Select cornea
Histology of cornea
A 36 year-old female presented to the Emergency Treatment Center with one day of right eye pain, photophobia and decreased vision. There was no history of trauma. The ETC physician performed fluorescein staining and made a diagnosis of a corneal abrasion.
Past Medical History:
Frequent herpetic "cold sores"
Herpes genitalis
Herpes Simplex Keratitis
Herpes Simplex Keratitis histology
Herpes simplex
intranuclear inclusion
Herpes Simplex Keratitis histology
Herpes simplex cytology
A 17 year old woman with subtle blurring of vision that cannot be corrected with glasses
Keratoconus is often discovered during adolescence. The most accurate test is called corneal topography, which creates a map of the curve of the cornea.
keratoconus histology
keratoconus histology
keratoconus histology
Normal angle:
- Trabecular meshwork

Fluid drains out of eye

Closed angle:
- Iris
- Blockage
- Lens

Fluid can’t drain well
Intraocular Pressure

Normal IOP is about 12–22 mm Hg. The use of the term "normal" does not signify "correct" but instead indicates the "statistically" normal range. In most people, IOP varies over a diurnal cycle; the highest level occurs in mid-morning and the lowest level occurs at night, during sleep.
Tonometry

This test measures the amount of force needed to temporarily flatten part of your cornea.
A collection of disease with changes in the visual field & in the cup of optic nerve

- Elevated intraocular pressure
- Normal or low-tension glaucoma
- Open angle glaucoma
- Angle closure glaucoma
- Primary & secondary types
Open angle glaucoma

• The most common type of glaucoma

• 1-Primary :
  • Mutation in the GLCIA OR TIGR gens
  • Gene product : mycocilne

• 2-Secondary :
  • Phacolysis
  • Ghost cell glaucoma
  • Pigmentary glaucoma
  • Exfoliation glaucoma
  • Melanomalytic glaucoma
Angle closure glaucoma

- The peripheral zone of the iris adhesion to the trabecular meshwork
- Primary:
  - Shallow anterior chamber, hyperopia
- Secondary:
  - Neovascular glaucoma
  - Necrotic tumors
  - Iridocorneal endothelial syndrome
  - Epithelial down growth
  - Tumors in the ciliary body
The normal eye can detect stimuli over a 120° range vertically and a nearly 160 degree range horizontally. While glaucomatous visual field loss can occur anywhere in the visual field, most patients with visual field loss have some detectable field loss within the central 24-30°.
Morphology of glaucoma

- Diffuse loss of ganglion cells and thinning of the retinal nerve fiber layer
- Glaucoma the only condition of optic atrophy with cupping
- Buphthalmos
- Megalocornea
- Staphyloma degenerative pannus in the cornea
Retinal atrophy
Optic disc cupping
What is this sign?
What is your diagnosis?

Optic nerve glioma
What is your diagnosis?

Thyroid ophthalmopathy

Thyroid eye disease also known as Thyroid associated ophthalmopathy (TAO) or Grave’s orbitopathy is an autoimmune disorder characterised by enlargement of the extraocular muscles and increase in fatty or connective tissue volume.
Findings on histologic examination of thyroid-associated orbitopathy include the following:

- Fibrosis with degenerative changes in the eye muscles
- Lymphocytic cell infiltration
- Enlargement of fibroblasts
- Accumulation of mucopolysaccharides
- Interstitial edema
- Increased collagen production
آقای 60 ساله ای با سابقه دیابت از 15 سال قبل اخیراً دچار کاهش بینایی شده است. چه عواملی را برای کاهش دید این بیمار می‌توانید بیان نمایید؟ و برای تشخیص چه آزمایشات چشمی را پیشنهاد می‌کنید؟
Visual acuity
Visual field
Slit lamp tonometry
Dilation & funduscopy
Angiogram
Visual acuity

A reference value above which visual acuity is considered normal is called 6/6 vision, the USC equivalent of which is 20/20 vision.
Fluorescein angiography

Fluorescein angiography is an eye test that uses a special dye and camera to look at blood flow in the retina and choroid. These are the two layers in the back of the eye.
Eye & diabetes mellitus

• Effect on lens & iris

• Thickening of BM of epithelium of the pars plicata of ciliary body is a reliable histologic marker of diabetes mellitus in the eye

• Preproliferative (background) diabetic retinopathy

• Proliferative diabetic retinopathy
Diabetic microangiopathy

- Thickening of BM of retinal blood vessels
- Pericytes diminishes
- Micro aneurysms
- Microhemorrhage
- Micro occlusion
- Macular edema & visual loss
- Hemorrhagic exudate
Thickening of BM of epithelium of the pars plicata of ciliary body is a reliable histologic marker of diabetes mellitus in the eye.
Preproliferative (background) diabetic retinopathy

- Microangiopathy beneath the internal membrane of the retina
- Intraretinal microangiopathy
Proliferative diabetic retinopathy
Proliferative diabetic retinopathy

- Up regulation of VEGF & retinal angiogenesis
- Neovascularization of disc or surface of retina
- Posterior vitreous detachment
- Non- rhegmatogenous RD
- Anterior synechiae
- Neovascular glaucoma
A 19 years old woman with a firm nodule of eyelid
What is your diagnosis?

chalazion
Chalazion

a localized lipogranulomatous inflammatory condition that involves sebaceous glands of the eyelid presumably due to duct obstruction
A 56 years old man with upper eyelid mass since 3 months ago.
What is your diagnosis?

Sebaceous cell carcinoma
Sebaceous cell carcinoma

The second most malignant tumor of eyelid

It is rare in patients under 40 years of age. More common in females and Asians

It occurs most commonly in the upper eyelid and is extremely rare elsewhere in the body. It can arise from meibomian glands, Zeis glands or sebaceous glands in caruncle.

It may mimic Chalazion or chronic blepharoconjunctivitis
Treatment

Wide local excision with frozen section control
A 67 men years old men with a ulcerative lesion in lower lid
What is your diagnosis?

Basal cell carcinoma
• The most primary intraocular malignancy of children

• The cell origin is neuronal

• %40 mutation of one RB allele

• May be bilateral

• pinealoblastoma
Retinoblastoma
Morphology of retinoblastoma
Prognosis is related to:

- Extra ocular extension
- Invasion to O.N
- Invasion to choroid
- Extension to brain & B.M
Uveal tract neoplasm

- Metastasis (most common)
- Uveal nevi & melanoma
- Rarely other neoplasms
• The most primary intraocular malignancy of adults

• Rare

• Metastasis first to the liver

• Spindle & epithelioid cells
Fig 5. -- Epithelioid cells with considerable pleomorphism, large nuclei, and abundant cytoplasm (hematoxylin-eosin).
Prognosis of uveal melanoma

- Site
- Size
- Cell type
- Proliferative index
- Exteraocular extention
- Monosomy 3 & trisomy 8
- Looping patterns rich in laminin
- Vasculogenic mimicry