Optic Neuropathy: Investigations

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Optic Neuropathy

- Diminution of vision
- Color vision deficit
- Central scotoma
- Relative afferent pupillary defect
- Swollen, pale or normal optic disc
Investigations

Check:
- Color vision .................. (Pseudoisochromatic plates)
- Visual field .................. (Automated perimetry)
- Optic nerve conduction ...... (Visual evoked potential)
- Optic nerve imaging .......... (Fundus photo, OCT, MRI, CT)
- Specific tests & procedures

Color Vision Testing

Pseudoisochromatic plates:
- Designed for screening congenital color vision deficiency.
  - composed of dots of different colors and sizes. Some of the dots form symbols like numbers, shapes or winding lines.
  - The symbol and background dots seem isochromatic to color deficient people, so they can't differentiate them. Normal persons can detect the color difference and recognize the symbols.
Color Vision Testing

Rt Eye: ?/12    Lt Eye: ?/12
Visual Field Testing

1. Defects extend from blind spot:
   = Nerve fiber bundle defects
   (pre-chiasmal lesions)

2. Defects extend from fixation:
   = Hemianopia
   (chiasmal & retro-chiasmal lesions)
Visual Field Testing

Nerve Fiber Bundles

Visual Field Testing

Nerve Fiber Bundle Defects
Visual Field Testing
Visual Evoked Potential

Indications:

- **Sub-clinical** optic neuropathy with apparent normal examination

- **Occult** visual pathway dysfunction in patients with multiple sclerosis.

Visual Evoked Potential (VEP)
Normal Pattern VEP

Abnormal Pattern VEP
Fundus Photo
OCT

- Evaluation of optic disc
- Evaluation of nerve fiber layer thickness
OCT
Neuroimaging

Indications:
- Optic neuritis, MS
- Atypical optic neuritis
- Traumatic optic neuropathy
- Optic atrophy (with no history of hereditary, ischemic or toxic etiology)
Neuroimaging

- MS

A typical optic neuritis
Neuroimaging

- Traumatic optic neuropathy
### Specific Tests & Procedures

- **Blood glucose, lipid** .......................... (*non-arteritic AION*)

- **CBC, ESR, CRP, STA biopsy** ............. (*arteritic AION*)

- **CBC, ESR, CRP, serological testing, tuberculin test, blood cultures** ....................................................... (*infectious optic neuropathy*)

- **Spinal tap** ............................................ (*infiltrative optic neuropathy*)

- **Gene mutation study** ......................... (*LHON*)

- **Vit B12** .............................................. (*nutritional optic neuropathy*)
Conclusion

- Ophthalmic investigations are important for diagnosis and follow up of patients as well as documentation of patients’ conditions.

- Investigations for optic neuropathy include color vision and visual field testing, neuroimaging, fundus photography and OCT of the optic nerve.

- Good utilization of investigations saves time, effort and money for patients and preserves clinical resources.

Thank you