



## A case of extrafoveal focal choroidal excavation

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### ABSTRACT

**Purpose:** To describe an extrafoveal presentation of focal choroidal excavation and corresponding imaging findings.

**Methods:** Retrospective case report.

**Patients:** Single patient with diagnosis of extrafoveal focal choroidal excavation.

**Results:** A 28-year-old man was referred for evaluation of a suspicious lesion in his right posterior fundus. Functional examination demonstrated best-corrected visual acuity of 20/40 in the right eye and 20/20 in the left eye. Ophthalmoscopy exam and fundus photography revealed a yellowish lesion superior to the fovea of the right eye. The lesion was hyperfluorescent on fundus autofluorescence imaging and late phase fluorescein angiography demonstrated staining of the lesion without leakage. Optical coherence tomography (OCT) of the lesion was consistent with focal choroidal excavation. Five months after presentation, the patient's vision, exam, and imaging remained stable.

**Discussion:** Focal choroidal excavation is a recently recognized clinical entity that is often incidentally found, and presents asymptomatic or with mildly decreased visual acuity in the affected eye. It has characteristic findings on optical coherence tomography (OCT) that can be used to distinguish it from other retinal lesions that may appear similar on ophthalmoscopy. We present the case of an uncommon extrafoveal presentation of FCE at a relatively young age, which may represent either a congenital abnormality or the sequelae of an unidentified chronic process. While most FCE remain stable, patients are often followed for lesion progression and the possibility of choroidal vascular pathology which might necessitate intervention.

### 1. Introduction

First described by Jampol in 2006, focal choroidal excavation (FCE) is an idiopathic choroidal excavation either in the macula or the periphery of the retina, identified through characteristic appearance on optical coherence tomography (OCT).<sup>1</sup> On fundoscopic examination, a small yellowish lesion may be present, though these are not always appreciable.<sup>2</sup> Many cases of FCE are asymptomatic and found incidentally on routine examination. However, further investigation, such as fluorescein angiography (FA), may be required to further characterize the lesion and evaluate for the presence of choroidal neovascular changes, which might necessitate further intervention. Here we report the case of a patient with an extrafoveal FCE that presented with visual acuity changes.

### 2. Case report

A 28-year-old male was referred to our center for a suspicious lesion in the right fundus found incidentally during a routine eye exam. The patient reported subjectively decreased vision in the right eye noted two years prior to presentation. The patient did not have metamorphopsias or changes to color vision. His best corrected visual acuity was 20/25–2 (LogMAR = 0.1) in the right eye and 20/20 (LogMAR = 1) in the left. The patient's refraction was −1.50 sphere in the right eye and plano −0.50 × 90 in the left. Intraocular pressure was 11 mm Hg in both eyes. The external and anterior segment exams were within normal limits bilaterally. Examination of the right fundus demonstrated a yellowish lesion with pigmentary changes in the superior macula adjacent to the superior arcades (Fig. 1A). Fundus autofluorescence revealed a hyperfluorescent region co-localized with the retinal lesion (Fig. 1B).

Fluorescein angiography of the right eye demonstrated staining of

*Abbreviations:* FCE, Focal choroidal excavation; FA, Fluorescein angiography; OCT, Optical coherence tomography.

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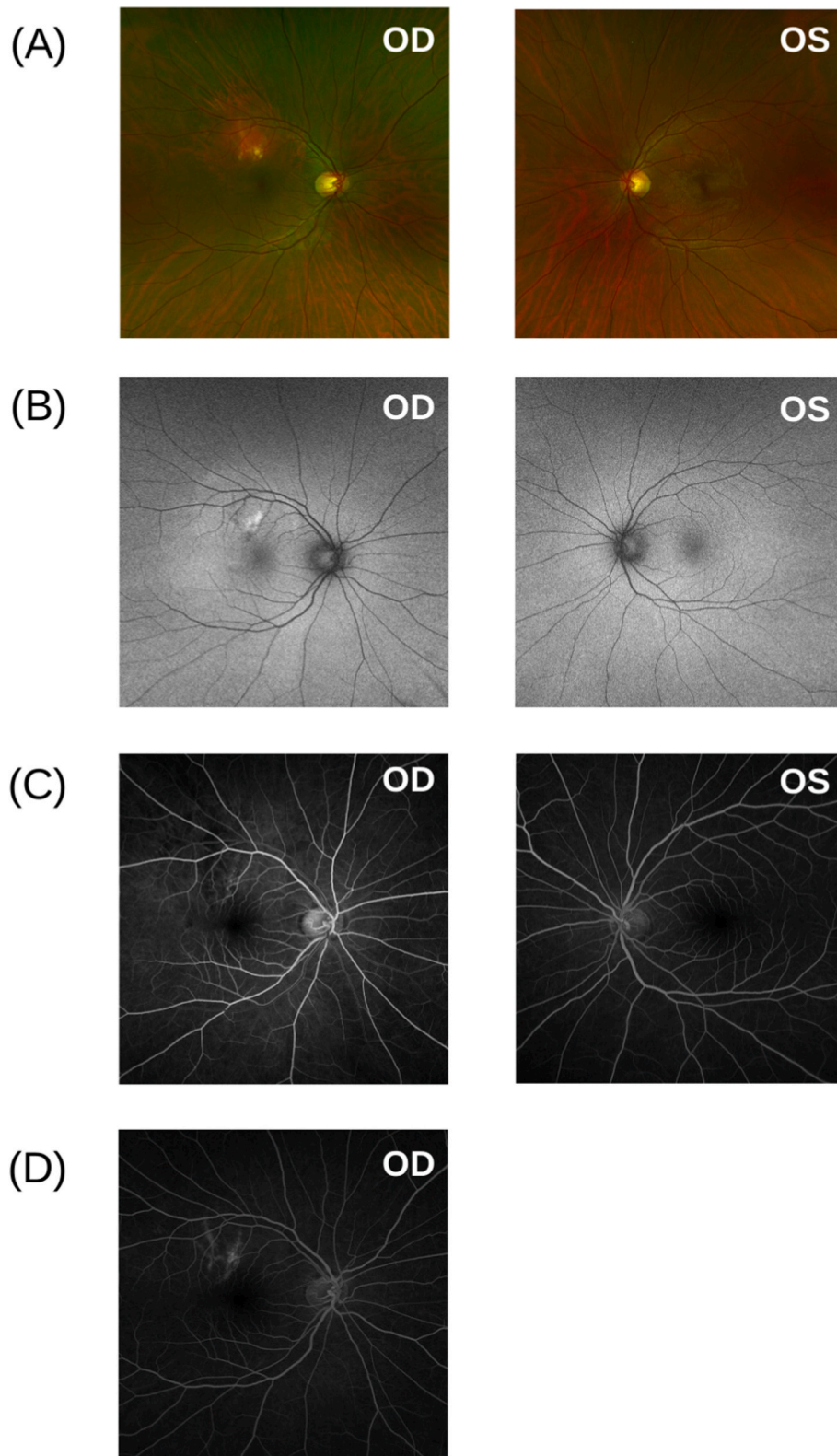
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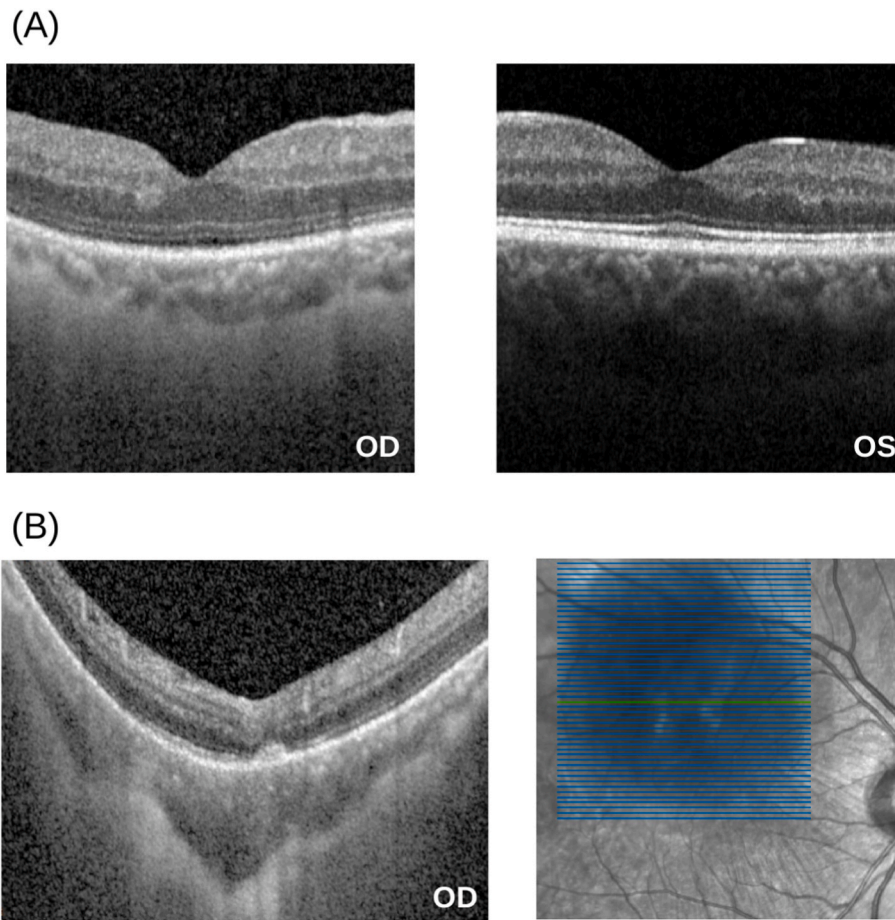
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**Fig. 1.** Imaging findings of FCE. (A) Color fundus photographs taken on Optos platform. (B) Fundus autofluorescence imaging (C) Early-phase fluorescein angiography (D) Late-phase fluorescein angiography. OD: right eye; OS: left eye. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)



**Fig. 2.** OCT scan of the fovea and retinal lesion. (A) Foveal OCT of both eyes without choroidal excavation (C) Extrafoveal section showing irregular conforming FCE in the patient's right eye.

the lesion, without leakage (Fig. 1C and D). OCT of the right eye demonstrated an area of choroidal excavation and scleral ectasia under the neurosensory retina superior to the fovea, with a normal foveal contour (Fig. 2). The excavation measured  $500\mu\text{m}$  at its maximum depth. There was mild choriocapillaris compression inferotemporal to the lesion but not elsewhere. There was pachychoroid on imaging. Humphrey visual field 24-2 demonstrated full visual fields bilaterally. No interventions were pursued based on the findings.

On follow up examination five months after initial presentation, the patient's vision was stable. The retinal lesion was unchanged on exam and imaging.

### 3. Discussion

Focal choroidal excavation (FCE) refers to a concavity of the choroid without local scleral changes that is often identified through a characteristic appearance on optical coherence tomography (OCT).<sup>1</sup> The etiology of FCE remains under active investigation. While most cases of FCE are thought to be congenital, several instances of secondarily acquired FCE have been reported.<sup>3</sup> In many eyes with FCE, areas of choroidal thickening and dilated choroidal vasculature may be present, suggesting that FCE may be a manifestation of the pachychoroid spectrum.<sup>4</sup> Other associations have also been described, including myopia, bestrophinopathy, Epstein-Barr virus (EBV) infection and multiple evanescent white dot syndrome (MEWDS).<sup>2,5,6</sup> FCE is usually located unilaterally within the fovea; although they have also been reported to present extrafoveally, similar to this case.

Many patients are asymptomatic or with mild visual symptoms upon diagnosis, and the lesion is found incidentally on routine examination.

In one case series of 37 eyes from 32 patients with FCE, 60% (18/32) complained of visual disturbances, either metamorphopsia, central scotoma, or decreased visual acuity.<sup>7</sup> In another, 77% (17/22) patients complained of visual symptoms with 23% (5/22) being asymptomatic.<sup>8</sup>

High resolution OCT remains the gold standard for diagnosis of FCE, and various OCT modalities including spectral-domain enhanced-depth and swept-source have been used to establish a diagnosis of FCE.<sup>9-11</sup> Angiography may be utilized to assess for choroidal neovascular changes that may require targeted management to prevent vision-threatening complications.<sup>10</sup> Degeneration of the retinal pigment epithelium may also be detected on angiography and may portend a worse visual outcome. If adequate scleral visualization cannot be accomplished by OCT, contact b-scan ultrasonography may be used.<sup>11</sup>

The majority of FCE remain stable over time, and observation without treatment is recommended for patients without choroidal neovascularization or neovascular membrane. Any vascular proliferation at the site of the FCE can be managed with further intervention, such as focal laser photocoagulation, anti-VEGF agents, verteporfin photodynamic therapy, or cryotherapy. If there is expansion, a thorough investigation for any ongoing secondary causes should be performed and any identified causes managed directly.

### 4. Conclusions

This case highlights the presentation of an atypical extrafoveal localization of FCE. Given the relative paucity of information regarding this clinical entity, the authors advocate for careful examination and follow-up to track the evolution of FCE. Careful monitoring is essential in isolating any latent secondary processes, as well as treating any

vision-threatening complications that may arise from the FCE itself such as neovascular membrane formation.

#### Patient consent

This research has been deemed exempt from IRB review by the Human Investigation Committee. All research adhered to the tenets of the Declaration of Helsinki.

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