Ophthalmology

- Vascular system
- Anterior chamber
- Posterior chamber
- Vitreous humour (gel)
- Sclera
- Tenons capsule
- Conjunctiva
- Iris
- Choroid
- Ciliary body
- Retina

- Air
- Aqueous humour
- Lens
- Nodal point
- Lens

- Role of ciliary processes:
  - Total no. of ciliary processes = 40

- Angle of vision:
  - From outside
  - Mechanism of vision

- Light rays bend at cornea -> Aqueous humour -> Lens -> Posterior chamber -> Anterior chamber -> Angle of AC -> TMH

- Blue Irr. & Cornea

- Iris & Cornea

- Peripheral space

- Image Focus

- First fall at nodal point & at...
- Retina
- Intraocular Pressure: 10-21 mmHg
- Sclera and optic disc are Lamina cribrosa.
- Aquous humor.
- Both cornea & lens are avascular & get nutrition from anterior chamber.
- Both function of retina: vision.
- Both function of cornea: focusing (bending of light rays).
- H2O. So there is a loss of refraction.
- Difference in media is media of H2O & H2O instead of air.
- Under H2O (If use H2O in eye) vision is less because of:
  1) Difference of index of a medium H2O
  2) Curvature of ant. Surface & cornea
- Most important factor to focus light rays on retina:
  More curvature, more is the refractive power.
- More curvature of the cornea due to curvature of bending of light is more of cornea due to curvature of:
  1) Nodal point: first focal point situated just behind lens
  2) Image straight.
  3) Inverted image fall on retina and brain which makes nodal point the image is crossed as inverted and same.
Length of optic n... 3.5 cm - 5.5 cm (6.5 cm)

Shape of orbit: Quad Radiat. & Pyramidal

Axial length of eye - (24 mm) Ant-post. Diameter

- GA scan - Axial length
- USG in eye - Axial length

Definition of Anisometropia:

1. Anisometropia:
   - + 2.5 D - 3.0 D
   - Hypertropia
   - Heterotropia
   - Heterotropia at birth: 14 mm

2. Infant Axial Length:
   - Axial length at birth: 30 cc

Length of Ant. chamber = 2.4 - 2.5 mm

Dist. of Refractive power bw 2 eyes > 2.5 D
Concave lens or wafer

Light goes focus before retina. It is in front of retina.

- Large -

Refractive power > than required

Myopia - (Power of eye)

- Hypermetropia

Convex lens are used.

- Light rays focus behind retina

- Total refractive power is less than required;
  eye is small

Hypermetropia is a condition where

- Behind retina - Hm
- Infront retina - Myopia
- Focus on retina - Emetropia

Hypometropia - light focus behind retina. (because bending is not much)
Asymmetry

Difference of refractive power blue 2 principal axes

more curvature = more power

\[ \text{Vertical} \quad \text{Horizontal} \]

\[ \text{H}\text{H} \quad \text{H}\text{H} \text{asymmetry} \]

\[ \frac{\text{Total} \ P_p}{\text{Total} \ P_p \text{ of Reduced eye}} = \frac{58 - 60 \text{D}}{58 - 60 \text{D}} \]

Reduced eye - A simplified refractive system of eye

Skeletist introduced reduced eye concept is Donner's Reduced eye

\[ \text{Pp of cornea} = \left( \frac{+45 \text{D} - 50 \text{D}}{} \right) \]

\[ \text{Pp of lens} = \left( \frac{16 \text{D} - 17 \text{D}}{} \right) \]

\[ \text{Index of lens} = (1.39) \]

\[ \frac{\text{Index of cornea} - (1.37)}{\text{Angle of incidence}} \]

\[ \text{In air, Index more at centre (1.4 - 1.9)} \]
Retina
- Funduscopy (ophthalmoscope)
  - Objective method of Refraction (Ref & Inverted)
  - Retina is synonymous with Fundus
  - OD is situated beside papilla
  - Indirect
    - 5 times
    - 8 DD (large)
  - Peripheral retina
- Direct Ophthalmoscope (to see retina)
  - 15 times
  - Exact
  - 2 DD (3 mm)
  - m x f
  - Ocular media
  - See media of eye (cornea, aqueous, vitreous humor)
  - Post subcapsular cataract can be seen by this
- Direct Ophthalmoscope looking at distance (25 cm)
  - Aqueous, vitreous humor
  - Central retina
  - Subcapsular cataract
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Gautam Nagar
Jain Stationery

6. Pseudophakia - artifical intra ocular lens.
5. Aphakia - absence of lens.
4. Micro Aphakia (small spherical lens)
3. Microphakia (small lens) > 9 mm
2. D > 4 mm
1. Biconvex shape

Lenses

7. Micrometro: D > 10 mm
6. Megalometro: D > 13 mm
5. 11.0 - 11.5 mm - diameter
4. Aspheric: curvature is gradually
3. Shape - aspheric
2. Center
The lens is a transparent, biconvex structure covered by a capsule of elastin and highly refractive.

Structure:
- Lens (Biconvex structure covered by a capsule of elastin).

Properties:
- Index: 1.39
- Power: +16 D (Positive power)
- Shape: Spherical
- Diameter: 9.0 mm (Equatorial diameter)

Diseases:
- 

The lens forms the eye fibers. It forms lens fibers at the posterior pole. The process of capsule formation involves the formation of lens fibers at the posterior pole. Younger fibers are cortex, peripheral part; cortex of the nucleus.

Phylogeny: Fishes 

 hombre 

Absorption 80% of glucose

Gluconeogenesis in type 2 diabetes (if hydropathic - cataract)

Metabolism in type 2 diabetes (if cataract - glaucoma)
3) Lacrimal gland

4) Epithelial lining of cornea & conjunctiva

Surface ectoderm

Embryonic development

Germ derived from surface ectoderm

---

1) Smooth muscle & Tenon's (Collatera & sphincter pupillae)

2) Sclera, coat temporal part

3) Endothelium of cornea

4) Stromata of cornea

Neural crest

---

G) Ciliary muscles

---

St) Proc. Collat. M主持人 (TMJ)
Cataract

1) All extracellular muscles
2) Blood vessels
3) Temporal part of sclera

Any of opacity which hinders optical homogeneity

Acquired

Congenital causes:
- TORCH's
- Infections
- Exposure
- Malnutrition
- Anoxia

Congenital cataract types
- Lamellar Zonular
- Aspect of opacity is cataract
- Adjacent areas clear
- On examine. Bluish spots
- Powder appearance of opaqueness

Blue dot cataract:
- Mc rips
- Cataract when seen ridges are seen. (Spokes like opacities)
Characterized by pigmentation

It is different to chromosomes

1. Retina - spot & pepper fundus
2. Lens - nuclear and perilenticular cataract
3. Bìtmaric + cornea - angle anomaly leading to glaucoma
4. At + cornea - keratins

At 1 yr of age ≥ 14mm

(a) axial length > 21 mm

I. Erythema + microphthalmia (small eye)

II. Coloured features of Rubella:

- Nuclear pearl + cataract > lamellar cataract

- N, + Tpe. of cataract - in Rubella

- Congenital Rubella Syndrome

- Rubella

- Congenital cataract

- Total of opacities

- Cataracts

- Heart defects

- \begin{align*}
\text{Cong. Rubella Syndrome} \\
\text{rubella}
\end{align*}

- Total lens cataract (0)

- Posterior polar (0)

- Anterior polar (0)
Rubella
b. Syphilis
c. Retinitis pigmentosa sine pigmento
d. Myotonic dystrophy
Leber's Amauosis; Total loss of vision
Amblyopia
a. Fugi; Transient loss of vision
Leber's Amauosisis
Acquired Cataract
Anatomically, no cataract is near to nodal point of eye
Reticular opacity that diminishes vision most; Post sub capsular
- 09654691327
JAIN STATIONERY
GAUTAM NAGAR
Cataract

Ethiological:
- Senile
- Metabolic
- Toxic
- Traumatic
- Complicated
- Maturity
- Acquired
- Nuclear
- Lens

Cataract Types:
- Nuclear
- Cortical
- Posterior subcapsular

Etiology:
- Hypertonic
- Hypotonic
- Inflammation
- Oxygen deprivation

Complications:
- Lensectomy
- Subluxation
- Aphakia
- Phacoplegia
- Glaucoma

Stages:
1) Early, incipient
2) Mature
3) Mature
4) Mature
5) Mature

Diagnosis:
- Slit lamp examination
- Funduscopy
- Ultrasonography

Management:
- Surgery
- Medical treatment

Medical Conditions:
- Diabetes mellitus
- Renal failure
- Hypertension

Pathological Changes:
- Protein deposition
- Pigment dispersion
- Nuclear sclerosis

Mechanisms:
- Intracellular accumulation
- Extracellular deposition

Complications:
- Limbal ischemia
- Zonularysis
- Capsular rupture

Treatment:
- Medical management
- Surgical intervention

Outcome:
- Vision improvement
- Prognosis varies

Follow-up:
- Regular examinations
- Adjustments required
myopia: pseudophoria set in after 40.

For Emmetropia: pseudophoria set in before 40.

Refractive Index

Succeeds in due to A I of Lens (max 1.4)

Importance of Nerve Block due to development of nucleus

and sight of old age:

Near glasses or pseudophoria

(3)

Convex lens — for near

—

Pseudophoria

Error of accommodation at age of 40 or > 40 yrs

(1) lens elasticity or rigidity

(2) weakness of ciliary muscles

At 40 yrs (J age):

3. Mild ↓ in curvature of lens (R F )

2. Relax of suspensory lig.

1. Contractility of ciliary muscles

Accomodation

and sight of old age — smooth nuclear contract.
Cataract

- Metabolic Cataract
  - Sorbitol Pathway
    - Cause: Sorbitol dependent aldose reductase.
      - Cataract in diabetes: Snowflake or snowstorm.
        - Enzyme is NADPH dependent aldose reductase.

1) Diabetes:

2) Galactosemia:
   - Dysregulation of enzyme.
   - Lamellar cataract.

3) Chalcosis:
   - Copper in eye.
   - Wilson's disease.

4) Cataract: Sunflower cataract.
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<tbody>
<tr>
<td>KF Rings</td>
<td>Reversible condition</td>
<td>Decrescendo membrane</td>
<td>Fleischer's ring: seen in keratoconus</td>
<td>- Iron deposition in cornea</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Iron deposited in epithilium</td>
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- Wilson's Ga Disease: Sunflower cataract
- KF rings:
  - Ant. Lenticonus (Alport's syndrome)
  - Familial Hemorrhagic nephritis
- Ant. Lenticonus: Joint ear loss
- Wandenburg Syndrome: Joint ear loss
  - Without deafness
  - Ant. Lenticonus
3. Drug: ACE

Toric = Drug

Toric Cathart

4. Actual (contrast nephrotoxic) Spread

3. Type of Complicated - PSC (post superimposed cathartic)

2. Blood - Culpus appearance

- Photographic: mixture - Pathognomonic feature

- C/F:

1. Any acute and post sympathetic lead to Complicated Cathartic

4. (Episodes - Gingival & phlegm)

Mandibular Symptom

IPD >>

due to nasal bridge
medial wall far apart

G Bunny Problem

Hypertension

(Inter carotid distance - Soft tissue problem - Athlete cathartic
Glaucoma
- Complications of Steroids in Eye: Glaucoma, IOP Open Angle

- Vision Diminished - Psc
- Steroid - Psc

- Mc Suprise of Complicated - Psc
- Mc Cataract - Psc

After All Scans

Radicat Cataract

Glaucoma and Icarapal to Temp in Blind Trauma

Recession Pectoralis: Angle Recession according cur

- Look Like Cherry Red Spot

- I/A - Cataract Aphakia

- Exterior Edema (edema in Macula)

Due to Blind Trauma:
1.) Blurring of vision
2.) Diminishing of vision
Any vision < 6/6

At nodal point of vision

E

75 min.

1

1.) Polypda - is a feature of Intumescent cataract
2.) Colored halos (Colored rings in light)

Glares

Cataract

Causes of colored halos

Acute Cong.
Glaucaroma
Eye swollen
Prem's comma
Corneal edema
Colored halos

Caused by Refract of light. Scattering.
Mucopurulent conjunctivitis.
Finding Indication of I.C.C.: Subluxation of Lens

(2) Indica is match method (puhing press on 6 & 12 position)

(3) Use vecs method

(4) Crochet test (gear method)

(5) Forces extracted by Arvager Forces

—

Taking of Lms by

—

Intraocular Suture

Indicating capsule fromming whole a lens

(2) Rx is only Surgery & I.C.C

(1) No role of medicine

Rx of Colaretic:

Acute Conglusion

Cataract

↑

Contact

↓

Dent Break

Break

→ Pocked

Holes

Functional Test:
2. ECC (Ex) PC IOL Implantation

- Extracapsular

IOL made up of Pinna (Poly(methyl methacrylate))

- Suture tech. (least damage least & IOL bag
- Suture tech. (multiple cuts in ant.
capsule)
- Envelope tech. (last dissecation)
3) SICS

- Small Incision

- NO SUTURE

- Length of Incision: 5-5.5 mm

manual SICS

Phacoemulsification

3.0 - 3.5 mm x 3.2

Partial thickness incision in sclera

→ Continuous capsulorhexis (CCC)

→ Scleral Tunnel (Tripolar Incision)

→ Ant Capsulorhexis (CC)

→ Hydrodissection

→ Take-out nucleus (Zingg's) process should be done after removing nucleus

→ Puts

No suture required

It will heal
Method of calculation of Tols:

- Rollable Tols (acrylic)
  
  \[ \text{Protrusion (mm)} \]
  \[ \text{Protrusion (mm)} \]
  \[ \text{Protrusion (mm)} \]

- Protrusion (mm)
  \[ \text{Protrusion (mm)} \]
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  \[ \text{Protrusion (mm)} \]

Clear corneal incision (6mm)

Partial thickness incision in cornea 1/8
A - 2.5L - 0.9K

A = Axial length
L = Axial length
Kc = keratometry

Congenital cataract: Ideal time to operate is as soon as possible (To prevent amblyopia) if growth after 2 yrs develop amblyopia.

Formula:

Calculate power.

Amblyopia should be done before 5-6 mon.

So operation should be done before 5-6 mon.

Max. growth of eye occurs in adolescents. (min)

Eye changes occur in YL to amblyopia develop deep & difficult to treat.

Lensotomy & vitrectomy.

Strong fixation.

Ant. hyaloida membrane.

Hyaloida capillaris lig.
After cataract post capsular opacification 2-colored.

- Flak ring at periphery.
- No defect of vision.
- Vision affected.
- Vision affected.
- Circular opacification.
- Post capsulotomy.
- YAG Laser.

Subluxation of lens.

So ICCE is c/l if in children pull of capsule vitreous pulled.

- Alkali - Hyaluro capsular lig.

- Partial dislocation?

- In congenital subluxation k/a - Ectopia lens.

- Ectopia lens (EL)

- EL (c/a 2 syndrome).

- Pupil.

- EL et.

- Simple.

- EL
Lasers in Eye:

Photocoagulative Lasers

1. Argon
2. Diode
3. Double Frequency (A.H.)

Photodisruptive Lasers

1. Nd: YAG
2. Proteolytic
3. Peripheral Irradiation

In cataract, we use laser i.e. femtolasers cataract sx.

Wavelengths of Laser:

- Excimer: 193 nm
- Femtolas: 1052 nm
- Argon: 514 nm
- Nd: YAG: 1,064 nm

Double Frequency Nd: YAG: 532 nm

Mark: 79 nm - 820 nm
Congenital Glaucoma

1. Trabecular dysgenesis
2.Flat In's insidious Aka - Plateau Ir's
3. Membraneous occlusions in angle

Gonkani's membrane

1. Photophobia (involunata to light)
2. Symptom
3. White

Bihrnausen's sign

1. Eyeball - Edema - Buphthalmos
2. Cornea - Large cornea - Descemet membrane break
3. Edema - Corneal
No nerve fibre, non myelinated axon.

Neuroretinal rim (area of disc occupied by nerve)

- Appears corresponding to Arachnoid Fibre

Acetate Area: Area in the visual field where first scotoma

First damage in Glaucoma occurs in Acetate Fibre

Cupping of Disc:

- Angle

- Cupping of disc

- Supracheal vs lens

- Flat lens

- Iridodonesis

- Angle anomaly

- Ant. Chamber: Deep AC

- Hadle's Stigm: Break in Descant Membrane
Cupping :- C:Dratio ↑↑↑
↑ cup area
↓ neuro-retinal rim

→ cupping is always in vertical direction

Physiological cupping:-
B/L - symmetrical
Horizontally - round

Glucoma is never B/L symmetrical

1° Open Angle Glaucoma

Risk factors :-

1) Age > 40 yrs
2) The Family H/O
3) High myopia
1) Diabetes
5) Smoking
6) HTN

Pathophysiology: Blockage in TMW
Fundus changes

1. C: D ratio > 0.3
2. Difference of C: D ratio > 0.2
3. Nothing of neuroretinal rim (ner)
4. Thinning of optic disc
5. Vascular changes of lamina cribrosa due to optic nerve damage
6. Nasal shifting of vessels
7. Baring of mid vessels

Tension Glaucoma

Central Corneal Thickness

Thick cornea - Overutilization
Thin cornea - Underutilization

Q: What is normal tension glaucoma?
A: Tension glaucoma is a condition where the pressure inside the eye (intraocular pressure, or IOP) is elevated, leading to damage to the optic nerve and eventual loss of vision.

The diagnosis of normal tension glaucoma is based on the presence of certain signs on examination, such as cupping of the optic disc, thinning of the retinal nerve fiber layer, and elevation of IOP.

Treatment options for normal tension glaucoma include medications, laser procedures, and surgical interventions. Early detection and management are crucial to prevent vision loss.

In the image:
- Fundus changes are described with various signs and symptoms.
- Normal tension glaucoma is illustrated with diagrams of the optic disc and retinal nerve fiber layer.
- Slit lamp biomicroscopy is also mentioned as a diagnostic tool.

If you need further assistance or have any questions, feel free to ask!
Tonometry

Schiotz
- Non-contact: Applanation
  - Indentation
    - Schiotz (not reliable) bar
    - Reading of Schiotz depends on scleral rigidity of pt’s
  - no measurement

Contact
- Pascal
  - Dynamic contour
- DOT (not dependent on CCT)
Primary Angle Closure Glaucoma

Maximum Angle Closure occurs at med dilated pupil

1. Risk Factors:
   1) Hypermetropia (small eye)
   2) Shallow AC
   3) Narrow Angle

2. Humphrey Field Analysis

3. Octopus

Fix → Red light
Respond at → multiple green lines

Kinetic Static

Humphrey Field (30°) Screen

Central peripheral

KAP - Automated perimeter
(Computerized)
5) Return to cupping so clear. If not, try again.

Path ← vertically over and down.

360° angle, Closed

3) Shallow-pit chamber

Correct position

1) High press

- 36/0

Euphoroquarium

- Phosphata

- Kedra

2) Param (more) and N 2 8 (foot and

N 2 8 (foot and

R PEER: at height of corn

acute congestive glaucoma: 360° angle, closed

some or angle close & then repels by itself.

Stage or constant instability:

- Stage or constant instability:

Ft. is asymptomatic

Predemal stage:

- Predemal stage:

CF:
Blind Shunt gef

Physical - Shrinkage of eye

At the damage total. Clayey, Puff K/A

Angle of Rx: To release Puff

R x oc of Absolute Glaucoma:

Cyclotherapy or Cyclospasmolytics

Pressure is so high that the diurnal bed is calm.

Glaucocomatic optic atrophy

Because Pressure is still high.

Absolute Glaucoma: Pupils Blurred eye

4) Angle is closed in Gonioscopy
3) Field defect
2) Fundus changes
1) IOP changes

Chronic Congestive Glaucoma

In youth, Pupil is constricted

In age, Pupil is mid-dilated
Other modalities of Rx of absolute Glaucoma:

1) Retrobulbar alcohol injection

2) Evisceration (removing eye)

Rx of ACG:

Peripheral Iridotomy by Nd:YAG (Definitive Rx)

For other eye - prophylactic P.I.

For open angle glaucoma:

Rx for Rx ACG:

Pilocarpine (Constrict pupill)

Rx for Acute congested glaucoma

Pres > 60 (Possible risk of ischemia of iris)

Rx:

Acetazolamide/mannitol → IOP

Pilocarpine

Pilocarpine
Lens protein is a sequel of Ag

Block Tum

↑

Engulf the lens protein

↑

Release of macrophage

↑

Lens Injury is a Foreign body so there is Immune reaction

(5) Phacoanaphylactic Glaucoma:

Blocking Tum

↑

Cataract开始了 a release of Lens Fiber

↑

Trauma

(8) Phacotoxic Glaucoma:

Lens protein lacking or blocking Tum

4) Phacolytic Glaucoma: K/L a. Open Angle Glaucoma

Lens Induced Glaucoma:

Secondary Glaucoma.
Phacomorphic Glaucoma: k/A 2° angle closure Glaucoma.

Intumescent + Cataract
↓
Pupillary block.

Pigmentary Glaucoma

Pigment from Iris
↓
block TMW

→ It is SOAG, 2° open angle Glaucoma.

→ We see Transillumination defects.

→ Deposited at back of Cornea, k/A Keratin precipitates (k).
called: Krukenberg spindles.

Pseudoexfoliation syndrome (mc type of 2° Glaucoma)

In - Glaucoma capsule.

White dandruff like material from ant. capsule of lens & suspension lig.
1. Hypotonic vs. Iris - groove angle

2. Hypotonic of anterior cone

Nevuscellar Glaucoma:

- OAG

- Malignant Glaucoma

- Sphenopteryglia

- Inverse Glaucoma - whenever Glaucoma is treated by medical

- Pars Plana Vitrectomy

- Post Operation, we see: hollow out chamber

- ND-Yag Laser - Hyphalotomy

- Rx: Dilate Pupils by Atropine

- Most commonly after trabeculectomy

- Any Intercocular Surgery

- Aquous Stacks Collecting in Inferior Cuty

- Ciliary Block Glaucoma

- Malignant Glaucoma
2. OAG

3. Closed-angle Glaucoma

4. OAG

1. Secondary Glaucoma

Deformation of muppehsochziders in Tma

Steroid Induced Glaucoma

Rx:

Acg (1per)

Neovascularisation in this block angle.
3) miotics: ↑ Trabecular outflow.

- Pilocarpine

4) PG analogues: ↑ Outer Vascular Ultrafiltration

- Latanoprost

- Brimonidine

5) Topical Carbonic Anhydrase I: ↓ Form of aqueous humour.

- Dorzolamide

- Brinzolamide

- Systemic Drugs

- Acetazolamide

- Chlorhydroxyquinone

- Antiglaucoma Drugs: C/I in sulpha allergies
Chamber & Subconjunctival Spac.

3) Probedectomy: Excise of Tumor & Making a Fistula Exit out
- 1) Schlemms Canal
- 2) Proceduroscopy: Cut in Tumor

Surgical:

Proceduroscopy

Phacoemulsification

P I by Nd-YAG

→

Acrylic

→

Laser Therapy

→

OAG

Eye Infection, Anterior Segment, Ocular

Med.: Topical, Synergol, Isosoride, Ora.

Men.: Dehydrogenative vitamins

2) Hyperosmotic Agents
1. Antimitic drugs
   - mitomycin
   - 5-Fluorouracil

2. Aquous drainage implant
   - made up of stainless steel

3. Odes - molteno implant
   - made up of polypropylene

Cornea

Diameter - 11 - 11.5
R. Index - 1.37
Mega-cornea - > 13 mm
Micro-cornea - < 10 mm

Structure:
- Epithelium
- Bowman's Membrane
- STROMA
- Neovascularization
- Pigment layer
- Dual layers 6th layer of cornea

Cornea is avascular.

It is dehydrated.

Endothelial layers act as barrier.

It has Na+ pump & H2O that comes in is sent back to vitreous.

If there is any endothelial damage - Corneal edema occurs.

In Adults = 3500 - 3000 cells/mm²
In Children = 3500 - 5500 cells/mm²

Endothelial cells never proliferate.
Any breach in epithelial membrane

Glucose utilization is impaired.

Nutrition from aqueous humour.

Cornea gets its oxygen from atmosphere.

Metabolism in cornea - Aerobic.

Due to corneal decompression.

Ebullition Keratopathy

Bubbles rise to form bullae.

Epithelial edema

Stromal edema

Decompression occurs:

Limit of compressant - 500 gms.

Morphologically functionally by polynuclear x polymorphs.

Endothelial damage surrounding all compressant.
1. Gonorrhea
2. Diptheria
3. Haemophilus
4. Listeria

Investigations related to Cornea:
1) Keratometry:
   - Centre of Cornea: measurement of curvature of cornea.
2) Pachymetry:
   - Centre: 0.5 - 0.6 mm
   - Periphery: 1 mm
3) Specular microscopy: method of examining endothelial cells
   - Both non-g & morphology
4) Corneal sensitivity

Organisms that can penetrate through intact epithelium:
- organisms that
- organisms that
Keratitis

Inflammation of the cornea.

C/F:
- Pain
- Photophobia
- Blepharospasm
- Redness
- Discharge

In keratitis we get ciliary congestion = keratitis.

1. Bacterial Keratitis

1. Fluorescein stain the ulcer.

2. Pus cells in anterior chamber called Hypopyon (sterile)

3. 3 Types:
   - Localized
   - Perforating corneal ulcer
   - Sloughing cornea

   Healing of ulcer when ulcer of cornea thinned out & iris covers it

   Due to necrosis, cornea sloughed out
2. Confluence (gapping: cover ulcer area & confluent area

3. Chemical cauterity - Tetrachloroacetic acid (TCA)

By Debridement.

Rx for Non-healing Ulcer:

1. Oral Ant. & 10 mg C (healing of epithelium)

5. Oral analgesic

4. Atropine (For - ans. Ulcer)

3. Antibiotic ointment

- Gentamicin - 15 mg/ml
- Captopril - 50 mg/ml

2. Moxifloxacin or other eye drops

Rx for Antibiotic (Good specimen)

Axillary Staphylococcus pneumoniae - Pneumonia - By: Pneumococcus

Axillary Carroat ulcer

Patient Name: Gautam Naqvi
Date: 09654691345

Train Station
1) Antiglaucoma - Top
   a) glaucoma, Cyanacrylate
   b) Ecol (Bandage c/t)

2) When there is thinning of cornea, Cyanacrylate glue is used for sealing

3) BCL (Bandage c/t)
   a) Highwater content
   b) Soft contact lens
   c) Semi softs/ RGP

4) Contac lenses

5) Eumegical keratitis

6) Kera keratolytic

7) Fungi infect Edema - C. albicans

8) Occur due to trauma, dry, vegetative or organic matter

9) A. Fusarium

10) Aspergillus fumigatus > A. Fusarium

11) Mc - dry, rough, exudation, projecting enda

12) fungus infect c/vae - c. albicans

13) Satellite nodules - 3/3

14) Hyphae (projecting enda)
HSV keratitis:

O/E:

- Epithelium
- Stromal
- Corneal edema
- Disciform keratitis
- Disciform keratitis in center of cornea

Rx:

- Acyclovir 5 times a day in any infective corneal ulcer
- No steroids
- No pad + Bandage
It should not exceed 14 days.

Oval reaction zone 5 to 7 mm a day +

Rx: Topical: 3% acyclovir oint.

- my nerve involved in herpes zoster = facial nerve

(3, 4, 6)

Ca. Patients

(5)

Levels

(2)

Disciform keratitis

(4)

Endothelium

(1)

Stroma

Epithelium

Microvascularity / pseudochoriodynia

Examination

Superficial keratitis

Bleb epithelial keratitis

Epiderm

Stroma

Derm

Hutchinson rule: 4th to 6th nose is involved, eye is involved.

- Regional metastasis

- Ocular involvement

- Skin involvement

1. Herpes zoster keratitis.

2. Herpes zoster dermatitis.
Rhinoconjunctivitis

Rectangular pattern

Pseudocapsules

On/In present in 3 weeks

Discharge

1. Bacterial

2. Viral

3. Allergic

4. Other

Acanthamoeba keratitis

Use lubricating eye drops

Stop drug

Drug error: Metkerzenic keratitis

Ulcer is not healing due to toxicity of antibiotic
1. Culture
   - Non-nutrient agar or E.Coli

2. Lactophenol Blue (old one)
   - Acidine Orange (new)

Staining

Rx:

1. Caseous white
2. Aseptic ulcer (Bd. in ret)
3. Acute primary infection

Rx:

PhMB (polyhexamethylene biguanide) - Dec.

2) Propanodine isothionate

3) Neomycine

- Interstitial keratitis (IK)
- Intestinal involvement

- Eyes
  - Strong
  - Moderate

- 1
  - 2
  - 3

- Cogan Syndrome = IK + deafness

- Salmon patch - patch of blinding in stroma

- Feature of Syphilis

- Syphilis
  - Lupus
  - Primary
  - Secondary
  - Tertiary

- Syphilitic hearing loss

- Syphilitic aortic valve

- Syphilitic myocarditis

- Syphilitic aortic aneurysm
Looking down.

2. Munson sign: Conical protrusion of lower lid on

Come in epithelium

0/1: Rangers ring - Red deposition on back of

1) Diminution of vision.

- C/E:

It is monocular.

- It is irregular astigmatism.

- It is slowly progressive in nature.

- It is a genetic disease.

Infammatory Compounded.

Dermopathy: Idiopathic spontaneous change in

Presumed to ectatic dermopathy of cornea.

Corneal protrusion of cornea.

Keratoconus.

8) Acanthomata.

4) Herpes zoster.

6) HSPMx.
3) Cornea Topography — we see irregular astigmatism.

4) Retinoscopy — objective method of Refract?

At pupillary — light reflex look like 2 bladges of scissors

k.a. scissors's reflex

= which are prominent:

k.a. prominent corneal nerves due to

2) Vogt's striae: break into Descemet's membrane

Caus of thickening of nerves:

1. Diagopy

2) NF. 1

Rx of keratoconus:

SPECTS correct astigmatism

1) Contact lens (semi-slight RGP) if we want — it is again irregular.

3) Collagen Crosslinking — arrest progress of keratoconus.
3) Replace cornea (if nothing works) - Do

Penetrating keratoplasty

Keratoplasty

Cornea (eye donor)

Cornea from Cadaveric eyes.

Within 6 hrs, we have to take cornea but extend up to 12 hrs.

Storage media:

Short term.

≤ 48 hrs

≥ 4 days

We use moist chamber,

McCorry Kaufmann media.

Organ culture.

Long term.

Indefinite life time.

Cryptourethral.

1) Penetrating.

Keratoplasty is by graft.

1) Lamellar.
Penetrating

Full thickness Replacement

Lamellar

Partial thickness Replacement

DALK

Epith

Strona

D

DELK

E

S

D

Deep Endothelium

Lamellar keratoplasty

DSEK

Descemet Stripping

Endothelial keratoplasty

→ endothelial cell loss

is 20-25%

Corneal degenerations

1. Age related Degeneration

1. Arcus senilis:

round

old age

→ Arcus

→ Lucid Interval of Vogt

→ No corneal opacity in bow 2 layers

→ occurs due to lipid deposition in stroma
2) Bandshaped keratopathy

3) Phthisis bulbi - Total shrinkage of eye

4) Hypercalcaemia

Rx: Chelation

Causes:

- Calcium deposition in cornea in Form of Band
- Idiopathic
- Phthisis bulbi - Total shrinkage of eye
- Hypercalcaemia
O.A. mc
- Stromal
- Corneal dystrophies
  1) lattice
  2) granuloma
  3) not at all
- Systemic disease:
  a) Chorioiditis
  b) Ciliary body
  c) Iris

Pathologically:
- Inflammation of iritis, chorioiditis, ciliary body
- Uveitis
- Nodules
- Granulomatous
- Non-granulomatous
- Panuveitis
- Posterior
- Intermediate
- Anterior

Classification:
- All are involved in AKA
- Inflamed iris, pars plana, choroiditis
- Root of iris, attach to iris

Inflammation:
- Of iritis, chorioiditis, ciliary body
- Pathologically:
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Nodules:
- Forms

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In granulomas, large u. crescent look R/S.

K.P's: 1. On endothelium

- Fine R/S, K.P's at it is no granulomatous

- White R/S, B.P's

5) Cystic change 
4) Ulceration
3) Photophobia
2) Redness -> Ciliary
1) Pain

Anterior uveitis

Lirce - D-shaped pupil
Curvature of pupil is interrupted in look

Indications:
- Any dilatation in root is Irido dermatitis
- Any dissection in
2) pupil is festoon shaped - festooned papill in post-synchiae is bone. For wound movement of

peripheral anterior synechiae

leading to angle closure glaucoma

inflamed membrane behind iris, inflamed g. lens

g. cycloplegia.

topical steroids.

1. Rx: topical cycloplegia
2. Rx: Topical steroids
3. Rx: oral spasms & gives
4. Must rest to ciliary m/s.

breaks post-synechiae (PS) & muscle is formed
Intermediate Uveitis

Rx: Non Steroidal Rx of ant. uveitis

Drug: Mydriatic (Immunomodulators like Cyclosporin)

Study is – LUMINATE PROGRAM

→ Pars planitis

1) Young
2) Blurring of vision
3) Some exudates
4) K.P

1) Retrolental Flare
2) While exudates floating in vitreous snowballs
3) If some exudates deposited in pars plana it is

KPA

Snow Banking – Pathognomonic Feature of Pars plana

Rx: Rx is indicated when vision is < 6/12

Rx: We follow 4 step approach.
1. Step: Local steroids – Sub Tenon inj of Triamcinolone aceta
2. Step: (I + II) Systemic steroids
3. Step: Cryotherapy
4. Step: Pars plana vitrectomy

Refraction

Refractory

Damage bid supply to syncytium (inflammatory membrane)

Adhesions, media become clear 4 no blurring of vision by

Reduce bulk of inflammatory

Post: Starts responding to steroids

Post Uveitis:

---

In Choroiditis:

1) Choroiditis is seen as round yellow patches

2) Vitritis

3) Papillitis

4) Cystoid macular edema (CME)

5) Retinal edema

JAIN STATION
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1. Local steroids

2. Systemic steroids

Diseases ax uveitis:

- Ankylosing spondylitis
- Psoriatic arthritis
- Reiter's syndrome
- Juvenile RA

RA:

1. Any arthritis in 16 yrs of age
2. < 5 joints involved
3. Pauciarticular

JRA:

1. Juvenile RA

NGAV:

1. Antinuclear antibodies
2. Sero-ve (RF & ESR)
3. Type of uveitis is non granulomatous ax uveitis

Systemic onset (Still's disease)

- Early onset
- Ax & e. uveitis
- 5 l moxa
In JRA → all 5 symptoms of ant. uveitis are absent so it is k/a - atypical ant. uveitis.

→ No redness so it is k/a - white uveitis.

Complications of IRN

1. Complicated cataract
2. Synechial band shaped keratopathy
3. Sarcoidosis: granulomatous inflammation (so there is sarcoid.
   1. Nodule on episclera
   2. Eyelid on conjunctiva
   3. Nodules on conjunctiva - due to hypercalcaemia

3. Band shaped keratopathy - due to hypercalcaemia.

G. Pterygium:
   1. Pterygium itself is very thick k/a. Cold.
3) Behçet's disease:
- Autoimmune disease
- Obiterated vasculitis due to circulating immune complexes
- HLA-B51

Type:
- Non-granulomatous either ant or post.
- Transient hypopyon
- ax 2

Early disease:
- Preferential recurrent retrochoroidal hemorrhage
- HLA B51

Diagnosis:
- History of recurrent uveitis
- Erythematous papules on the skin
- Ocular manifestations
- Oral ulcers
- Genital ulcers

Rx:
- Topical and oral steroids
- PPMT: Panuveitis, rheumatoid arthritis
- Total pancreatectomy
- Photorefractive keratectomy
3) Herpa Zoster cause acute renal necrosis (4/40)

2) Protozoa (Cysts, Cholecystitis, Toxoplasmosis)

Other opportunistic infections:
- Buph fire appearance

Cam Anthills spreading along blood vessels IR 1/4

... and in:

Cam Anthills present at Source of Cheese

Hypertensive Retinopathy

- macroaneurysm
- DM Retinopathy
- also seen in
cotton wool spots

Retinal Detachment - India

Soft exudates - India

Hemorrhage

microaneurysm

1
2

percent 2

Microangiopathy

a. Macular Infarct of HIV - Amy retinits opportunistic

b. Macular Reaction of HIV - Microangiopathy

HIV +

Sherida

To enhance the reabsorption of hemorrhage give
- Autoimmune reaction to the local tissue.
- Other eye: If occurs due to perforating injury in one eye causing to injury to sympathetic ophthalmia.

2) Pseudops (quiet eye or eye ball)
   - Alopeca
   - Alpinus
   - Alalgio
   - B) Vertebral-vertebral dysfunction
   - C) Encephalitis

--- Systemic features are:

- It is a granulomatous pan uveitis
- VKH syndrome: Vogt-Koyanagi-Harada syndrome
- MC narrow spectrum: Phylacterium keratoconjunctivitis
- MC ocular feautre: Uveitis

Rx: Attenuated pan uveitis

Rx: Pencil

T.B.
Fuchs Heterochromic Cycles

1. First sign is Retinalinal Flare (Refr).
2. First symptom is difficulty in near vision and accommodation.
3. Donaghy area of eye - cloudy body becomes any.
4. Photophobia.

Fuchs heterochromic iridocyclitis is a first a symptom of the disease that develops.

\[ \frac{1}{\text{Chord}} \]

\[ c \]

Form modulator : 0 in Bridges microphthalmic retina.

\[ \text{It causes granulomation pan uveitis} \]

\[ \text{max. case manifests Blau 3 weeks to 3 month.} \]

It will never occur before 4 weeks.
It is included in vision 2010.
- It is granulomatous either at a post.
- Caused by Ochroconis Volvulus.
- Often glaucoma.

Androecia (un.)

Angles of slit angles lead to bleeding in another.

---

---

It is important is c/I in TFE.

5) No role of strabismus and cycloplegia.

4) No part Schnick.

3) HIV (Acquired Immune) - Neurocutaneous

2) HIV

1) KPs are shaped in stelloke KPs.

5) FIt is non granulomatous only. Usually.

4) No part Schnick due to not intra inflammat.
Ophthalmia

0) Trachoma
1) Diabetic
2) Cataract
3) Refractive errors
4) Childhood blindness
5) Glaucoma

For India:

a) Refractive errors
b) Childhood blindness
c) Glaucoma
d) Refractive errors
0) Cataract

5 diseases are

2020

It is a WHO program to control 5 diseases in

Diseases in vision 2020
2) Visual field defects (VPD) → central scotoma

3) Afferent pupillary defect (APD) → don't get light reflex

4) Color vision

5) Brightness

→ First sign of optic nerve disease is APD

Retrobulbar Neuritis (RBN)

1. Relative APD → (isochromatic) Farnsworth Munsell 100HP
2. Pathognomonic feature of RBN

3. By scotopic, flash light test

4. → Marcus Gunn Pupil

Ethological classification:

1) Inflammatory optic neuropathies
2) Degenerative optic neuropathies

Other factors:

Toxic amblyopia
Drug-induced visual loss
Psychiatric diseases
Toxic amblyopia:

1. Tobacco - Field defect, retinal atrophy, choroidal atrophy
2. Ethanol - It is chronic damage with retinal degeneration, retinal detachment
3. Cq
4. Ethyl alcohol - It is chronic damage with retinal degeneration, retinal detachment
5. Methanol alcohol - It is very acute damage

- Ocular effect of Chloroquine - Cq
- a) PSC
- b) Optic atrophy, degenerative
- c) Bulky eye maculopathy
- d) Vortex keratopathy
- e) Corneal deposit in whom Cq

Other causes of Vortex Keratopathy:

1. Hemoderivative
2. Tamoxifen
3. Fabry disease

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Sphenian Nasal

4th Ischemic CN -

Optic neuritis in connective tissue disorders

- Optic atrophy

3rd Anomalous optic nerves:

- Optic atrophy

4th Ischemic CN -

Optic neuritis in connective tissue disorders

- Optic atrophy

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4th Ischemic CN -

Optic neuritis in connective tissue disorders

- Optic atrophy

3rd Anomalous optic nerves:
1. Sudden but painless diminishment of vision
2. A nonarteritic ischemic optic neuropathy
   a. Optic disc enlargement
   b. Blurred disc margins
   c. Vision loss and visual field defect

3. Arteritic ischemic optic neuropathy

4. Diabetes mellitus
   a. Nephropathy
   b. Retinopathy

5. Hypertensive retinopathy
   a. Recent hypertension
   b. Proteinuria

6. Amaurosis fugax
   a. Transient visual loss

7. Optic neuritis
   a. Inflammation of the optic nerve

8. Acute ischemic optic neuropathy
   a. Acute visual loss
   b. 导致 Optic atrophy

9. Optic neuropathy
   a. Genetic disease
   b. Mitochondrial DNA defect

10. Optic nerve
    a. 脱失 ON (in other eye)
    b. 导致 ON (in other eye)
Papilloedema
- Edema around disc
- Telangiectatic vessels

Papillitis (on)

Papilloedema
- VA (2)
- Papillary reaction (2)
- A.P.D.
- Color (2)
- Brightness (2)
- V.F.D.
- Central scotoma

Blind spot

Visual field defect - Enlargement

Of Papilloedema

1. First sign: Venous dilatation
2. Blood disc margin

Rx: Treat the cause
Pathophysiology of papilledema:

1. Interstitial edema (prelamina area) causes:
   a. Trauma
   b. Sy.
   c. Chronic

2. Stasis of axoplasmic flow
3. Swelling of axons
4. Press on veins
5. Leakage

6. There is no distortion of axons in papilledema only.

7. Intraocular pressure is seen.
2) Intracranial cause:
   - Tumor
   - Inflammation
   - Thyroid disease

3) Intracranial cause: which

   a) Encephalitis
   b) Pseudotumor Cerebri

   → ICT
   → ICT but there is no lesion in brain
   → CSF composition
   → Because of
   → ICT

   → Because of
   → Choroidal plaque
   → Malignant HN
   → Severe anemia

   1. Endocrine
   2. Vit A Toxicity
   3. O.P.S.
   4. Systemic cause

   Optic Atrophy
   → All nerve fibres are absent
   → Phthisis bulbi

   pt is blind
Glaucosa

Classification of optic atrophy:
- Consecutive
- Retina

Signs:
- Optic nerve
  - 2°
  - 3°
  - In arco

- Blurred disc
  - Margin: Dirty
  - Papilla:
    - Papillitis
    - Papilledema
    - Traumatic
    - Nervopathy

- Multiple: Neurospheric

- Traumatic:
  - Cupping disc

- Normal Pupillary Reactions:
  - Convergence
  - Miosis

- Accommodation

2) Near a reflex:
- Direct
- Conensual
- 0: Tight reflex

- Lajo: Lujo

1) PI.

10: 2°
Conjugated

4. Pupil is mid-dilated

5. Homens syndrome: Laxion of Siphon

4) Ipsilateral: no supply to Oliver's pupil or simonotation

3) Suggest: tendon reflex - IV reflex

Cause of disturbance of pupil

e) loss of C diagnostic reflex: when you pinch at nape

b) anergia

c) entorhinal - opposite end of hippocampus to thalas

ipsilateral - supplied by 3rd nerve

II. Muscles - sympathetic - or sympathetic

- mid-pross

b) pross

5) Parasympathetic system

a) noise - no supply to Oliver's pupil or simonotation

3) Suggest: tendon reflex - IV reflex

Horners is both con and ncu and required

Horners is best detected by 1 minus

Horners is both con and ncu and required
Papillary Light Reflex Pathway:

Effector pathway:
- 3rd nerve

Inferior division
- Cranial division

CN III nerve to internal oblique
- Cilia ganglion
- Short ciliary nerve
- In sphincter

Inferior m. supplied by 3rd nerve are:

1) Iris sphincter
2) Ciliary m.
1. Ipsilateral blindness
2. Dorsal palsy - Bitemporal hemianopia
3. Ptosis
4. V. cut (less), W. tract (less) → Lt. homonymous hemianopia
5. Contralateral homonymous hemianopia

- Cortex lesion: always congruent
- Visual cortex

- Only lesions that are heteronymous - Chiasmal lesions
- Chiasmal lesions lead to pituitary adenomas
- Craniopharyngiomas
- Oligoastrocytomas
- Chromophobe adenomas

- Hemianopia, pupill: Y, Y
- Optic tract lesion

- Visual cortex
LR → Abduct

Horizontal Gaze Centre is located in Pons (PPRF)

PPRF → Parietal Paramedian Ponsphere Reticular Format

seg IL → cl IL
contrat Lat. Raxis
contrat Left Side Mk.

LR (K)

R (PPRF)

Any lesion of Muscles is called - Inter nuclear Opticoplegia

INO "Features:

1) Defective I'll Adduct
2) Cl. Abducting eye shows Exotonic nystagmus
3) Position of eye in side nerve palsy - Down & Out

Depressed & abducted

1) Ext. Opticoplegia - Only extracocular muscles involved
2) Int. Opticoplegia - Only intracocular muscles involved

Las. sou-douze passing...
1. Weber's Syndrome
2. Benedikt's Syndrome
3. 3rd nerve palsy \( \rightarrow \) 3rd hemiplegia

3) Millard-Gubler Syndrome
4) Foster Kennedy Syndrome

Symptoms:
1. Lesion in Fronto lobe
2. \( \downarrow \) 6th nerve
3. \( \uparrow \) 7th nerve

Nystagmus

Involuntary movement of eyeball

Syndromes

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Involuntary movement of eyebal
Physiological Nystagmus:

1. Optokinetic Nystagmus (OKN):

   Consists of
   
   Saccadic
   Pursuit

   Fast, abrupt movements
   to refix the object on
   the fovea.

Q: Defective at OKN lesion is in Parietal lobe

2. Objective Test: is → OK Drum Test
   (Optokinetic Drum Test) to detect malingering

2. Extremes of gaze:

3. Oculo vestibular reflex: COWS

Pathological Nystagmus

1. due to sensory deprivation:

   Any cause of opaque media in 5-6 months
   of age.

Q: Motor imbalance: Atomic nystagmus. Feature of
b) Latent Nystagmus = Failure of Infantile Esotropia.

c) Spasmus mutans = Any nystagmus + head nodding.

d) Downbeat nystagmus = when the fast phase is downwards.

Sein in Arnold-Chiari malformations.

e) Upbeat nystagmus = when the fast phase is upwards.

Sein in 1) Post-fovea lesions

2) Phenotypic hypoglossion.

f) See - Solo nystagmus - one eye up & one eye down.

BiTemporal hemianopias i.e. chiasmal lesion

Post pointing Nystagmus - Nystagmoid reactions.

Mixed - Nystagmus - Vestibular disturbance.

Rotatory Nystagmus.

Feature of cerebellar lesions.
Hypoplastic ulna
Fallacy of aggregation of common granulomas
Follicular Reaction
Conjunctivitis shows 2 reactions
Pathologically

4. Allergic [ ]

3. Ulcer

2. Chlamydia

1. Bacterial / Pathology:

- Discharge
- Discharge

- Ulceration
- Ulceration

2. Redness

1. Conjunctival congestion

- Pain

Conjunctivitis

Inflammation of conjunctiva is Conflunctivitis

Conflunctiva
Continuations of a column (crude or lost) & extension of

Anginal Continuations

- G. Supplicative Hemolyticus
- 2. Secretive Organical Infection
- 3. Mild Diphtherial Infection

Do not bleed on peeling

All Features + Membranous Form

Pseudomembranous Continuations

- Etiology: Gphteria

All the Features + Membrane bleeds on peeling

Membranous Continuations

Allergic: Acute Allergic x Strides

Viral: Antibiotics to prevent x Infection

Champhal: Antibiotics

Ectrogen: Antibiotics

Rx: Dependent upon Etiology.
TRAUMA

1. Tachoma

5. Pterygium (sleeping cat eye)

4. Ectropic (drooping eye)

3. HN

2. Trauma

1. Haemorrhagic conjunctivitis

Cause of subconjunctival haemorrhage:

- Ectropion - 3%
- Coxe - Sache - 30%
- Adenovirus
- Herpes virus - 70%
- Comm. bacterial - Pneumococcus, Haemophilus

All features + Subconjunctival haemorrhages

Haemorrhagic conjunctivitis

Rx: Antibiotics + Zinc oxide lotion

Rem: There is no etiological enquiry.
Trachoma

Chlamydia Trachomatis - A, B, C serotype

It cause adult inclusion conjunctivitis

Itching

Swimming pool conjunctivitis

Chronic conjunctivitis of child 0-9 yrs caused by

0 - Normal, clear
1 - Conjunctival redness
2 - Epiphora
3 - Lid edema
4 - Corneal opacity
5 - Granuloma
6 - Hypopyon

According to WHO, Trachoma is divided into

I. Inflammatory stage
   - Follicles, papillae
   - Herbet's pits
   - Linear scaring in upper tarsal conjunctiva

II. Follicular stage
   - Follicles in upper palpebral conjunctiva
   - Arlt's line

III. Scar stage
   - Linear scaring in upper tarsal conjunctiva

IV. Determination of incidence

Jain Stationary
Complication of Trachoma: corneal ulcers.

Pathology:
- Follicular + papillary read
- HP bodies
- Inclusion bodies
- Halibes stellites
- Pseudomuk

Community Ophthalmology

Trachoma:
- Sx → Trachiasis
- A. Antibiotics
- Oral Azithromycin or Topical Tetracycline
- F. Facial Hygiene
- E. Environmental cleanliness

SAFE Strategy:
- Children 20mg/kg
- Adults 1g
- SAFE for starting

Criteria for stopping:
- Prevalence of Trachoma follicles in ≤ 4%
2) Trachoma is a part of vision 2020.

3) Doc for Blanket Therapy (mass therapy for patients):
   a) Azithromycin
   b) Tetraacycline
   c) Sulphasalazine eyedrops

Allergic Conjunctivitis

Phlyctenular Keratoconjunctivitis:

q) Allergy to endogenous Ag.

q) Staph aureus

1) Phlyctenular keratoconjunctivitis:

2) TB

q) itchy, watery

q) phlycten (node) at limbus

q) Conjunctival congest

q) Foveolitis

q) Lens as opacities

JAIN STATIONER
GAUTAM NAGAR
09811988449
Cl / A

- (Cupola Bow) Prevention
- Lahiv inverted CORNEA → ulcer opacity in upper cornea
- Cilium STRIPE appearance
- Rifampicin

Cl / E

- Itching, watery eyes
- Purulent discharge
- Farrow reaction
- 3) No follicular reaction

2) Age group involved is males children

1) Exogenous allergy to dust & pollen

Cl / A - Sping Catarrh

Veronal Ketotocumphine

3. Mild steroids

2. Sodium Chromoglycate → mast cell stabilizer

1. Epinephrine
- Steroids
- Antihistamines
- Mast cell stabilizer
The method is not followed now.

E.g., in Child.

To prevent gonorrhea infection, giving 1/4 A 9 to both.

E.g., HSV

1. Gonorrhea
2. Chlamydia
3. Conjunctivitis

Computer: Chlamydia mcc

Conjunctivitis to 12 mon of age. Any type of

Gonorrhea: Neonatal Conjunctivitis

Ophthalmia Neonatorum

Diagram:

- Type I HSV
- Max well - Lyon Sign
-?
Present Time

Chemical Conjunctivitis - 24 hrs

Gonorrhea - 2-4 days

Chlamydia - 4-10 days

Conjunctival Xerosis

Vit A deficiency

Epithelial

Vit A deficiency

Pathomydiasis

Scarring of conjunctiva

due to:

1) Trachoma

2) Quehn's - Chemical

3) Steven Johnson's syndrome

Alkalai is more dangerous than acid because

it penetrates cornea & cause inflammation.

Ca environment - Pyrophosphatase

Ca secretion was proteolytic enzymes

2) NaCl is used to create low

slit lamp examination

Immediate measure:

-
WHO Grading:

Night blindness / nyctalopia

X N

Conjunctival xerosis (Sx)

X T

B - Bitot spots

X II

Corneal xerosis.

X III A

Keratomalacia

X III B

< ½ rd

B

> ½ rd

X S

Scarring

X F

Xerophthalmic Fundus - Look like white spotted Fundus

--- due to changes in outer segment rods.

Bitot spots occur in:

Both > temporal.

First symptom to:

Conjunctival xerosis.

Rx:

Injectable vit A - 10,000 IU on 0, 1, 14 days → 7 days

Pt is < 1 yr → ½ the dose.

Jain Stationary

Gautam Nagar
It is a connective tissue disorder.

- Exposure to UV-G rays.
- MC: Nasally (UV rays which travel laterally on nasal

C/F: - Cosmetic
- Astigmatism
- Diminution of vision

Rx: 1) Excision
2) Recurrence occurs

QA to prevent recurrence

Autografting - Base sclera technique

pterygium

Subconjunctival Fibrovascular Tissue - Support

Cornea.

Encapsulation
Recurrent = 0

PERFECT Sx

Plano-Extended Resection followed by extended conjunctival transplantation.

Different Layers of Tear Film:

1) Mucin layer
   - Secreted from goblet cells
   - Role: Reduces surface tension, acts as a lubricant

2) Mucin layer
   - Cells of conjunctiva
   - Role: Lubricant

3) Lipid layer
   - Secreted in meibomian glands
   - Prevents evaporation of tear

Definition of dry eye disease:

Deficiency of any of these 3 layers is called dry eye.
3) Rose - Benegal strain

- Starch dark cell עד

- heiß < 5 sec -> dry spot

- Congo

- Time from last burn to 1st dry spot on the

- BUT Test:

- if is > 5 mm -> (DE) dry eva.

- Tear strip put in lower lid for 5 min

- Ix: 1) Schimmelp Test

- Secretion - dimension of tear

- gutter serosae

- burning serosae

- Dragging slightly + RA | connective tissue disorders

- 2) Dehiscence

- dry ear + dry mouth (xerostomia)

- 10 seconds

- Deficiency of anterior layer

- Keratoconjunctivitis Sicca:
(2) Pressure syndrome with retropectoral obturatin

at carotid or below carotid

2. Syndrome: Introducing 3.0 into lower puncta

Irregular Teri press in mucus canthi

Discharge

(3) or Epirpora

↑

(2) Epirpora in ocular system

Tracing is Epirpora

3) Due to overproduction of PABA - Lacrimal

- Watering in eyes

- Lacrimal

- Inf. meatus

- Upper puncta is medial to

- Lacrimal drainage system

- Carotid
3) Jones Dye Test

4) DCG → Dacryo Cystography
   - Studying lacrimal sac filling defect

5) Dacryoscopy
   - Using radioactive dye

Dacryocystitis

Acquired

Chronic

Congenital

Acute

Inflammatory lacrimal sac

Blockage of NLD

Noncanalized NLD

Clf;
Epiphora

Discharge

Rx: depends on age

< 6 mo: antibiotic gromping (or hydastatic press)

6-18 mo: probing

> 18 mo: DCR - (Dacryocyst Rhinostomy)

(Prabha Dacryocyst Rhinostomy)
Acute Acquired Dacryocystitis

1. Epiphora
2. Discharge
3. Pain
4. Redness
5. Tenderness

Rx: Control inflammation by giving antibiotics & anti-inflammatory drugs

DCE

Rx for lacrimal fistula = DCR.

→ Sequelae: Acute lead to lacrimal fistula.

Rx for lacrimal fistula = DCR.

→ 

→ Therapeutic agent of acute = strept. hemolyticus, pseudomonas, cone conjunctivitis.

Anti-istapha autum
Chronic Acquired Oaczyglossitis

CFL: Ectropion
2. Discharge
Rx: DCR

Sequela: Any chronic lead to maculae

Rx: Oaczyglossectomy

Both the lacrimal sac is
adhered so notumen.

\[ \text{Rx: Oaczyglossectomy} \]

\[ \text{Rx: Ocular ulcer of mumps -> Oaczyglossitis} \]

\[ \text{Rx: Ocular ulcer of measles -> vit A deficiency; nightblindness} \]

\[ \text{Rx: Ocular ulcer of mumps -> Oaczyglossitis} \]

\[ \text{Rx: Ocular ulcer of measles -> vit A deficiency; nightblindness} \]

Snowblindness

UV-8-rays

Injury to eye by pm.

Also called: Photophobia

CFL: It causes corneal epithelial erosion.
Exam Fundus - H is red (N)

Set in dark for 1 hr — no night blindness

M. round phenomenon — Oak leaf disease

Poster fundus (most vertical)

Congenital retinal bunions

6) Quincke's Disease

4) Late stage of 1 open angle glaucoma

3) High myopia (>6D)

2) Retinitis pigmentosa

1) Xerophthalmia (dry eye disease)

Causes of uveitis / iridocyclitis

Macular scar

Leading to

It causes - Macular Eburn

Solar eclipse 2 unaided eye

Occurs when you are directly looking at

Injury to eye by infrared rays

Scotomata.
3. Cong. absence of cones.
2. Central laminar opacity
1. Central corneal opacity
Cause:
Kila → Hama
(Up! is conjugated, any opacity can cause)

Day

Blepharitis

4. 50% of pt. respond to wet 6 therapy

2. Non-secreter of cholinergic
1. 1-receptor free diet

Therapy patches in cheek - In e/c

Cheek area cream

Chloroquine

Amino Transferase

Gryge atrophy occur due to atrophy of ciliary

1. Chloroamide + night blindness + white spotted fundus

6. Fundus Albinotatus
L - Kappa - L B/W. Pupillary Line & Visual Axis Cornea

L C - L G/L: Optic Axes & Visual Axes Normal Point

Formed at

Visual Angle

Image absent in aphakia - III & IV

Image on part surface of lens - Image is inverted

N - Formed on part surface of lens - Image is inverted

L - Formed on part surface of lens

III - Formed on part surface of cornea

II - Formed on part surface of cornea

I - Formed on anterior surface of cornea

There are 4 Types

Projected Image
1. Myopia (more than required)
2. Hypermetropia (less than required)
3. Astigmatism
4. Anisometropia - Difference of R.P. blw 2 eyes > 2.5 D.
5. Asthenopia - Difference of Image size blw 2 eyes
6. Aniseikonia
7. Fovea
8. Compound Hypermetropic
9. Simple Hypermetropic
10. Simple Myopic
Astigmatism:

- Regular
- Irregular

- Oblique Astigmatism
- L axis less than 90°

- 90°
- 90°

I Rule:
- Vertical Curvature is vertical power
- Seen in keratoconus
- Even in singu axis
- There is a variation

Rule:
- More than horizontal power due to press of
- Vertical curvature

VC ≥ HC

Aphakia:
- Absence of lens
- Extreme degree of high hypermetropia (due to less
- IOL implantation)
- Insert lens or
Ring Summa

1. for

Presumption: so nothing is seen from property

= High Prismatic Effect: The property of spectacles is high

Pin Cushion Effect

= pr is seeing everything in paraboloid (l)

High Aphakia above aberration

High degree of anisotropia, which needs to disappear

If you can't correct unilocular aphakia in spectacles

= Magnification is around 30%. - If it's

Use thick convex lens (right)

Greening aphakia in spectacles

For 3 days.

O - choice of cycloplegic in children - labyrinthine coat response

= Phenylephrine

Only drug that is mydriatic & no cycloplegic action

Cyclopentolate

O choice of site & Tol. Implantat - post - chamber or

O xac f or aphakia - Tol. Implantat

69
65

- Soft lens
  - Cover whole cornea
  - More H2O content more
  - O2 transfer is less
  - Permeable

- SemiSoft:
  - Smaller than cornea.

- Dk/t
  - Diffusion coefficient
  - Solubility coefficient
  - Thickness

- O2 transmissibility depends on

- Amblyopia
  - No organic cause
  - No ab(x) in eye

- Partial loss of vision < 6/6

Q pathology lies in LGB.
From L to B is dull so

The Optic Radiat is k/Lazy eye.

Ambyopia is k/Lazy eye.

1) Diminution of vision
2) Light sensitivity
3) Sun glass effect
4) Form Deprivation. Pt. is having amblyopia pt. cannot see letters
5) Foveal reflex is not formed properly.
6) Strabismic Ambyopia
7) Refractive Ambyopia
A Rx of Amblyopia:

-Occlusion of one eye.
-Atropine Penetration by patches.

Other modalities of Rx of Amblyopia:

1) Can stimulator - like drum.
2) Leotopes - excentric eccentric.
3) Pleoptics - method of treatment excentric eccentric.

- Fixation
- Eccentric Fixation
- Taking centre of fixation
- When one eye is not even on covering of other eye.

Amblyopia is corrected only in 6 yrs of age.

After 6 yrs there is no chance of improvement.

Jain Stationary
Girija Naada
Binocular Single Vision (BSV)

- Also called Binocular Function
- Faculty of brain to fuse 2 retinal images as one
- BSV develops by 5-6 yrs of age (Foveal reflex 5-6 mos.)

I. Simultaneous Perception
   - Gradual
   - Fusion
   - Stereopsis → (Depth perception)

II. Visual Perception
   - 4 Types of senses:
     1. Light sense → light
     2. Form sense → object
     3. Contrast sense → sharpness, object
     4. Color sense → tell color

Visual Acuity Charting is a measure of Form Sense.

Diplopia → One Vision - True Image
Double Vision → One vision - False Image
3. Elbow out

2) Instrumental Caract.

1) Other: Polyclara (multiplpilery)

- G Buccal - Supraknot of L Uns

3) Unicollar Diplopia

2) Unicollar Diplopia

1) Thyroid ophthalmophobia

- Neck: Ruelm

- Other: Retractive Causal

G Buccal - Paranthetic Squint

Unicollar Diplopia

1) Unicollar Diplopia

Le Polisy

- Uncrossed - Concurrent Squint

\[ \times \]

- It is Exotropia

- Squint

- It is a Feature of Alloquet

- Side

- False Image Opposite to Squint

- Crossed

\[ \leftarrow \]

- Uncrossed

\[ \leftarrow \]

- Classiscatology

\[ \leftarrow \]

- Classiscatology

\[ \leftarrow \]

- Vertical

\[ \leftarrow \]

- Horizontal

\[ \leftarrow \]

- Torsional
<table>
<thead>
<tr>
<th>Action of muscles</th>
<th>Recti are adductors</th>
<th>Recti are adductors</th>
<th>Recti are adductors</th>
<th>Recti are adductors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. m. psoas</td>
<td>I.R.</td>
<td>S.Q.</td>
<td>Extos.</td>
<td>Elev.</td>
</tr>
<tr>
<td>4. Yolk muscles</td>
<td>CL synergists</td>
<td>CL synergists</td>
<td>CL synergists</td>
<td>CL synergists</td>
</tr>
</tbody>
</table>

**Vertical muscles:**

- LR → abduct.
- m. psoas → adduct.
- Yolk muscles: CL synergists.

**Actions:**

- Rectus: Adductors
- Psoas: I.R., S.Q., Elevate, Elevate, Elevate
- Yolk muscles: CL synergists
Inconcomitant squint

1° duviation = 2° duviation

2° duviation, deviation of squinted eye.

2° duviation, deviation of 2° eye behind the cover.

Sherington's law: there is equal & reciprocal innervation.

Hering's law: Equal innervation in both eyes.

In agonist & antagonist (2 muscles in one eye).

If we look down → sup. rectus is agonist.
Inf. rectus is antagonist.

For paralytic squint:

Management for paralytic squint:

1. Wait for 5-6 months.

Squint Sx

Square vs.

For an underacting muscle → we do Resect (cutting) overacting muscle → we do Recession.
1. RX of Concomitant Squint:
   a. Refract
   b. Check for amblyopia - go for occlusion therapy (if needed)

2. Orthoptic exercises (if needed): Occlusion exercises - convergent exercises
   (not done in convergent squint)

3. Rehnoscropy:
   a. Point of neutral fixation
   b. No light reflex is visible

4.光

5. Corrected Factors
   - Distance
     - 2nd order: 66 cm
     - 1.5
   - Defocus
     - -0.5

6. Spectacles
Incision Sx:

Arcuate Keratotomy - Thal CA T-cuts

- Used to correct astigmatism
- We give IOL cut aspheric
- One becomes flatter, the other remains steep
- It is a cupping effect

Lamellar Sx:

- Laser Assisted

Preoperative Preparation:

1) Age > 18 yrs
2) Pachymetry
3) Anterior Segment

1) Pachymetry
2) Anterior Segment
3) Toric IOL curvature by corneal topography

1) Phacoemulsification Keratotomy
2) LASIK SX - Laser in situ keratomileusis.

1. Raise flap of cornea which has epithelium & stroma.

2. Apply laser to deeper stroma (stromal bed).

3. Put flap back (vision becomes 6/6).

Q: Minimal thickness of stromal bed should be.

\[ \text{Plate} = 270 \mu \]

Q: Epi-LASEK vs. LASERX - Laser sub epithelial keratomileusis.

1. Raise flap of only epithelium.

2. Apply laser to superficial stroma.

3. Put flap back.

Q: Pt. suffers corneal opacity (superficial stromal involvement).

So do Epi-LASEK & LASERX > PRK.

Q: SLE of laser SX:

1) Dry eye - use lubricants for 2-3 yrs.

2) Regression of no. - use specs.

3) Glare.

4) Epithelial ingrowth.

5) Infection.
1. Clear lens extract?
2. Phakic IOL implantation?

1. To counteract refractive error.

- We have lens, but again, we are putting lens.

- Plate haptic lens in ciliary sulcus.

- Sx to correct presbyopia.

- Conductive keratoplasty.

- Conductive keratoplasty done at only one eye is in monocular vision.

- Conductive keratoplasty at periphery.

- Conductive keratoplasty at centre.

- Radiofrequency shrinkage at periphery.

- At base of scena, bulging at centre.

- Conductive keratoplasty.

Risk:
- Retinal detachment.

1) One eye has full vision & another eye has near vision.
ORBIT

\[ \text{v. o. l. of orbit} \rightarrow 30 \text{cc} \]

\[ \text{shape of orbit} \rightarrow \text{Quadrilateral:} \begin{array}{ll} \text{frontal} & \text{maxillary} \\ \text{lacrimal} & \text{ethmoidal sinus} \end{array} \]

\[ \text{ovale wall of orbit} \rightarrow \text{medial wall} \]

4. Sphenoid.

\[ \text{# of blow out of floor due to blunt trauma} \]

2. Optic foramen formed by:

\[ \begin{array}{ll} \text{Frontal bone} & \text{Lesser wing of sphenoid} \\ \text{Lateral orbital margin} & \text{Apex of cornea} \end{array} \]

\[ \text{Proptosis, protrusion of eyeball} \]

\[ \text{Any distance} \rightarrow > 2 \text{nm} \]

\[ \text{Distance of both eyes difference is} \rightarrow > 2 \text{mm} \]

\[ \text{Exophthalmometer used for thyroid disorders} \]

\[ \text{Instrument:} \quad \text{Exophthalometer} \]

\[ \text{Hertels} \]
Pathophysiology:

- Infiltration of inflammatory cells

- LID signs
  - Soft tissue signs
  - Myopathy
  - Optic neuropathy
  - Proprioception

Hyper or Hypothyroid

- Not related to thyroid hormone i.e. it is euthyroid
- Common in O
- IT is autoimmune disease
- Also called Grave's eye disease

Thyroid Ophthalmopathy

3. Arros (eye protruding straight line) non axial
Because of intraorbital press

Pt. will show symptoms of optic neuritis & show compress optic neuropathy

Rx:
1) systemic steroids
2) radiation therapy → anti inflammatory role
3) of severe → decompression Sx (break wall of orbit)

Pupillary reactions i.e. APD, etc.

First wall to be broken is medial wall

Thyroid myopathy

Myxofibrosis

This restrictive myopathy

If Diplopia

Rx: squint Sx

6) If Muscle involved → I. Rectus, If. Rectus

7) 2) Last muscle involved → Oblique

8) 3) With part of muscle involved → Belly of muscle
3. Kocher's sign - Stamping look out to too much

4. Von Graefe sign - Lid lag

- Lid retract

- Dog leg sign

-due to overaction of LPS (It's fibrosed)

Lid signs:

- Adhesion of eye drops - For mucus deposit

- Rx: 4ml scler:

- h: Mucus deposit

- 3. Sup. Lymphal Kretza

- 2. Chemosis - Edema of conjunctiva

- 1. Pericircular edema

Hy. Scler issues signs:

- If not moving - Fibroplastic

1. Forced Duct Test - In forwards & moves freely - Paralytic

To know paralysis of fibroplastic
1) Orbital Cellulites

2) Periorbital edema

3) Lid lag: Excessive lagging of the lid due to weakening of the orbicularis oculi muscle.

Ax: An ovoid depression of the lid

Rx: Use of counter of LPS

A) Stellate sign - decrease frequency of blinking.
4) Fever x malaise

Rx: Oculus emergency → due because it leads to

- Cavernous sinus Thrombosis.

1) Admit pt.
2) IV antibiotics both aerobic & anaerobic
3) IV Inflammatory

- Cavernous sinus Thrombosis

⇒ 6th nerve along to Int. Carotid a. Passing through body

c/o signs:
- 1st sign: 6th nerve palsy
- Total Restrict of eye movement
- 3, 4, 5 nerves also involved
- Slowly

5) 2nd nerve gone → O light reflex
8th nerve → blink reflex.

6th nerve → painful papilloedema.

8. Palsy (E. papilloedema we can’t appreciate ptosis).

2. It can be benign (benign mixed Tx).

Lacrimal gland Tumor

1. Lymphoepithelioma.

2. Mucoepidermoid.

Etiology:
1. Adenoid cystic (most common because it spreads through nerves (primary invasion). It is painful.

malignant: adenoid cystic.

malignant: adenoid cystic.

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malignant: adenoid cystic.

malignant: adenoid cystic.
Cavernous Hemangioma

- mc intra orbital Tx of adults
- It is encapsulated, easily resected
- It is Intraconal (Inside muscle cone)

Optic Nerve glioma (oma)
- Non-neuronal cells of nervous system are glial cells.
- ONG - Tx of astrocytes
- is Tx of astrocytoma
- very slow growing

1. VHL
2. VHL
3. VHL
4. VHL
5. VHL

- C/F - 1. Tx of children
- mc in G

Proposis is late feature
- 1/2-1 NF 1
- pt. exhibits all 5 features

cause - proposis

Cause - proposis
In microscopie: Tx look like hair-like cells

1. Chemotherapy
2. Radiotherapy
3. Surgery

Rx:
1. Observation & Follow-up
2. Radiotherapy
3. Surgery

Retinoblastoma:
- Derived from neuroectodermal tissue
- Common in infants
- Presents in 1st year

Leukokoria, also called "cat's eye" reflex

Amnestic cat's eye reflex

Strabismus, squint
1. Present ed. Glaucoma (due to m. Iop)

2. Pseudohypopyon (not pus cells, it is Tx all is not kph)

3. Orbital cellulitis

4. Leukocoria

5. In 3 yrs child - congenital cataract (nc)

6. Cycloic membrane

7. Fundal Endothalmitis due to toxocara

8. Retinal Coloboma (when sclera is not)

9. Retinal dysplasia

10. RDP (Prematurity)

11. Persistent hyperplastic primary vitreous (PHPV)

Jain Stationery
Gautam Nagar
Knudson's hypothesis

Knudson's hypothesis

Trial: RG → 8/L RG + Pinceloma

13q syndrome

p

RG + Dysmorphetic facial features

Genetic of RG

3. Pleione

2. Homer - Weight

Fllexner - Winter stenner

Better prognosis

Undifferentiated

Any tx can be

Microscopy

Pathology

Calcification

Intra orbital

Calcification

Calcification
Stage I: Quiescent stage: silent stage
Stage II: Granulomatous stage
Stage III: Stage of extracocular extension
Stage IV: Distant metastasis

Rx: Rx: Laser photocoagulation, Tx size ≤ 3mm in height, damaging blood supply of Tx

2. Cryotherapy
   For ant. lesions → Cryotherapy
   Post-lesions → Laser

3. Radiotherapy
   Ext. Beam RT
   Brachytherapy CO-60
4) Thermotherapy: Thermal effect of diode is used to damage the tumor.

5) Chemotherapy: Neoadjuvant Therapy

- Used for Chemoreduction

- Drugs: Carboplatin, Etoposide, Vincristine.

(1) Intraocular $T_x \rightarrow $ Enucleation

(2) $T_x$ spread to orbit $\rightarrow$ Exenteration

$S_x$ To remove R. Eye:

(1) Enucleation: Removing whole eyeball & max. part of optic nerve.

- Around 10-15mm optic nerve is landing.

Put Orbital implant $66$ mm,$\downarrow 6-8$ wks
Endophytic

1) Entire excision is done in panophthalmitis.

2) Sclera is left as in excision of main part of eyeball.

3) Cut max. part of sclera.

4) Scoop out all uveal tissue.

5) Cut corneal at limbus.

For cosmetically better:

1) Removal of orbit contents.

2) Pterion is removed.

3) lids are cut.

4) In prepared a gauze to bring a C Yaneq Company.

5) Extricate.
Endophthalmitis

Endoscopy of eye ball is inflamed.

Rx: 0.5 Intravitreal antibiotic inj.

1. Cephalosporin  - For gram +ve
2. Vancomycin  - For gram -ve
3. Very small dose of Dexamethasone to control inflammation.

which antibiotics are cl/divas/divo because they are maculotoxic.

1. Gentamycin
2. Amikacin

Antifungal given intravitreally is: I. Amphotericin B
2. Voriconazole (new)

Mucormycoma

Endophthalmitis is a fungal infection, orbit.

1. Aspergillosis
2. Mucormycoma

Fungal Organism/bacterial cause of Endophthalmitis

Aspergillosis

Fungal Organism/Bacterial cause of Endophthalmitis

Early onset: Propionibacterium acnes
Late onset: Staph. epidermidis

Q1, Q2, Q3, Q4, Q5
Blow out #

1) Periorbital Ecchymosis

2) Ptosis on cheek due to damage of infraorbital nerve.

3) Enophthalmos (eyes going inside)

4) Diplopia. Binocular diplopia

5) Subcutaneous emphysema [of nasal wall is #]

I X:

L 1. X-ray

Pneum

maxillary sinus

2. CT Scan

Rx:

1) Antibiotic

2) Anti-inflammatory X 10 days

3) No improvement of enophthalmos

4) No improvement of diplopia
1. Trichiasis: Long anomaly where double row of eyelash
   a) Meibomian gland
   b) False eyelid
   c) Eyelash loss
2. Distichiasis: Double row of eyelash
   a) Meibomian gland
   b) False eyelid
   c) Eyelash loss
3. Medial canthus: Loss of eyelashes and outer edge of margin
   a) Lysis
   b) Mucocutaneous
   c) Ectropion
   d) Inward turning of lid margin
   e) Outward turning of lid margin
4. Ptosis: Drooping of lid
   a) Surgical
   b) Lysis
   c) Mucocutaneous
   d) Ectropion
   e) Inward turning of lid margin
   f) Ectropion
5. Trichiasis: Long anomaly where double row of eyelash
   a) Meibomian gland
   b) False eyelid
   c) Eyelash loss
   d) Cheilitis

Blepharitis: Inflammation of lid margin.

Post. L+ Meibomianitis

Ant.

Squamous → Oranaphth

In eyelashes

Staphyloccal infect

Scales +

If you remove scales, ulcers occur.

Rx: Antibiotic c

Steroid combi

Rx: Antibiotic

Rx:

Lubricating eye drop are given.

Hordeolum Externum: It is k/a - style.

H/E

Chronic pain + swelling.

Rx: Hot fomentation.

Style is defined as staphyloccal infect of hair follicle along ecc gland of Zeiss & gland of moll.
Acute Conjunctivitis: Give eye drops.

Hordeolum Internum:
- Acute inflammation of meibomian gland
- Painful swelling on lid
- "Hot Press" treatment
- Oral antibiotics
- Oral anti-inflammatory

Chalazion:
- It is a chronic inflammatory process of meibomian gland
- Sebaceous gland
- Present as painless swelling on lid
- Incision & drainage

Recurrent Chalazion:
- Sebaceous Cell Ca.
- Most common malignant of eyelid
- Basal cell Ca.
- Most common site of BCC = lower lid
- Medical cauterity

Ptosis:
- Drooping of lids
- Neurogenic or myogenic
- Classified as:
  1. Neurogenic
  2. Myogenic
3) the common of conductional scattering
2) any multiple chalcogen
1) type I III

3) structural phase
2) Horner's chalcogen (multi's nuclear)
1) nerve paraly

3) Taylor-coning phenomenon

3) structural phase also called macula eum
Acquired myasthenia gravis → Ocular myopathy.

Features of Blepharoophthalmic syndrome:
1) Narrow palpebral fissure
2) Telecanthus (IPO=2)
3) Congenital entropion of lower lid
4) Epianchus inversus (extra fold of skin on medial canthus)

Rx:
- LPS rect
- LPS ache with lid exercises
- n-12 mm 1 ml
- It should be at least 4 mm

Inversus
2. M. rectus
3. Sling operation

JAIN STATIONERY
GAUTAM NAGAR
09654691387
09811982449
LPS

Blakowski

By skin route

Everbrook

→ Müller's resection
→ Sling operation
→ Fasanella, Servat operation

→ Connecting upper lid to forehead

→ Ideal material to connect bleb to frontalis is fascia lata

→ Sling operation + total

→ Rectus by LPS + e

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Retina

most sensitive part → Fovea centralis

Thinnest part → Orba Serrata

Blood supply:

1. Outer 4 layers → Postcapillary v. of
2. Inner 6 layers → Central Retinal a.

Anastomosis blue short post. ganglionic a. & Central Retinal

3. Is known as?

Dot blot haemorrhage

Deep haemorrhage

Intra capillary shunt

Plant figure shaped haemorrhage

superficial
**Pan Renal Coagulation:**

- Hyponatremia → Anoxia → No release of chemotactic factors.

**Chemotactic Factors:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VEGF</td>
</tr>
<tr>
<td>2</td>
<td>bFGF (basic fibroblast GF)</td>
</tr>
<tr>
<td>3</td>
<td>Insulin like GF</td>
</tr>
<tr>
<td>4</td>
<td>PDGF</td>
</tr>
<tr>
<td>5</td>
<td>TGF/β</td>
</tr>
<tr>
<td>6</td>
<td>TNF-α</td>
</tr>
</tbody>
</table>

**IL & Interferons are not related to angiogenesis.**

**Fluorescein angiography → Fundus FA**

- We can see leak block → capillary non perfusion (CNP).

**ICG Angiography → Fix Choroidal lesion**

- Inject dye at antecubital vein → we can take picture → 5 sec.
- If pt is old → 8-12 sec.
- Indigo-carmine green → 98% bound to plasma protein.
Diabetic Retinopathy

ICG angiography is used for occult choroidal neovascularisation.
Pathological changes at capillary level:

1. Loss of pericythe

2. Thickening of basement membrane

3. Neovascularization

4. IRMA

5. Looping & beading of veins

6. Neovascularization (venous infarcts)

2. Large block hemorrhage

3. Edema

4. Hemorrhage

5. Microaneurysms

First sign of back, digital, echography
DR classification:

- Non-proliferative DR (NPDR)
  - Severe:
    - All features of preproliferative stage
  - Moderate:
    - All features of mild DR
  - Mild:
    - Only microaneurysms

PDR:

- Panretinal photocoagulation (PRP)
  - Macula:
    - We can apply all retina Tout
  - Quadrant:
    - Infrared quadrant
    - We start laser from outside quadrant
    - We give: 2000 - 2500

Rx by DR:

- NPDR
  - Criteria:
    1. Edema
    2. Hard exudates
    3. 500 μm from centre
  - FFA
  - Focal photocoagulation
    - (Single focal) when building +
    - Grid photocoagulation

- PDR
  - Only hard exudates
  - FFA
  - Focal photocoagulation
    - Single focal

I st diffuse burning - Grid photocoagulation

Focal photocoagulation
Hypermetropia (small eye)

- Pupillary Reaction
  - Direct reaction
  - Constriction of Iris

- Quick Factors:
  - CRVO

- Pregnancy Related HR: HR

- No Neurovascular or NO Release of Chemical Factors

- Papilloedema (Edema of disk)
  - Hemorrhages
  - Focal Spasm

- Generalized Atherosclerosis (Narrowing due to vasospasm) of arteries

- Retinal Vein Occlusion: A/V ratio: 2:3

- Any Long Standing HTN: HR

Hypertensive Retinopathy (HR)

- Photo coagulation laser should never hit central fovea centrally.
1. Blood viscosity syndromes
   \[\text{Pathogenesis:} \quad \text{Cerebromedullary infarction}\]
   \[\text{Non Ischemia} \quad \text{Non Hypoxia} \quad \text{Renin-Sodium}\]

2. Multiple haemorrhages around disc
   \[\text{Spiralized Snake Appearance}\]

3. 100 day Glaucoma seen in Ischemic CRVO
   \[\text{Not Rx after 100 days}\]
   \[\text{Neovascularization cluster}\]

4. \(\text{CIF}\)

5. \(\text{FFA}\)
   \[\text{Ischemic Leak}\]
   \[\text{Block}\]
CRAO

Risk Factors: due to Embolism

RX:

PRP

Diagnosis:

1) Heart Disease
2) Carotid Disease pt.
3) Vascular
4) Radiation Exposure

Other Causes:
1) Mucormycosis

C/E:

Pt. Presents C 1)

OLE:
1. Severe Oedema - White Retina
2. Marked Elevation - Thread like arteries
5. Cherry Red Spot (CRS)

- Causes of Cherry Red Spots:
  1. Blunt Trauma
  2. CRAO
  3. Neuritis
  4. Gm-1 gangliosidosi

- Causes of Blunt Trauma
  1. Taysach's disease
  2. Neuritis
  3. Gm-1 gangliosidosi
  4. Gaucher's disease etc.

- CRAO
  - Type I
  - Type II
  - CRS seen

- Gm-1 gangliosidosi

- Pt.-s㏄		CRAO or pt. has not blind

- Due to dual supply to macula. (branch of short post-ciliary a.)

- Cilio-retinal a. (branch of short post-ciliary a.)

- In acetazolamide.

- Rx:- sudden L.V. IDP
  normal massage
1. Perimetry (because it RP involve and retinal"

(a) Normal scotoma - Early stage

(b) Late stage. Tubular vision

2. EOG. Electroretinogram

(a) Tell about - Rods & Cones

(b) Outer nuclear layer

(c) Mitochondria

\[ a = \text{amplitude of } \text{RP} \]

\[ b = \text{bipolar cell activity} \]

\[ c = \text{amplitude of rods} \]

Both a & b waves are lost in RP

C = tells activity of retinal pigment epithelium.

Atypical RP:

- Instead of mid periphery, it affects pericentral RP.

- It is called Inverse RP.
Best treatment: Dysphagia

Rx for RP: NO effective Rx

MC syndrome associated w RP: Liebers Syndrome

4) RP & Other Scans:

- Salt & pepper fundus & pigmentary disturbance
- No bone spurs
- RP score pigment.
- Better prognosis

2) Sectoral RP
Shallow Retinal Detachment

Accumulation of fluid in subretinal space

Up

Weakening of pump mechanism of inner retinal fluid accumulations

Central Serous Retinopathy

\[ \text{CSR} \]

Periphery

Terminal from ganglion cell layer till to visual VEP: Visual Evoked Potential

For best detection Arden Ratio \( \geq 1.05 \)

[\( \geq \) ]

Arden Ratio = 1.85 or above

Dark Pseud (min Pseudonormal) Fonte

- Light peak (max Pseudonormal in right) Arden Ratio

Measure standing potential of the eye.

Electrooculogram
1) Young & disease
   a) Self limiting disturbance disease
   b) Disturbance of vision (when macula is involved)
      \[ \text{micropsia} \] (CSR)
      \[ \text{distorted image is small} \]
      \[ \text{RING, REFLEX} \]

2) Amsler Grid Test: macular area direct
   - Smokestack
   - FFA (2 types of leakage patterns)
   - Enlarging "ink blot appearance"

3) Q. A.
   - "Visual field q ~ 10"
Cystoid macular edema

Rx:
- No effective Rx for CME as cisper is aggravated

2) Steroids are c/I as cisper is aggravated

- Inflammatory
- Postuveitis

2) Degenerative
- RP

4) Traumatic - Gass syndrome - any CME after cataract surgery

Dissection of vitreous leads to detachment of retina

- Postop complication

- OLE = Foveal reflex = dull/Absent
- Oedema in umbilico, so reflex obliterated & become dull

CME: FFA

Outer plexiform layer at macula is radially placed, which is Henle's layer so
Blood Retinal Barrier: Inner layer - Capillary, outer layer - ERM, Zonula occludens, RPE break & leak seen in CSR.

Rx:

- Henle's layer has:
  1. Zeaxanthin
  2. Lutein

- These 2 help maintain integrity in age-related macular degeneration.

Rx:

- Oral acetazolamide
- Topical NSAIDs (Indomethacin)

Puster's Retinopathy occurs due to trauma.

1) Head trauma
2) Chest trauma
Pathological myopia

It is a cerebrovascular degenerative disease. Pattern: maho syndrome / Gatti's disc

1) central chorioretinal atrophy
2) macular chorioretinopathy
3) hyaloid cell

Alternating area of hypo & hyperpigmentation
bull's eye maculopathy
around disc.

It presents as multiple cothon spots
It occurs due to fat of age embolism
Retinal Detachment: (20)

Separation of RPE from non-sensory retina

Types:
1) Tractional
   2) Rhegmatous
      a) Break in continuity of retina
         
         
         Traction (PVD)
         
         → Tearing due to post-vitreous Detachment
         
         Long Exudate from choroid circulating into sub retina space.

           [Diagram of Retinal Detachment]

           1. Diminution of vision
           2. Visual field defects
           3. Floaters

The retina's protrombosis
↑
Hypera
↑
Free radical dysfunction Injury to blood vessels
↑
Temporal blood vessels didn't derive
↑
Pathogenesis: If you give 01 to premature baby

Temporal blood vessels develop till 1 month of age.

Refractopathy of Prematurity

ROP

Temp. - 7.29

↑
Cryo of scleral bucking
Closure of breast is by

2. Rheumatous - Put cryo to corresponding sclera:
1. Triangular - Phacoemulsification

Rx: Treat the cause

Grey
Choroid it appears red. In this it appears
5. Grey reflex - actual Rhexal canal is grey but due to

to treat in Rod & cone
4. Photopsia (Flash of light seen by patient) occurs due
G/F

1) RSA

2) Neovascularisation

3) Sub-total retinal detachment

4) Laser photocoagulation of hypoxic part

5) Total retinal detachment

Criteria:

Stage

Zone

Extent

Threshold retinopathy

Demarcation line

Ridge format

0.1

I & II zone

I & II zone

5 contiguous clock hours
Degeneration (Arm)
Age Related Macular
Retinal Splinter
Subretinal Bruchs
4) Chorioretinal
Retinal Pigmen
t Detachment

1. Dry AMD

Reversible loss of vision

Irreversibly in macula in old age causin

It is charactery change in macula in old age causin

It is Choroid Cholesce

Degeneration (Arm)
Age Related Macular

Progresses age ? & "M" age 31-33 mos

Screening age for ROP?

ROP birth &

Yellow pigment

Premature

1. All criteria should fulfilled to R x patient

2. Plus Disease = Systolic of arteries & veins

94
1. **Intravitreal Injection** of anti-VEGF agents.

2. **PDT** (Photodynamic Therapy).
   - Use benzoporphyrin derivative as a photosensitizing agent to damage the choroidal neovascular membrane.

3. **TTT** (Transscleral Thermotherapy).
   - Thermal effect of diode laser is used to damage the choroidal neovascular membrane.

4. **Antioxidants** such as lutein and zeaxanthin help in prophylaxis of AMD.
Vitreous

Composition of Vitreous:

Type I collagen & Hyaluronic acid.

→ Adult vitreous

1. vitreous in embryonic period

2. vitreous - zona cle of zon of懨n

3. vitreous - Suspensory ligament.

Floaters & - Tions

1. Inflammatory cells

2. haemorrhagic clots.

3. Synchysis Scintillans - composed of cholesterol, bodies.

Q5 Asteroid hyalosis:

Q6 Diseases of old age

Q7 Haem composition of lipids & co.

Q8 W MHN & high cholesterol
Ascorbola is very high in vitreous.

A. 0 to 2.0 vitreous detached from retina detachment.

A. 1 vitreous detached from retina.


A. PTEP.

Art Mt (behind lense)

Bergmeister pilla

Muscles (vulvaria)

Neur attachment 2 or 3 sera.

Zf retina strong attachment is to vitreous base

Remant of hyaloid tissue in I. Vitreous.

(6) Muscles volutators.
Community ophthalmology

1) In India: Cataract
2) In world: Cataract

mcc of blindness in developed countries: Glaucoma > Amdo
mcc of blindness in India: Refractive Errors (RE)
mcc of preventable blindness in India: Trachoma
mcc of ocular morbidity in India: RE Refractive Errors

mcc of childhood blindness -> Trauma
mcc of YL blindness -> Trauma

Prevalence of blindness in India > 0.56%.

Intracranial pressure in India -> 50 yrs.

Prevalence of cataract in India -> 62.6%.

School Screening program in India -> School Teachers.

Cut-off limit is vision < 6/9.
Blindness: In Better eye

- Best Corrected Visual Acuity (BCVA) < 3/60
- BCVA ≤ 6/60

Economic Blindness: In Better eye

- In 10 lakh population, 1/5 lakh secondary service centre
- 1:50,000

Optometry:

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Bhagwati Nagar