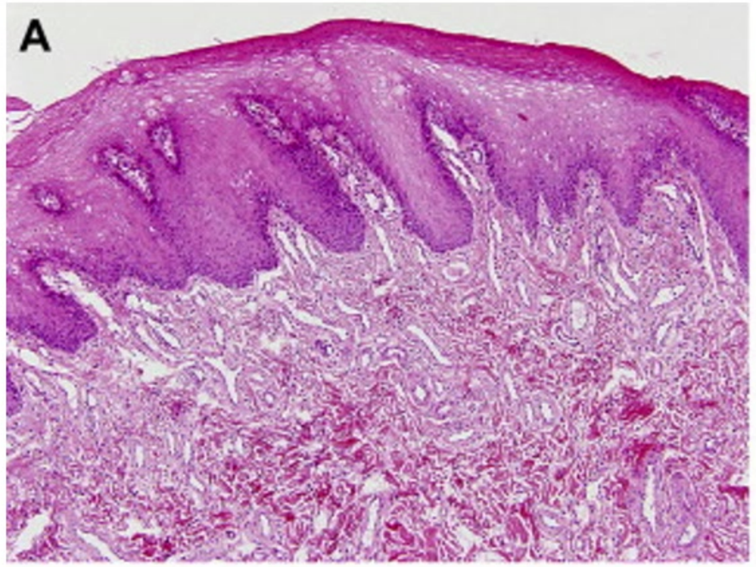
Vascular malformations

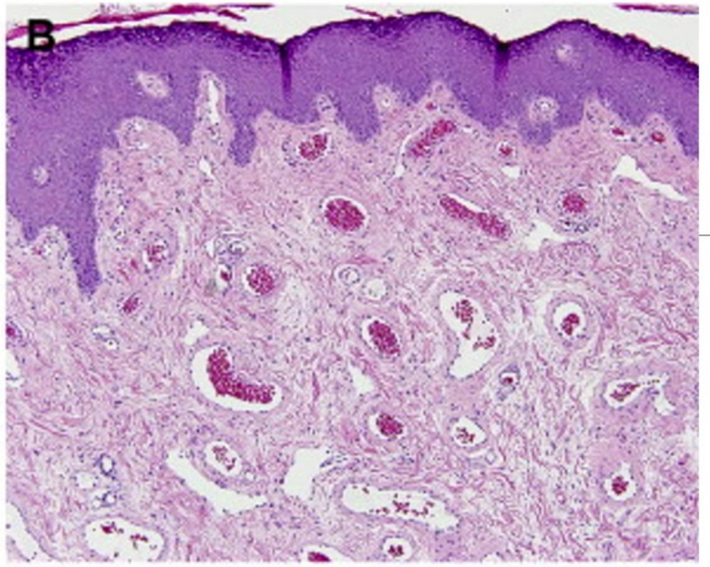
Clinical Features

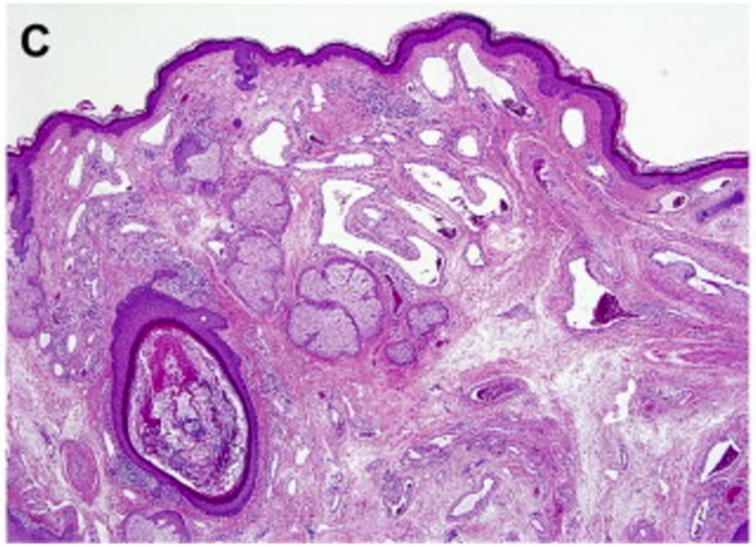
- Wide range age manifestations
- 4- 10 % of newborn children: congenital lesions – labelled birthmarks
- Clinical features vary according to extension of lesion, location and displacement of neighbouring tissue
- Port wine stain most common vascular malformation
  - Skin, oral mucosa, sclera
  - Isolated or part of systemic disease
- Slow-flow vascular malformation detected at birth
  - Vary in colour depending on depth: normal colour – deep purple
  - Consider haemangioma → continuous growth
- High flow vascular malformations
  - 3rd decade of life
  - Bluish- colour
  - Arteriovenous malformation (AVM) – swelling, pain, bleeding, not fluctuant, pulsatile
- Mixed
  - Behave as high flow due to arterial supply
  - Should be distinguished from HHT
- Intraosseous
  - Poorly defined borders or well – circumscribed halo
    - unilocular, multilocular
    - Unicystic to honeycomb appearance
    - Bone expansion

Most common vascular malformations of the head and neck according to blood flow pattern

Slow flow	High flow
Sturge-Weber syndrome	Arteriovenous malformations
Venous malformations	Arteriovenous fistula
Capillary malformations	Capillary arteriovenous malformation
Capillary venous malformation	Capillary lymphatic venous arteriovenous malformation
Capillary lymphatic malformation	
Lymphatic venous malformation	
Capillary lymphatic venous malformation	







Histopathology of Capillary Malformation

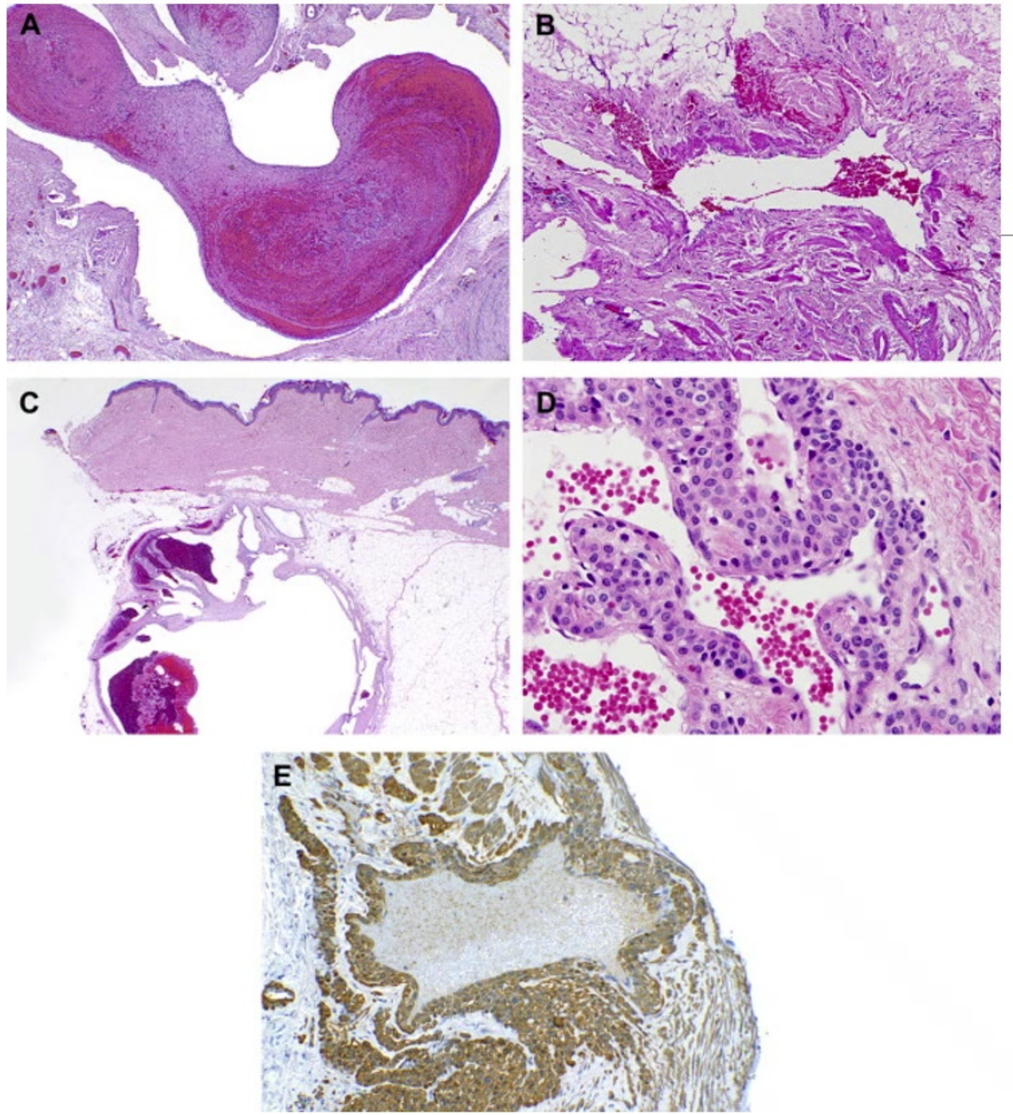
Capillary malformation (CM).

(*A*) Facial CM with lip hypertrophy in a 4-year-old boy showing an excessive number of thin-walled venule-like channels with narrow lumens (hematoxylin-eosin, original magnification ×100).

(*B*) Facial CM with lip hypertrophy in a 17-year-old boy has an increased number of enlarged vein-like channels with both thin and thick, mostly fibrous walls. Intervascular fibrous tissue is increased (hematoxylin-eosin, original magnification ×100).

(*C*) Facial CM with thickening and nodules in a 35-year-old man with Sturge-Weber syndrome. Nasal skin shows a nodular cluster of large, abnormal vein-like channels. Fibrosis and follicular dilatation and keratin plugging are present (hematoxylin-eosin, original magnification ×40).

•Anita Gupta MD and Harry Kozakewich MD
Clinics in Plastic Surgery, 2011-01-01, Volume 38, Issue 1, Pages 31-44, Copyright © 2011



Histopathology of venous malformations

Venous (VM) and glomuvenous malformation (GVM).

(*A*) VM shows malformed venous channels with an organizing thrombus (hematoxylin-eosin, original magnification ×20).

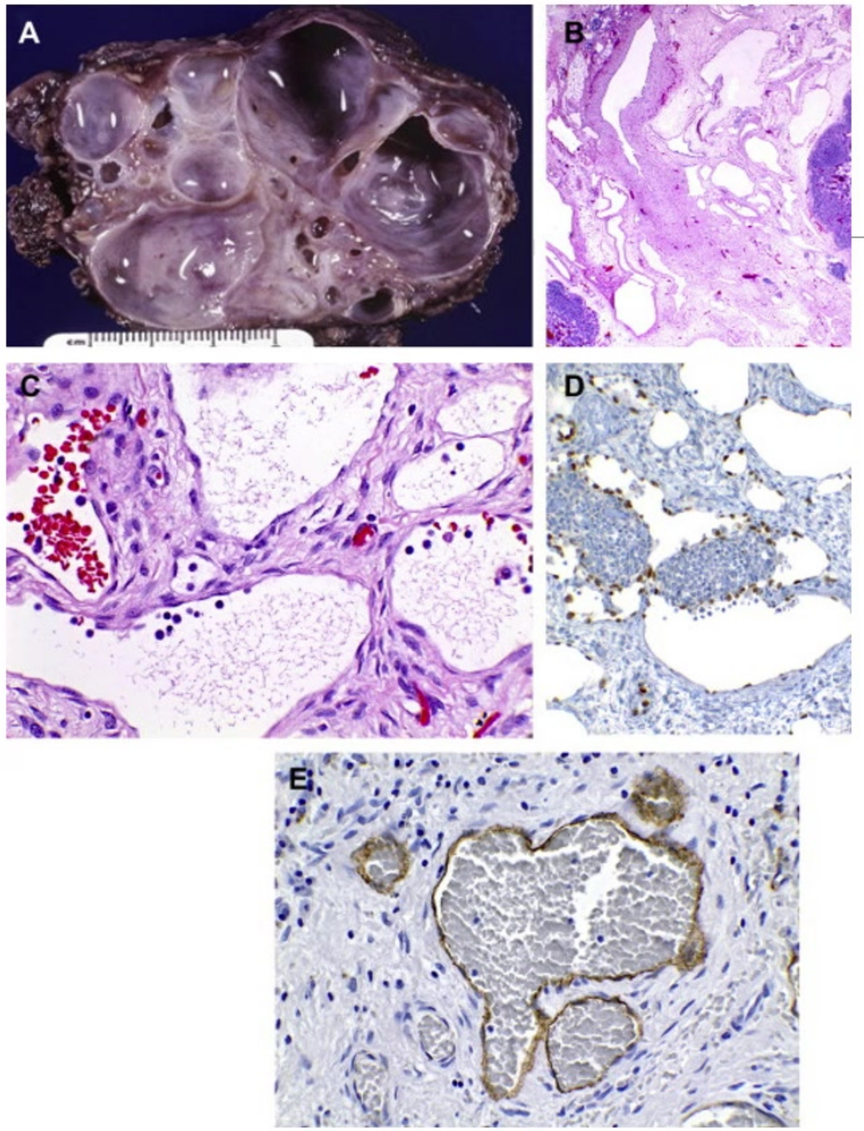
(*B*) Venous wall is irregularly muscularized and focally lacks muscle (hematoxylin-eosin, original magnification x100).

(*C*) GVM overview of a deep dermal/subcutaneous lesion with organizing thrombi (hematoxylin-eosin, original magnification ×20).

(*D*) Vascular channels in GVM have cuboidal glomus cells replacing smooth muscle (hematoxylin-eosin, original magnification ×200).

(*E*) Glomus cells are highlighted by smooth muscle actin immunostain (original magnification ×200).

•Anita Gupta MD and Harry Kozakewich MD
Clinics in Plastic Surgery, 2011-01-01, Volume 38, Issue 1, Pages 31-44, Copyright © 2011



Histopathology of lymphatic malformations

Lymphatic malformation (LM).

(*A*) Macrocystic lymphatic malformation (cyst-like channels are greater or equal to 1 cm.

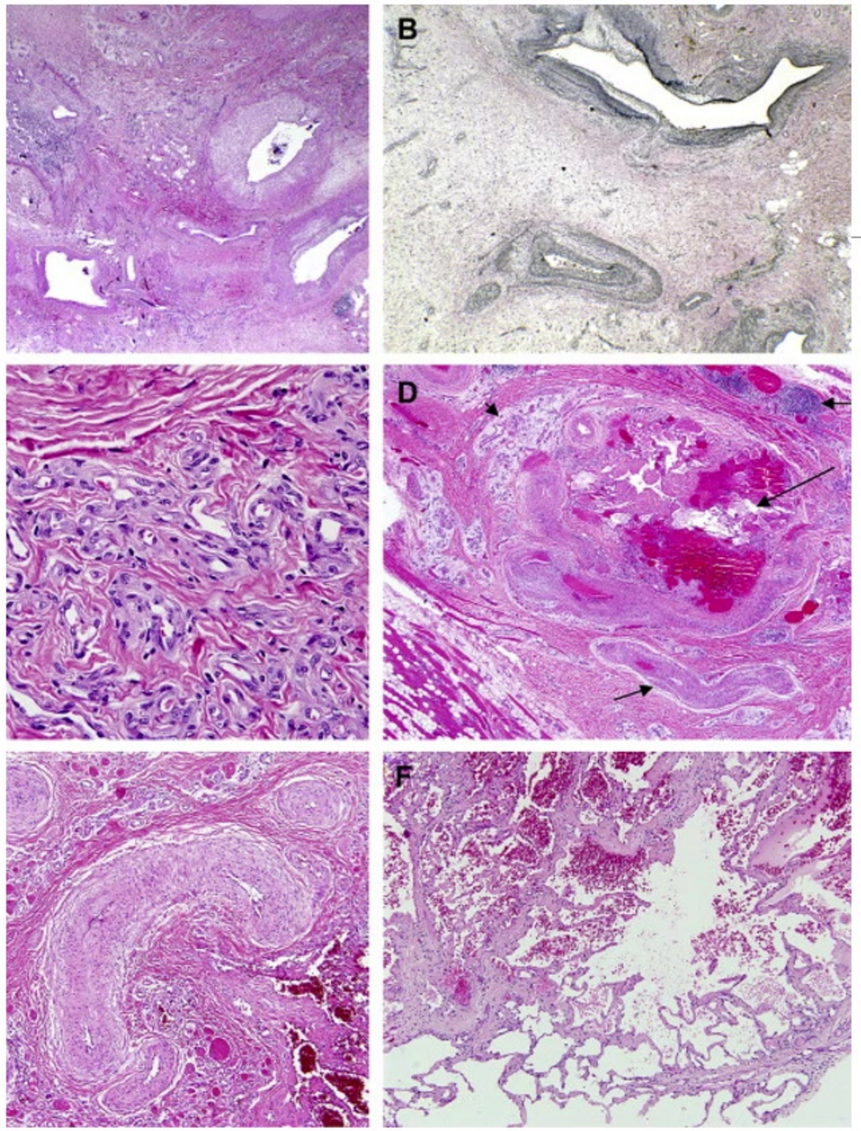
(*B*) Microcystic LM showing vascular channels less than 1 cm (hematoxylin-eosin, original magnification ×2).

(*C*) These small thin-walled channels in LM have thin endothelial cells with no apparent muscular wall and lumens contain protein and lymphocytes (hematoxylin-eosin, original magnification ×20).

(*D*) lymphatic endothelium is highlighted by PROX-1, brown nuclear stain (PROX-1 immunostain, original magnification ×10) and (

E) D240, brown cytoplasmic stain (D240 immunostain, original magnification ×20).

•Anita Gupta MD and Harry Kozakewich MD
Clinics in Plastic Surgery, 2011-01-01, Volume 38, Issue 1, Pages 31-44, Copyright © 2011



Histopathology of AVM

Arteriovenous malformation (AVM) and PTEN hamartoma of soft tissue (PHOST).

(*A*) AVM shows malformed arteries and veins (hematoxylin-eosin, original magnification ×20).

(*B*) AVM with Verhoeff-van Gieson stain highlights the disrupted internal elastic lamina in arteries with transition to indeterminate type elastic pattern (*top vessel* ; VVG special stain, original magnification ×4).

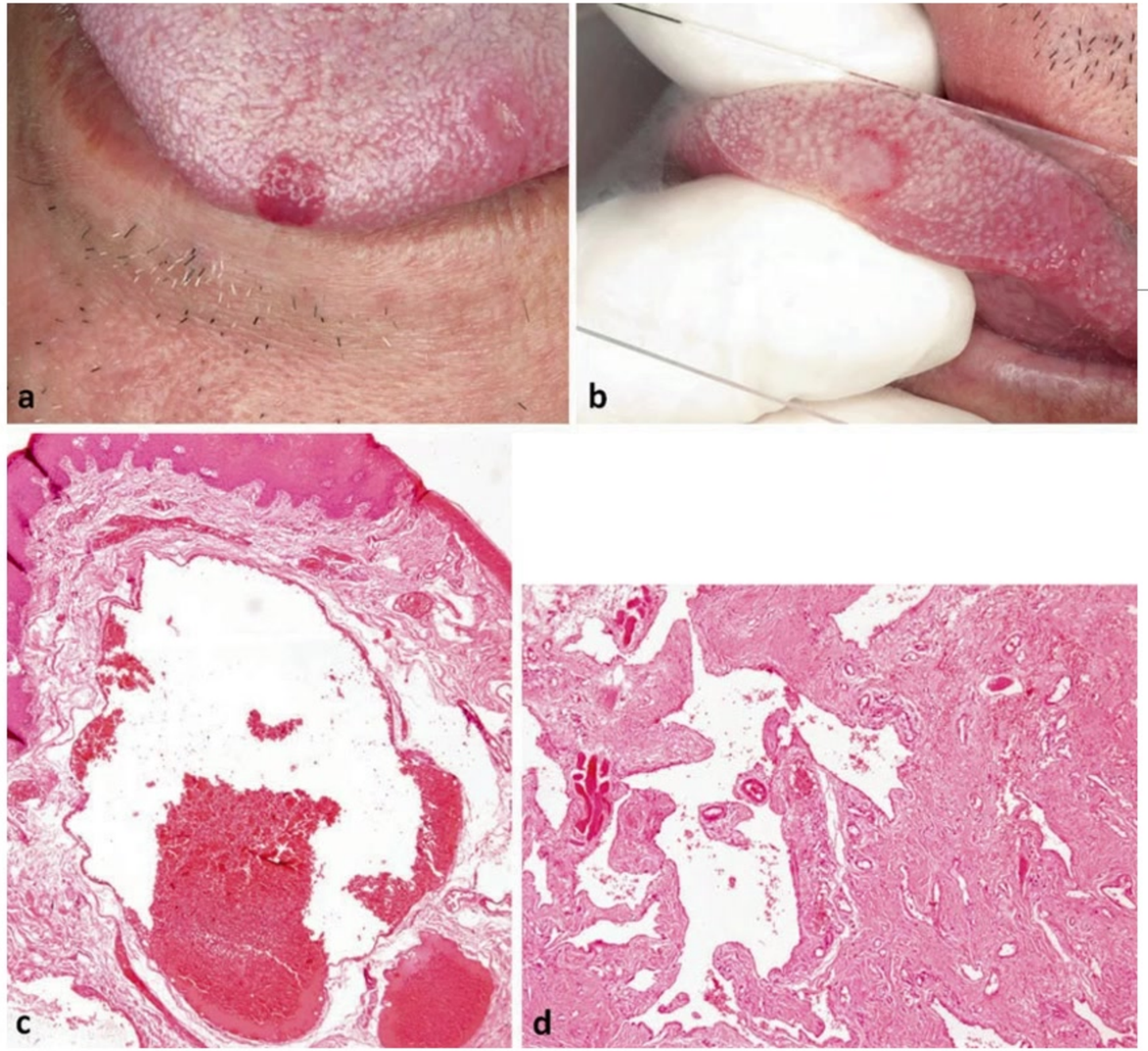
(*C*) Small vessel (proliferative component) in AVM has foci of small channels with plump endothelium and pericytes (hematoxylin-eosin, original magnification ×400).

(*D*) Intramuscular PHOST shows a large nodule composed of a large vein (*long arrow*) with a very irregular lumen and focally hypermuscularized wall surrounded by prominent arteries (*shorter arrow*) and dense fibrous tissue containing small myxoid vascular nodules and (*shortest arrow*) and lymphoid clusters (*horizontal arrow*) (hematoxylin-eosin, original magnification ×40).

(*E*) PHOST with tortuous arteries showing transmural muscular hyperplasia and small lumens (hematoxylin-eosin, original magnification ×100).

(*F*) Some vascular clusters in PHOST are composed of very thin-walled abnormal veins resembling pulmonary alveoli (hematoxylin-eosin, original magnification ×100).

•Anita Gupta MD and Harry Kozakewich MD
Clinics in Plastic Surgery, 2011-01-01, Volume 38, Issue 1, Pages 31-44, Copyright © 2011



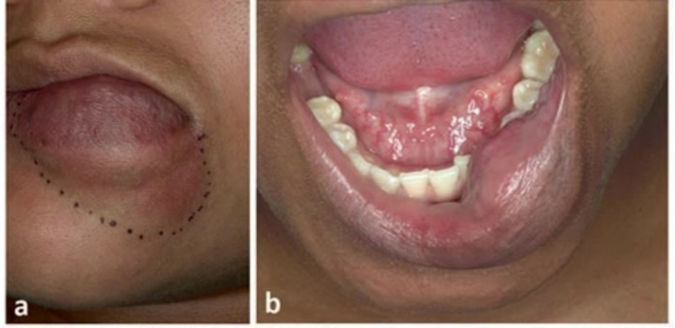
Vascular malformation at the apex of the tongue presenting clinically as a red patch (a). Diascopy (blanching procedure) reveals whitish appearance after

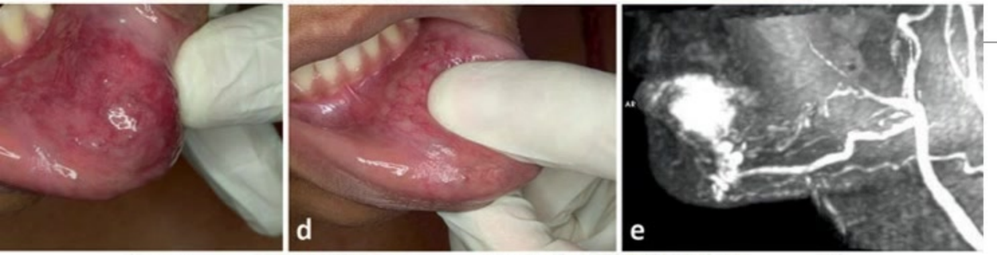
compression (b). Low power magnification of venous-capillary malformation showing multiple blood vessels of variable width (c + d) (Hematoxylin and eosin stain)

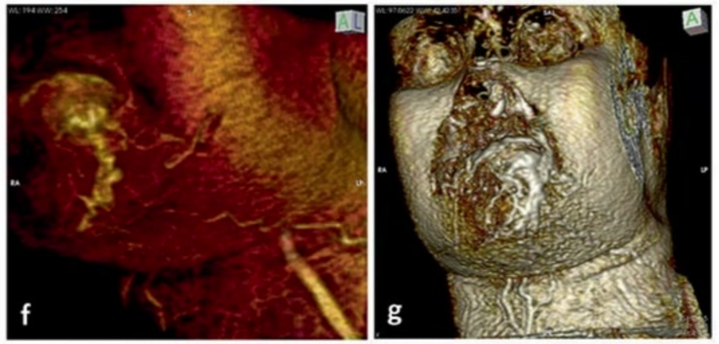
Vascular malformations

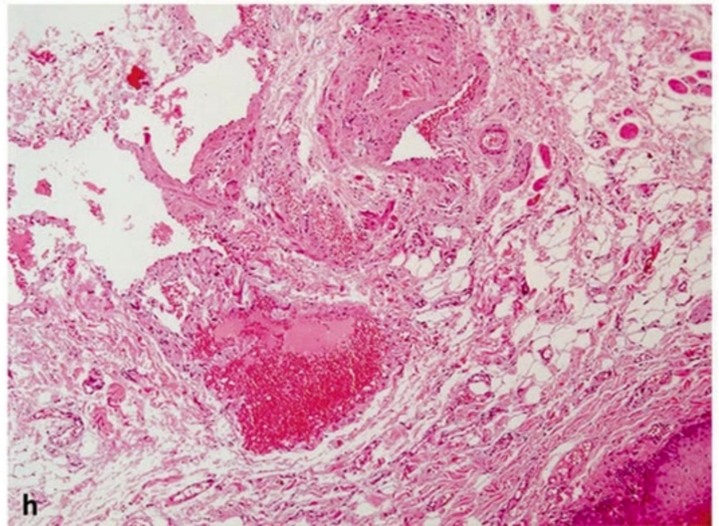
Diagnosis

- Diagnosis is important to determine appropriate treatment planning
- Microscopic evaluation provides best impression of the vascular alterations present in the lesion – sometimes high risk for patient
  - Differentiate from haemangioma
  - Nerve bundles consistently present in vascular malformations
- Hyper contrast CT examination
- MRI is best imaging tool for diagnosis and treatment planning
- Magnetic resonance arteriogram and a computed tomograph arteriogram can give excellent images of AVM









AVM

High-flow arteriovenous malformation. The patient presents with a pinkish non-fluctuating nodule extending from the midline of the lower lip to the left labial commissure (a + b). The mucosal aspect of the lesion (c) and clinical compression exam (d) reveals the pulsating behavior of the lesion indicating its flow pattern. MRA exam reveals the arterial origin from the facial artery and the appearance of an arteriovenous fistula forming a plex- iform arrangement with dilated vessels and the effluent mental vein (e–g).

Microscopic aspect of the arteriovenous malformation (h), revealing the close relationship of arter- ies with thick walls and narrow lumen, and veins with dilated blood-filled lumen and thin vascular walls. The lesion infiltrates the surrounding tissue. In this specimen, adipose tissue is seen with striated skeletal muscle as well as neural fibers in the original connective tissue from the affected area (Hematoxylin and eosin stain)

Vascular malformations

Treatment

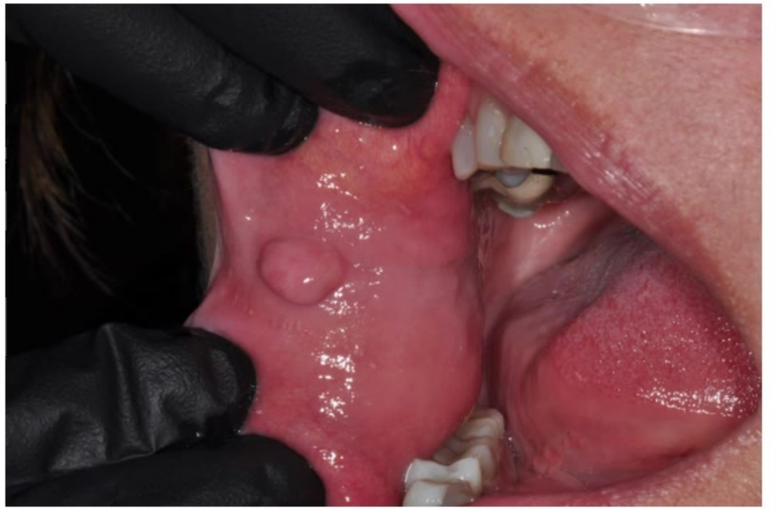
- Usually need treatment at multi-disciplinary centre
- Conservative measures
  - Only effective for venous malformations
- Electrocautery
- Laser therapy
- Embolotherapy combined with surgical excision
  - AVM

Fibroepithelial polyp

- Fibrous nodule
- **Aetiology**: Induced by recurrent local irritants of oral cavity –bite trauma, denture irritation, food impaction, poor oral hygiene
- **Pathophysiology**: Reactive proliferation rather than true neoplasm

Clinical Features

- Smooth, round, exophytic nodule
- Pedunculated or sessile with normal overlying epithelium
- Can be ulcerated, or demonstrate thickened white surface (hyperkeratosis)
- Asymptomatic generally
- 1-2 cm in diameter
- Labial mucosa, tongue, palate



Smith MH. Irritation fibroma. PathologyOutlines.com

Fibroepithelial polyp

Histopathology

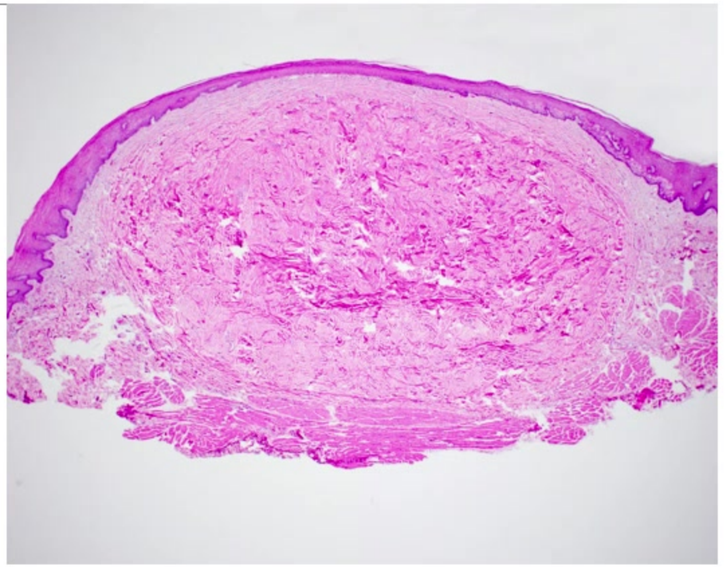
- Nonencapsulated nodular mass
- Mass composed of fibrous connective tissue with collagen bundles interspersed with fibroblasts, blood vessels and scattered chronic inflammatory cells
- Overlying surface of squamous epithelium

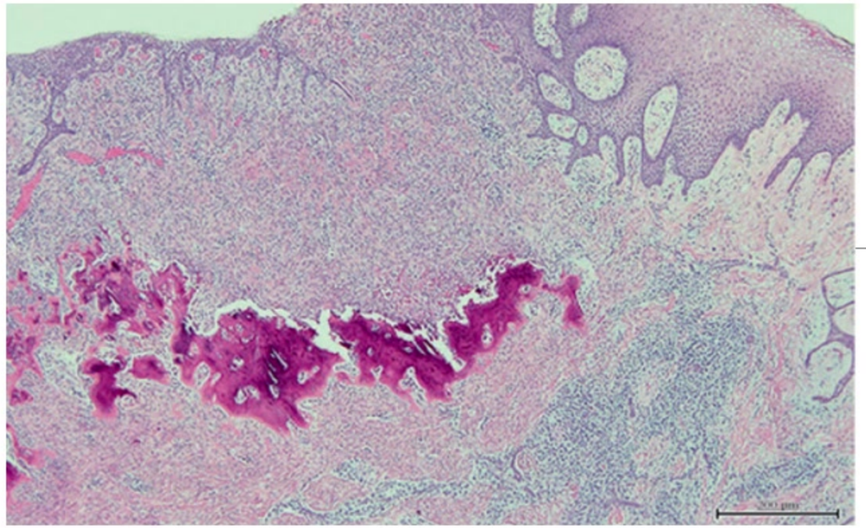
Diagnosis

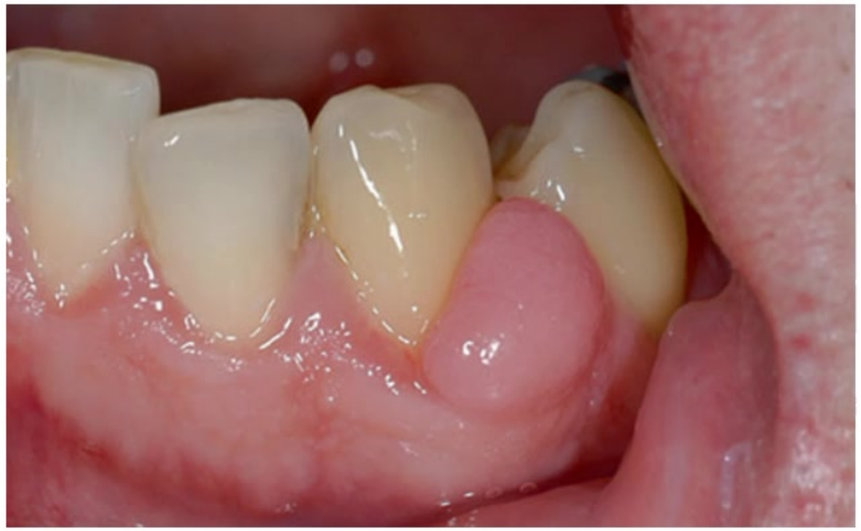
- Definitive diagnosis made upon histopathological examination
- Highly suspected based on clinical features

Treatment

- Surgical excision with removal of local irritants







Fibrous epulides

Fibrous lump on the gingiva

Localised hyperplastic fibrous gingival mass formed as a response to chronic irritation

Clinical features:

- Smooth pink nodule on marginal/attached gingiva
- Often around inflamed gingiva

Histopathological features:

- Mature fibrous tissue
- Minimal inflammation
- Mineralisation commonly seen – dystrophic calcification

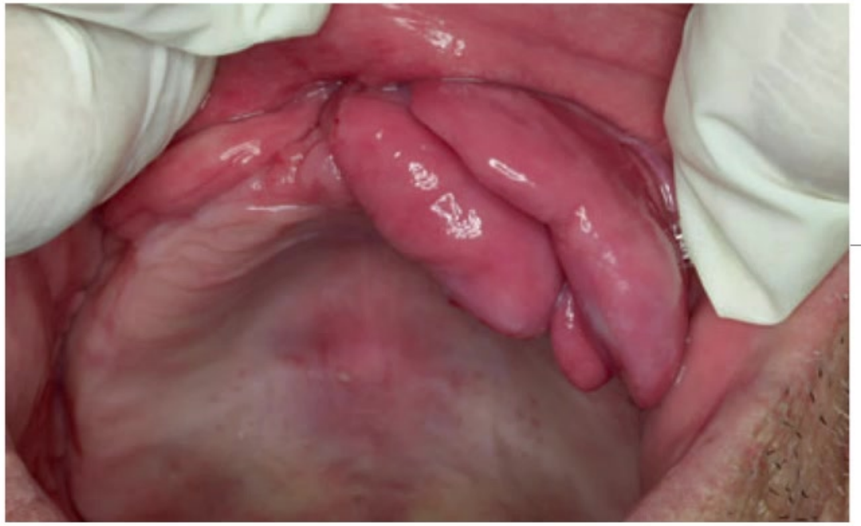
Diagnosis

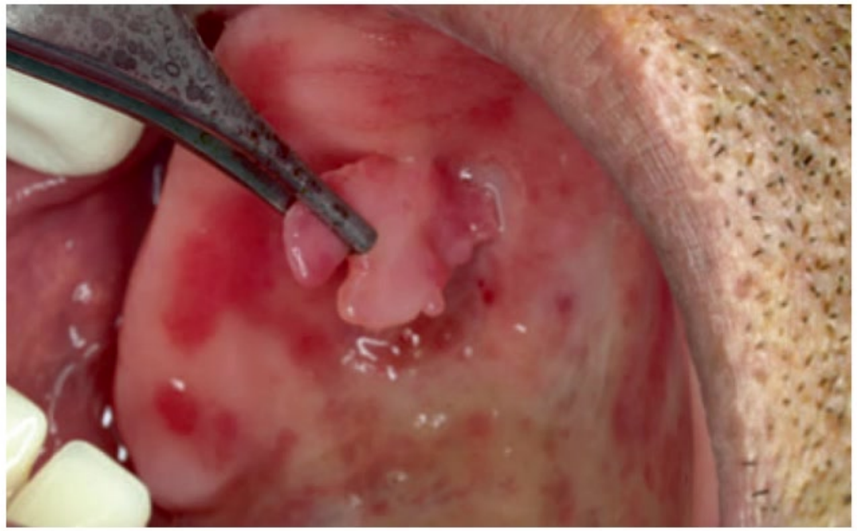
- Histopathological evaluation needed to confirm diagnosis

Treatment

- Surgical excision to periosteum, scale and clean, with removal of local irritants
- Recurrence can occur if irritants not removed

Clinical images from Contemporary Oral Medicine



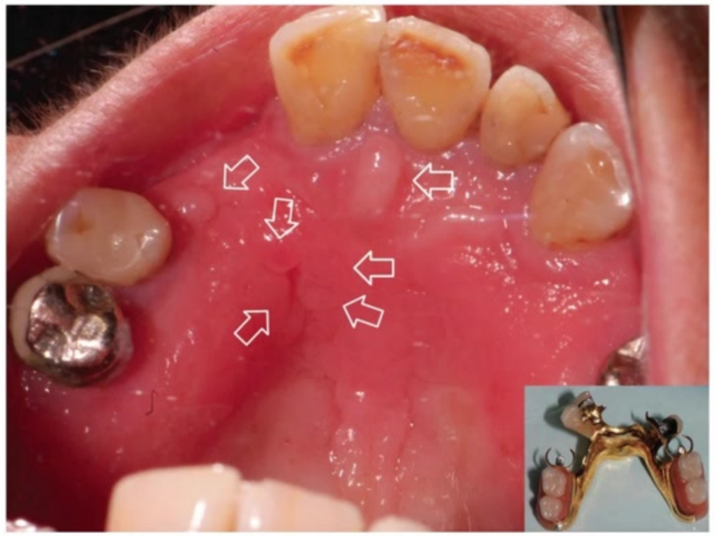


Denture hyperplasia

- Denture fibroma
- Flabby ridge
- Inflammatory hyperplastic reaction by chronic irritation, usually due to ill-fitting dentures
- Clinical features:
  - Sessile or pedunculated, pink nodules
  - Slow growing
  - On alveolar ridges or denture bearing areas, usually seen under dentures
- Histopathology:
  - Epithelial hyperplasia, acanthosis, pseudo-epihteliomatous hyperplasia
- Diagnosis
  - Based on clinical features and histopathological assessment
- Treatment:
  - Local surgical excision
  - New, well-fitting dentures
  - Denture hygiene

Inflammatory papillary hyperplasia

- Benign soft tissue lesion
- Often associated with use of removable upper dentures; pathogenesis unclear
- **Aetiology**: Ill-fitting dentures, continuous day and night denture use, poor oral hygiene, sensitivity to denture liners, tobacco
- Often associated with colonization of Candida caused by poor oral hygiene
- **Clinical features:**
  - Growth of one or more nodular lesions
  - 2mm or less
  - Almost exclusively involves the hard palate
  - Mostly asymptomatic
  - Colour of mucosa may vary from pink to red



Gual-Vaqués P, Jané-Salas E, Egido-Moreno S, Ayuso-Montero R, Marí-Roig A, López-López J. Inflammatory papillary hyperplasia: A systematic review. Med Oral Patol Oral Cir Bucal. 2017 Jan 1;22(1):e36-e42. doi: 10.4317/medoral.21405. PMID: 27918740; PMCID: PMC5217495.

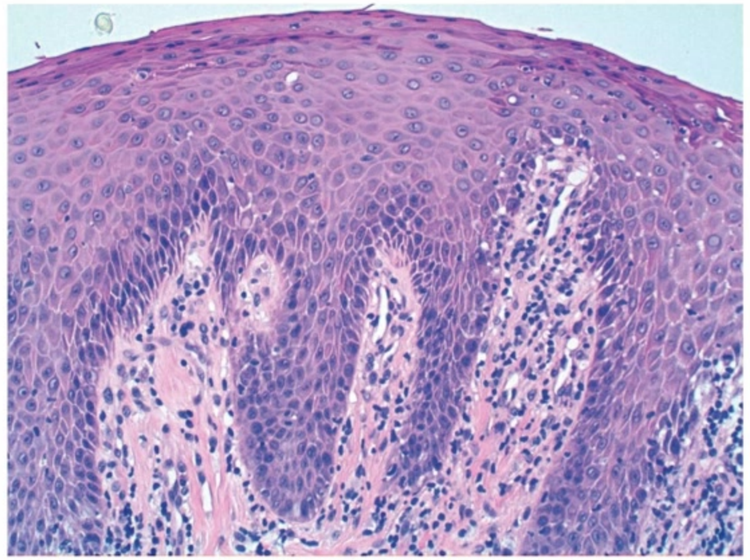
Inflammatory papillary hyperplasia

Histopathology:

- Papillary projections covered by stratified squamous epithelium with or without chronic inflammation

Diagnosis:

- Clinical examination and histopathological evaluation



Treatment:

- Depends on severity
- Laser
- Electrosurgery
- Cryotherapy
- Small localised lesions: 0.12% chlorhexidine mouthrinse, antifungal gels, local excision

Gual-Vaqués P, Jané-Salas E, Egido-Moreno S, Ayuso-Montero R, Marí-Roig A, López-López J. Inflammatory papillary hyperplasia: A systematic review. Med Oral Patol Oral Cir Bucal. 2017 Jan 1;22(1):e36-e42. doi: 10.4317/medoral.21405. PMID: 27918740; PMCID: PMC5217495.

Pyogenic granuloma

- Benign soft tissue lesion

Aetiology

- History of trauma
- Response of tissues to minor trauma and/or chronic irritation
- Associated with poor oral hygiene, chronic trauma, pregnancy, medications

Pathogenesis

- Largely unknown, although in pregnancy, estrogen enhances vascular endothelial growth factor (VEGF) production in macrophages, likely contributing to the development of pyogenic granulomas
- Also in pregnancy, progesterone may function as an immunosuppressant in gingiva, preventing an acute inflammatory reaction against oral bacteria and resulting in proliferative gingival inflammation
- Increased estrogen and progesterone in pregnancy increases concentrations of *Prevotella intermedia* in the subgingival biofilm, decreases the host response to the bacteria and increases the vascular permeability and infiltration of fluids into the gingival tissues, contributing to formation of pyogenic granulomas

Kamal R, Dahiya P, Puri A. Oral pyogenic granuloma: Various concepts of etiopathogenesis. *J Oral Maxillofac Pathol*. 2012;16(1):79-82. doi:10.4103/0973-029X.92978

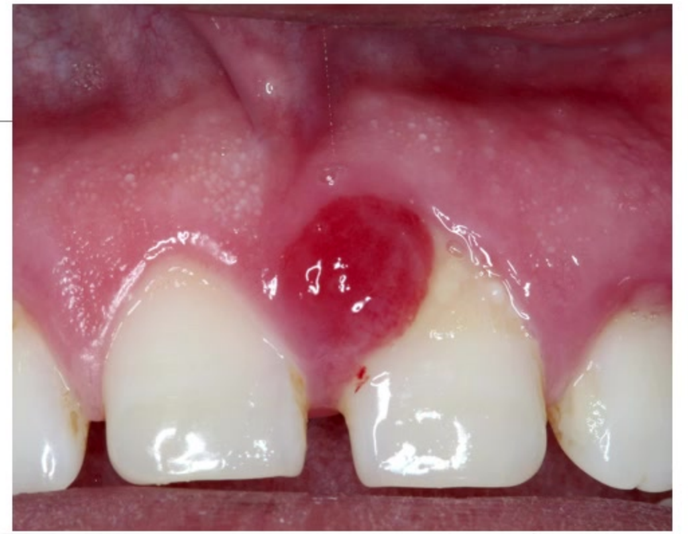
Pyogenic granuloma

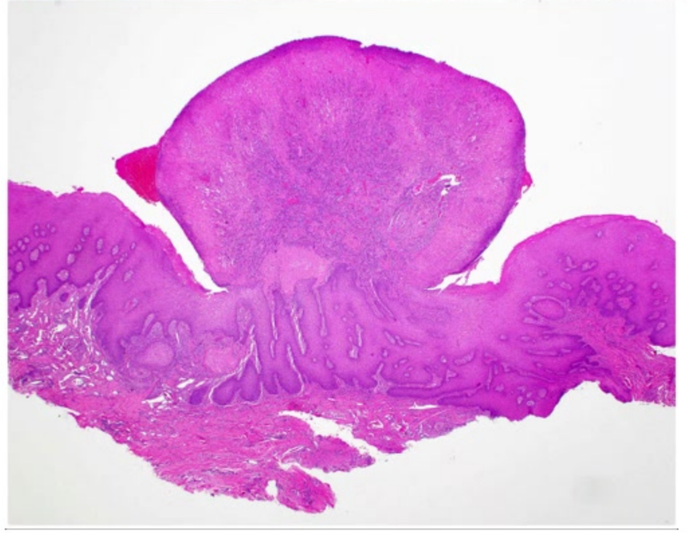
Clinical features

- Wide range of ages affected
- Gingiva most common site
- Can occur extra orally
- Soft, painless, deep red to reddish-purple in colour

Histopathology:

- Highly vascularized proliferation of granulation tissue
- Often demonstrates surface ulceration and a subacute inflammatory cell infiltrate comprised of neutrophils, lymphocytes and plasma cells
- May demonstrate a lobular arrangement of capillary vessels and proliferating endothelial cells delineated by fibrous septae (termed lobular capillary hemangioma)
- May be pedunculated
- May show brisk mitotic rate (up to 10 mitotic figures per high power field); however, lacks pleomorphism





Kamal R, Dahiya P, Puri A. Oral pyogenic granuloma: Various concepts of etiopathogenesis. *J Oral Maxillofac Pathol*. 2012;16(1):79-82. doi:10.4103/0973-029X.92978

Smith MH. Pyogenic granuloma. PathologyOutlines.com website. h

Pyogenic granuloma

Differential diagnosis:

- Peripheral giant cell granuloma
- Peripheral ossifying fibroma
- Fibroma
- Peripheral odontogenic fibroma
- Haemangioma
- Kaposi's sarcoma

Diagnosis

- Diagnosis made on histopathological evaluation

Treatment

- Surgical excision of gingival lesions
- curettage of underlying tissue
- Remove causative agent
- Recurrence rate of 15.8%

Neurofibroma

- Benign peripheral nerve sheath tumour composed of variable mixture of Schwann, Perineural-like, and fibroblastic cells as well as with features intermediate between these various cells, contained in collagenous or myxoid matrix
- Can occur as solitary lesion or part of generalised syndrome of neurofibromatosis (4-7% display oral manifestations)

Pathogenesis:

Solitary neurofibroma not associated with Neurofibromatosis-1 poorly understood

Somatic inactivation of NF-1 gene located on chromosome 17 leads to increased and abnormal production of neurofibromin which leads to activating p21(ras) and p13

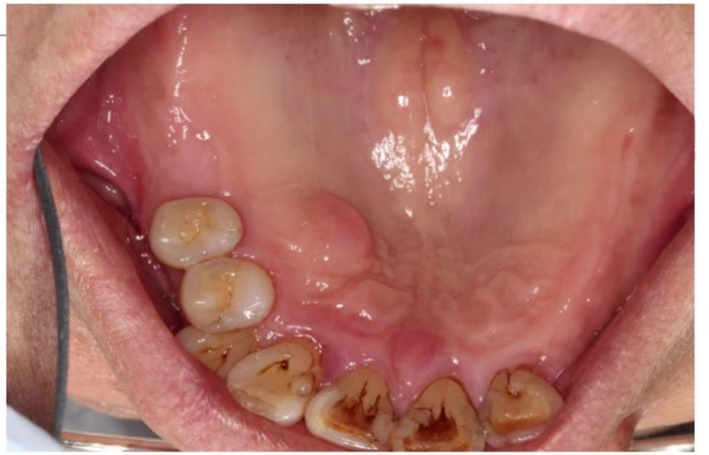
Causes cellular proliferation of Schwann cells associated with neurofibroma

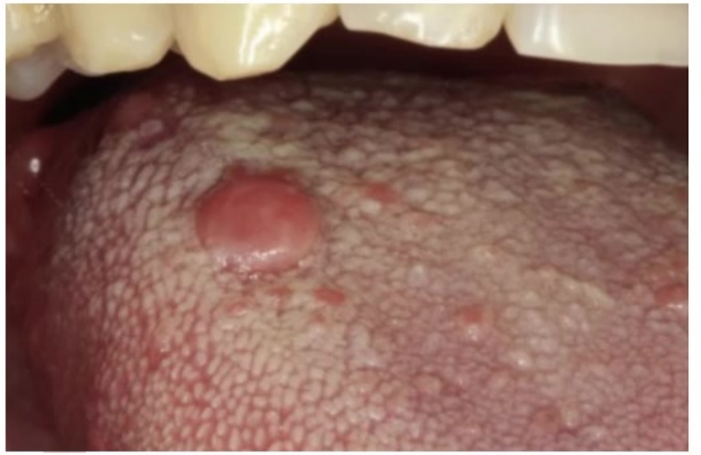
Storlazzi et al. Journal of Cancer. 2005

Neurofibroma

Clinical features

- In the oral cavity present as submucosal, nontender, discrete mass
- Intraoral lesions of neural tissues mainly originate from branches of fifth, seventh, rarely ninth cranial nerve
- Tongue, buccal mucosa, vestibular area common sites and posterior mandible is the most common intraosseous location
- Further divided based on clinical presentation – localised/solitary growth, diffuse discrete, multiple nodules, plexiform types
- Overlying mucosa of solitary NF not associated with NF-1 gradually blends with surrounding normal mucosa, no clear-cut demarcation between lesion and normal mucosa

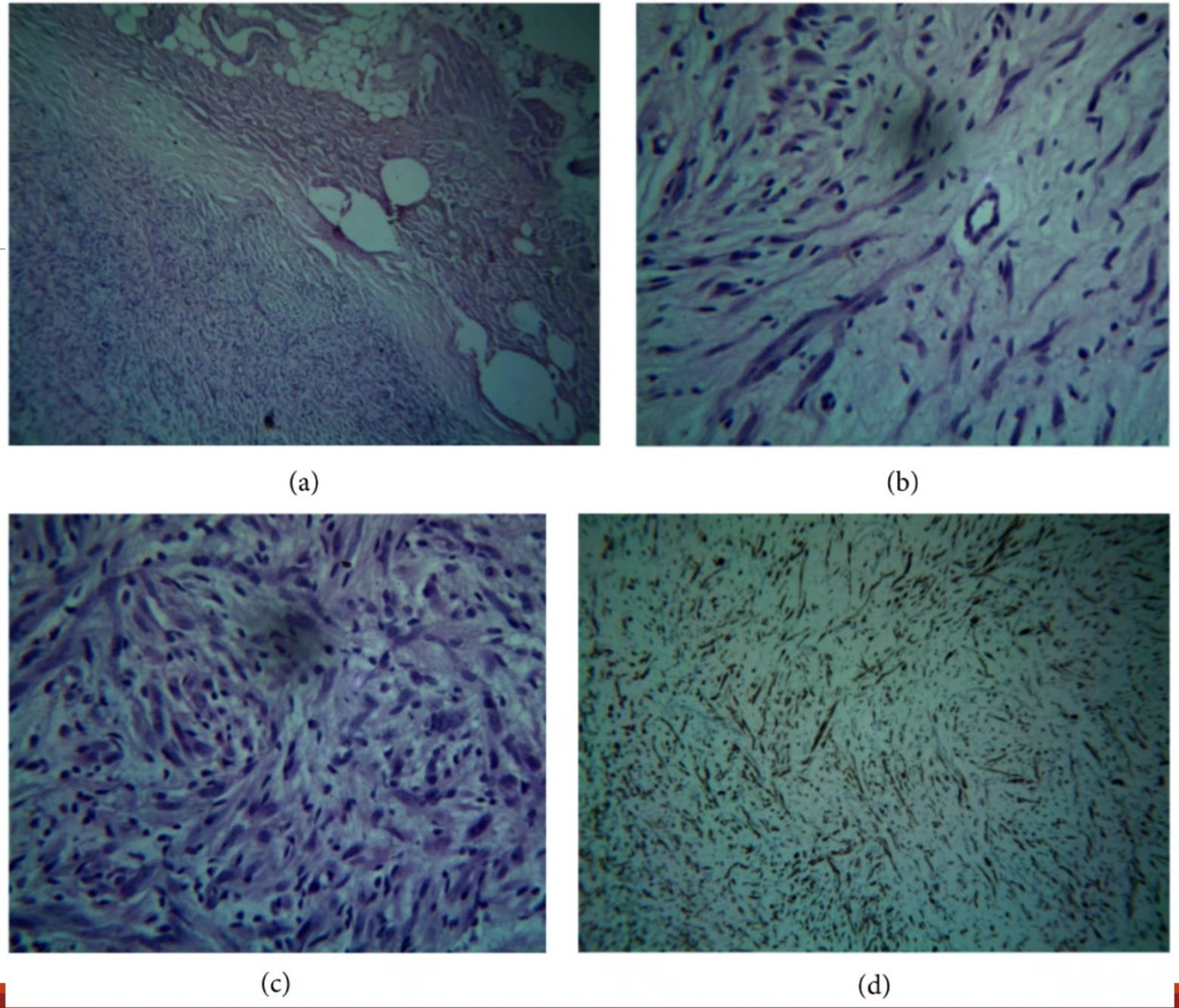




Storlazzi et al. Journal of Cancer. 2005

Histopathology

- Unencapsulated
- Proliferation of Schwann cells
- Elongated fibroblasts with wavy nuclei separated by abundant collagen fibres
- Perineurial cells
- Mast cells
- Myxoid connective tissue



Mahmud A et al. Case Reports Dentistry. 2016

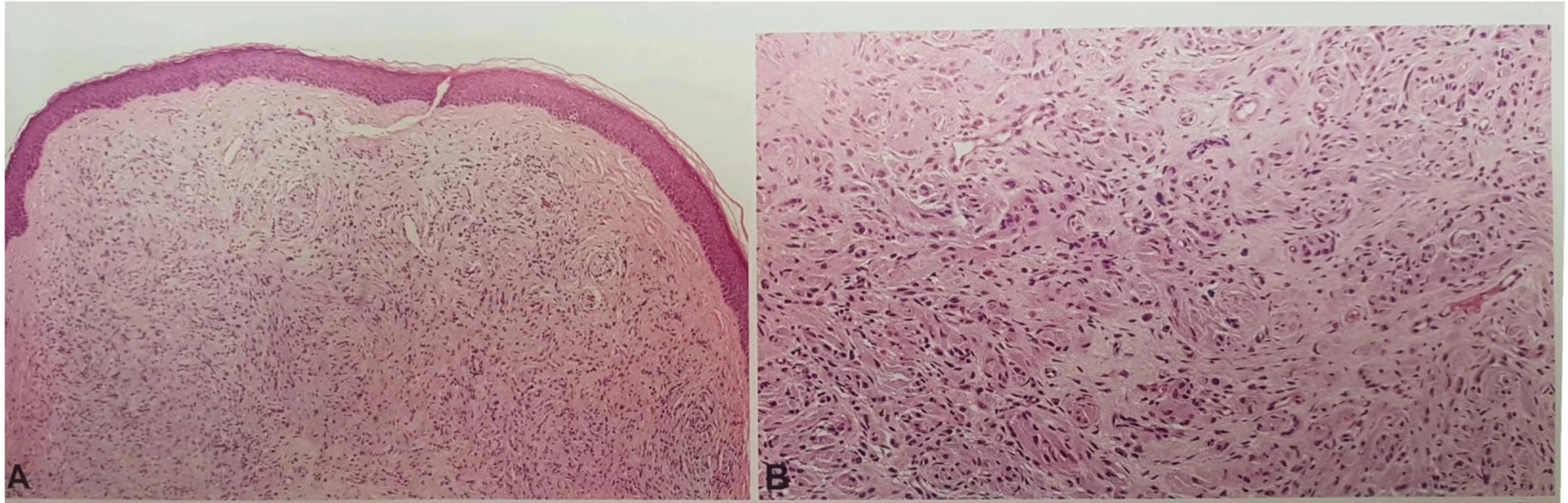


Fig. 1.45 Nasal neurofibroma. **A** An intact squamous mucosa overlies a proliferation of Schwann cells, perineurial cells, and fibroblasts blended with collagen fibres. **B** Nerve fibre twigs are interspersed among Schwann cells, perineurial cells, and collagen fibres; mast cells are also present.

WHO Head and Neck Tumours 2017

Neurofibromatosis type 1

Complex autosomal dominant disorder affecting multiple organ systems

Caused by germline mutations in NF1 tumour suppressor gene on chromosome 17

Defining feature of NF-1: neurofibroma

Previously knows as von Recklinghausen disease

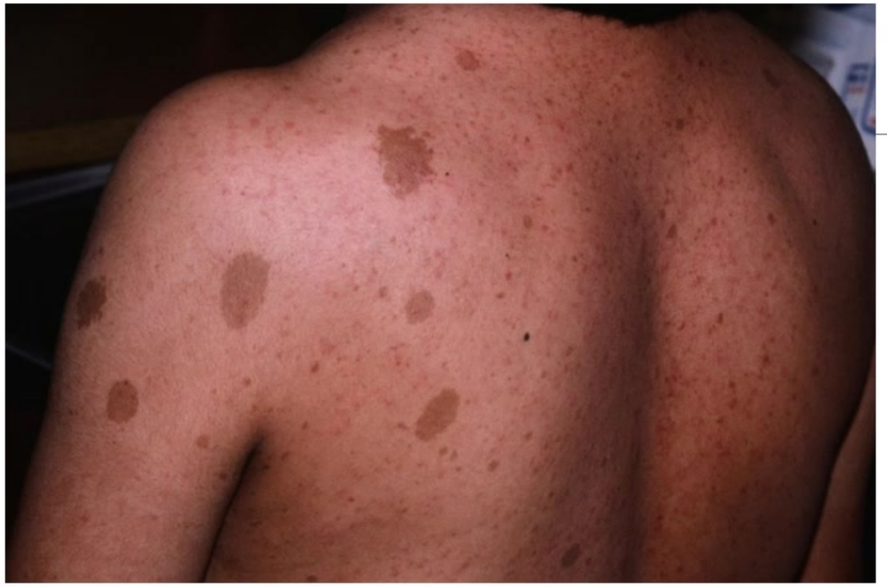
Nearly all individuals with NF-1 develop pigmentary lesion

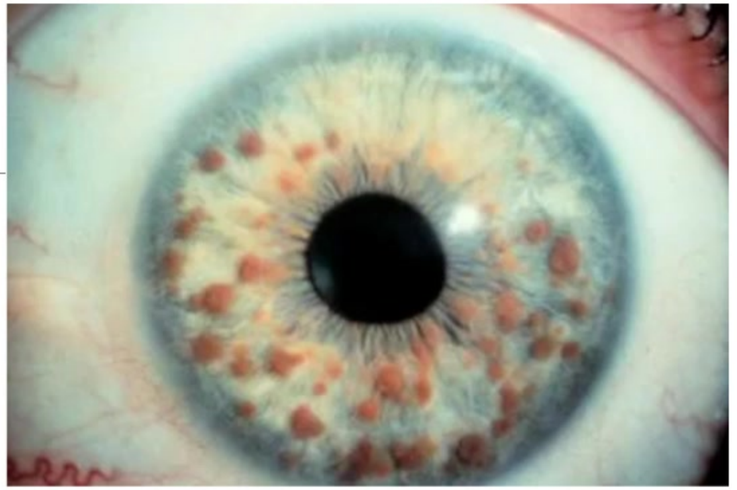
- Café-au-lait macules
- Skinfold freckling
- Lisch nodules
- Dermal neurofibromas

Skeletal abnormalities, brain tumours, peripheral nerve sheath tumours, learning disabilities, social and behavioural problems = lowered QOL

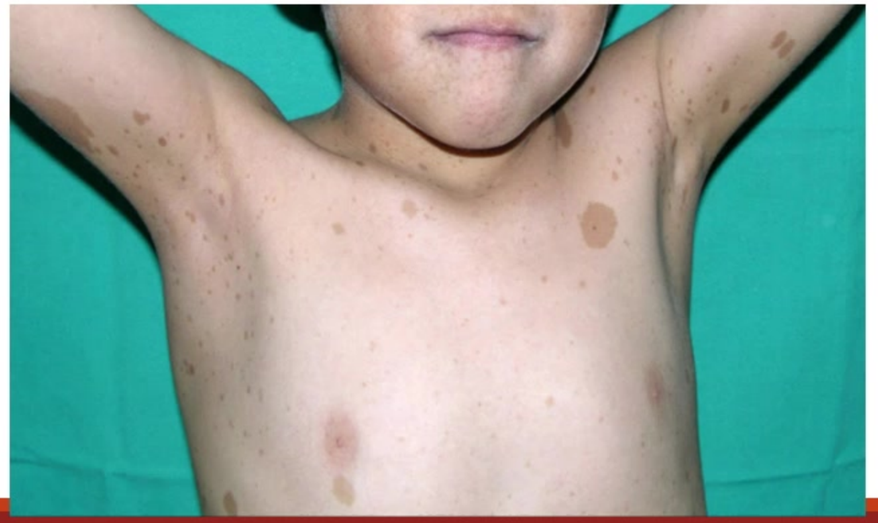
Progressive over lifetime, rate of progression and severity vary

Gutman D et al. Neurofibromatosis type 1. Nature Reviews Disease Primer. 2017



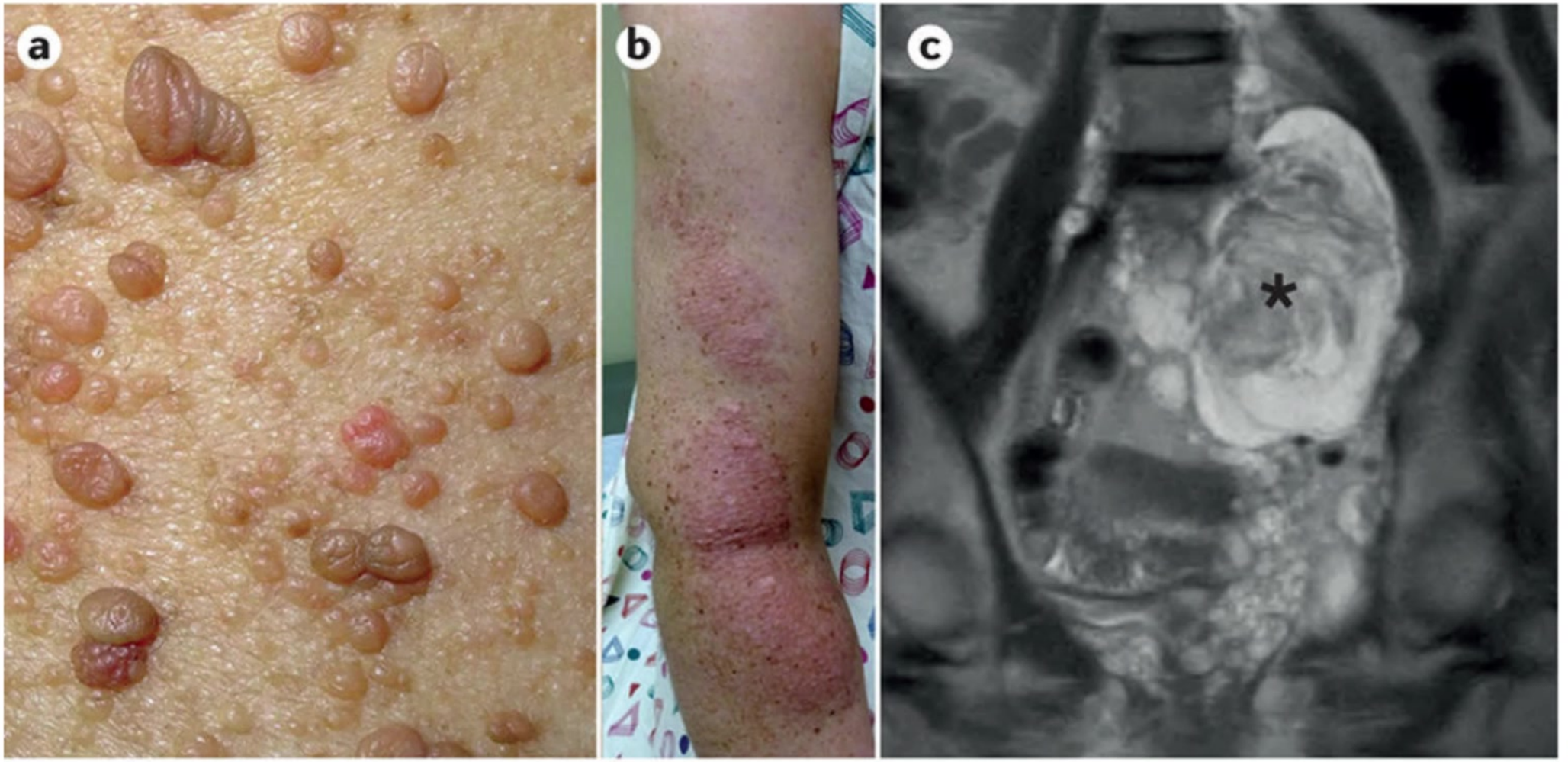


Typical appearance of multiple Lisch nodules in a patient with neurofibromatosis-1.



https://www.dermatologyadvisor.com/

NF-1



Gutman D et al. Neurofibromatosis type 1. Nature Reviews Disease Primer. 2017

Epidemiology NF-1

Global prevalence: 1 case per 3000 individuals

50% of NF1 cases are familial, remainder arise from denovo NF1 mutation

Life expectancy reduced by 8-21 years

- Younger individuals – most common cause: malignant peripheral nerve sheath tumour (MPNST)
- Cumulative risk of malignancy by 50 years ~ 20-39%
- Lifetime cancer risk ~ 60%
- 50 fold increased risk for high-grade tumours
  - Malignant brain tumours
  - Endocrine cancers
  - Connective tissue malignancies (1000 fold increased risk for malignant peripheral nerve sheath tumours)
  - Increased risk of buccal cavity, pharyngeal, oesophageal, skin (melanoma), thyroid, ovarian cancer also described

Gutman D et al. Neurofibromatosis type 1. Nature Reviews Disease Primer. 2017

Oral manifestations of NF1

72% of affected individuals exhibit oral manifestations

Gingival enlargement and pigmentation
- Common in children with NF1
- Diffuse, unilateral enlargement of attached gingiva
- Fibrous, do not exhibit signs of inflammation
- Rare cases: melanin pigmentation of gingiva

Dental abnormalities
- Impacted teeth, supernumerary, missing or displaced teeth
- Plexiform neurofibromas can be associated with aplasia of mandibular second molars, increased spacing between teeth and jaw asymmetries

Neurofibromas
- Commonly affect tongue – macroglossia as a result of plexiform neurofibroma

Osseous lesions of jaw
- Not very common – unique for affected individual
- May include increased size of coronoid notch, lateral bowing of ramus
- Neurofibroma involving articular disc of TMJ has been reported

Javed et al. Critical Reviews in Oncology / Hematology (2014)

Diagnosis

Solitary:

- Histopathological evaluation

NF-1:

- Clinical diagnosis of NF-1 based on criteria set by National Institutes of Health Conesnus Conference in 1987
  - At least two major disease features out of the following:
    - A first-degree relative with NF1, six or more cafe´ au lait patches >5 mm in greatest diameter in prepubertal individuals, and >15 mm in greatest diameter in postpubertal individuals
    - Axillary or groin freckling, two or more neurofibromas, or one plexiform neurofibroma
    - Two or more Lisch nodules in the iris
    - Optic pathway glioma
    - A distinctive osseous lesion, including bony dysplasia of the sphenoid wing, or pseudoarthrosis of the long bones

Management

Solitary:

- Complete excision
- 5% recurrence rate due to incomplete excision
- Malignant transformation rare

Early detection of potential treatable complications

Neurofibromas

- Dermal neurofibromas
  - Surgical removal, laser ablation for small lesions, electrodessication
- Plexiform neurofibromas
  - Pain management, excision of surgically amenable tumours
  - Many biologically targeted therapies (mTOR inhibitors, imatinib, selective MEK inhibitors) that inhibit pathways responsible for tumour growth evaluated
- Atypical neurofibromas
  - Symptomatic neurofibromas revealing hypercellularity and atypical nuclei, few mitoses, no necrosis : suggestive as pre-malignant
  - Complete excision and clinical surveillance
- MPNST
  - Complete excision, neoadjuvant chemotherapy

Neurilemoma

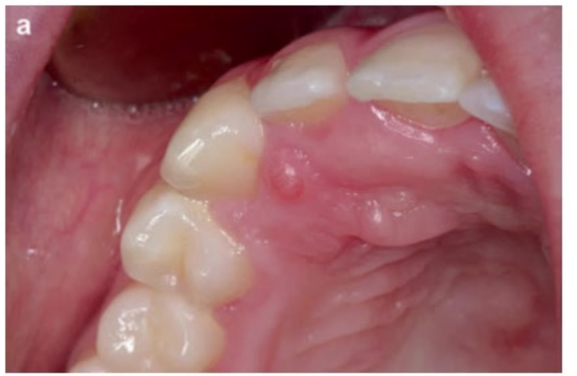
- Schwannoma
- Most common benign neurogenic neoplasms
- Neoplastic proliferation comprised exclusively of cells that resemble Schwann cells and have antigenic phenotype of Schwann cells

Aetiology

- 90% are sporadic
- Can occur in specific syndromes – NF2 (3%), Schwannomatosis (2%), Carney complex
- Genetic

Clinical Presentation:

- Majority are non-vestibular or extracranial
- Solitary
- Encapsulated masses of long duration at time of presentation
- Rarely show rapid growth course
- Painless and not ulcerated
- Can manifest with facial hypoesthesia, paraesthesia, or pain
- Bilateral schwannomas related to NF-2



Neurofibromatosis type 2

Characterised by development of:

- Schwannomas
- Meningiomas
- Ependymomas

Majority of patients developing bilateral schwannoma involving superior vestibular branch of 8th cranial nerve

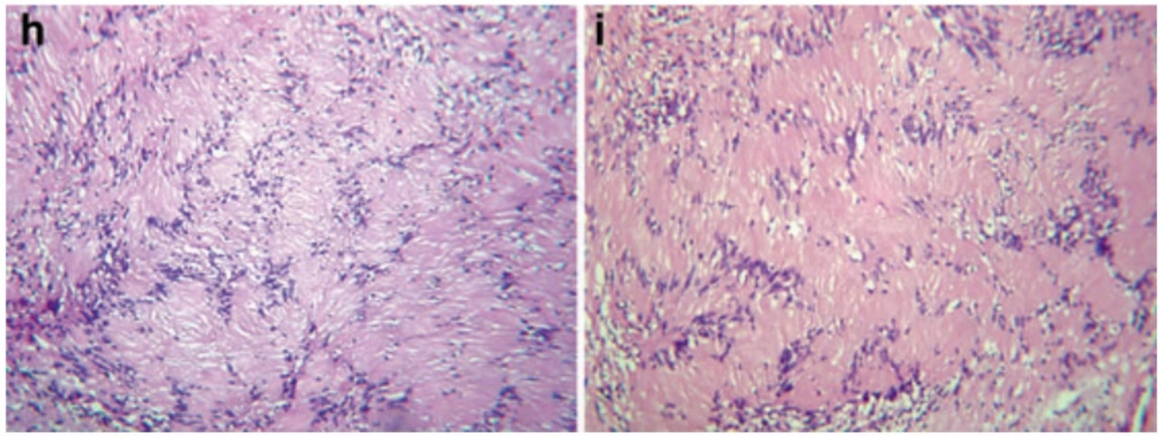
- Hearing loss, tinnitus, imbalance

Although disease classified as “neurofibromatosis” , neurofibromas are relatively infrequent

Dominantly inherited tumour predisposition syndrome caused by mutations in NF2 gene on chromosome 22

Evans DGR. Neurofibromatosis type 2 (NF2): A clinical and molecular review. *Orphanet Journal of Rare Diseases*. 2009;4:16

Neurilemoma



Histopathology

- Encapsulated
- Two main patterns observed: Antoni A and Antoni B types
- Antoni A: highly cellular, composed of elongated Schwann cells exhibiting area of organized spindle-shaped cells in a palisading arrangement around acellular, eosinophilic areas forming Verocay bodies
- Antoni type B: composed of elongated Schwann cells, arranged in less dense myxoid manner, more disorganised compared to Antoni A
- Cystic change becomes more prominent as tumour enlarges and is associated with mucinous degeneration, haemorrhage, necrosis, microcystic formation

Neurilemoma

Diagnosis

- Histopathological evaluation

Management

- Complete resection curative, not likely to recur
- Malignant transformation has not been reported
- Depending on location of lesion – possible risk to major nerve or other vital structures, possible to opt for close follow-up observation

Lipoma

- A rare, benign tumour of the adipose tissue.

Epidemiology

- More common in men.
- Most frequent benign mesenchymal tumour.
- 15-20-% occur in the head and neck.
- Intra oral lesions are less frequent, representing 1-4% of head and neck lipomas.
- Often seen in overweight individuals.

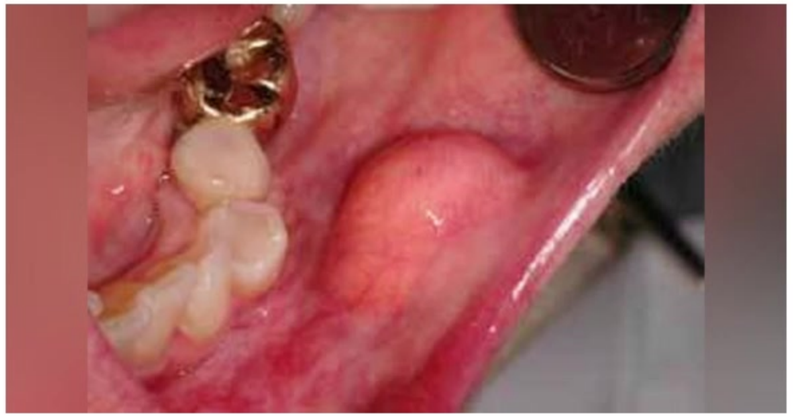
Aetiopathogenesis

- Well-circumscribed benign neoplastic proliferations of adipose tissue.

Lipoma

Clinical Presentation

- Slow growing, yellowish, soft, semi-fluctuant, painless mass.
  - Usually seen on the buccal mucosa, followed by tongue, lips and floor of mouth.
  - Covered by normal mucosa or skin.
  - Can be solitary or multiple.
  - Size of lesions vary, with an average size of 2cm.

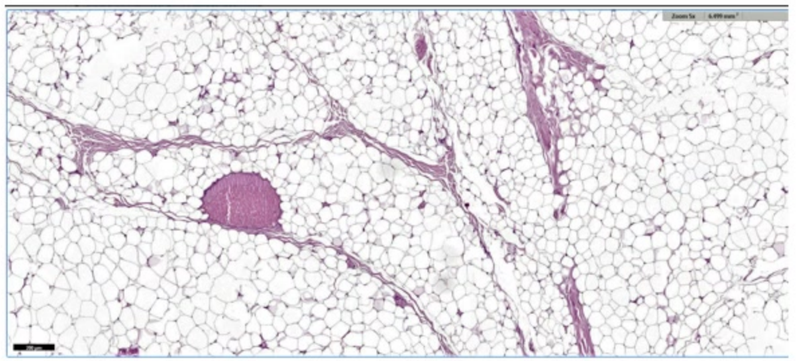


Histopathology

- Proliferation of mature adipocytes
- Paucicellular fibrous septa can be present
- Fat necrosis is often found in larger tumor

Diagnosis

- Lesions demonstrate characteristic low attenuation on CT and signal intensity is similar to that of fat on all MRI sequences.
- A biopsy is diagnostic, that typically exhibit connective tissue capsule circumscribing lobules of hexagonal cells that resemble normal adipose tissue.
- Patients with multiple lesions in the body should be investigated for syndromes and rare obesity disorders.



Management

- Excisional biopsy
- Recurrence is not likely
- Adequate imaging, diagnostic biopsy and careful assessment paramount before surgery planned of large and difficult to access lesions.

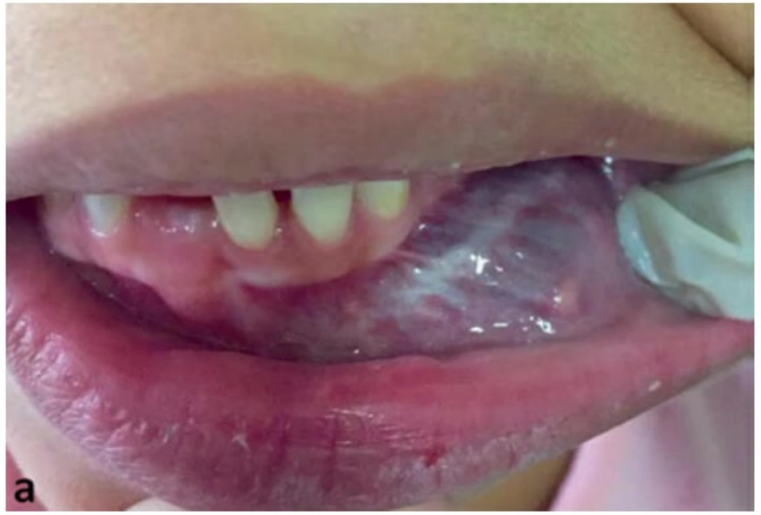
Hemangioma

- True neoplasms of blood vessels formed by endothelial proliferation assuming variable width
- Aetiology & Pathogenesis:
  - Originate from embryonic placental angioblasts or intrinsic endothelial progenitor cells with the ability to clonally duplicate in a precise environment of cytokines and oestrogen concentration
  - Arise from progenitor cells with directional preponderance to become placental-like tissue in specific organs such as skin and liver
  - Role of molecular signalling involved in vascularization
  - Increased levels of common molecular contributions to endothelial cell migration and new vessel development have been discovered during proliferative phase of haemangioma growth as vascular endothelial growth factor (VEGF), basic fibroblast growth, insulin-like growth factor, matrix metalloprotease – 9.

Hemangioma

Clinical Features

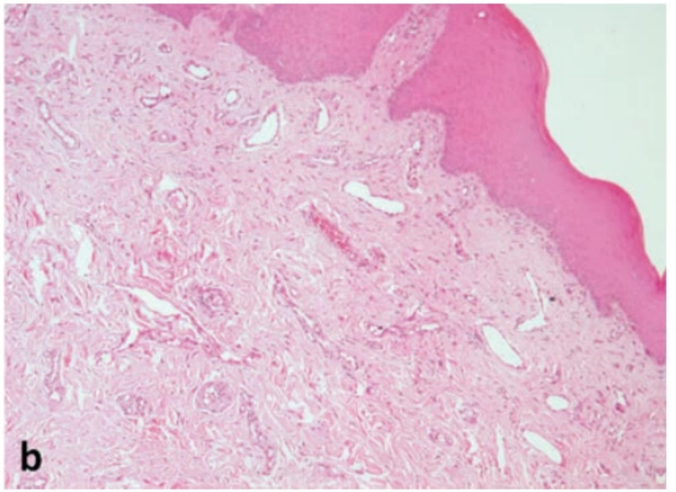
- Proliferate 9 – 12 months of life and subsequently involute at a variable course over many years
- Female predominance
- Infantile hemangioma develops shortly after birth (60% occur in head and neck region)
- Congenital hemangioma are rare, present at birth, does not follow natural growth phase
- Smooth, reddish, purple, sessile, polypoid, or pedunculated masses, often with increasing size and occasional bleeding
- Infantile hemangiomas are evident shortly after birth as well demarcated, red, vertically expansive lesions



Hemangioma

Histopathology

- Classified according to the lumina of the capillary vessels that are predominant in the lesion
- Capillary hemangiomas consist of multilobular arrangements of proliferating endothelial cells and capillaries of various shapes and sizes surrounded by pericytes
- Appears more cellulary rich, mitotic activity is similar to cavernous type
- Cavernous hemangiomas found in penial cavernous body and show larger dilated vascular spaces lined by endothelial cells
- Final diagnosis may require immunohistochemial panel



Hemangioma

Diagnosis

- History.
- Clinical examination including diascopy.
- Biopsy is NOT indicated due to bleeding risk.
- Investigations including imaging or angiography.

Management

- Small hemangiomas need no treatment – self involute by age 9
- Laser therapy
- Corticosteroids

Rhabdomyosarcoma

- Malignant neoplasms of skeletal striated muscle cells
- Most common in children and adolescents (5-8% of all childhood malignancies)

Aetiology

- Sporadic presentation
- Small subset of patients, part of genetic syndrome
  - Beckwith-Wiedeman
  - Von Reclighausen disease
  - Gorlin

Rhabdomyosarcoma

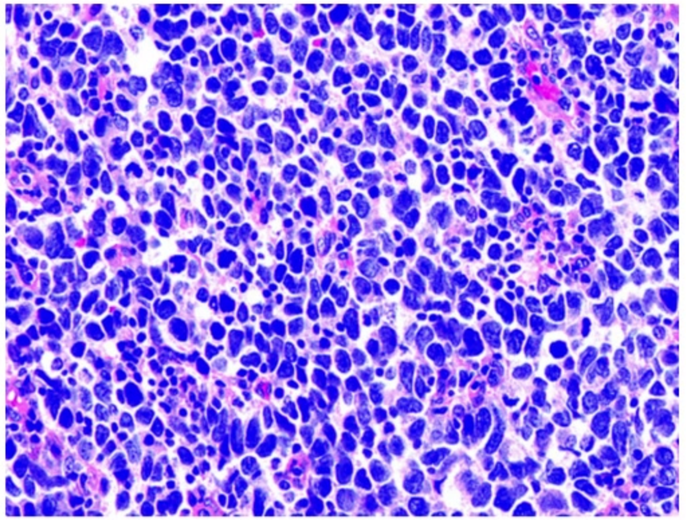
Clinical Features

Three subsites based on anatomic location and local relapse

- Parameningeal including paranasal sinuses, nasopharynx, nasal cavity, pterygopalatine, oral cavity
- Palpable, circumscribed, rapidly growing mass

Histopathology

- 3 microscopic subtypes:
  - **Alveolar**: sheets of small, round cells clustered with variable amounts of fibrous septa; may contain scattered giant cells
  - **Embryonal**: cytologically round to spindle cells with scant cytoplasm in a myxoid background; elongated cells with more abundant eosinophic cytoplasm referred to as "strap" cells or "tadpole" cells
  - **Pleomorphic**: sheets of large cells demonstrating marked nuclear atypia or "anaplasia" with eosinophilic cytoplasm



Rhabdomyosarcoma

Diagnosis

- Histopathological assessment

Treatment

- Challenging due to an increased failure of local control
- High rate of early metastases and recurrence rate
- Surgery, chemotherapy, radiotherapy

Fibrosarcoma

- Malignant neoplasm of mesenchymal origin
- Fibroblasts are the cell of origin
- Arise in soft tissue or within the bone

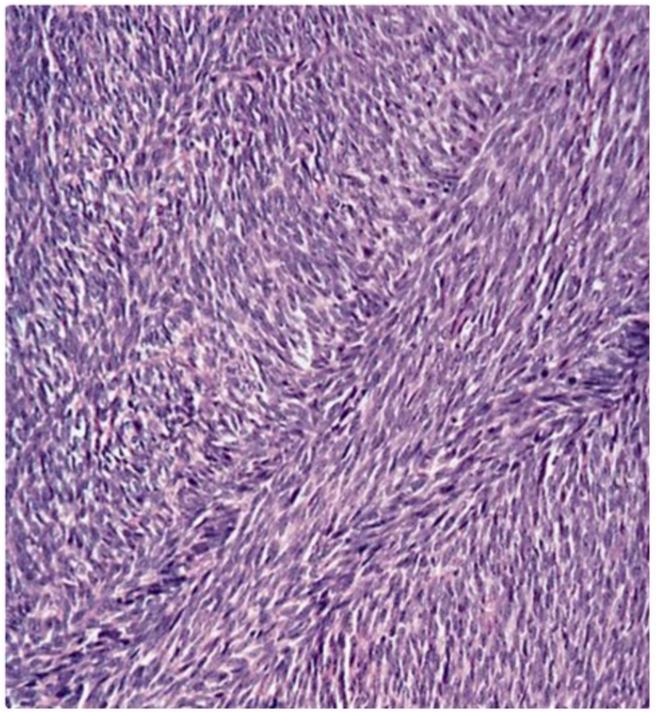
Clinical Features

- Pain, Swelling, paraesthesia, and occasionally loss of teeth and ulceration of overlying mucosa
- High local recurrence
- Hematogenous metastasis may involve the lungs, mediastinum, abdominal cavity, bone
- Innocuous, lobulated, sessile, painless, nonhemorrhagic submucosal mass of normal colouration

Fibrosarcoma

Histopathology

- Highly cellular fibroblastic proliferation in herringbone pattern (cells in columns of short parallel lines with all the lines in one column sloping one way and lines in adjacent columns sloping the other way)
- Cells have scant cytoplasm, tapering elongated dark nuclei with increased granular chromatin, variable nucleoli
- Mitotic activity present, often with abnormal forms
- Variable collagen
- Usually no giant cells
- No pleomorphism (or call pleomorphic MFH), no other distinct cell types
- **Patterns:**
  - Keloid-like (thick hyalinized collagen fibers), loose fascicular, focally myxoid



Fibrosarcoma

Diagnosis

- Local extent of the neoplasm and the presence or absence of local and distant metastasis needs to be determined
- Imaging: CT or MRI
- Histopathology: low grade and high grade

Treatment

- Wide local excision, at least 1 cm of margin confirmed by histopathologic clearance
- Radiotherapy
- Chemotherapy

Kaposi Sarcoma

- Angioproliferative malignant neoplasia of endothelial cells forming an infiltrative capillary-rich lesion that eventually disseminates to multiple cutaneous sites, viscera, and lymph nodes

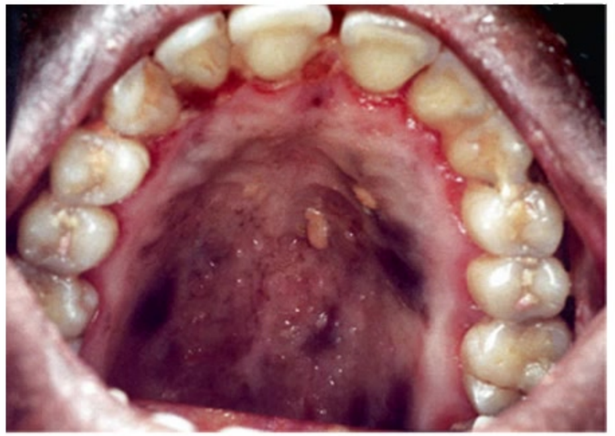
Aetiology & Pathogenesis

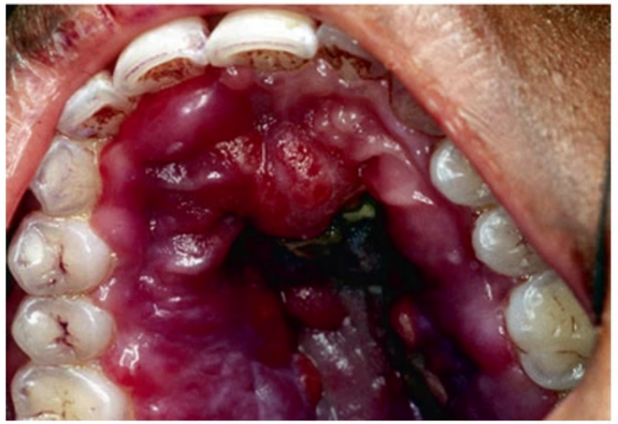
- Caused by HHV8 infection of endothelial cells
- Found in immunocompetent people and is active in immunosuppression
- Tat protein produced by lymphoid cells infected with HIV promoted the infection of HHV8 contributing to the highly aggressive nature of AIDS-KS by inducing inflammatory cytokines and angiogenesis

Kaposi Sarcoma

Clinical Features

- second most frequent tumour in HIV-infected patients worldwide
- Most common cancer in Sub-Saharan Africa
- Most affected oral location: hard palate → gingiva → tongue
- 70% of patients with cutaneous AIDS-related KS also have oral lesions
- Multiple patches, and papules with bluish to purple colour are the most common skin and mucosal presentations
- Develop to more nodular stage as it progresses
- Hemorrhage, pain, ulceration, secondary infections as it advances
- Highly aggressive lesions are infiltrative, involve soft tissue and bone
- Can disseminate compromising visceral organs and lymphatic nodes





Kaposi Sarcoma

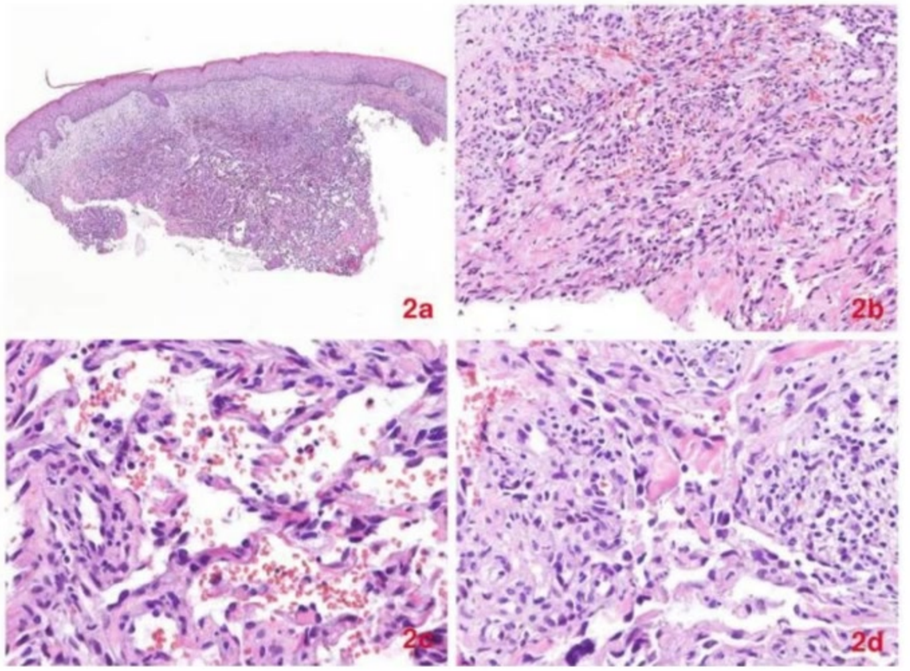
Histopathology

Early "Patch-Stage" lesion

- Proliferation of small and jagged endothelial-lined spaces surrounding normal dermal vessels and irregularly shaped
- Slit-like vascular spaces dissecting collagen bundles, parallel to the endothelium
- Extravasated erythrocytes and lymphocytes

Advanced stage

- Accumulation of spindle-shaped cells, which are considered to be tumour cells of KS
- Intra and extracellular hyaline globules and increased mitotic activity



Temelkova, Ivanka & Tronnier, Michael & Terziev, Ivan & Wollina, Uwe & Lozev, Ilia & Goldust, Mohamad & Tchernev, Georgi. (2018). A Series of Patients with Kaposi Sarcoma (Mediterranean/Classical Type): Case Presentations and Short Update on Pathogenesis and Treatment of the Creative Commons Attribution-

Kaposi Sarcoma

Diagnosis

- HHV8 positive peripheral blood, as well as lesional tissue

Treatment

- Local excision, radiation therapy, chemotherapy, and the adjustment of immunosuppressive medications can all be considered
- Local recurrence is common in AIDS-KS patients, but survival is more related to the immunological status of these patients; the mortality rate can reach 20–25%.

Thank you for listening

lalima.tiwari@uwa.edu.au