Importance of neuroimaging in normal tension glaucoma

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Key words: Magnetic resonance imaging, normal tension glaucoma, primary empty sella

Primary empty sella syndrome (PESS) is caused by an increase in the cerebrospinal fluid (CSF) pressure or a defect in the diaphragma sellae, where the pituitary gland is absent or present as a thin membrane. Optic nerve examination and visual field analysis show glaucomatous changes with normal intraocular pressures (IOPs).

A 51-year-old male weighing 65 kg presented with gradual progressive painless diminution of vision in both eyes for 1 year with no significant medical or other histories. Best-corrected visual acuity (BCVA) oculus dexter (OD) was 6/18. Intraocular pressures (IOPs) were normal. A relative afferent pupillary defect in the right eye (RE) was found. Color vision was defective. Gonioscopy revealed open angles in both eyes. Pachymetry was in the normal range. Fundus examination OD revealed a 0.7-cup disc ratio and in OS 0.8-cup disc ratio, with both eyes showing bayonetting, baring of circumlinear vessels, and nasalization of blood vessels, with rim pallor more than cupping suggesting neuroophthalmic cause [Fig. 1].

Two hourly diurnal fluctuations ranged normal. Visual field examination showed severe generalized depression,
tubular field and absence of split fixation in the left eye (LE) [Fig. 2].

All systemic investigations were within normal limits.

Magnetic resonance imaging revealed an empty sella [Fig. 3] and venography was non-significant.

Normal tension glaucoma (NTG) is a diagnosis made after excluding causes of burnout glaucoma and previous episodes of acute hemodynamic disturbances. In PESS, nerve fibers in optic chiasm are perfused from the posterior communicating arteries, which pass round the infundibulum above the
pituitary gland. If any mechanical changes occur near the pituitary or sella turcica, the arachnoid may be drawn inferiorly simultaneously pulling the optic chiasm and perfusion vessels downward with resultant optic nerve ischemic changes.\textsuperscript{[3]} We need to remember this association between empty sella, NTG and resultant visual loss.\textsuperscript{[4]} Hence, it becomes necessary to include neuroimaging as an added diagnostic tool in our armamentarium for NTG to avoid diagnostic delay and prevent visual disability.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

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