Dear Editor,

Peripapillary wrinkle (PPW) also known as Paton’s line is an important clinical finding in cases of idiopathic intracranial hypertension (IIH). There is a possibility of PPWs getting missed on routine fundus examination and colored fundus photography (CFP). We herewith report a case of IIH in which the PPWs were picked up on multicolor imaging (MCI) which was otherwise missed on CFP. To the best of the authors’ knowledge, this is the first report describing the MCI characteristics of PPWs.

A 34-year-old woman who was a diagnosed case of IIH was referred by the neurologist for a complete neuro-ophthalmic work-up. Her best-corrected visual acuity in both eyes was 20/20 with normal color vision and normally reacting pupils. Her anterior segment examination was within normal limits. Fundus examination showed resolving disc edema in both the eyes with very mild obscuration of vessels at the disc margin. Color fundus photograph (CFP) of the right eye showed subtle obscuration of vessels [Figure 1a]. However composite image of MCI showed fine greenish hyper-reflective radial PPWs arising from the disc in the right eye [Figure 1b] which was more pronounced in the blue reflectance (BR) image [Figure 1c]. Optical coherence tomography (OCT) of the right eye did not reveal any retinal folds [Figure 1d]. CFP of the left eye showed mild obscuration of the vessels at the disc margin [Figure 2a]. However composite MCI displayed greenish hyper-reflective radial and concentric PPW arising from the disc and its temporal portion respectively [Figure 2b], which were more pronounced in BR images [Figure 1c]. These temporal concentric PPWs in the left eye were well picked up by the OCT as tightly packed projections in retinal nerve fiber layer [Figure 1d]. The findings were documented and the patient was referred back to the neurologist along with all relevant findings for further management.

Chorio-retinal folds are well known to be associated with IIH. These folds are clinical manifestations of stress and strain on the optic nerve head and the surrounding structure induced by raised intracranial tension.\(^1\) Although these folds are pronounced in cases with severe papilloedema, they can be seen even with mild or no papilloedema.\(^2\) Sibony et al.\(^3\) described four types of folds in IIH patients—PPWs also referred to as Paton’s line, outer retinal folds (ORFs), inner retinal folds (IRF) and choroidal folds (CF). They also described the association between the type of folds and structural parameters of optic nerve head. PPWs were found to be associated with higher grade of papilloedema; CF with anterior deformation of peripapillary retinal pigment epithelium/basement membrane layer, while RF were found to be associated with both.\(^4\)

The major ocular morbidity associated with IIH is loss of visual function. Although the vision loss is mild in approximately 86% of case, approximately 10% of cases can develop

**Figure 1:** (a) Color fundus photo (CFP) of the right eye showing mild obscuration blood vessels at disc margin (black arrow). (b) Composite Multicolour imaging (MCI) of the right eye showing radial peripapillary wrinkles (PPW) (black arrow). (c) PPW more pronounced in blue reflectance (BR). (d) OCT raster imaging of optic nerve head (ONH) did not show any folds in retinal nerve fibre layer

**Figure 2:** (a) CFP of left eye showing subtle obscuration of vessels at disc margin (black arrow). (b) MCI of left eye showing radial PPW (black arrow, thick) and concentric PPW (black arrow, thin) (c) PPWs more pronounced in BR (black arrows). (d) OCT raster imaging of optic disc showing concentric PPW as tightly packed projection in retinal nerve fibre layer temporal to disc (white arrow)
profound visual loss.\[5\] These folds are indicative of increasing stress on the optic nerves and might serve as an indicator for intervention or change in the ongoing management.\[1\]

Sibony et al.\[3\] reported that these folds could be detected in only 43% of the cases using CFP possibly due to slight offset in the photographic plane of focus or obscuration of folds by superficial nerve fiber layer edema. Spectral-domain OCT (SD-OCT) appears to be more sensitive in detecting folds than CFP but SD-OCT is prone to artifacts (irregular shadow of blood vessels, small z-axis movement of eye) which may simulate folds.\[3\]

MCI is a non-invasive retinal imaging technique available in the Spectralis OCT platform (Heidelberg Engineering, Heidelberg Germany). It simultaneously acquires three reflectance images using three different lasers and a composite multicolor image is produced for analysis.

MCI characteristics of PPWs have never been described in the literature. In composite MCI images they appear as greenish hyper-reflective fine radial folds arising from the disc radially (radial PPW) [Figures 1b and 2b] and relatively broader greenish hyper-reflective folds concentric to the optic disc mostly located temporally (concentric PPW) [Figure 2b]. These PPWs are best seen in BR images as it best focuses on inner retina and vitreo-retinal interface [Figures 1c and 2c]. The present report highlights the potential of MCI in detecting and delineating PPWs better than CFP and OCT. MCI can be considered as a future imaging tool for retinal imaging in cases of IIH.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

Sweksha Priya, Md. Shahid Alam
Departments of Pediatric Ophthalmology and Neuroophthalmology, 'Orbit, Oculoplasty, Reconstructive and Aesthetic Services, Aditya Birla Sankara Nethralaya (A Unit of Medical Research Foundation, Chennai), Kolkata, West Bengal, India

Address for correspondence: Dr. Md. Shahid Alam, Department of Orbit, Oculoplasty, Reconstructive and Aesthetic Services, Aditya Birla Sankara Nethralaya, Kolkata - 700 099, West Bengal, India. E-mail: mshahidalami@gmail.com

References
1. Friberg TR. The etiology of choroidal folds. A biomechanical explanation. Graefes Arch Clin Exp Ophthalmol 1989;227:459-64.
2. Jacobson DM. Intracranial hypertension and the syndrome of acquired hyperopia with choroidal folds. J Neuroophthalmol 1995;15:178-85.
3. Sibony PA, Kupersmith MJ, OCT substudy group of the NORDIC idiopathic intracranial hypertension treatment trial. “Paton’s Folds” revisited: Peripapillary wrinkles, folds, and creases in papilledema. Ophthalmology 2016;123:1397-9.
4. Sibony PA, Kupersmith MJ, Feldon SE, Wang J-K, Garvin M, OCT substudy group for the NORDIC idiopathic intracranial hypertension treatment trial. Retinal and choroidal folds in papilledema. Invest Ophthalmol Vis Sci 2015;56:5670-80.
5. Wall M, George D. Idiopathic intracranial hypertension: A prospective study of 50 patients. Brain 1991;114:155-80.