

PAPILLEDEMA

Dr. Pankaj kundal

CONTENT

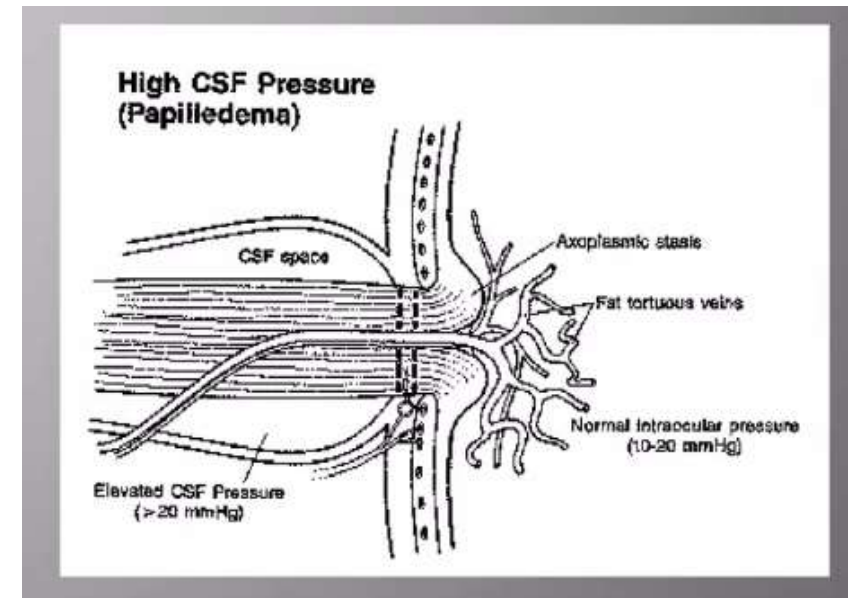
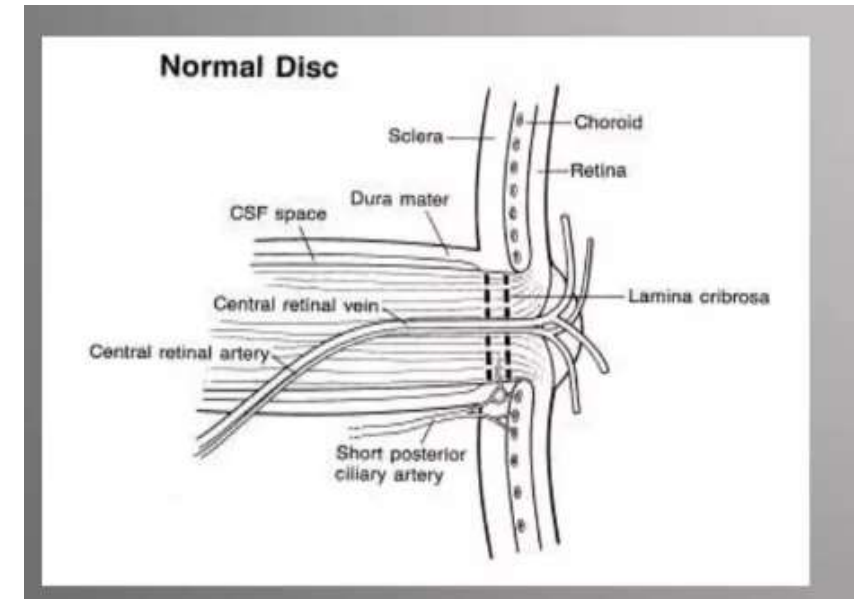
- Definition
- Pathophysiology
- Causes
- Clinical features
- Types
- Investigations
- Treatment

DEFINITION

- Passive hydrostatic non inflammatory swelling of optic nerve head secondary to raised intracranial pressure.
- Usually bilateral, may be unilateral.
- Optic disc swelling in the absence of raised intracranial pressure is referred as optic disc edema.

Pathophysiology

- Disturbance in axoplasmic flow causing stasis swelling of axons and leakage.
- Increased intracranial pressure is transmitted along subarachnoid space with optic nerve sheath acting as a tourniquet.
- Increased intracranial pressure leads to increased optic nerve tissue pressure which alters pressure gradient resulting in stasis.



Theories of Genesis

- Mechanical Theory
- Ischemic Theory
- In most cases combined mechanism operates.

Causes (Bilateral)

- Space occupying lesions
- Blockage of CSF flow
- Reduction in CSF resorption
- Increased CSF production
- Idiopathic intracranial Hypertension
- Focal or diffuse cerebral edema
- Reduction in size of Cranial Vault
- Vitamin A toxicity

Causes (Unilateral)

- Foster Kennedy syndrome
- Previous unilateral optic atrophy
- Posterior fossa tumor
- Brain abscess
- Subarachnoid hemorrhage
- Optochiasmatic choroiditis

Symptoms (Ocular)

- Visual Acuity
- Transient obscuration of vision
- Central vision affected late
- Horizontal diplopia



Symptoms (General)

- Headache more in the morning, intensifies with head movement, coughing or straining.
- Projectile vomiting
- Loss of consciousness / generalized motor rigidity.

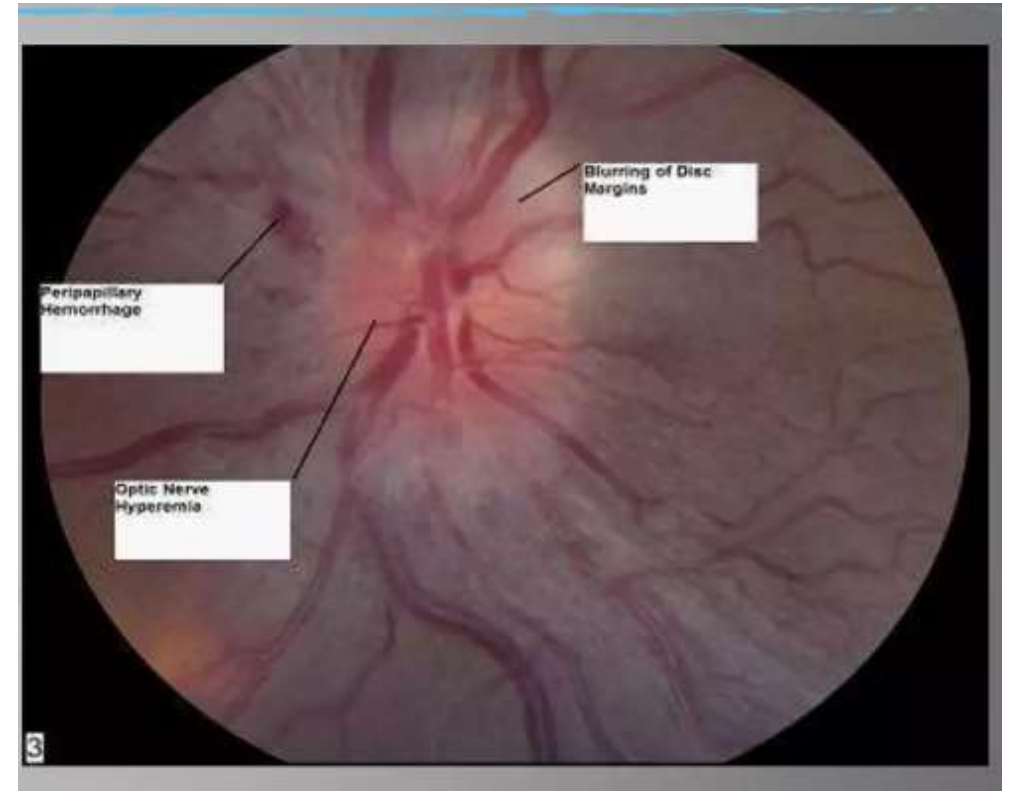
Signs (Mechanical)

- Elevation of the optic disc
- Blurring of the optic disc margin
- Filling in of the physiological cup
- Edema of the peripapillary nerve fiber layer
- Retinal or choroidal folds (Paton's lines)
- Macular fan



Signs (Vascular)

- Hyperemia of the optic disc
- Vascular congestion
- Peripapillary hemorrhage
- Exudates in the disc or peripapillary area
- Nerve fiber layer infarcts



GRADIND OF PAPILLODEMA ACC. TO SEVEITY AND ITS CHRONICITY

Early Papilledema

- Disc elevation
- Venous distension and tortuosity
- Obscuration of the normal disc margin and overlying retinal vessels
- Absence of spontaneous venous pulsations



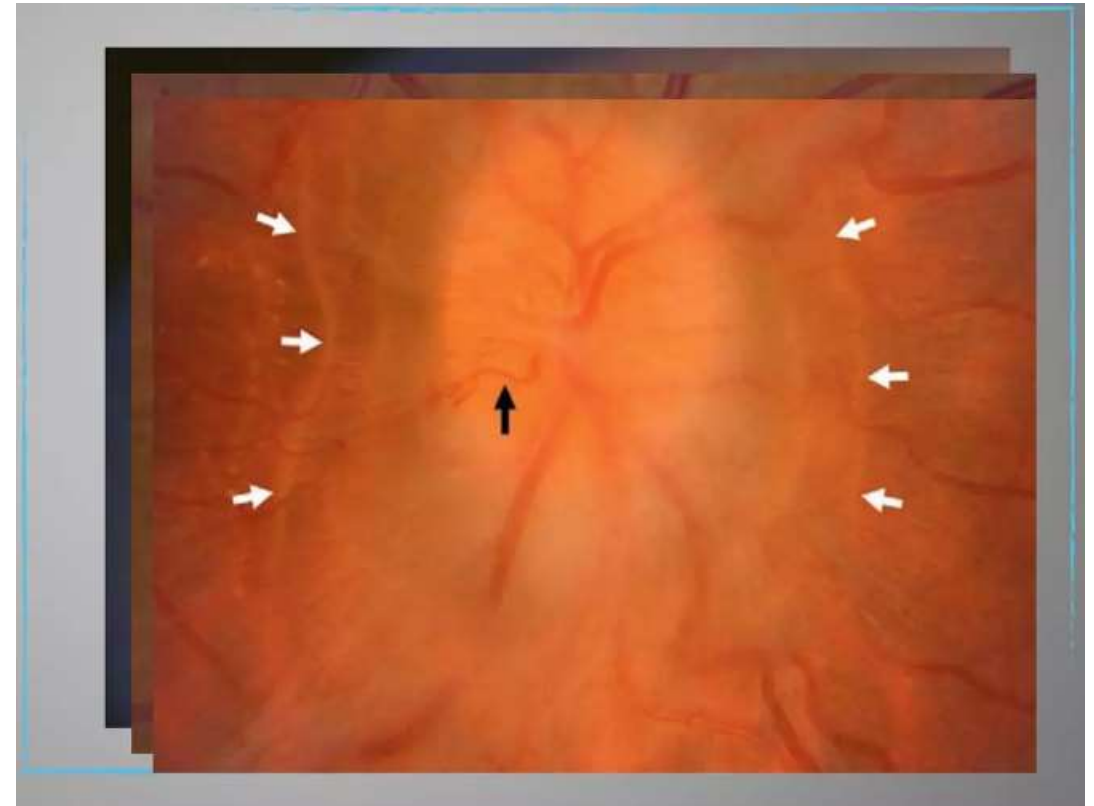
Established Papilledema

- Marked elevation of nerve head with blurring of margins
- Engorged tortuous venules
- Peripapillary splinter haemorrhages
- Cotton wool spots
- Hard exudates over the disc and macular area



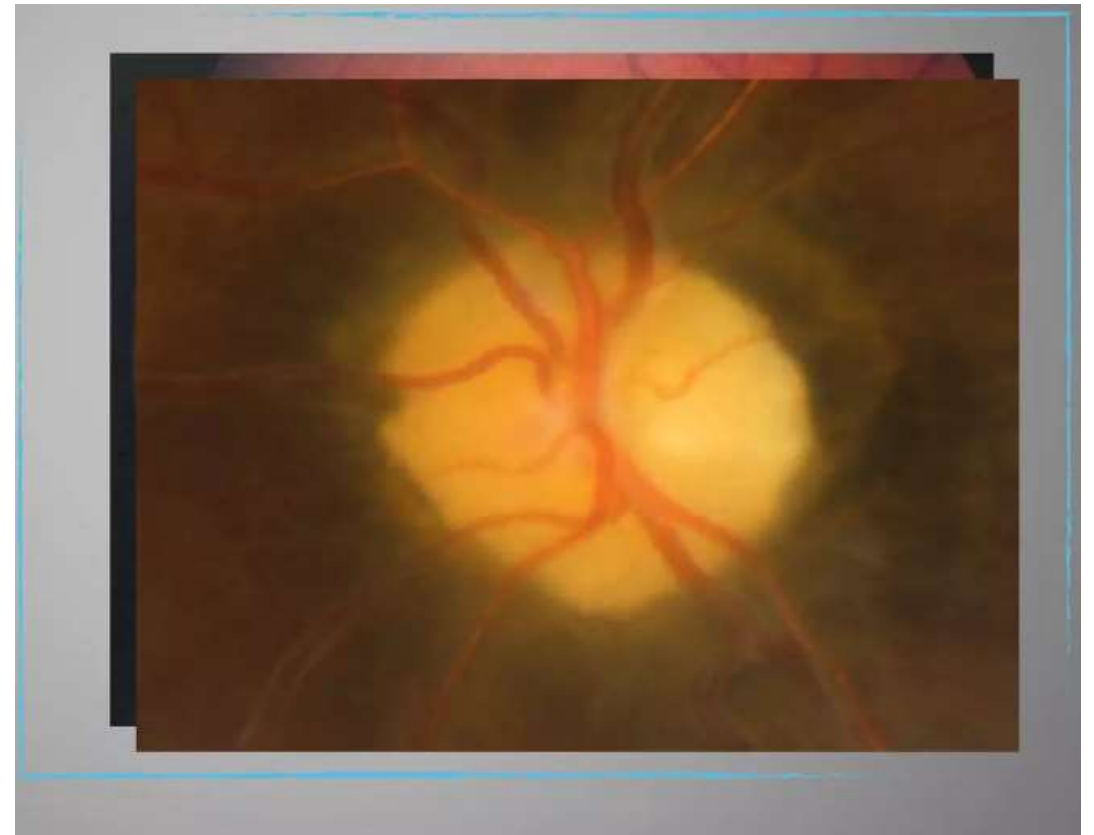
Chronic Papilledema (Classical “Champagne cork appears of disc)

- Disc hyperemia decreases and disc progressively appears pale in color
- Opticociliary shunts and drusen like deposits may be present on the disc
- High water mark



Atrophic Papilledema

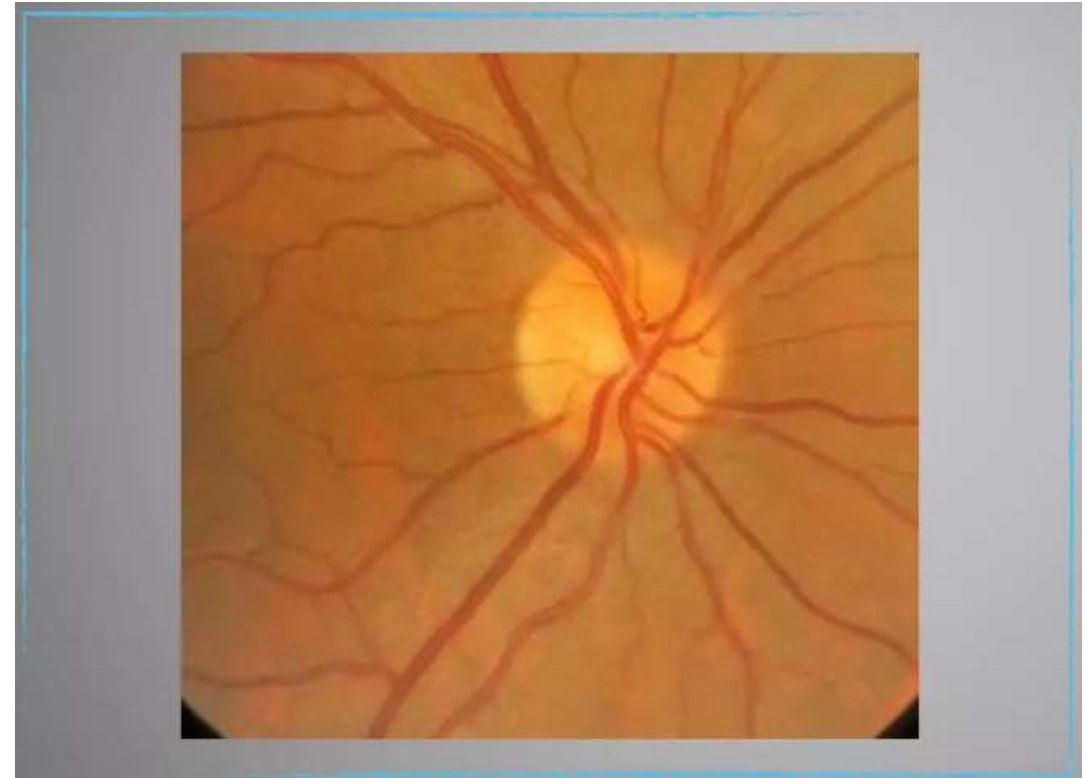
- Onset of optic disc pallor (secondary atrophy)
- Decrease in disc haemorrhage
- Narrowing of blood vessels and their ensheathing
- Optic disc appears dirty white and blurred due to glial reaction



Papilledema Grading System (Frisen Scale)

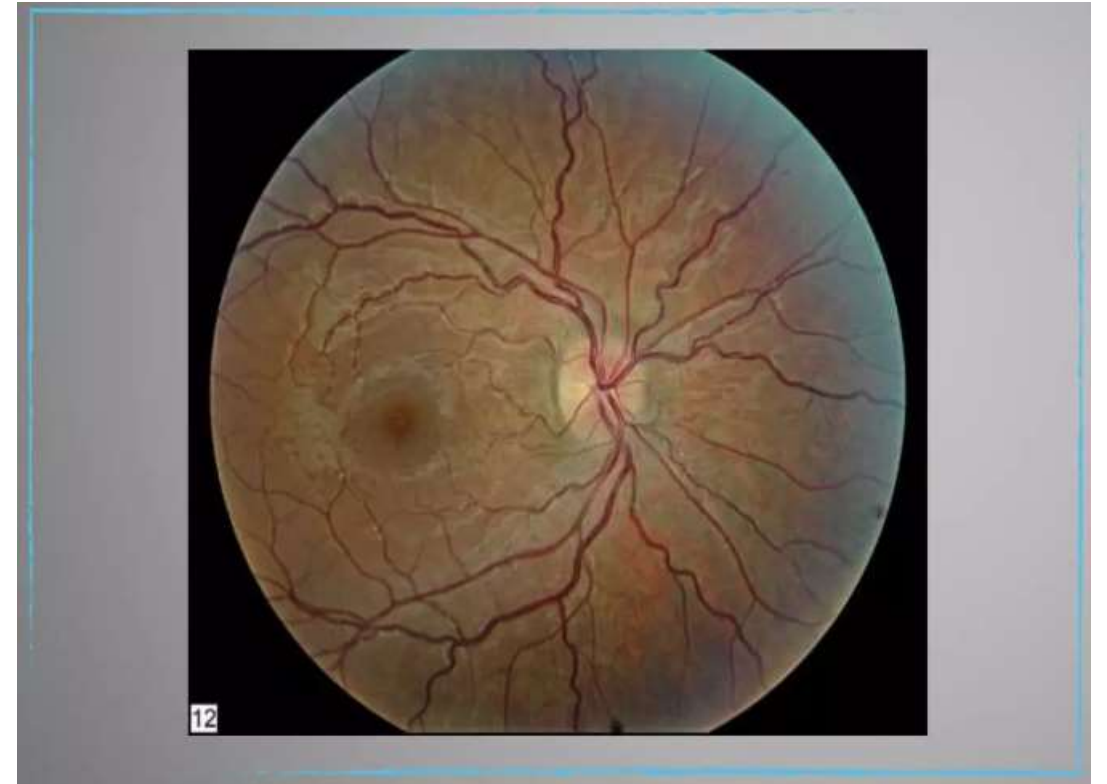
Grade 0

- Mild nasal NFL elevation
- Rare obscuration of a portion of major vessel (usually at superior pole)



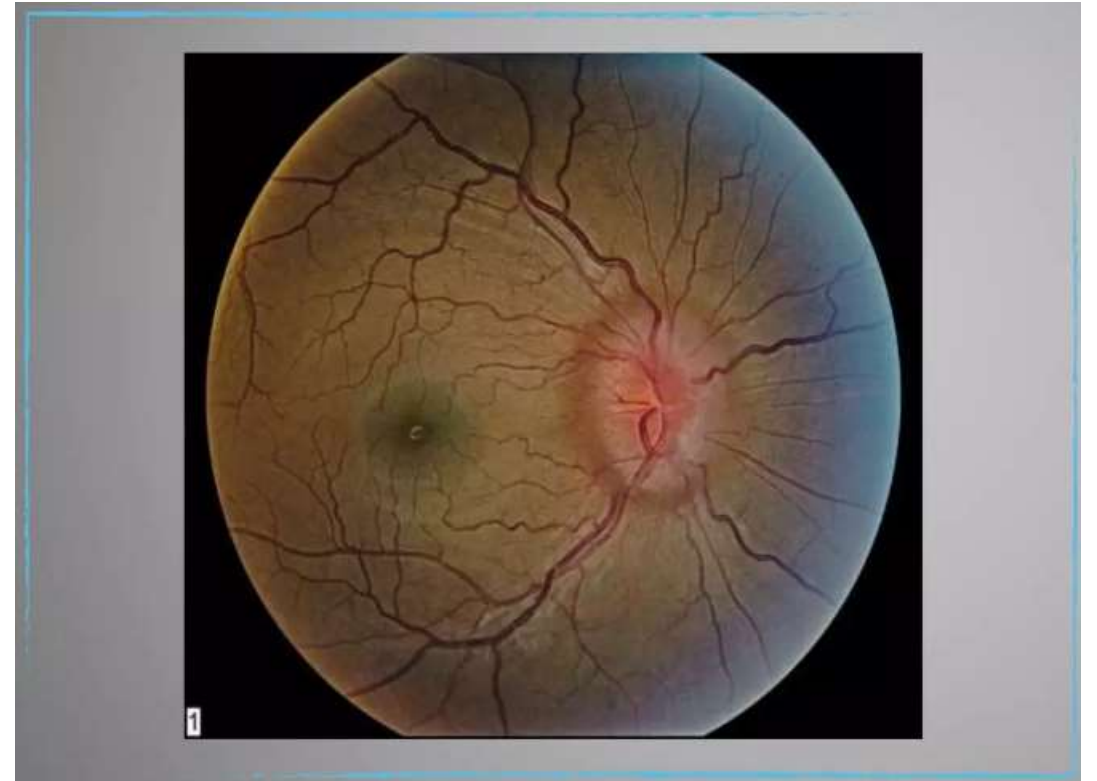
Grade 1 (Very early Papilledema)

- Obscuration of nasal border of disc
- Normal temporal disc margin



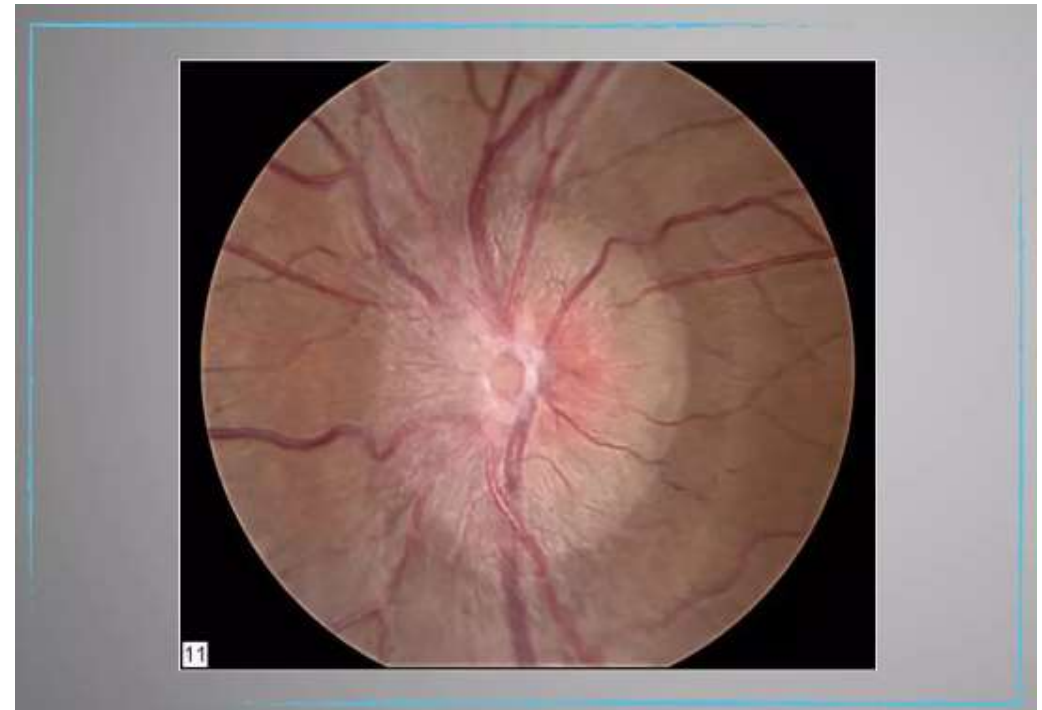
Grade 2 (Early Papilledema)

- Obscuration of all the disc borders
- Elevation of nasal border
- No major vessel obscuration



Grade 2 (Moderate Papilledema)

- Obscuration of all the borders
- Increased diameter of optic nerve head
- Obscuration of segment of major blood vessels as they pass disc margin



Grade 4 (Marked Papilledema)

- Obscuration of all the disc borders
- Elevation of entire nerve head
- A segment of major vessel obscured on the disc



Grade 5 (Severe Papilledema)

- Total obscuration of vessel on disc surface
- Anterior extension of optic nerve head
- Obliteration of optic cup



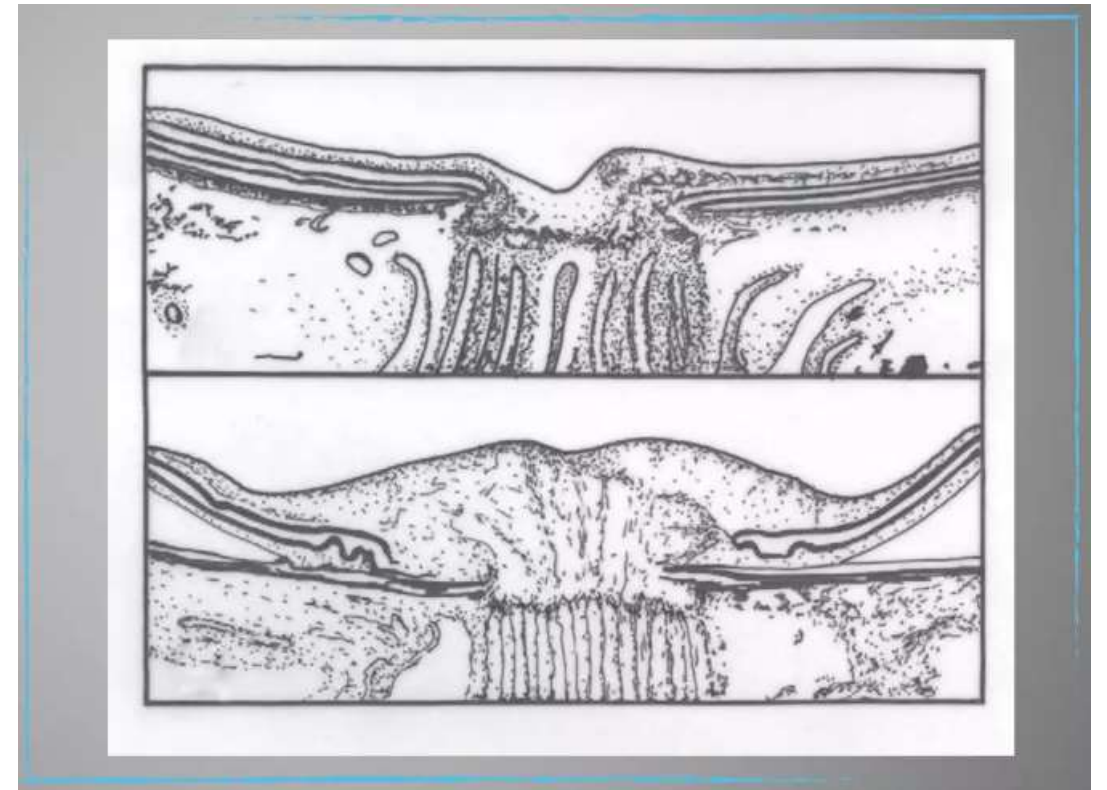
Histopathological Findings

Acute disc edema

- Accumulation of extracellular fluid in and anterior to retinal lamina cribrosa, with enlargement of subarachnoid space with stretching.
- Engorgement of axons occurs in prelaminar portion.

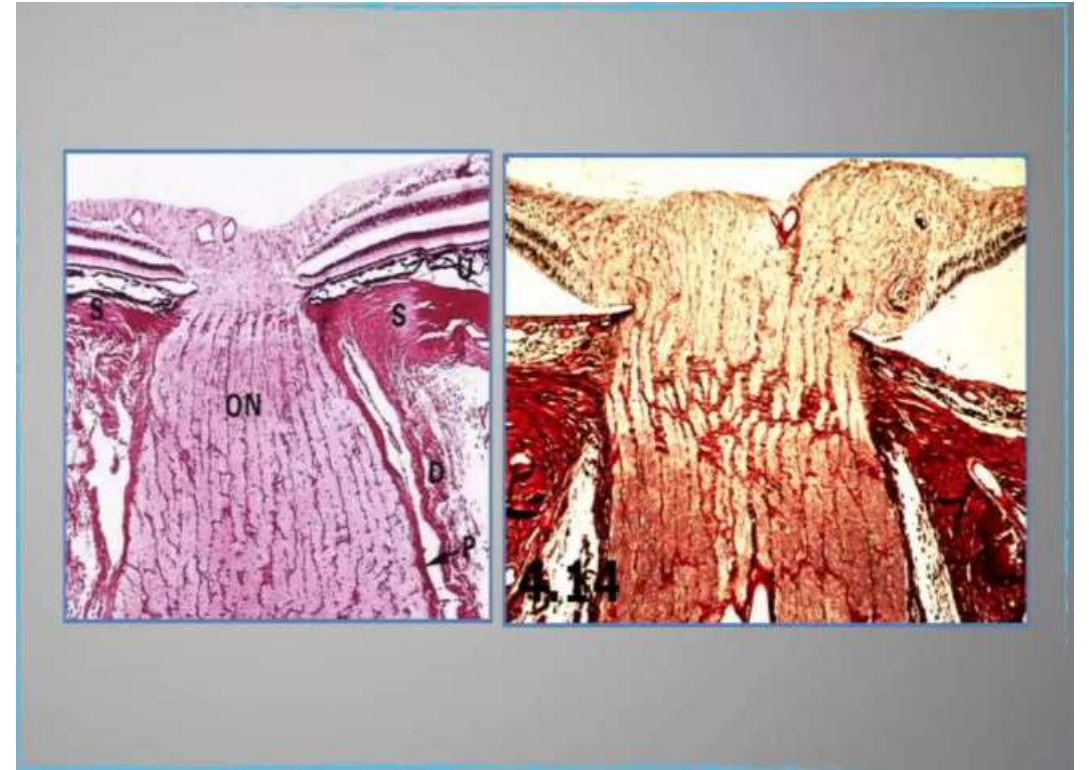
Sensory Retinal changes

- Displacement of retina away from optic disc
- Buckling of the outer layers of retina
- Displacement of rods and cones from their anchor near Bruch's membrane
- Serous RD in peripapillary area



Electron microscopy of axons

- Axonal swelling and accumulation of mitochondria
- Mitochondrial swelling and disruption
- Disruption of fascicles of the microtubules

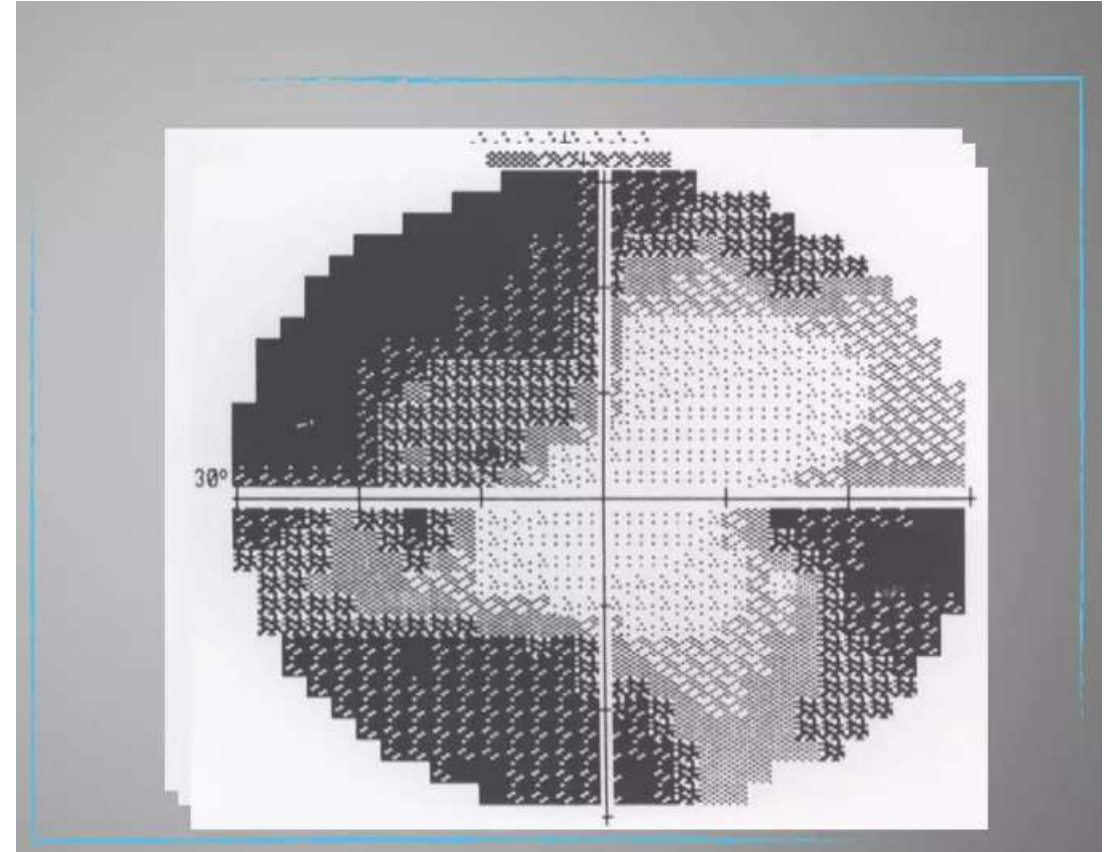


Chronic disc edema

- Degenerative and fibrotic changes in both anterograde and retrograde manner (Hence atrophy may occur anywhere from retinal nerve fiber layer to optic nerve.)

VISUAL FIELD CHANGES

- Enlargement of blind spot
- Earliest loss of visual field commonly involves inferior nasal quadrant
- Peripheral concentric constriction
- Relative scotoma (first to green and red)
- Complete blindness



➤ In all cases visual field changes should be monitored carefully and decompression to be done before peripheral constriction sets in.

Differential diagnosis of Papilledema

- Papillitis
- Pseudo papilledema – Drusen of optic drusen, High Hypermetropia (crowded nerve fibers at disc)
- Optic neuritis
- Tilted optic disc
- Hypoplastic disc
- Myelinated nerve fibers

Investigations

- History and physical examination including BP measurement.
- Fundus examination, assessment of visual acuity, pupillary examination and visual fields.
- MRI with or without contrast is the best investigation of choice

CT Scan

- To rule out – Intracranial lesions and Obstructive hydrocephalus
- Can detect –
- subarachnoid, epidural and subdural hemorrhages
- Acute infarctions
- Cerebral oedema
- Contraindication for MRI

Lumbar puncture

- Therapeutic procedure –
Pseudotumor cerebri
- CSF for microbial
and infectious
studies.
- Diagnostic -
recording opening
pressure

Fundus Fluorescence Angiography (FFA)

Early phase

- Disc capillary dilation
- Dye leakage spots
- Microaneurysm over the disc

Late phase

- Leakage of dye beyond disc margin
- Pooling of dye around the disc

Treatment

- Treatment directed at underlying cause
 - Timely intervention – good prognosis
 - Vision recovery is faster than subsidence of fundus features
 - **Brain tumour** – Craniotomy to remove tumour
- Resolution of papilledema within 6-8 weeks

Pseudotumor Cerebri

Medical – Acetazolamide
oral glycerol
Corticosteroids
Weight reduction

Surgical – Repeated lumbar puncture
Decompression
Shunting procedure

➤ Resolution of papilledema within 2-3 weeks of shunt procedure

Papilledema in PIH

- General – Bed rest
- Control of BP
- Control of oedema – Diuretic, Hypertonic glucose
- Non responders – Termination of pregnancy

Surgical Decompression

Indications

- Failure of Medical treatment – Marked disc swelling (>5 D)
Engorged veins
Extensive haemorrhages
Early exudate spots
Progressive headache
- Progressive optic neuropathy
(early field constriction)

➤ Direct Fenestration of optic nerve sheath

Therapeutic success

- Relief of headache
- Transient visual obscuration decreased
- Stability / improvement of field defects

References

- Papilledema : epidemiology, aetiology and clinical management by M. rigi, Sumayya and adrew lee
- Durcan fj et al : incidence of pseudo motor cerebri
- Parson disease of the eye by Radhika tandon
- Ophthalmology : A.K Khurana