



# Papilloedema

## DESCRIPTION

Papilloedema is defined as 'swelling of the optic nerve head secondary to raised intracranial pressure' (RICP). (When intracranial pressure is not raised, the appropriate term is 'disc swelling' or 'disc oedema'.) Although the mechanism is imperfectly understood, experiments suggest that RICP is transmitted through the optic nerve sheath, compressing nerve fibres particularly at the lamina cribosa, where the optic nerve passes through the sclera. This impairs intracellular transport within nerve axons (axoplasmic stasis) resulting in leakage and swelling, vascular obstruction and dilatation, and eventual retinal and optic nerve ischaemia.

## CAUSES OF RAISED INTRACRANIAL PRESSURE

- Intracranial space-occupying lesions (for example, tumour, haemorrhage, abscess)
- Cerebral oedema from head trauma
- Increased cerebrospinal fluid (CSF) production (for example, choroid plexus tumour)
- Decreased CSF absorption (for example, meningitis, subarachnoid haemorrhage)
- Obstruction of CSF flow within the central nervous system (congenital or acquired)
- Increased cerebral blood volume (vascular malformations)
- Obstruction of cranial venous outflow (for example, venous sinus thrombosis)
- Pseudotumour cerebri.

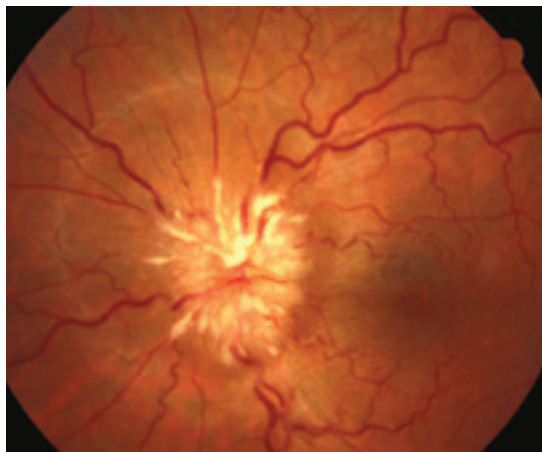
## SYMPTOMS

Transient visual obscurations (for example, dimmed vision lasting seconds) are common with early papilloedema. RICP classically produces headache, nausea and vomiting, which is most severe in the morning. The conscious state may also be affected, particularly with severe or sudden increases in intracranial pressure. Double vision with sixth nerve palsy is a non-specific feature of intracranial pathology.

## SIGNS

Differentiating papilloedema from 'pseudopapilloedema':

- Visual acuity is usually intact with early papilloedema. It is usually



Hyperaemic disc swelling, cotton wool spots affecting axons, small haemorrhages, surrounding ring of retinal oedema

affected acutely in several other differential diagnoses (for example, optic neuritis, arteritic ischaemic optic neuropathy)

- Optic disc morphology is informative to the experienced clinician. For example, with optic disc drusen, the disc margin may be irregular, with effacement of the optic cup and abnormal branching of blood vessels. Peripapillary haemorrhages, exudates and cotton wool spots are common with papilloedema
- Venous pulsation at the disc is present in approximately 80 per cent of normal eyes, and absent in 20 per cent. The presence of venous pulsation suggests that raised CSF pressure is unlikely.
- Symmetry. While often asymmetrical, papilloedema is almost always bilateral. (As a rare counter-example, optic atrophy may prevent disc swelling in one eye despite RICP.)

Clinical features of papilloedema are described in more detail in the next condition, 'Papilloedema – Evolution and sequelae'.

## SIGNIFICANCE

Many causes of RICP are potentially life-threatening and require urgent evaluation. Untreated papilloedema can result in optic atrophy and permanent loss of vision.

## DIFFERENTIAL DIAGNOSIS

Optic disc drusen, Myelinated nerve fibres, Hypertensive retinopathy (malignant hypertension), Anterior ischaemic optic neuropathy, Optic neuritis,

Neuroretinitis, Diabetic papillopathy, Central retinal vein occlusion, Intraocular lymphoma, Intraorbital tumours.

## SEE ALSO

Papilloedema – Evolution and sequelae, Pseudotumour cerebri, Chorioretinal folds and Retinal folds.

## MANAGEMENT

Treatment is needed for the underlying cause of the papilloedema.

## Urgent, additional investigations, blood tests

Urgent imaging of the brain and optic nerves is required (computed tomography and/or magnetic resonance imaging). Following imaging studies, lumbar puncture may be performed to confirm elevated intracranial pressure, and for CSF analysis. Other blood tests will be influenced by the clinical presentation.

The full series of these articles will be available in the book *Posterior Eye Disease and Glaucoma A-Z* by Bruce AS, O'Day J, McKay D and Swann P. £39.99. For further information click on the Bookstore at [opticianonline.net](http://opticianonline.net)

- **Adrian Bruce** is a Chief Optometrist at the Victorian College of Optometry and a Senior Fellow, Department of Optometry and Vision Sciences, The University of Melbourne.
- **Justin O'Day** is an Associate Professor in the Department of Ophthalmology, The University of Melbourne and Head Of Neuro-Ophthalmology Clinic, Royal Victorian Eye and Ear Hospital.
- **Daniel McKay** is a Medical Officer at the Royal Victorian Eye & Ear Hospital.
- **Peter Swann** is Associate Professor in the School of Optometry, Queensland University of Technology.