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CASE REPORT

Use of MP-1 microperimetry in optic disc pit and secondary retinoschisis

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Abstract The optic nerve head pit is a congenital anomaly of the optic disc due to imperfect closure of the superior edge of the embryonic fissure. We studied in detail by means of fluorescein angiography (FLA), microperimetry (fundus related perimetry), and ocular coherence tomography (OCT) the case of a 30-year-old woman who had an optic pit with secondary retinoschisis in her right eye.

Keywords Optic pit · Microperimetry (MP-1) · Retinoschisis · Optical coherence tomography

Introduction

The pit of the disc is a congenital anomaly of the optic disc due to imperfect closure of the superior edge of the embryonic fissure [1]. We investigated by means of MP-1 (Nidek Technologies) microperimetry, fluorescein angiography (FLA), and ocular coherence tomography (OCT) a case of optic nerve head pit and secondary retinoschisis.

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Materials and methods

A 30-year-old woman presented with a 2-year history of blurred vision in her right eye. She underwent a complete ophthalmological examination, which consisted of fundus biomicroscopy, FLA, microperimetry (fundus related perimetry), and OCT.

Results

Her best-corrected visual acuity was 0.1 in the right eye and 1 in the left eye. Fundus biomicroscopy of the right eye revealed a large, asymmetric optic nerve head, with a grey oval pit at the temporal margin and a brownish rim on the temporal side, with signs of schisis-like retinal detachment. The papillomacular bundle was darker compared with the other quadrants owing to severe retinal nerve fibres layer (RNFL) loss, as can be seen in Fig. 1. Fundus examination of the left eye was unremarkable.

Horizontal cross-sectional OCT image (Fig. 1a) showed an optic disc pit with secondary retinoschisis extending from its temporal side. Vertical cross-sectional OCT (Fig. 1b) image showed signs of macular schisis-like. Linear OCT (Fig. 1c) disclosed a significantly reduced thickness of retinal nerve fibres layer (RNFL) in the temporal quadrant (11 μm) of the optic nerve in the right eye. The size of the optic disc was significantly larger when compared with the mean size (1.76 mm) in normal eyes, reducing the mean RNFL density.

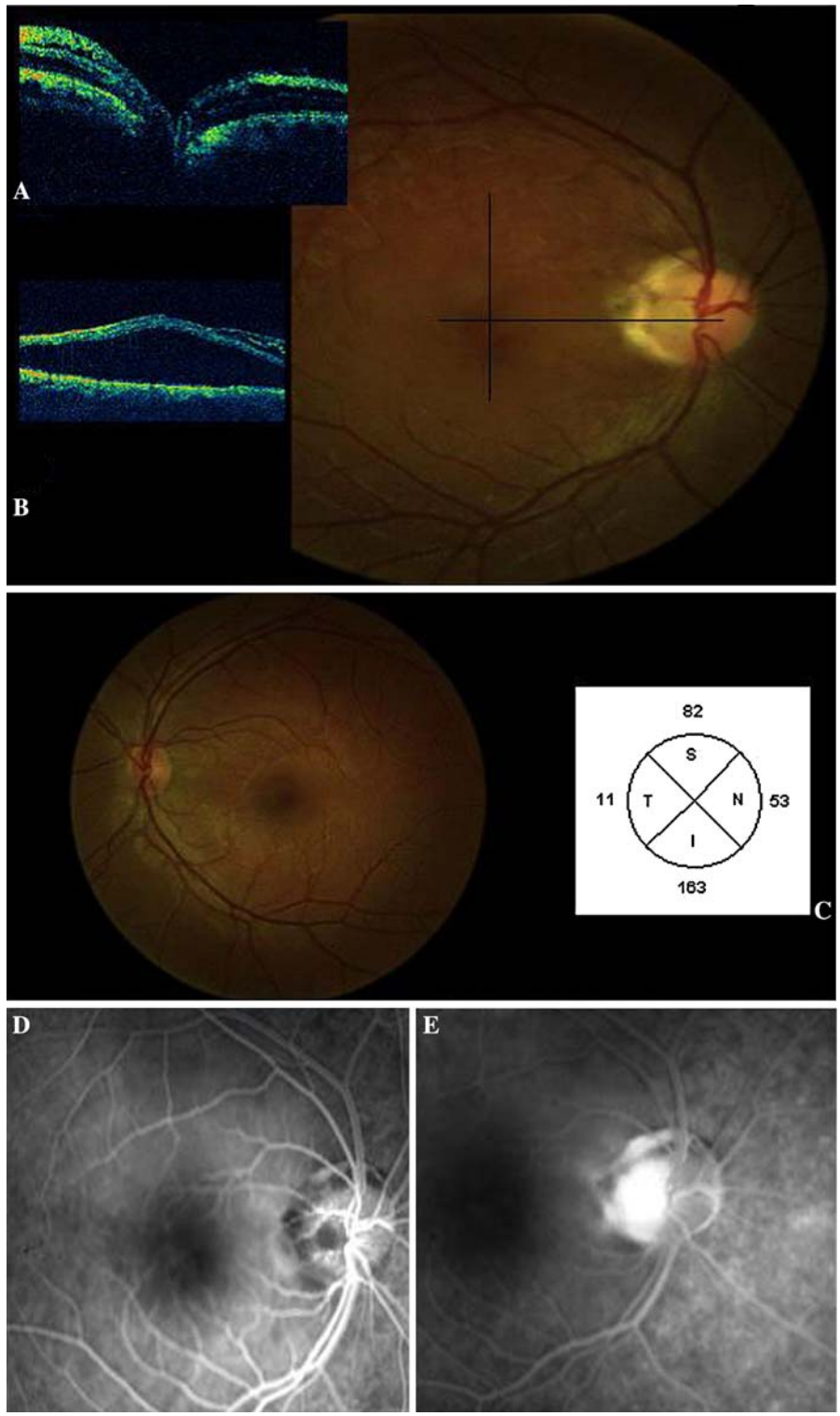

Fig. 1 Correlation between retinography, OCT scans, and FLA in optic pit. The black lines indicate the location of the corresponding areas of OCT scans

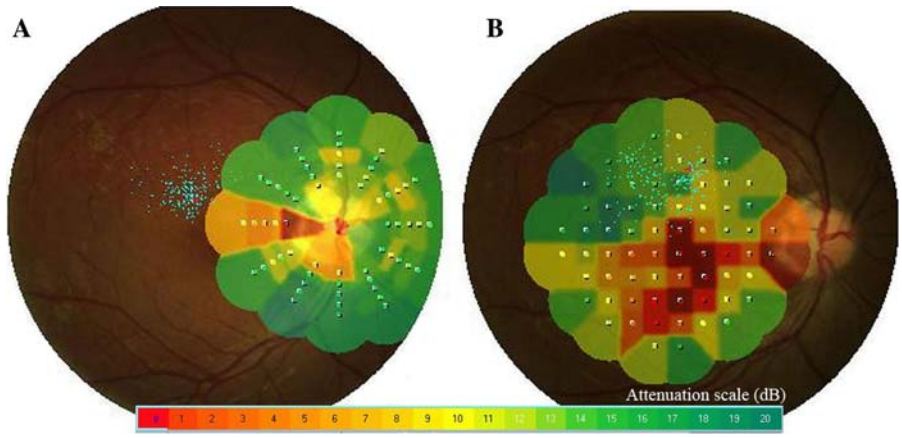

Fig. 2 Microperimetry in optic pit

FLA (Fig. 1d) showed early fluorescence blockage in the temporal area adjacent to the disc, no choroidal or retinal leakage, but optic disc "late staining" or hyperfluorescence (Fig. 1e) due to the presence of fluid that had leaked into the optic pit in the right eye; the left eye was unremarkable.

MP-1 microperimetry (Humphrey 10-2 program, Goldmann III stimuli, 4-2 strategy on 68 points, 1° single cross-fixation target) of the right eye (Fig. 2a) disclosed a central, large inferior arcuate scotoma (which was perceived as a central and superior scotoma by the patient), which was absolute in the central area and relative around, and an unstable fixation plot directly over the scotoma; MP-1 microperimetry (peripapillary program, 4-2 strategy, 12 rays of five points, Goldmann III stimuli, 1° single cross-fixation target) (Fig. 2b) revealed low retinal sensitivity near the optic disc at the 9 o'clock position in the temporal quadrant due to the severe RNFL loss and anatomical location of the optic pit. The stimulus attenuation ranged from 0 to 20 dB with Goldmann-type size, as described in the colored scale in Fig. 2. Fixation was unstable; 31% of the fixation points were inside the 2° diameter circle and 67% were inside the 4° diameter circle.

Discussion

This is the first study which compares retinography, OCT, and FLA and analyzes a case of optic pit by means of microperimetry. Our case contribution was limited by the study of one case at only one time period. Fundus-controlled perimetry allows a detailed and precise, point-to-point correspondence between the fundus image and the perimetric results of the vision-threatening macular changes associated with optic disc pits that cannot be obtained by means of projection perimetry. Follow-up of these findings with microperimetry, OCT, and FLA could provide further information on the still obscure nature of this fluid collection.

Reference

1. Meyer CH, Rodrigues EB, Schimdt JC (2003) Congenital optic nerve head pit associated with reduced retinal nerve fibre thickness at the papillomacular bundle. Br J Ophthalmol 87:1300–1301