PSEUDOGLAUCOMATOUS OPTIC DISC

Prof. Dr. Abdalla Farag El-Sawy
Professor of Ophthalmology
Faculty of Medicine-Benha University

Dr. Mohamed A. Elwahed Alredy
M.Ophth- Specialist
Benha eye hospital
Elevated IOP

- Disc excavation
- VF changes

No sign of increased IOP

NO other cause of ON disease

Progressive VF LOSS

Cupped discs

NTG

glaucoma
Another clinical scenario

Disc cupping due to other diseases of the optic nerve.

Pseudoglaucoma

- Pseudoglaucoma is defined as false or deceptive glaucoma with or without ocular damage (Birge, 1962).

- Multiple entities can produce "pseudoglaucomatous optic disc" and should have a special attention to differentiate from glaucomatous eyes that behave, at least for a time, as though it did not have glaucoma.
of patients may be misdiagnosed and treated for glaucoma due to misinterpretation of the optic-disc cupping (Piette and Sergott, 2006).
**PSEUDOGLAUCOMATOUS OPTIC DISC**

**Congenital optic disc anomalies**

**Hereditary conditions**
- LHON
- DOA

**Acquired causes**
- Vascular
- Compression
- Inflammatory
- Traumatic

**Congenital optic disc anomalies**

1- Megalopapilla

Enlarged optic discs with no other morphological abnormalities

- Large cup/disc ratio and may be confused with advanced glaucomatous damage

- Normal VF (may be enlarged blind spot)
- Normal daily pressure curve
- Preserved ISNT rule

**Pseudo glaucomatous disc**
2-perivenricular leucomalacia (PVL)

A unique form of bilateral optic nerve hypoplasia

- Large cup
- Thin NRR
- Normal disc size

Large cups can simulate glaucoma

- Normal IOP
- Symmetric inferior VF defect
- History of prematurity

3-Morning glory disc anomaly (MGDA)

- Congenital, funnel-shaped excavation of the posterior fundus that incorporates the optic disc.
- Large anomalous tortuous blood vessels with S-loops.

4-Optic disc coloboma

- Appear as an enlarged, excavated, and sharply demarcated defect with normal retinal vessels appearing at the margin of the excavation.
5-Congenital optic disc pit

- Congenital excavation of the optic nerve head
- Do not change appearance with time
- Poor disc field correlation
- Serous RD

6-Congenital tilted disc

- Oblique insertion of the optic nerve into the globe.
- The relative prominence of one pole give the appearance of rim thinning and raise the suspicion of glaucoma.
- Superior bitemporal visual field defect not respecting vertical meridian.

7-Papillorenal syndrome

- Bilateral anomalous optic disc associated with hypoplastic kidneys
- Normal sized excavated disc
- Cilioretinal vessels emanate from disc periphery
- Absent central retinal circulation

8-Optic disc drusen (ODD)

- Deflection of the blood vessels, causing an irregular branching pattern.
- RNFL loss and VF defect resembles glaucoma.
- No correlation between disc drusen and VF loss
Congenital disc anomalies are common. Childhood onset. VF defects may mimic glaucoma yet DO NOT produce progressive VF defects.

Heredodegenerative optic atrophy
leber’s hereditary optic neuropathy

- Onset 15-30 yrs–65 yr is exceptional
- +ve family history
- central vision affected
- Central, centrocecal VF defect
- Bilateral, temporal, pallor
- cupping in atrophic stage
Dominant optic atrophy

- onset 4-6 yrs
- +ve family history

- central vision affected
- Central, centrocecal VF defect

- Bilateral temporal, pallor
- Deep disc cupping

The most common hereditary optic neuropathy

Acquired causes

Ischemic optic neuropathy

Vascular

- Anterior ischemic optic neuropathy (AION)
  - Cupping is a common end stage
  - Pale NRR, inferior altitudinal field

- Posterior ischemic optic neuropathy (PION)
  - Diagnosis of exclusion
  - Temporal pallor and cupping
Compressive lesions

- Pituitary adenoma
- Suprasellar meningioma
- Craniopharyngioma
- Carotid-ophthalmic A aneurysm
- ICA dilatation
- Graves’ disease

Pallor & excavation

- Age <50 yrs
- Central vision affected
- VF respecting vertical line
- + bitemporal field defect

Inflammatory

- History of acute optic neuritis
- Segmental disc pallor and excavation
- Band disc atrophy

Demyelinating optic neuritis (MS)

Traumatic

- Traumatic optic neuropathy
- Radiation induced neuropathy
- Methanol induced excavation
DIAGNOSIS OF PSEUDOGLAUCOMATOUS OPTIC DISC

The primary distinction between physiologic cupping and pathologic cupping, and the accurate subclassification of eyes with pathologic cupping is of paramount importance (Greenfield, 1999).

- **History**
  - Rapid onset, progression
  - Other neurological symptoms
  - Insignificant family history of glaucoma

- **Demographic data**
  - Age under 50 years

- **Ocular laterality**
  - Suggested unilateral damage

**Examination**

- IOP
- Factors affecting
  - Vision loss not correlated with cupping
  - APD
  - Dyschromatopsia
  - Neurological symptoms
Optic disc evaluation - Five rules (5RS)

- **Sclera Ring** to identify the limits of the optic disc and its size.
- **Size of the Rim**.
- **Retinal nerve fiber layer**.
- **Region outside the optic disc for parapapillary atrophy**.
- **Retinal and optic disc hemorrhages**

**Optic disc characteristics**

- **Cupping is the hallmark**
- **PPA and DH common**
- **Greater vertical oval cupping**

**Glaucomatous**

- **PPA is not common**
- **NRR Pallor and cupping**
- **Temporal thinning of NRR**

**Pseudo glaucomatous**
Visual field characteristics

- NF bundle defects
- Aligned H at meridian
- Non specific at V-H meridian
- Pseudo glaucomatous
- Disc/field correlation
- Poor disc/field correlation

- Vertically aligned defects should raise the suspicion of pseudoglaucomatous optic disc

Neuroimaging

- Loss of central vision or central field
- Rapid progressive visual loss
- Asymmetric or unilateral ON
- NRR pallor
- Hemianopic VF loss

Rapid progressive unilateral VF loss. MRI demonstrate pituitary adenoma
Ancillary diagnostic testing

- Fluorescein angiography
- A/B - scan ultrasonography
- MGDA
- Drusen

Serological evaluation

- ANA → vasculitis
- ESR for cranial arteritis
- DNA analysis for LHON and DOA
- B12, folate, complete blood count (CBC) for nutritional optic neuropathy
- Basic serologic testing for unexplained optic atrophy
- (FTA-ABS) → syphilitic ON
Currently, an outbreak of recent evaluation and imaging techniques has developed and always has recent modalities to abolish that zone of confusion in diagnosis of pseudoglaucomatous optic disc.
Gupta et al. study 2011

Glaucmatous Vs non glaucomatous cupping by OCT

Conclusion
Oct may have the potential to help in decision making (glaucmatous vs nonglaucmatous cupping) When VF is not definitive with progressive cupping and normal IOP.

Old AION
A pale nerve, inferior altitudinal visual field loss, and acquired cupping of the nerve head on OCT and thinning of the retinal nerve fiber layer (Randy and Susan, 2004).
Confocal scanning laser ophthalmoscopy (CSLO)

Heidelberg retina tomography (HRT)

- CSLO is the imaging technology and HRT is the major commercially available instrument that utilizes this imaging system to study the eye.
- CSLO is capable of obtaining three-dimensional images of the optic disc by acquiring high resolution images.

HRT

Sampaolesi and Sampaolesi 2001

ONH
Megalopapilla Vs Glaucoma
By HRT parameters
- there was a statistically highly significant difference in terms of disc area, rim area and rim volume, while the difference is less significant in terms of cup area and cup volume and there is no significant difference as regards cup shape measure.
Scanning laser polarimetry (SLP)

- **SLP** provides objective measures of the RNFL by measuring the change in polarization (retardation) that occurs when light illuminates birefringent tissue, such as the RNFL.

**Conclusion**

- **Mind association** between increased cupping and glaucoma should be changed.

- **A special attention** should be given to pseudoglaucomatous optic disc cupping that may produce a zone of confusion, and is considered as a daily challenging diagnostic dilemma for glaucoma specialist because of optic disc appearance without an elevated IOP.
Thank you