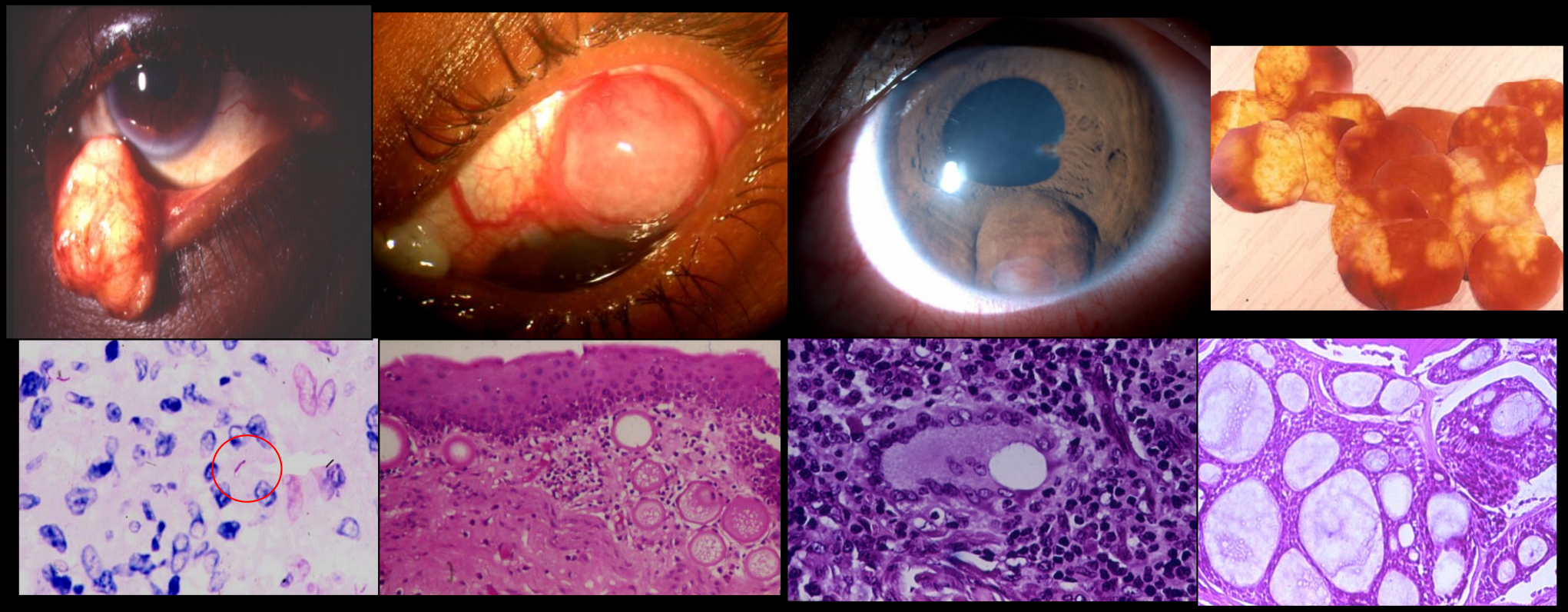
Ophthalmic Pathology for the Clinicians



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"As is our pathology so is our practice "

William Osler

OUTLINE OF MY TALK

- **How to send ophthalmic pathology specimen.**
- **Techniques used in ophthalmic pathology.**
- **Stains used in ophthalmic pathology.**
- **Normal histology of the eye and adnexa.**
- **Clinicopathological correlation in few ophthalmic diseases**

Steps in Histopathology

- Fixation
- Grossing
- Tissue processing
- Paraffin embedding
- Sectioning
- Staining

Fixatives used in ophthalmic pathology

- Routine Histopathology : 10% Neutral buffered formalin
- Cytology : 95% Ethyl alcohol
- Electron microscopy : 2.5% Glutaraldehyde

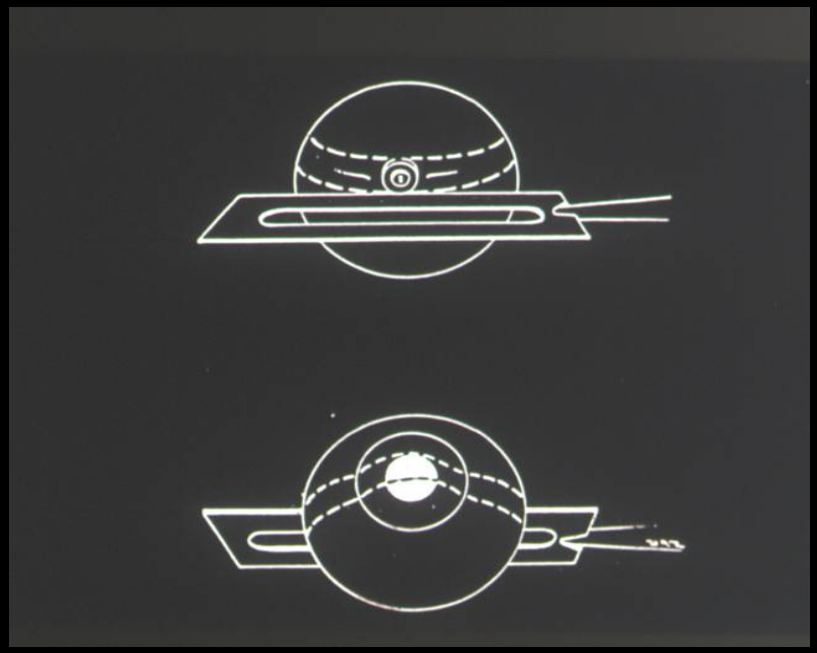
Time required for Fixation

- Corneal Button : 6 hours
- Globe or large orbital mass : 24 hours
- Exenterated specimen : 72 hours

Transillumination – suspected intraocular tumour

Grossing Area

Grossing



Automatic tissue processor

Paraffin wax embedding

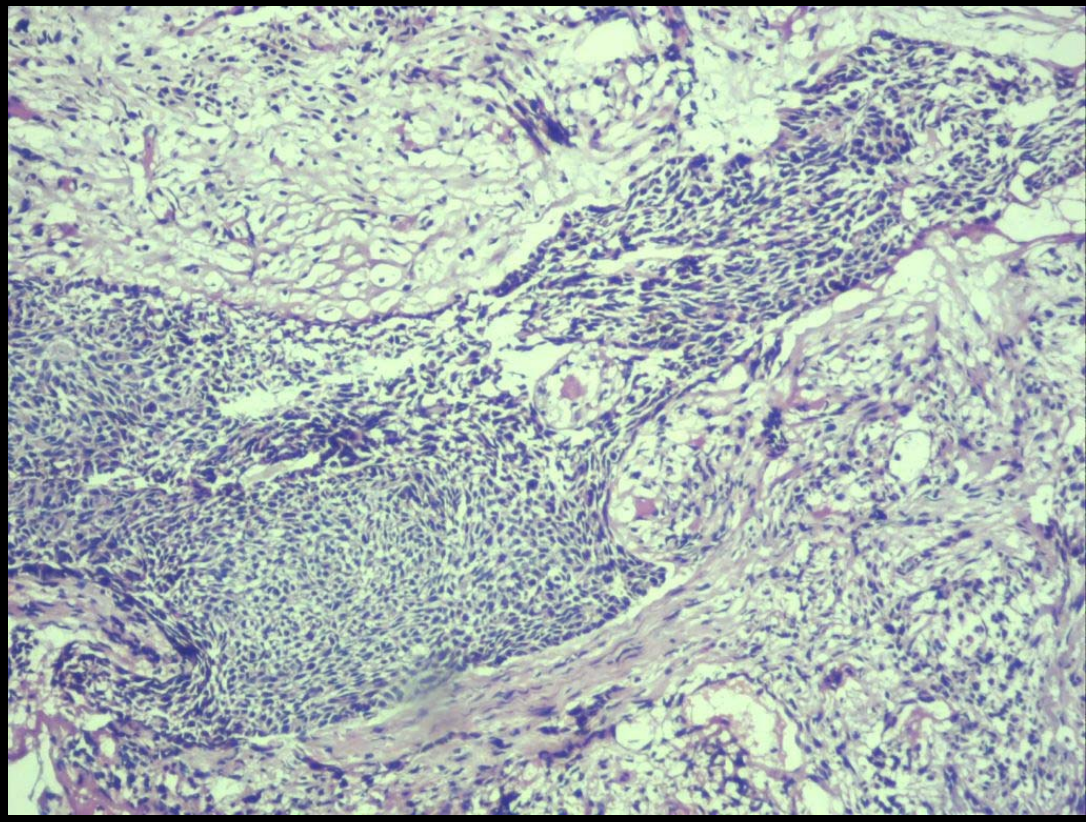
Sectioning

3 to 6 microns

Cryostat- Frozen section minus -20 degree

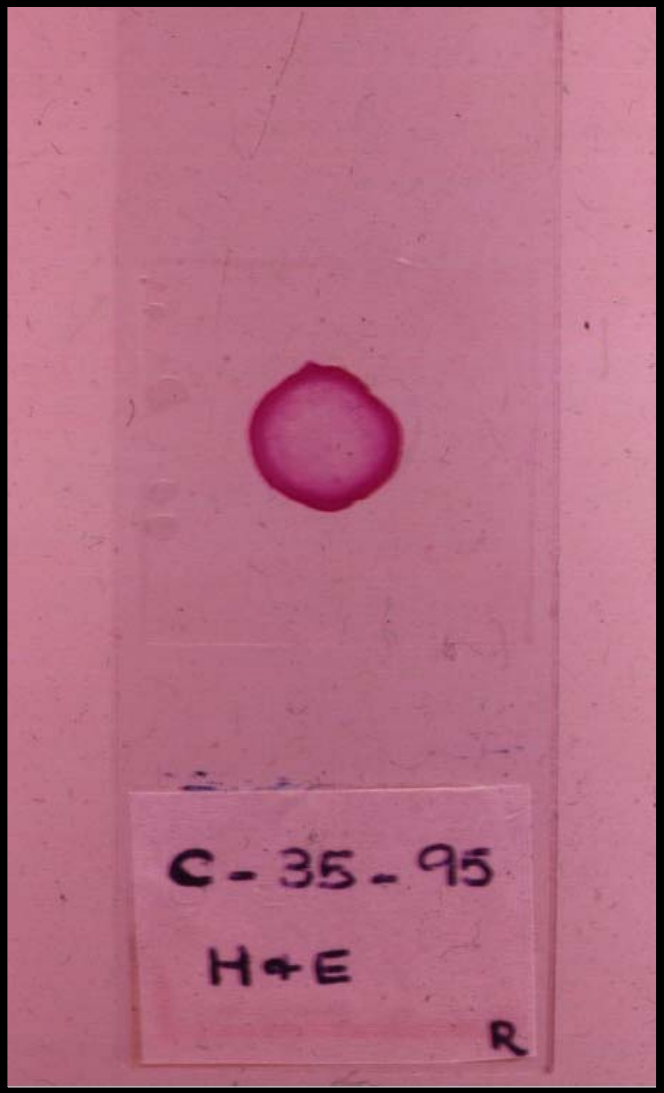
Basal cell Carcinoma – margin clearance

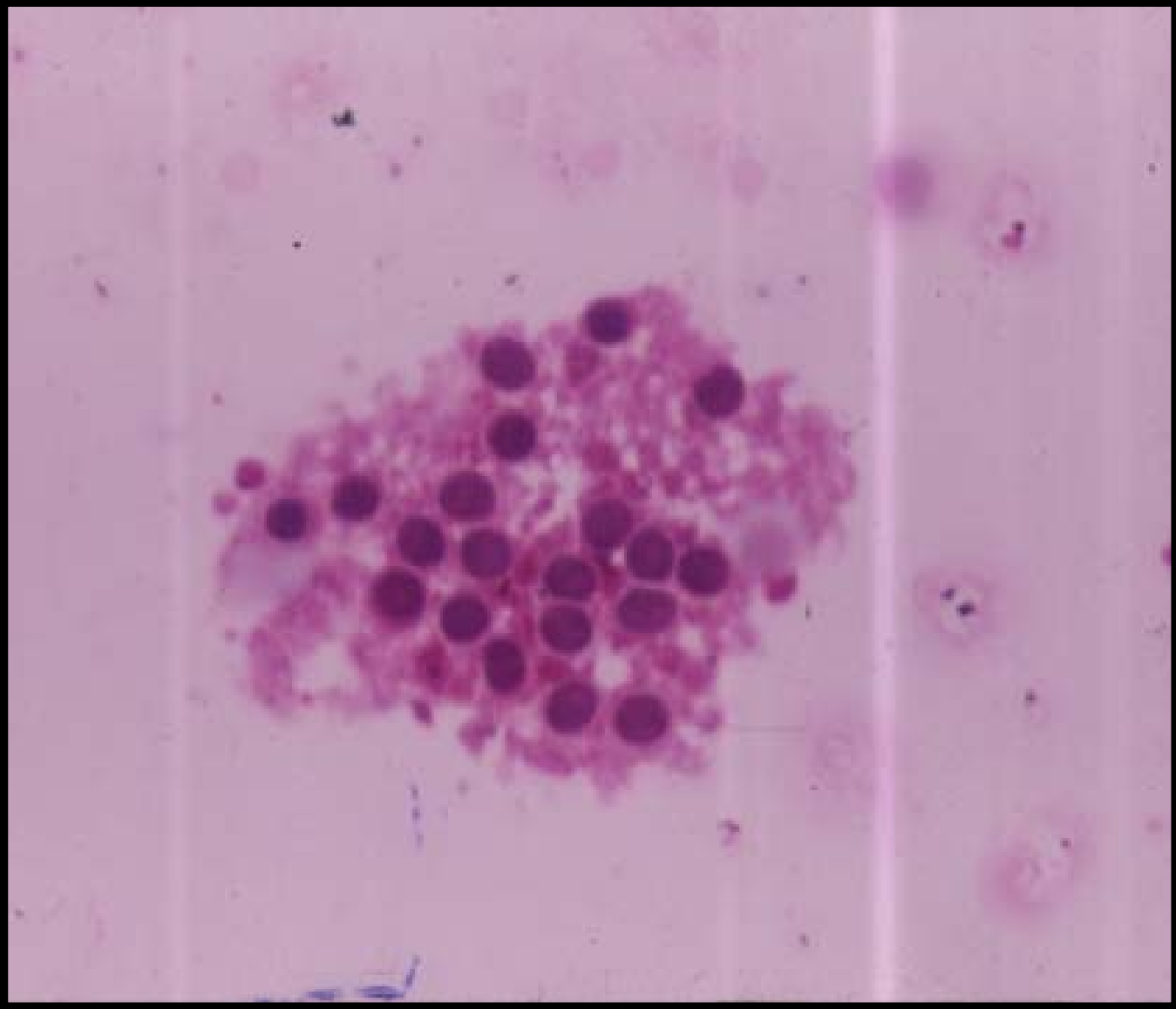
Frozen section



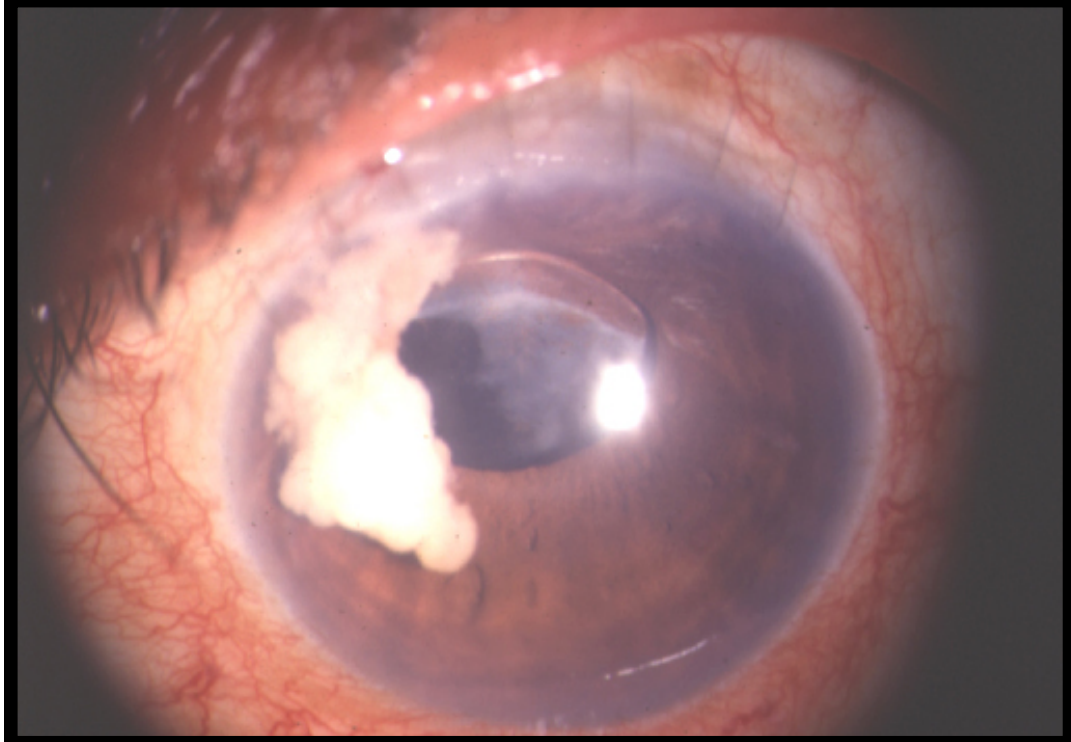
Cytology

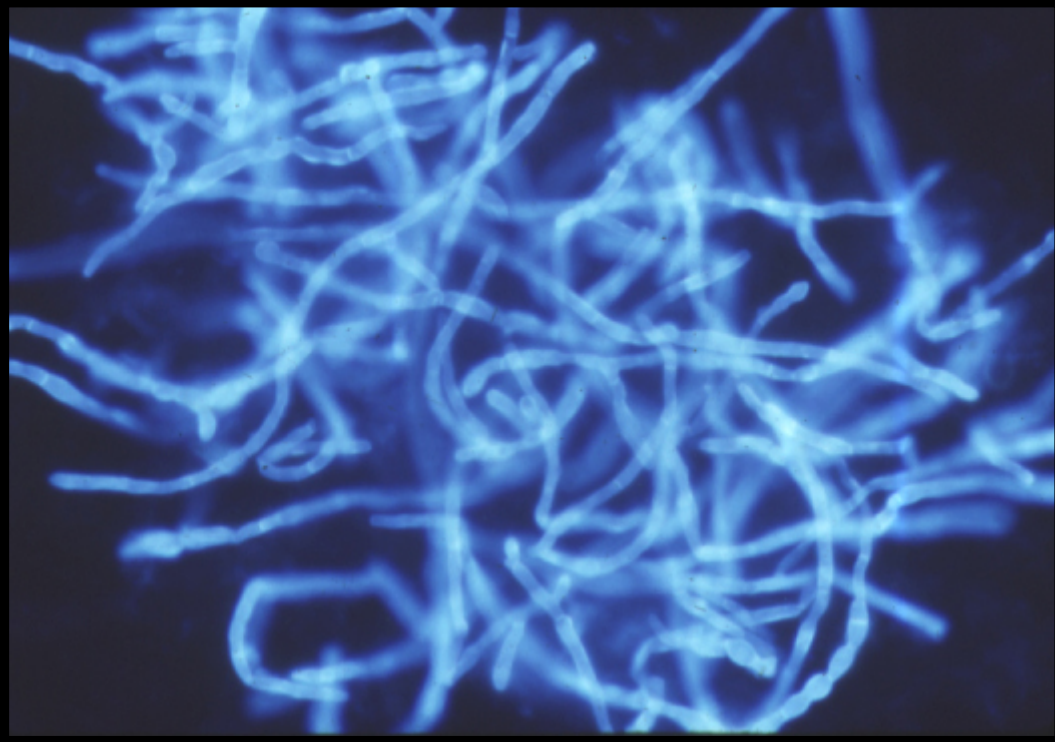
Cytospin machine 1000 rpm
for 5 minutes


C-35-95
H+E
R



Calcofluor stain showing clumps of fungus





Stains used in ophthalmic pathology

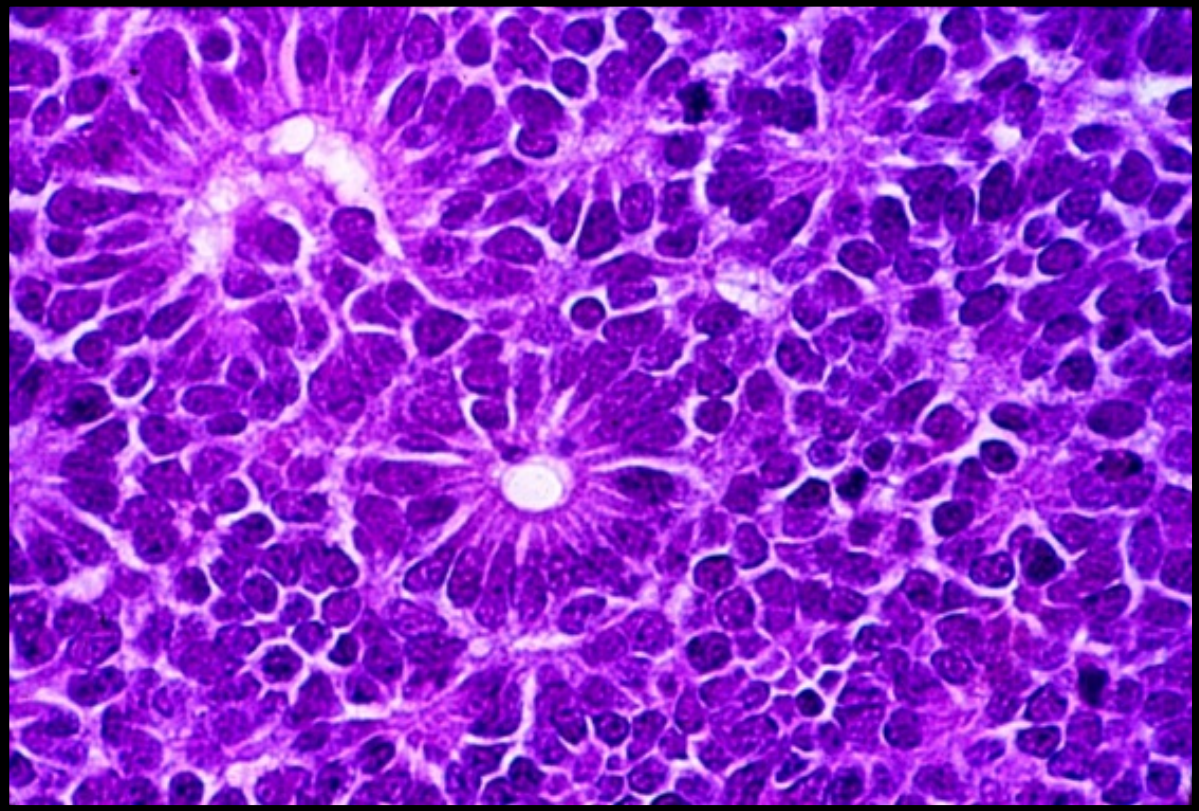
- Routine staining : Haematoxylin and eosin

Stains for organisms :

- Fungus - Gomori Methanamine Silver stain (GMS)
- Bacteria : Gram stain (Brown Hopps method)
- Acid Fast Bacilli : Ziehl Neelsen stain

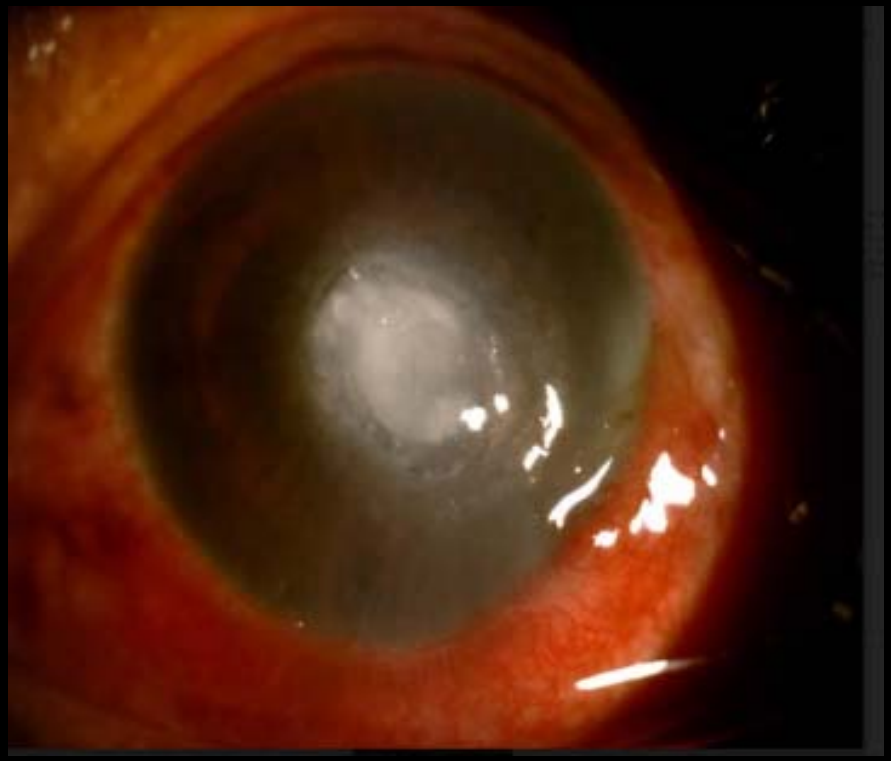
Staining Area

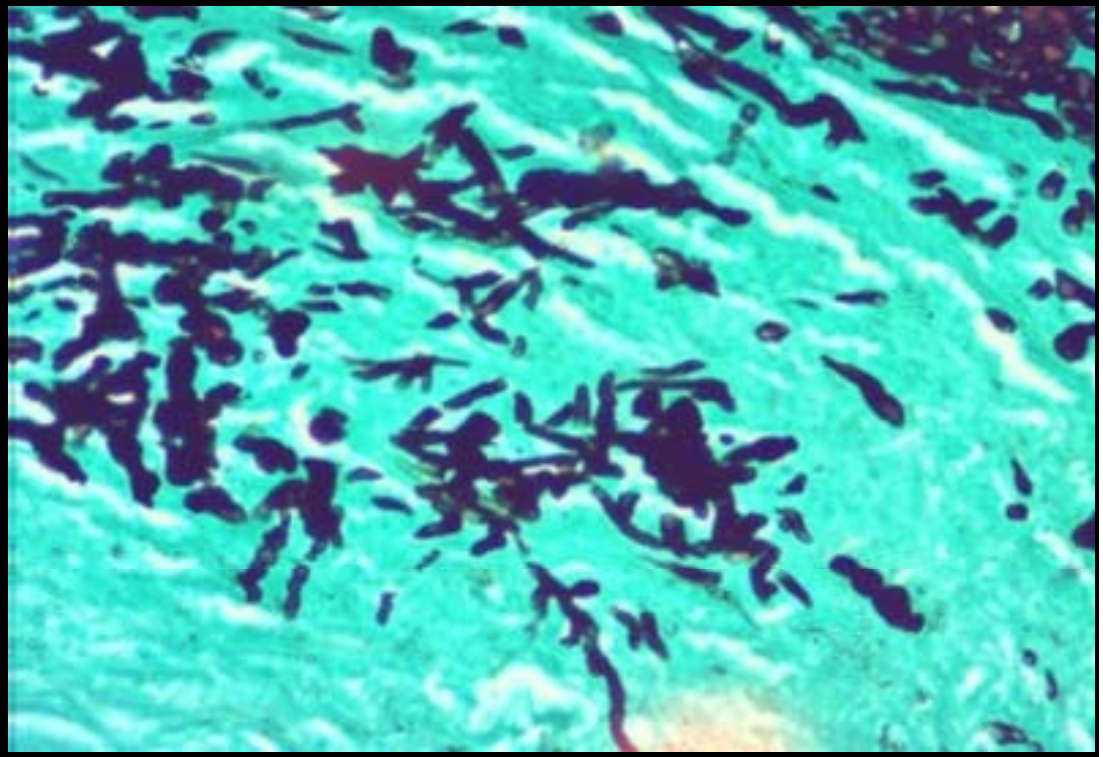
Haematoxylin and Eosin



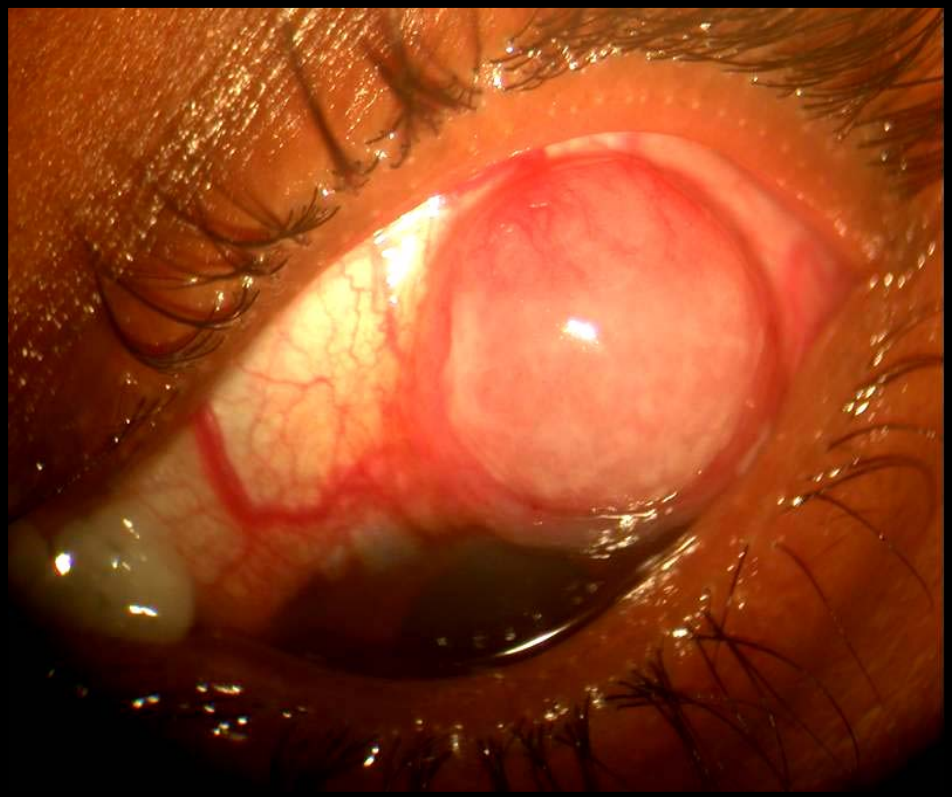
Cytoplasm –pink, Nuclei- Blue

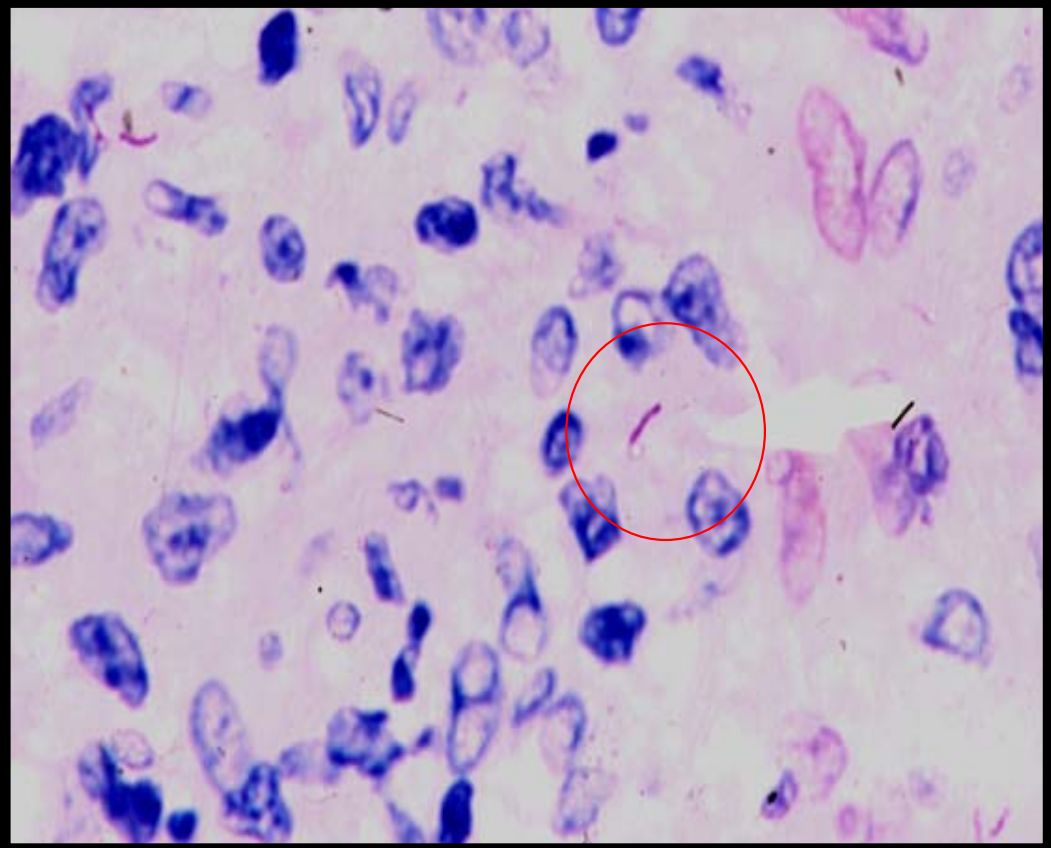
GMS stain for Fungus





Ziehl- Neelsen stain showing AFB



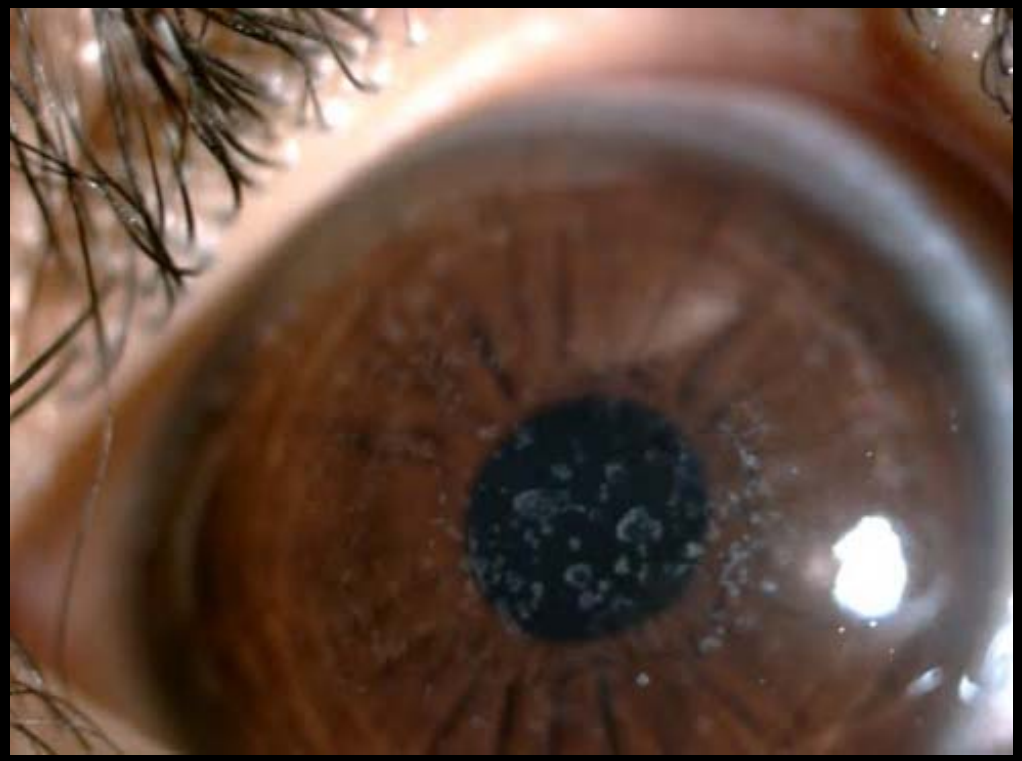


Special stains

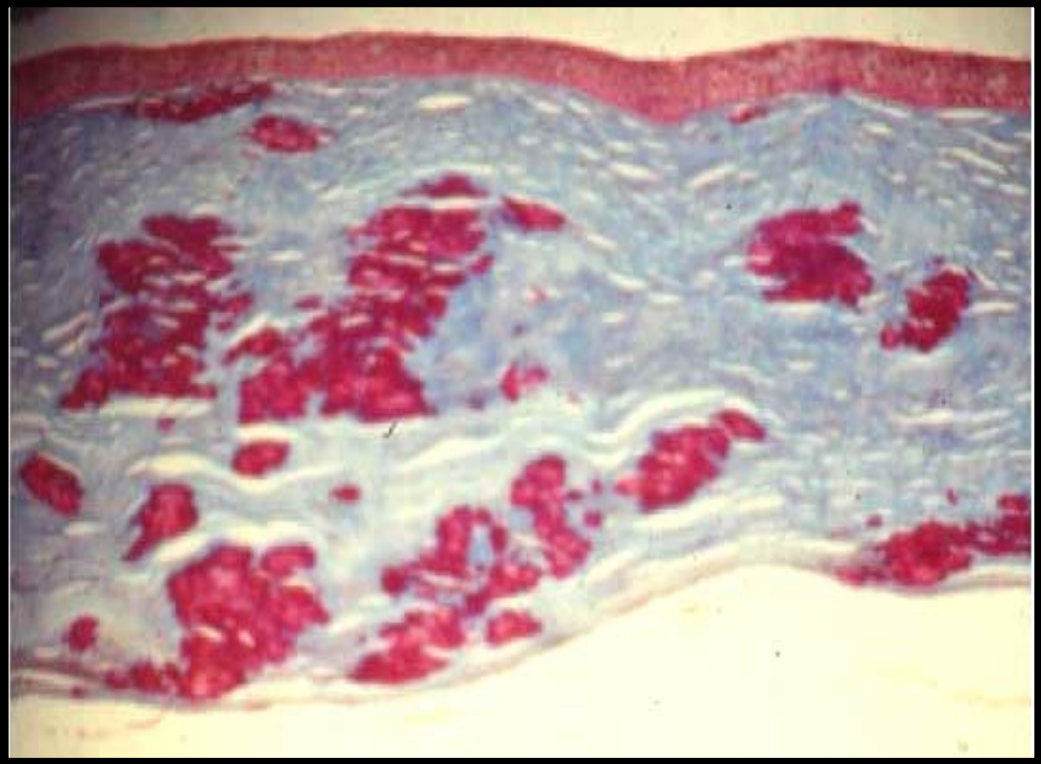
- Connective tissue : Masson Trichrome stain
- Mucin : Alcian Blue, Periodic acid Schiff
- Iron : Pearl's Prussian Blue
- Fat : Oil O Red
- Calcium : Alizarin Red
- Amyloid : Congo Red

Trichrome stain

Granular stromal Dystrophy

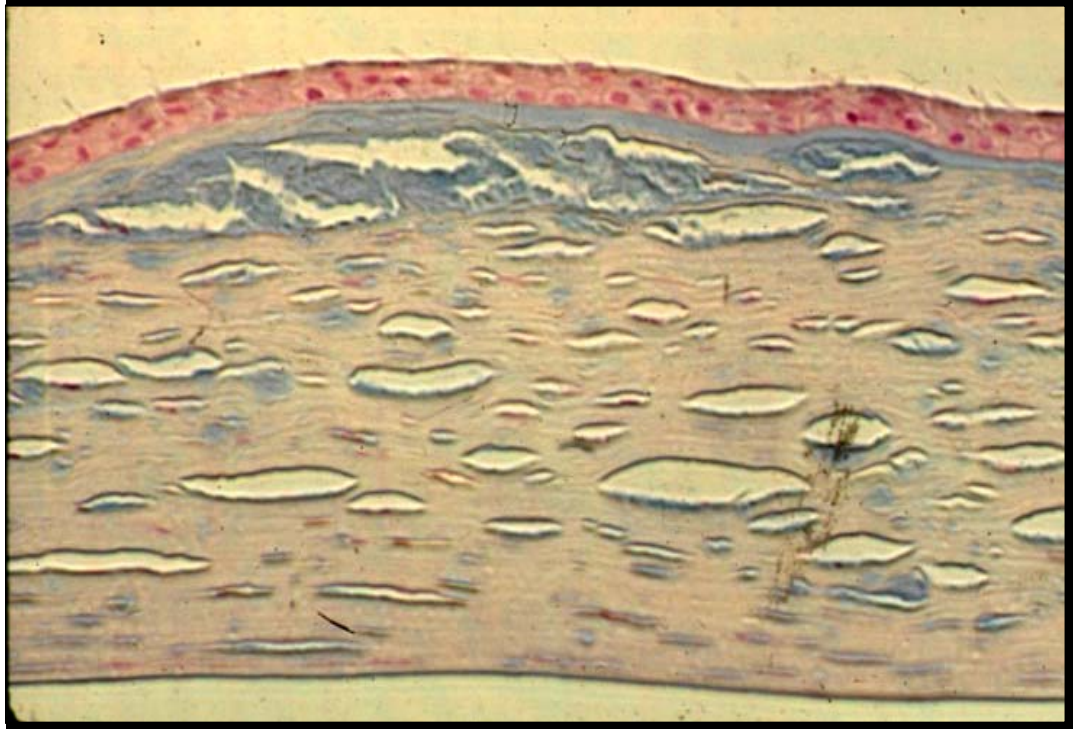


Hyaline material

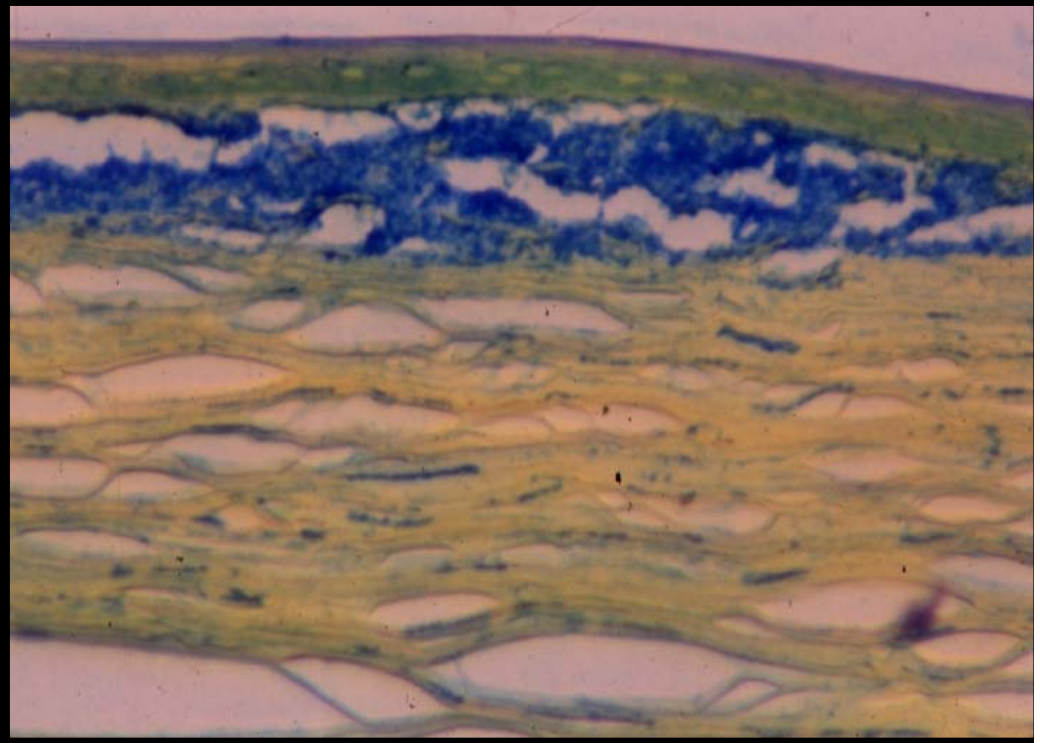


Macular Dystrophy

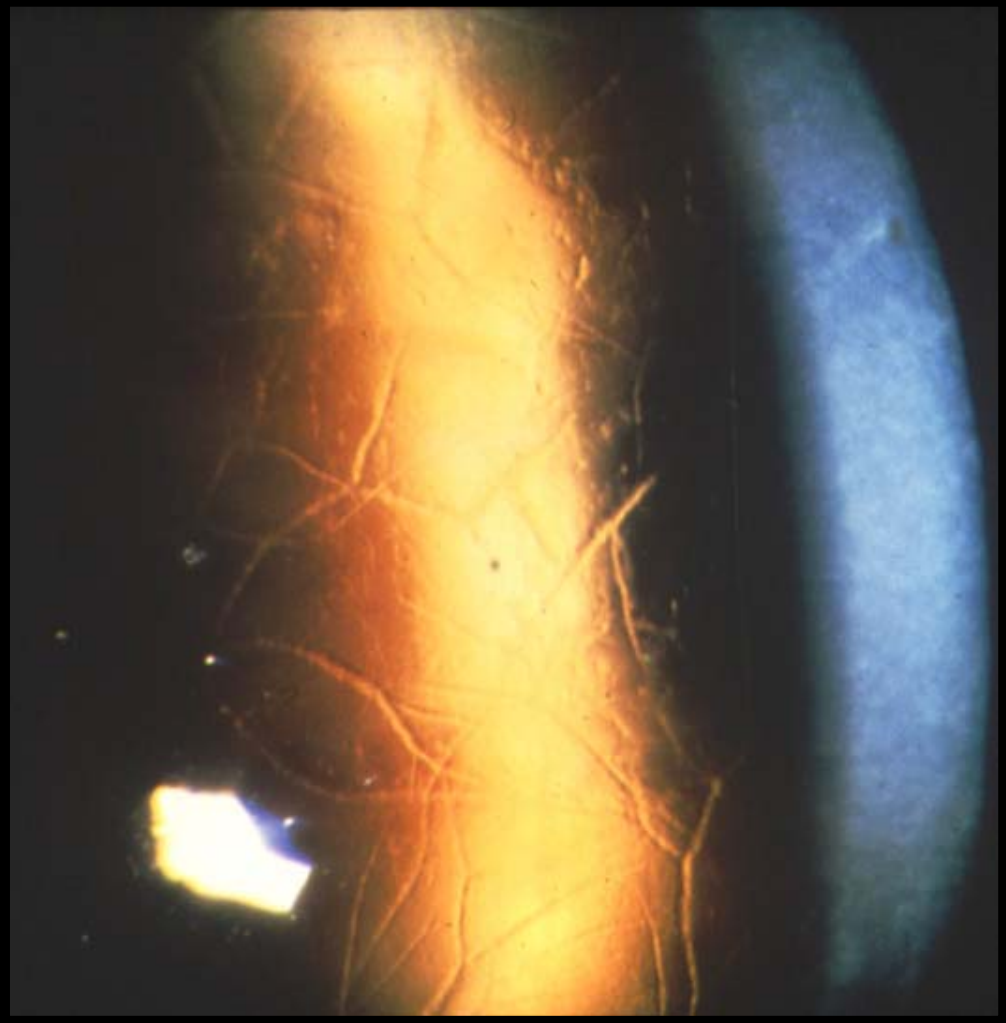
Alcian blue

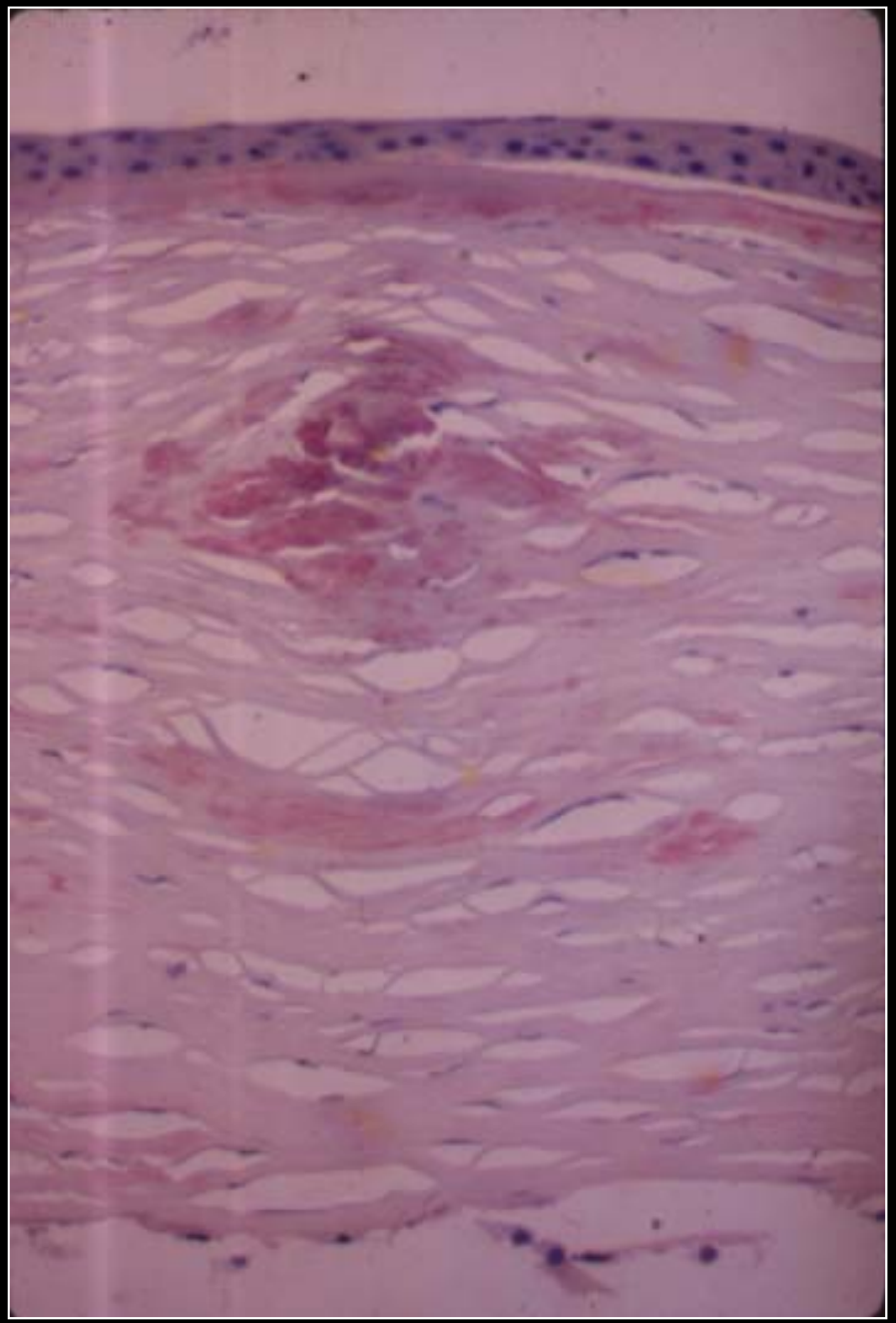


Colloidal iron

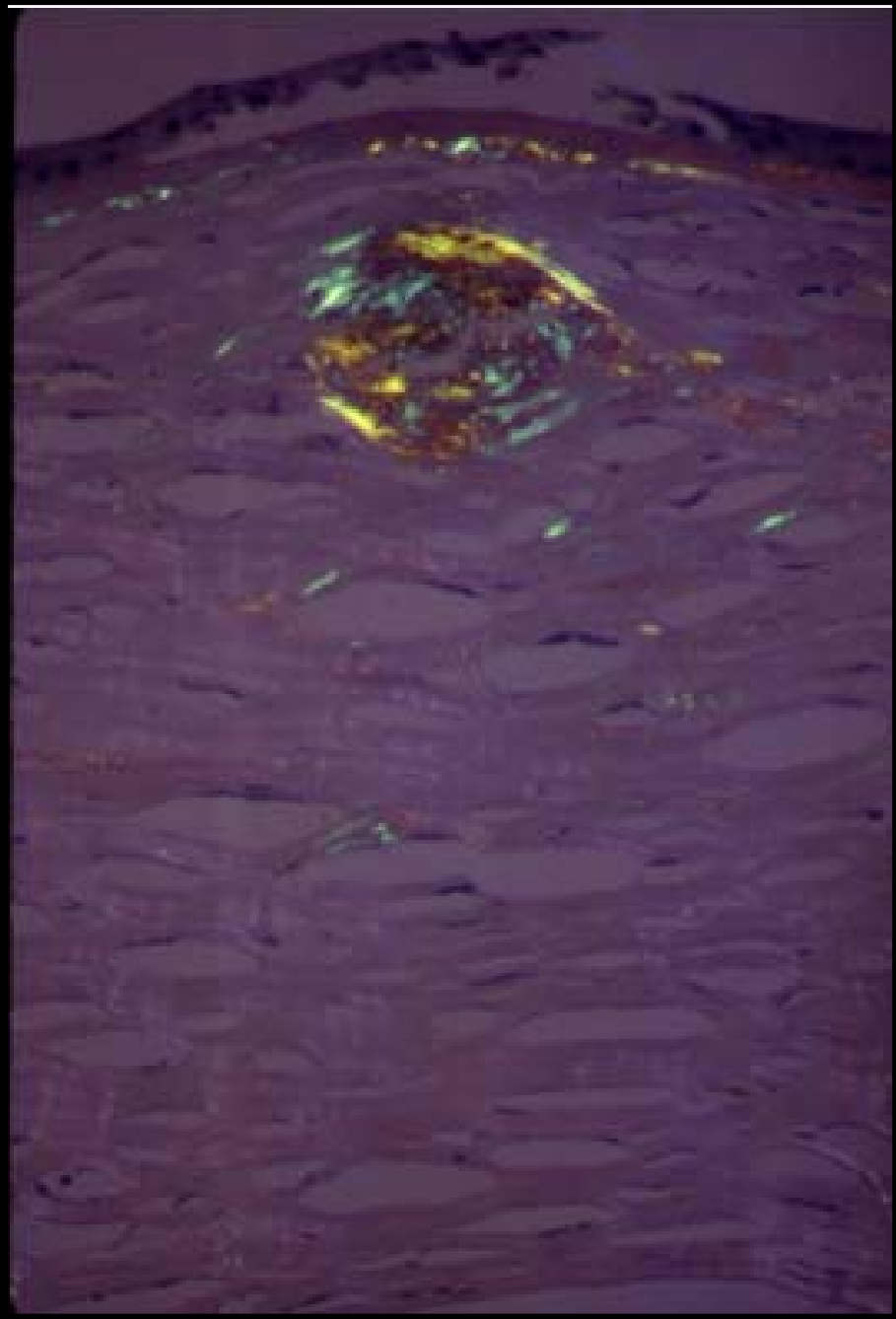


Lattice Corneal Dystrophy



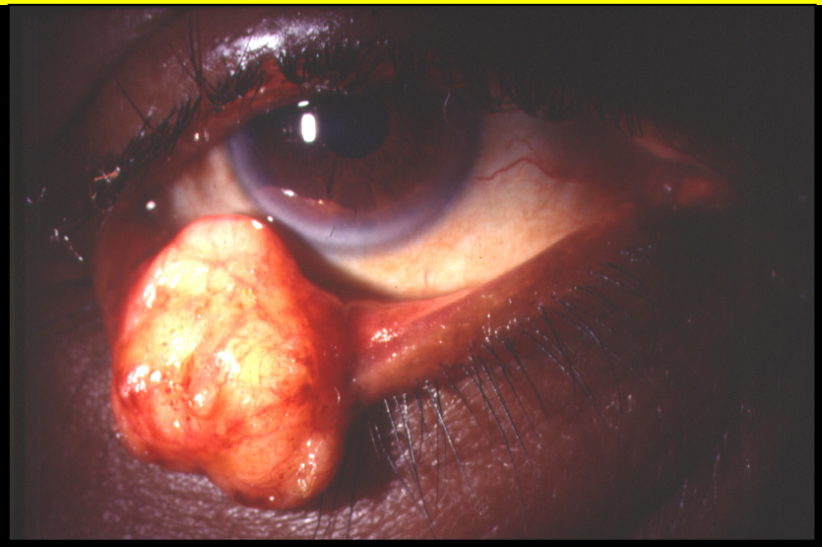


Congo red

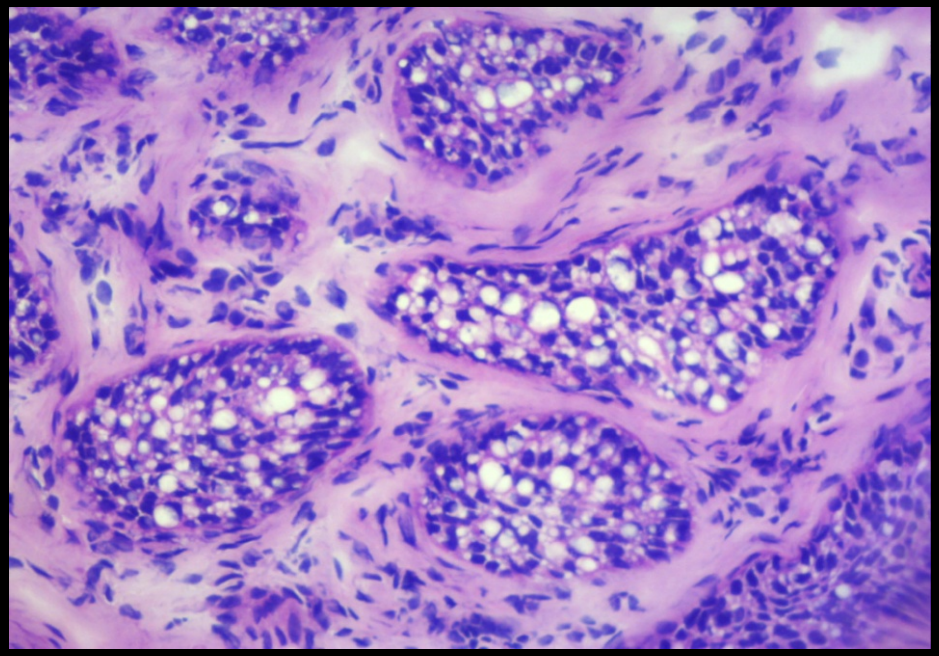


Apple green birefringence

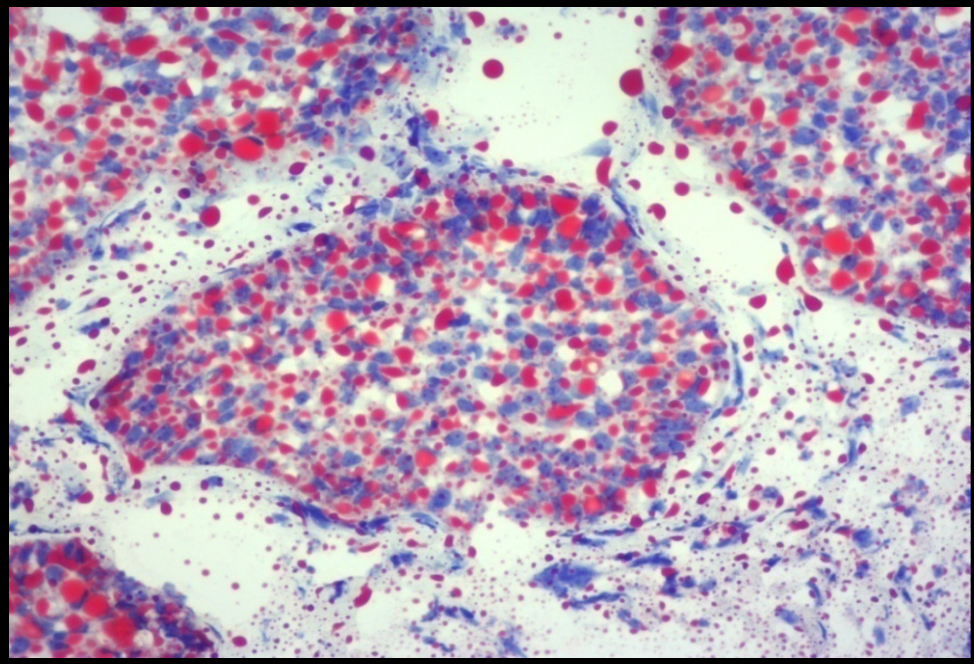
Sebaceous gland Carcinoma



Haematoxylin and eosin



Oil- O- red
(frozen section)

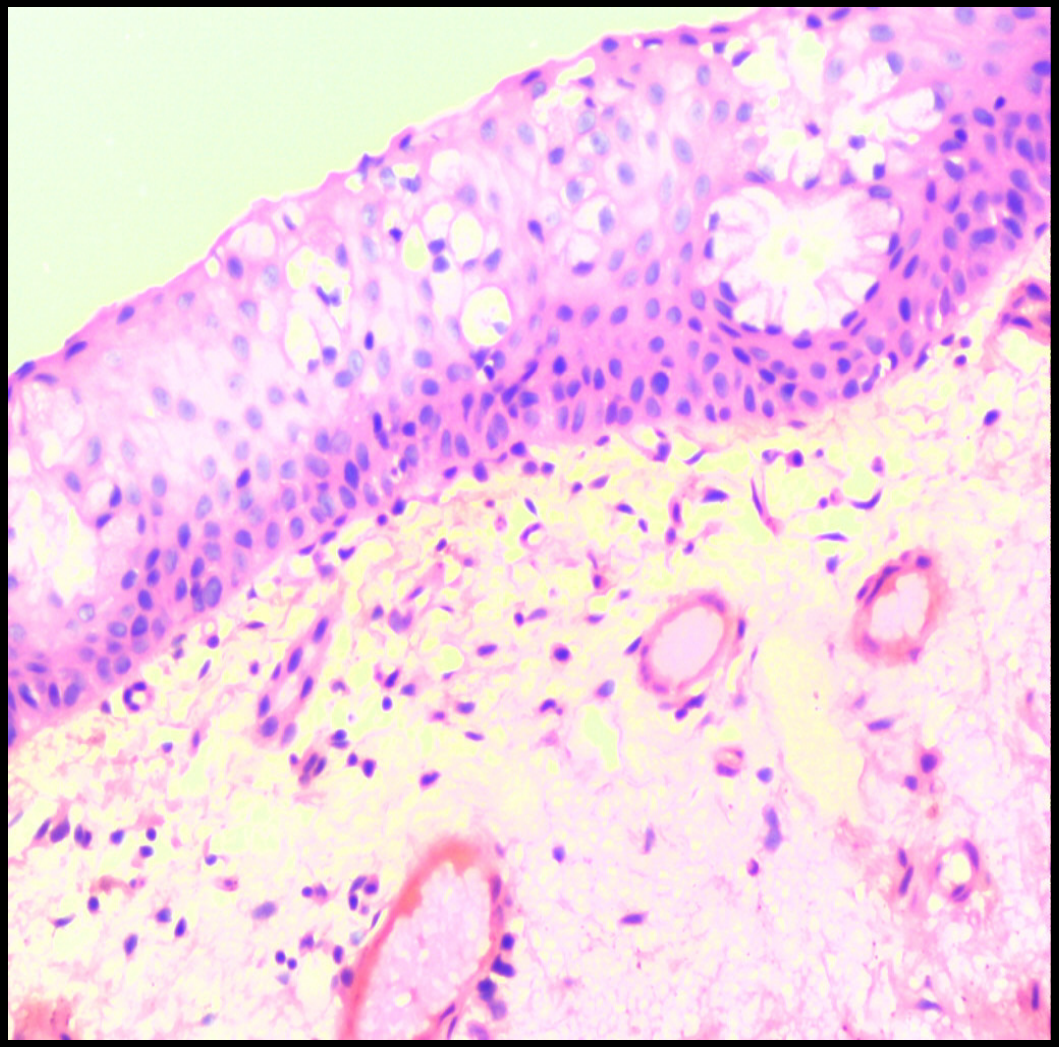


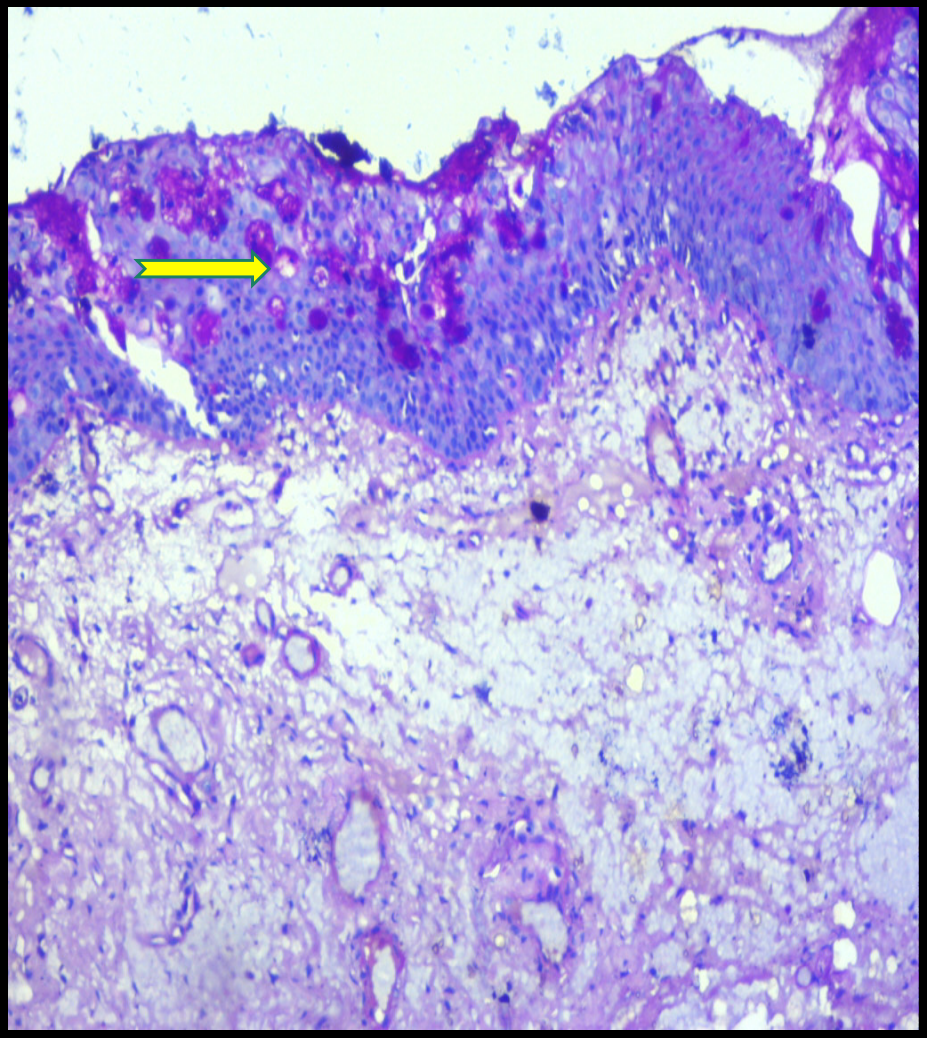
Normal Histology of Eye

Normal Lid

Trichrome stain

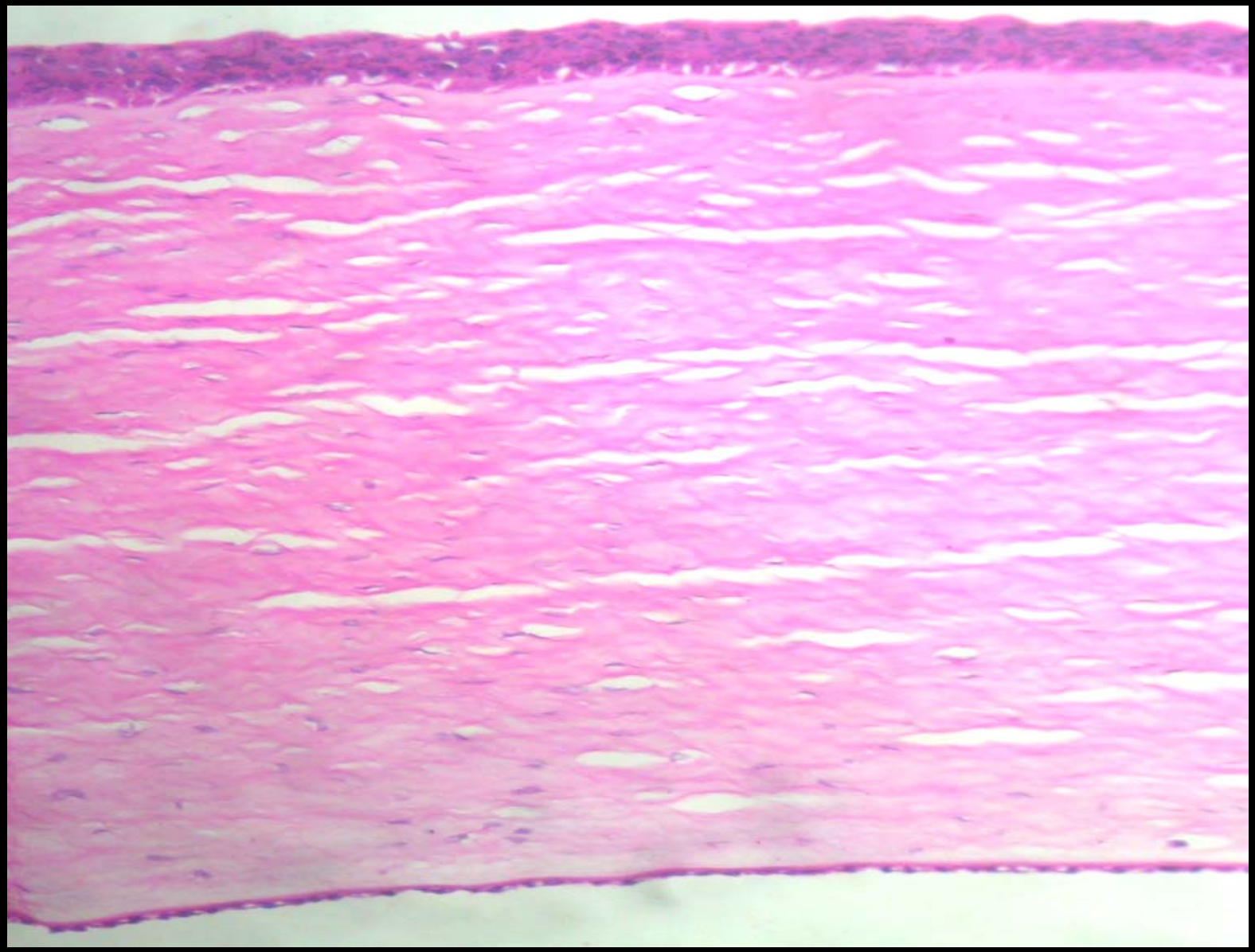
Normal conjunctiva with goblet cells



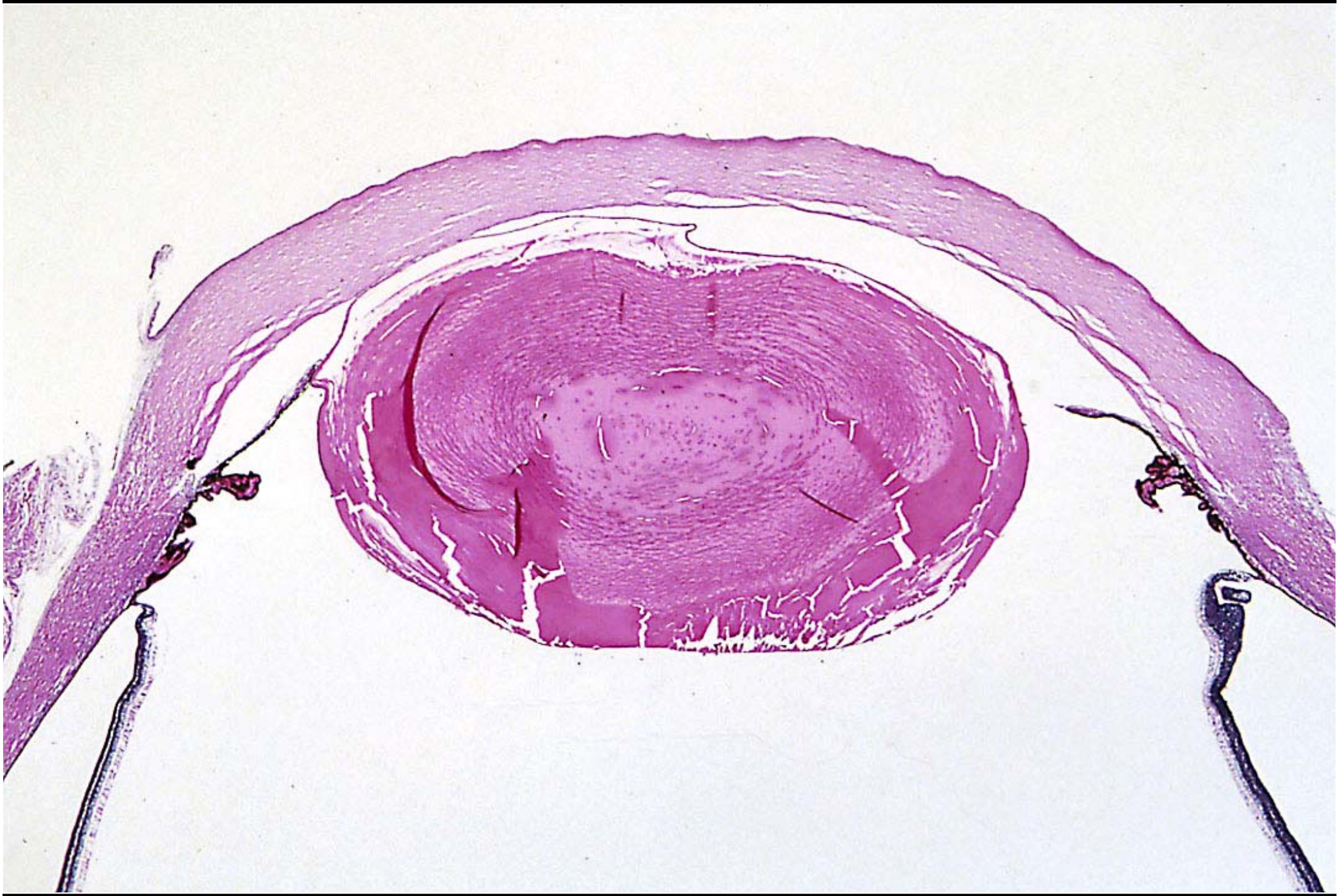


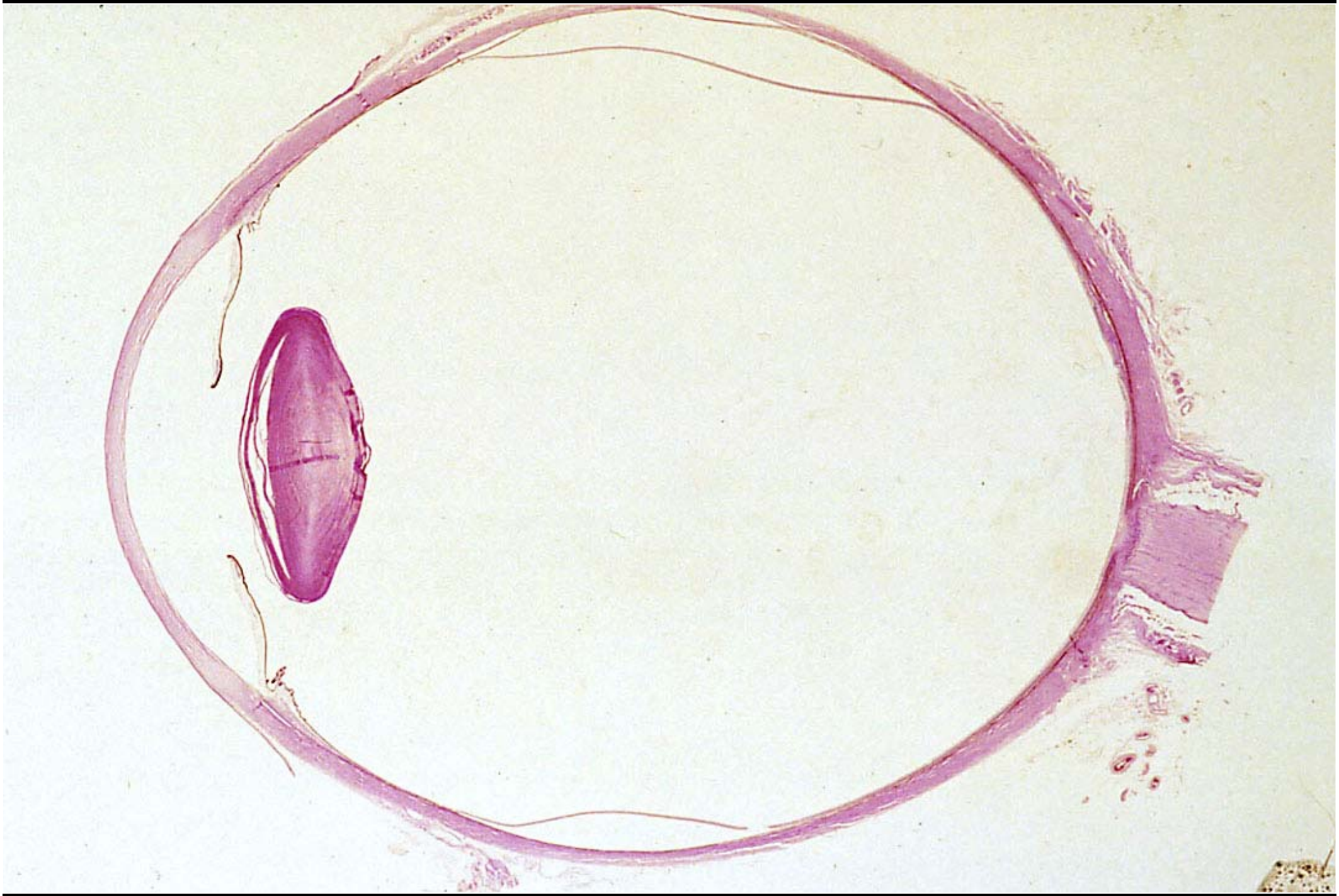
PAS STAIN

NORMAL CORNEA

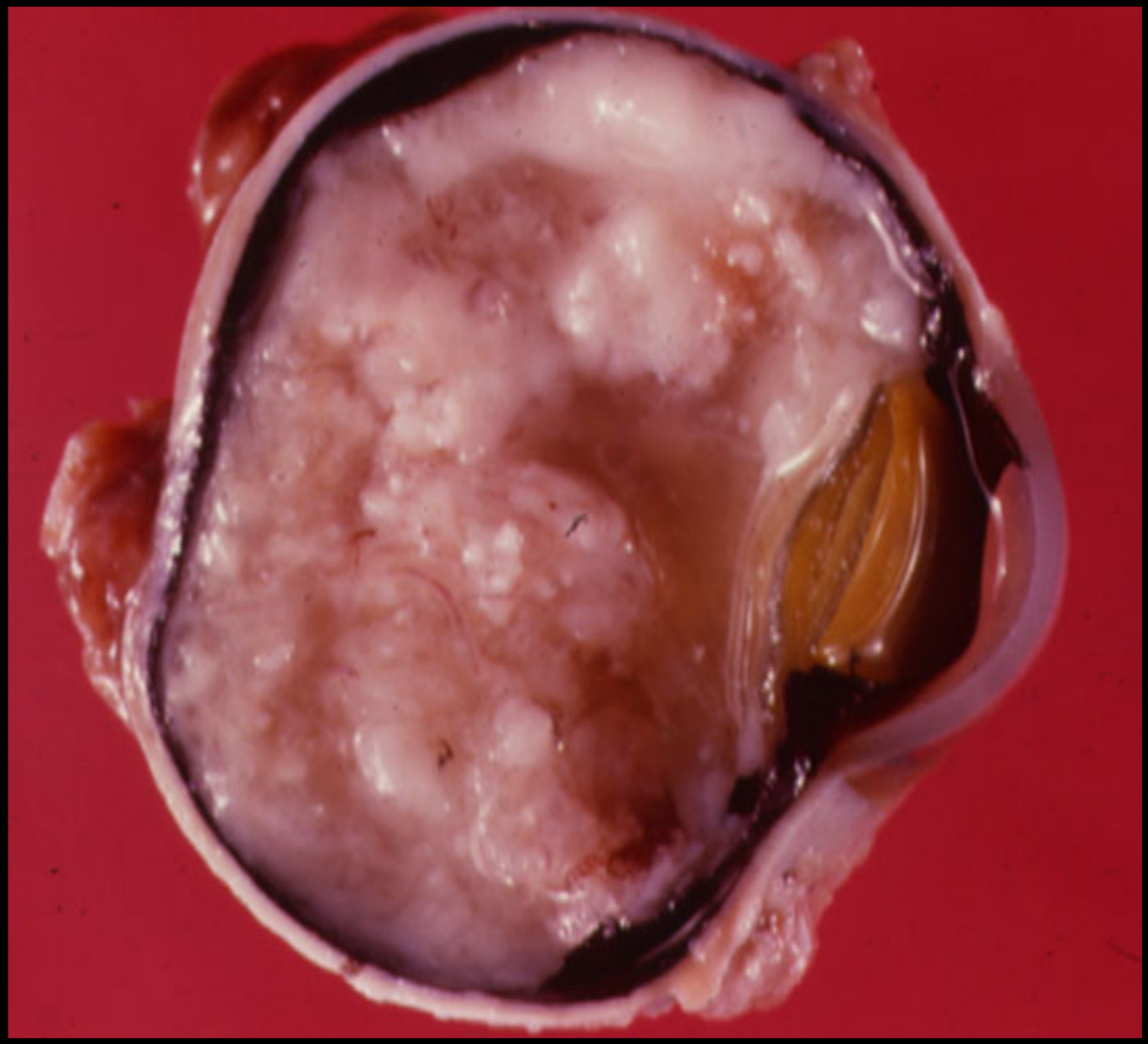


Four layers



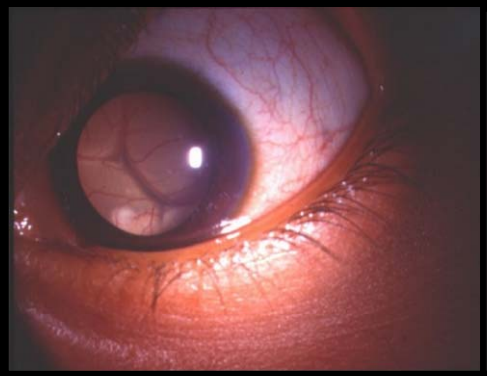


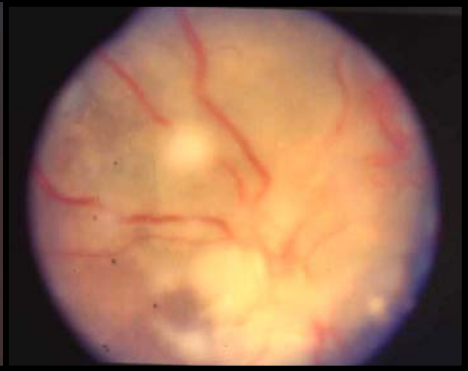
What is this tumour ?

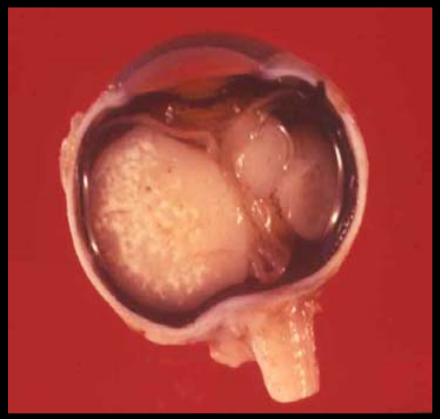


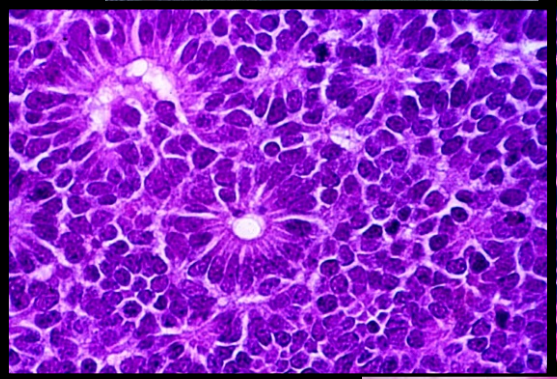
Cut section of the globe enucleated in a 2 year old child

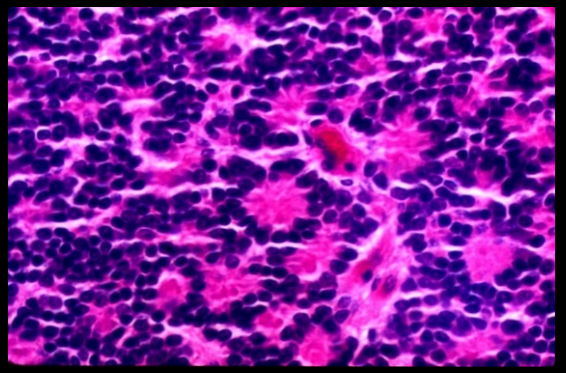
Retinoblastoma

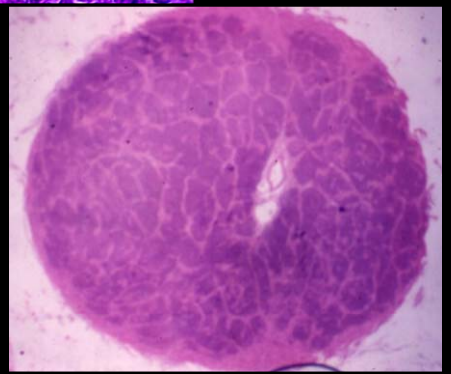




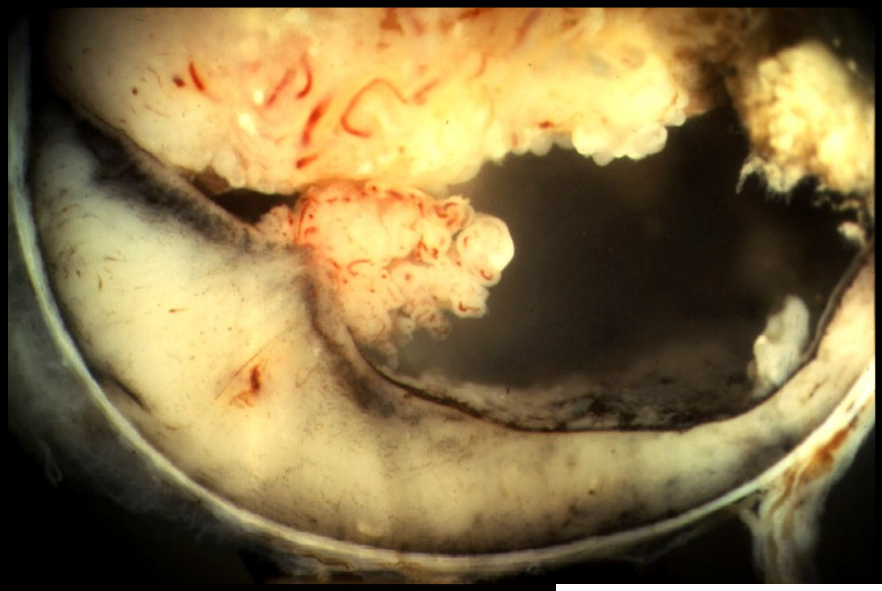


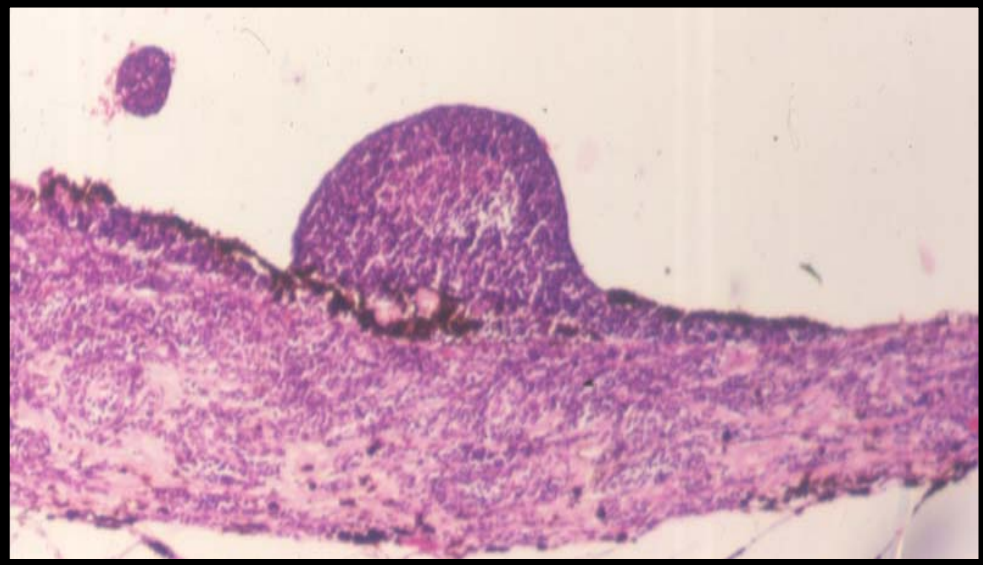




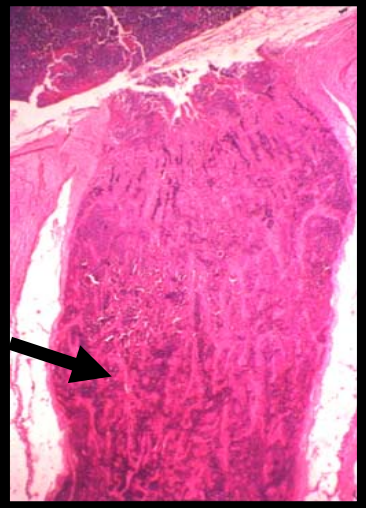


Choroidal Invasion





Optic nerve invasion

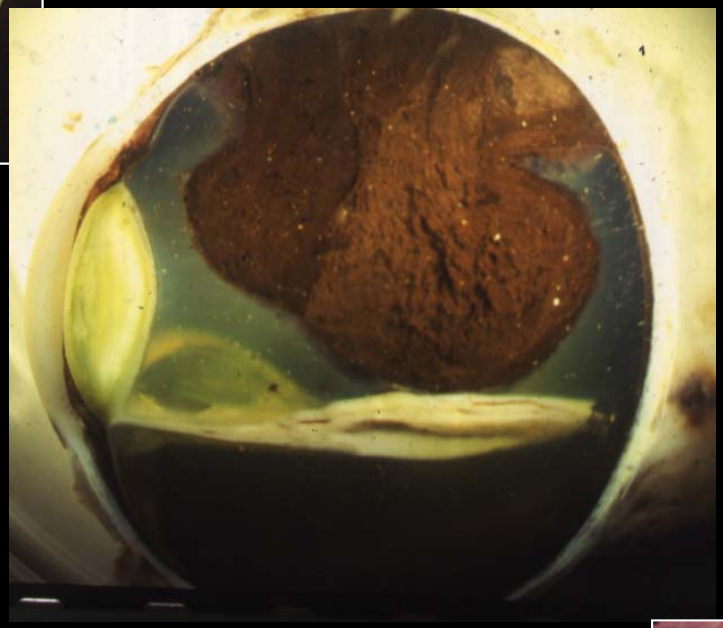


Retinoblastoma

Role of Pathologist

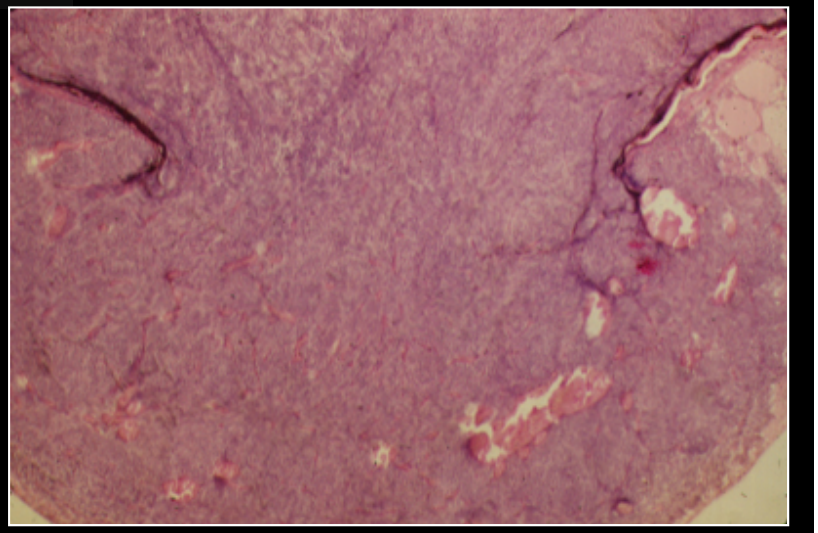
- To confirm the clinical diagnosis
- To identify the extent of tumor spread
- To assess the risk for metastasis
- To guide the clinician in the management

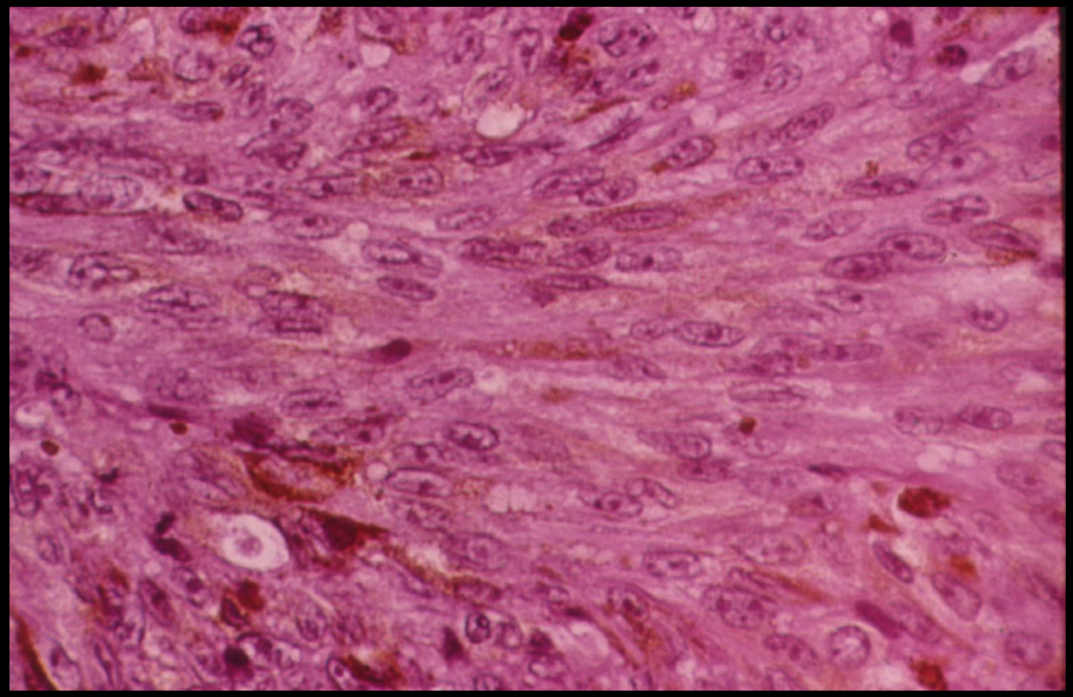
Malignant melanoma
Of choroid



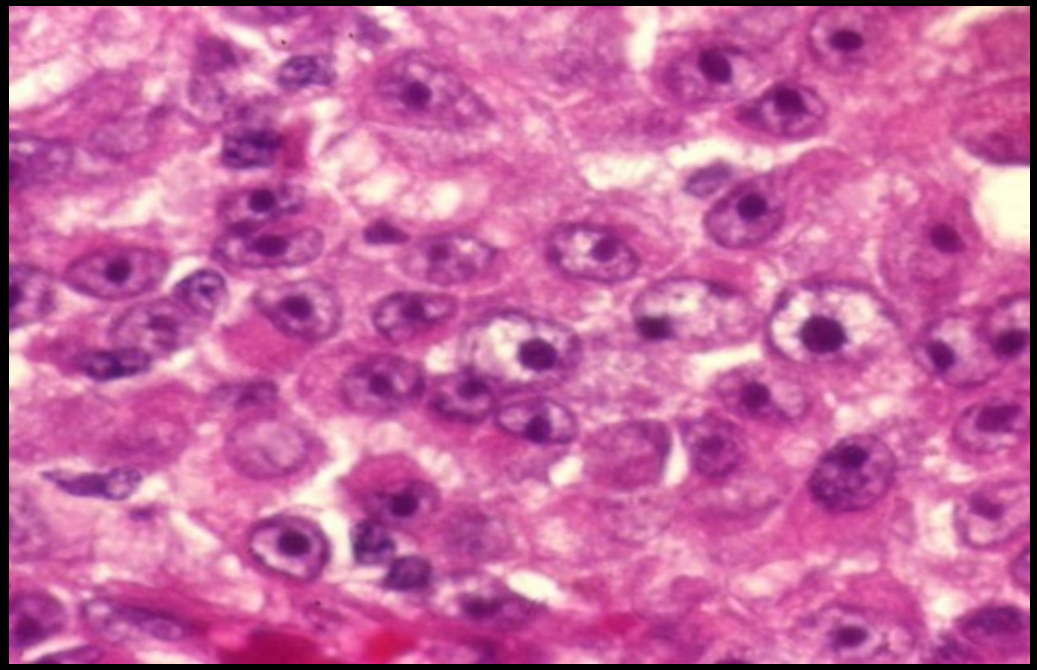
Mushroom-shaped
pigmented tumor mass

Collar stud appearance





Spindle cells

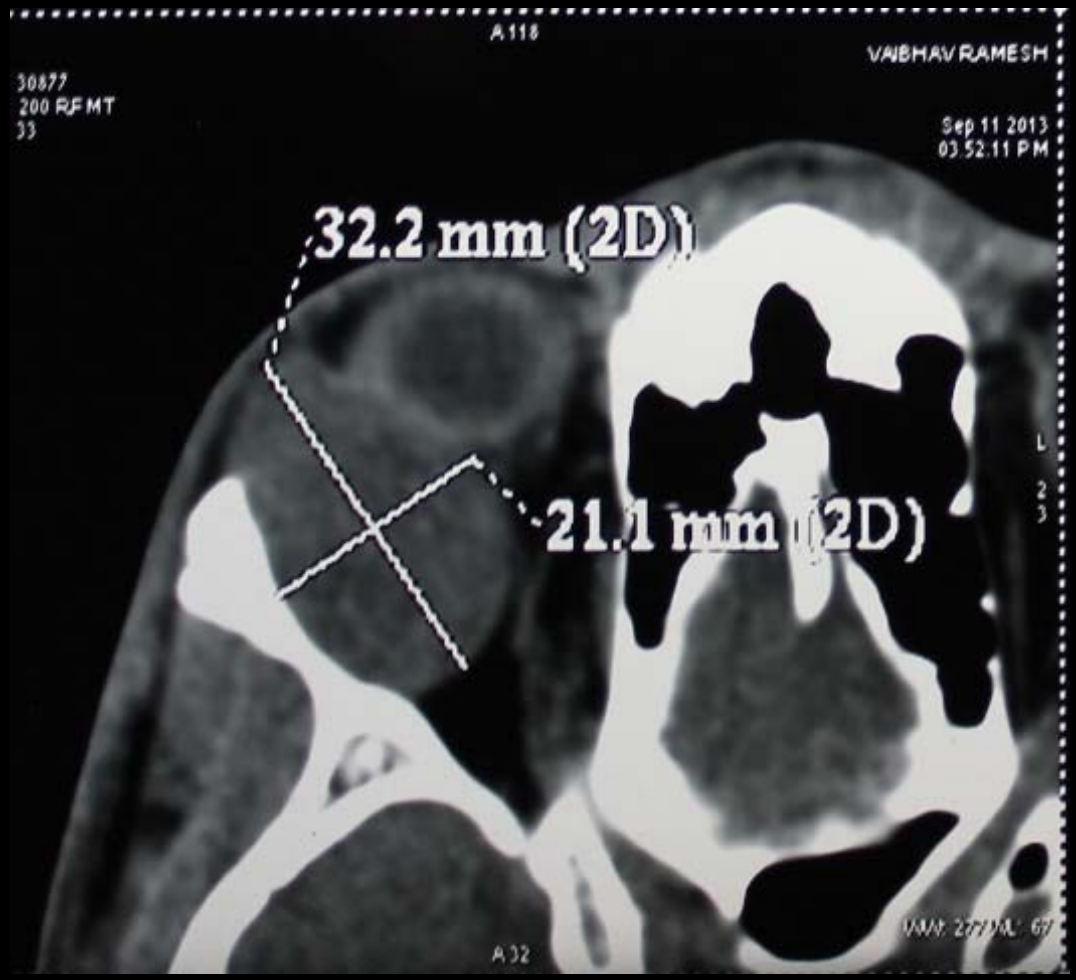


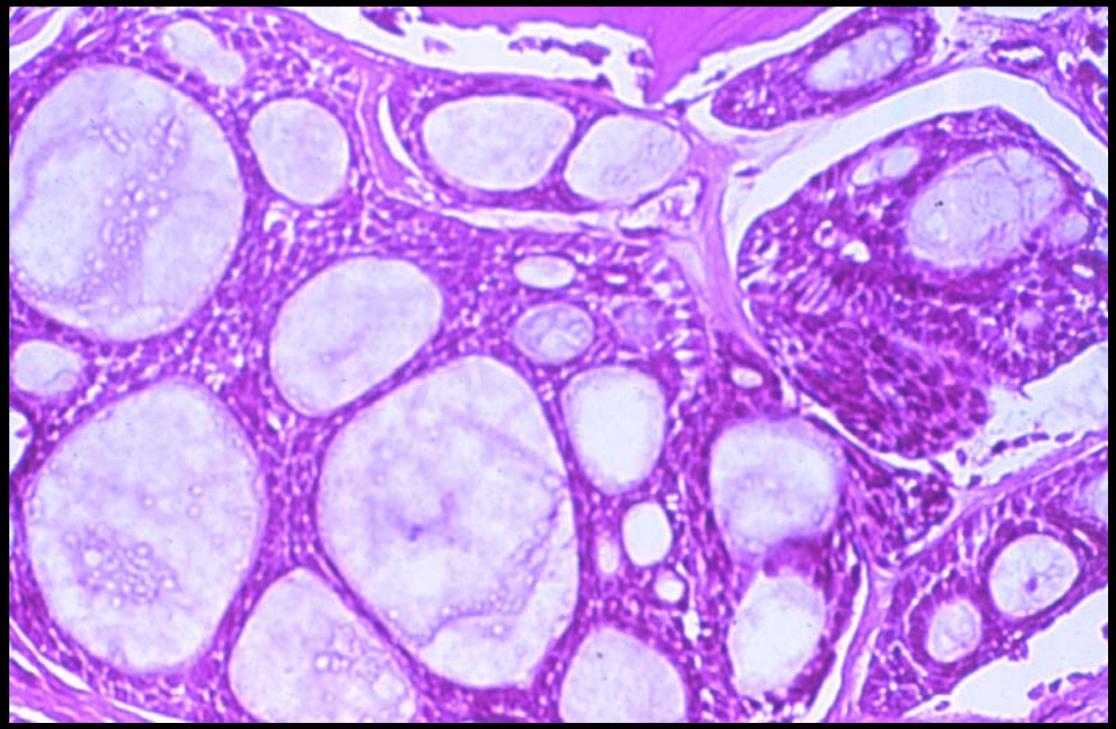
Epithelioid cells

Mixed (both spindle and epithelioid cells)

Orbit- A Pandora's Box

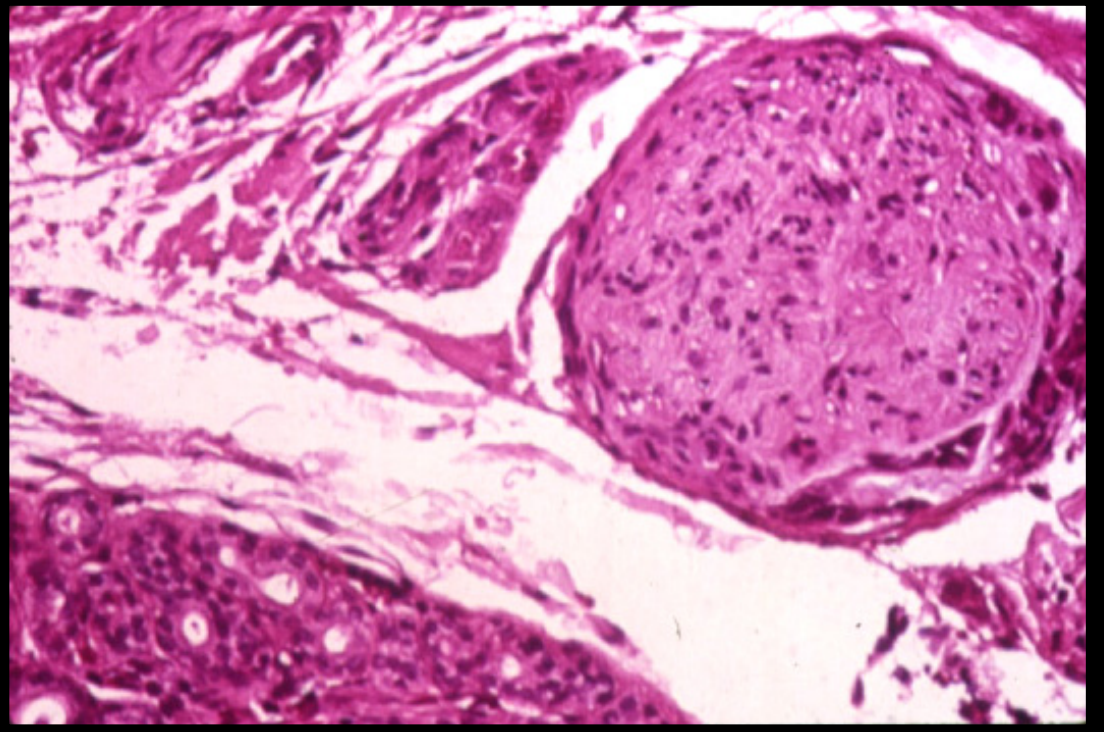
24 year old man , axial proptosis



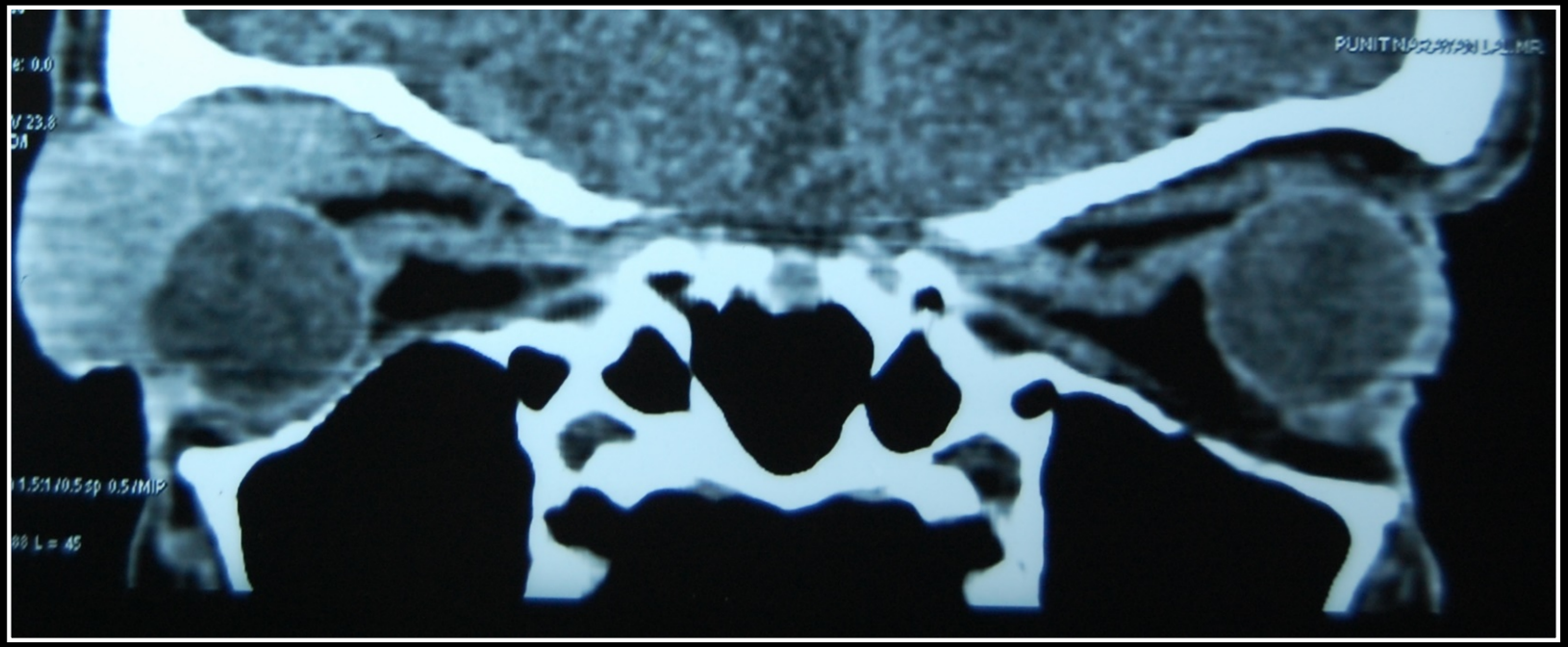


Adenoid cystic carcinoma

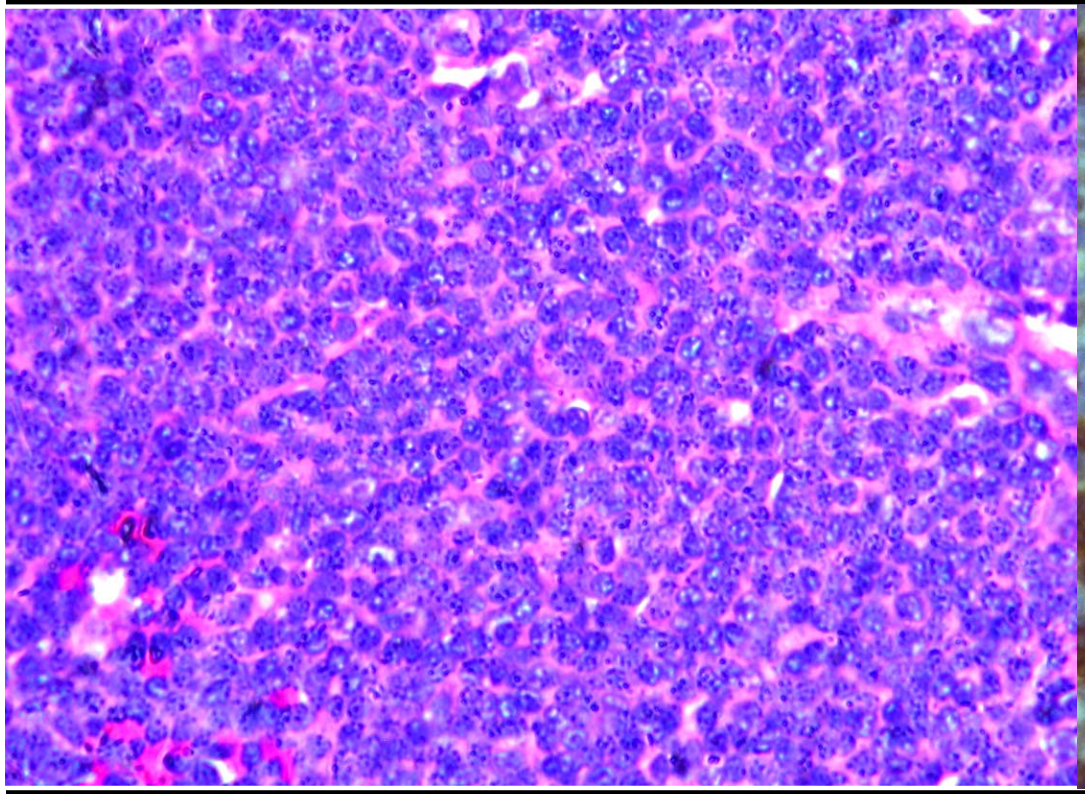
- **Cribriform or swiss cheese pattern**
- **Perineural invasion**

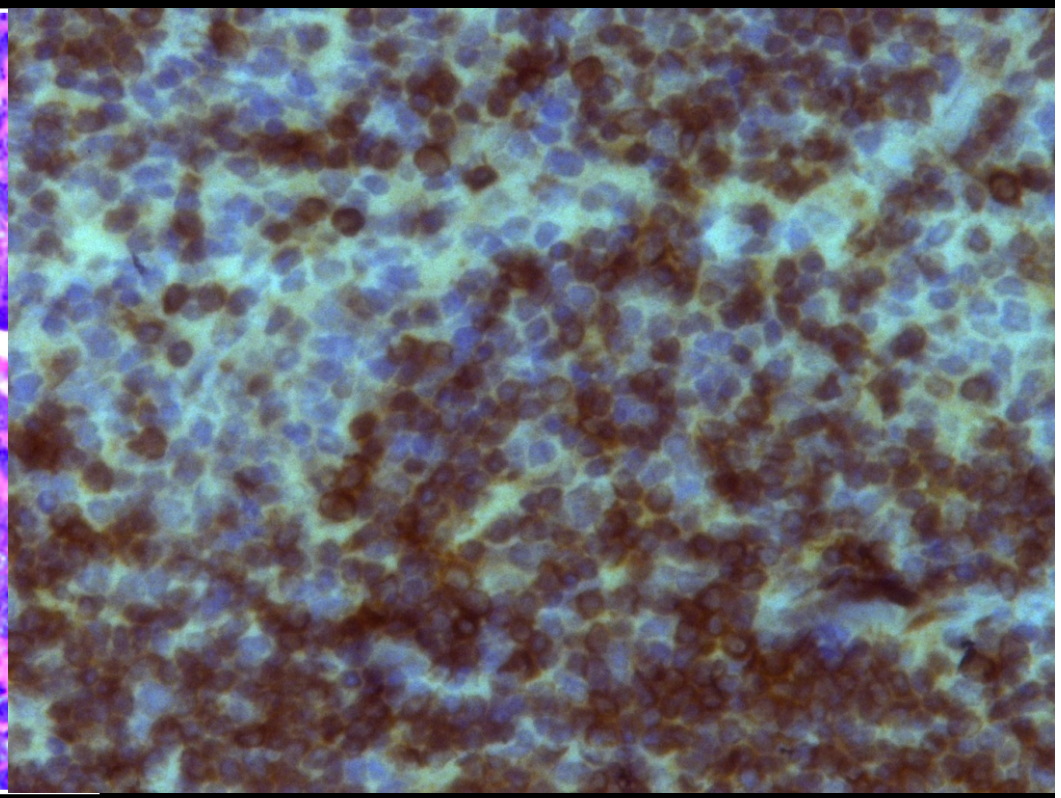


60 year old man
Painless swelling in the lid



Immunohistochemistry





Non- Hodgkin lymphoma

CD 20 (B cell marker) +VE

Conclusion

- Gold standard in diagnosis
- Guides clinician in management
  - Intraoperative : Frozen section
  - Post operative : Tumour extent and invasion
- Better understanding of the disease by clinicopathological correlation
- Yes, it can be interesting too

Our team

Our PUBMED indexed publications from Ocular Pathology lab

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Indian Journal of Ophthalmology 2021

Special Focus, Parasitic Infections, Original Article

Clinicopathological study of parasitic lesions of the eye and ocular adnexa in a tertiary care ophthalmic center in South India

Meenakshi Mahesh, Marian Pauly[1], Shruthi M Krishna, Raman M[2], Jyotirmay Biswas

Purpose: To study clinical and pathological features of parasitic lesions in the ocular adnexa in a tertiary care ophthalmic center in south India. **Methods:** 43 cases of ocular parasitosis were analysed clinically and correlated with the pathological findings (gross morphology and histopathology) over a period of five years (2015–2020). **Results:** Among the 43 cases, the age group ranged from 9 months to 78 years (mean age of 41.6 years). Female patients were more common than male patients, with a percentage of 63% (27) and 37% (16) respectively. Cystic lesion in the lid or orbit was seen in 23 cases (53.4%); solid mass lesions were seen in 17 cases (39.5%); subconjunctival worms in three cases; and subretinal parasite in one. Gross examination and histopathologic study showed Dirofilaria in 23 cases (53.5%), followed by Cysticercus in six cases (14%) and Microfilariae in four cases (9.3%). Exact species identification was not possible in ten cases (23.25%). Correlation between the type of lesion and type of inflammatory cells with the specific parasite was done. **Conclusion:** Our study showed that important clinicopathological correlations can be made from the parasitic lesions in the eye and adnexa, which can aid in definitive diagnosis and prompt identification of the parasite for patient management.

Key words: Cysticercus, dirofilaria, granulomatous reaction, microfilaria, orbital mass, parasite

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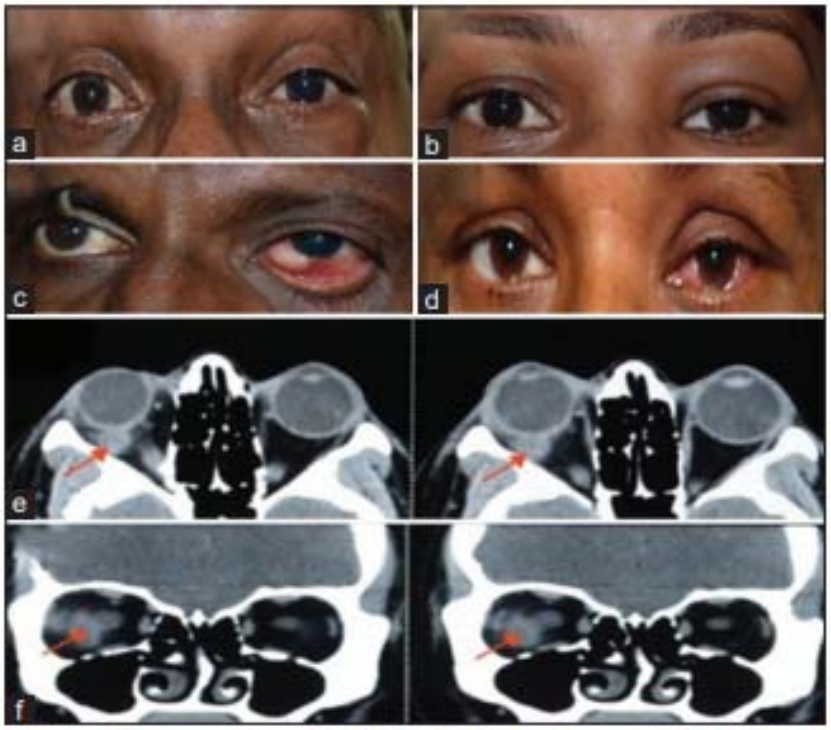


Figure 1: Presentations of Dirofilaria (a) Pre-treatment lid swelling of a case of parasitic lesion in the left lower eyelid. (b) Pre-treatment lid swelling of a case of parasitic lesion in the left upper eyelid. (c) External photography showing a Tenon's cyst in the left eye. (d) Dirofilarial conjunctival cyst in the left eye with chemosis. € CT scan image showing the parasite in the orbit (red arro–) - Axial section. (f) CT scan image showing the parasite in the orbit (red arrow) - Coronal plan

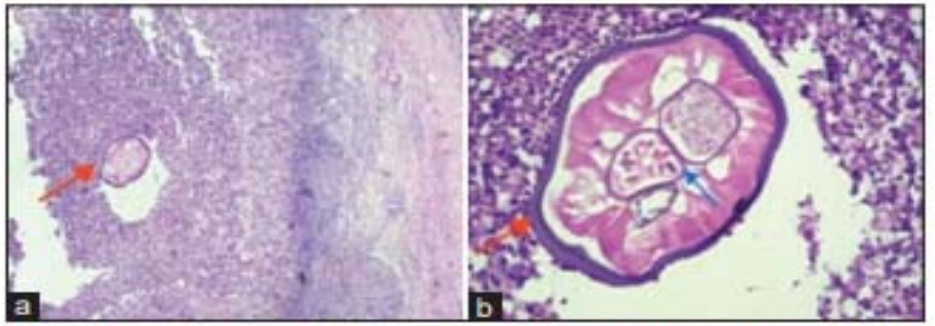


Figure 2: Histopathological findings in Dirofilaria (a) Microphotograph showing adult female filarial nematode cyst (red arrow) in the conjunctival tissue with severe inflammation around the parasite (Hematoxylin and Eosin stain, X100) (b) Microphotograph showing an oval cystic structure (red arrow) with cuticle, longitudinal ridges organelles (uterus and intestine) shown by blue arrow (Hematoxylin and Eosin stain, X400)

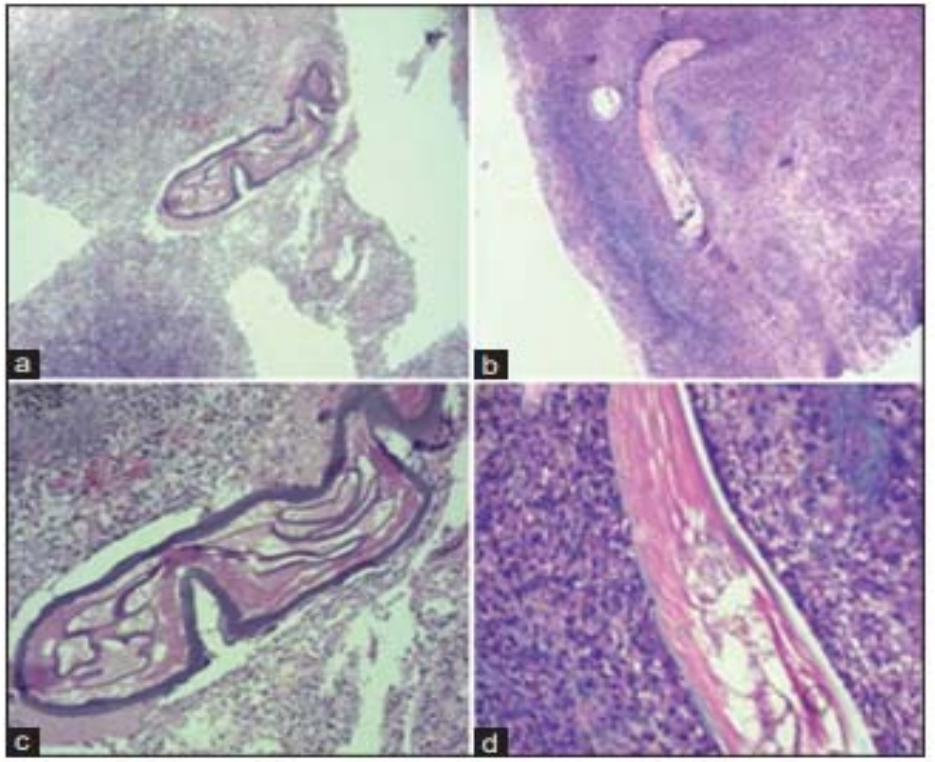
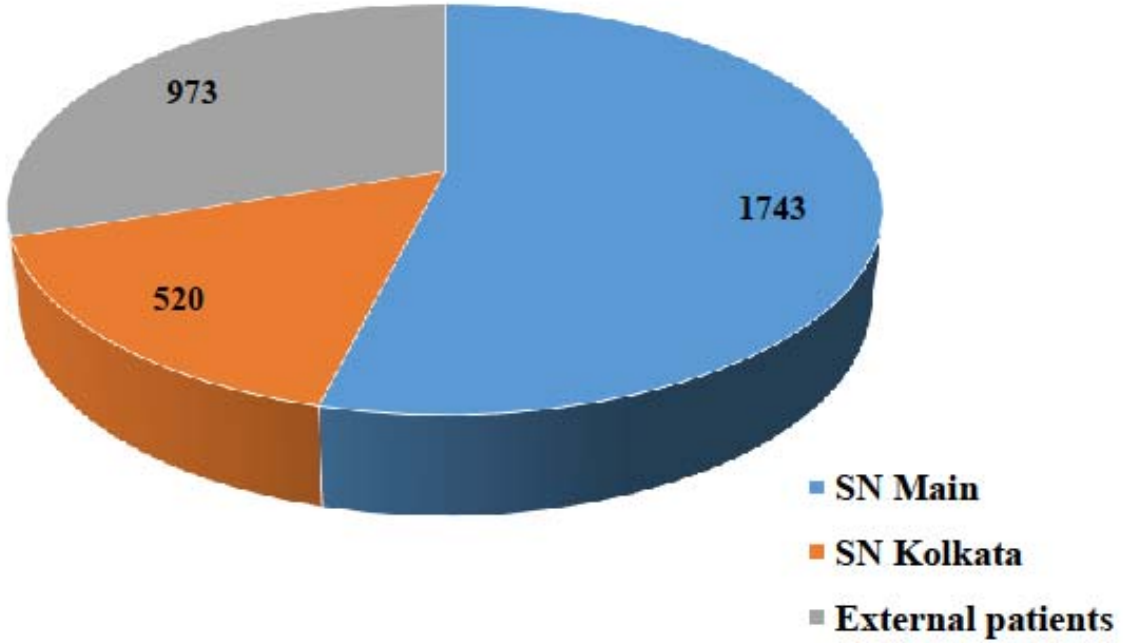


Figure 3: Histopathology of Microfilaria (a) and (b) Microphotograph showing an irregular parasite surrounded by acute inflammatory cells (Hematoxylin and Eosin, X200). (c) and (d) Microphotograph showing a chitinous structure and inner organelle (Hematoxylin and Eosin, X400)

Histopathology and Cytopathology
No. of specimens Received in 2022

3236



"As is our pathology,
so is our practice."
-Osler

THANK YOU

A SANKARA NETHRALAYA PRESENTATION