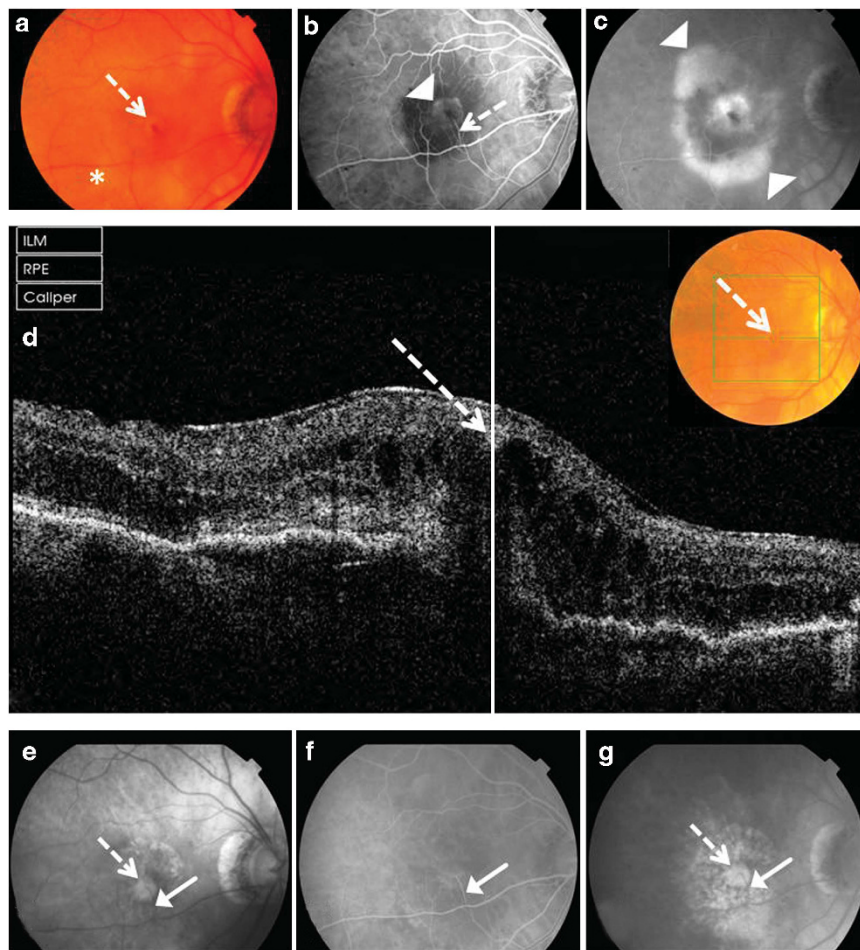


Sir,  
**Imaging retinochoroidal anastomosis via  
 spectral-domain optical coherence tomography**

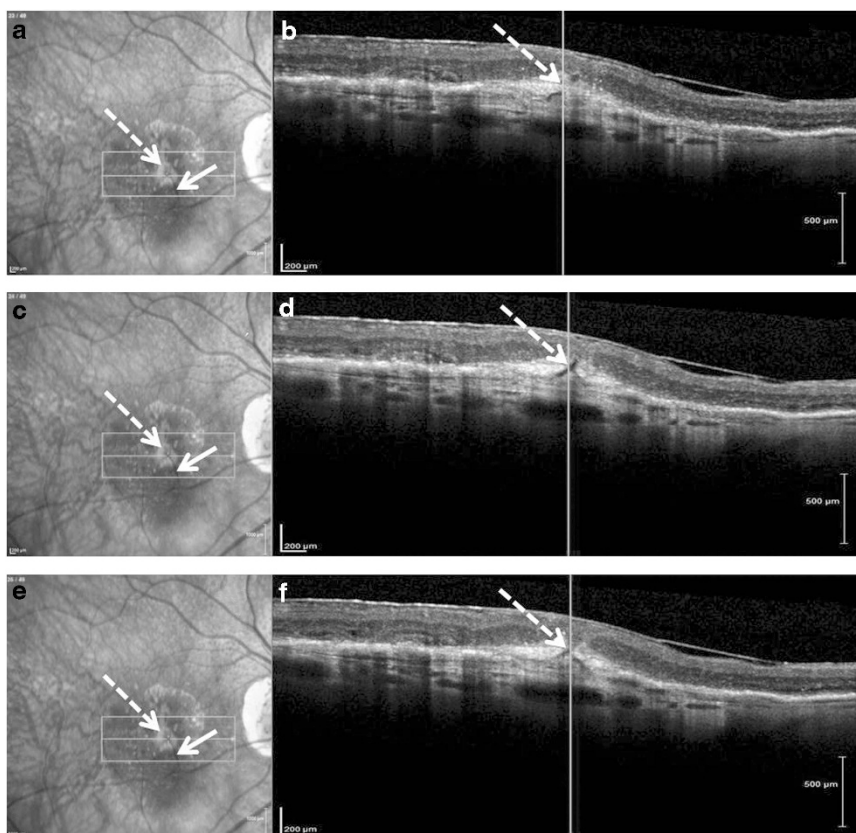
The retinochoroidal anastomosis represents a communication between the retinal and choroidal circulation and is described in a subset of patients with neovascular age-related macular degeneration (AMD).<sup>1</sup>

**Case report**

We present the spectral-domain optical coherence tomography (SD-OCT) features of an 83-year-old Caucasian lady with retinal angiomatous proliferation (RAP) in her right eye (OD). This was treated with intravitreal ranibizumab injections. SD-OCT imaging was performed using both a Topcon Medical Systems, Inc. (Oakland, NJ, USA) (3D OCT 1000) and a Heidelberg Engineering Spectralis Imaging System (Carlsbad, CA, USA).



**Figure 1** The color fundus, red-free, FA and SD-OCT images of the right eye (OD) obtained before (a to d) and (e to g) after treatment with intravitreal ranibizumab. (a) The color fundus image shows an area of pre-retinal and intra-retinal hemorrhage close to fovea (white arrow) with adjoining retinal elevation and streaks of exudate infero-temporal to fovea (white asterisk). (b) The early-transit FA at 0.30 min shows the blocked fluorescence with adjoining hyperfluorescence from subretinal neovascularization (SRN) (white arrow head) and surrounding hypofluorescence. The white arrow points toward the branch retinal arteriole. (c) The late-transit FA at 4.23 min shows the further increase in the hyperfluorescence from SRN with late hyperfluorescence from filling of a retinal pigment epithelial detachment (PED) (white arrow heads). (d) SD-OCT B-scan shows the elevation of the retinal pigment epithelium (PED) with the presence of the intra-retinal fluid and shadowing resulting from the intra-retinal hemorrhage (white arrow). The B-scan is colocalized with the color fundus image (top right) and the arrow points to the retinal hemorrhage. These findings were suggestive of retinal angiomatous proliferation (RAP) OD. (e) The red-free image shows a round lesion (white dashed arrow) just inferior to fovea with a branch retinal arteriole (white solid arrow) seen penetrating into it. (f) The early-transit FA image obtained at 0.30 s shows filling of the branch arteriole with mild adjacent hyperfluorescence. (g) The late-transit images obtained at 5.04 s shows staining from the scar (white dashed arrow) with adjacent window defects from retinal pigment epithelial atrophy and the branch retinal arteriole (white solid arrow). These findings were suggestive of an inactive choroidal neovascular membrane and scar formation (white dashed arrow) with a branch retinal arteriole penetrating the scar.



**Figure 2** The Heidelberg-Spectralis SD-OCT imaging was performed after treatment with intravitreal ranibizumab injections. The dense raster scans measured  $4.5 \times 1.5 \text{ mm}^2$  in  $x$  and  $y$  planes and were separated by  $31 \mu\text{m}$ . The near-infrared images (a, c, and e) show the registration of the fundus image with the B-scan, the scar tissue (white dashed arrow), and the branch retinal arteriole (white solid arrow). The respective B-scans (b, d, and f) (23 to 25/49) show a curvilinear optically empty space (white dashed arrow) seen progressing from the inner-retinal surface into the retinal pigment epithelium. The epiretinal membrane is also noted. These features on the serial B-scans are suggestive of a retinochoroidal anastomosis.

The acquired B-scan images were registered with color (Topcon) or near-infrared (Heidelberg) fundus imaging.

On initial presentation, the best-corrected visual acuity (BCVA) was 20/300 in the right eye (OD). Dilated fundus examination and fluorescein angiography (FA) OD findings demonstrated a RAP type of choroidal neovascularization (CNV; type III). This is a subgroup of neovascular AMD (Figure 1a–d).<sup>1</sup> Serial SD-OCT B-scans revealed a pigment epithelial detachment (PED) with intra-retinal fluid and a high-reflective lesion in the inner retina corresponding to the intra-retinal hemorrhage seen on color photography OD (Figure 1e).<sup>2</sup>

After 18 months and seven intravitreal ranibizumab injections, the BCVA was 20/240 OD. There was no evidence of retinal fluid clinically or on SD-OCT evaluation. FA confirmed the inactive CNV with scar formation (Figure 2). Interestingly, further evaluation of the serial B-scans from dense raster scans revealed an optically empty curvilinear space seen vertically dipping

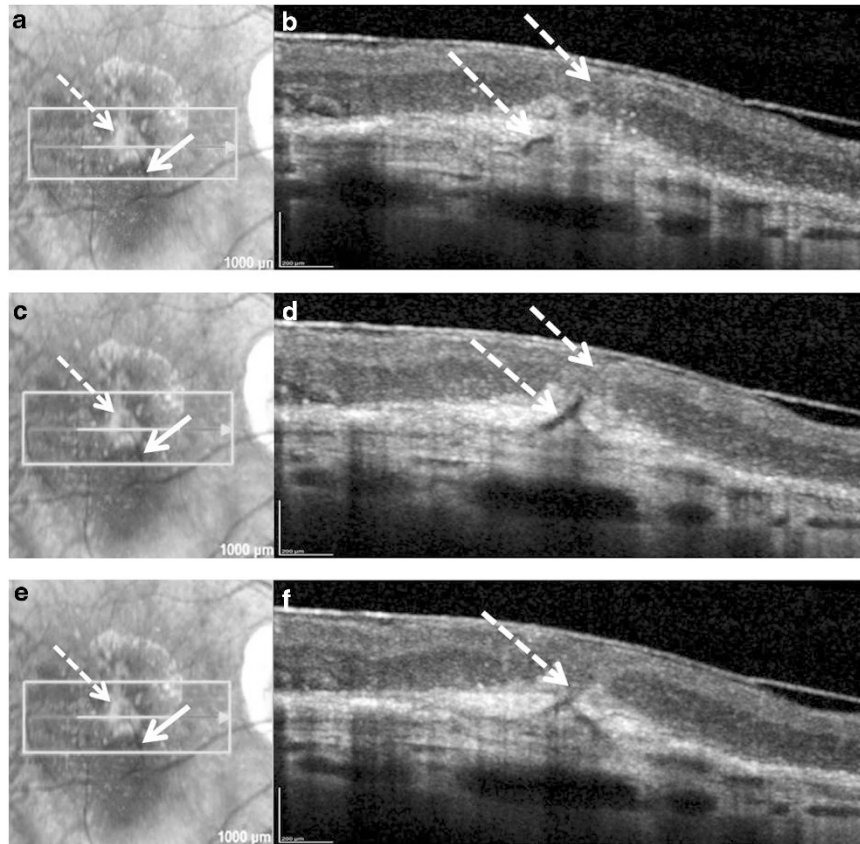
from the inner-retinal surface into the PED OD (Figure 3). Furthermore, this observation on OCT B-scans co-localized with a branch retinal arteriole seen penetrating the scar tissue on near-infrared and color fundus images. This represents a retinochoroidal anastomosis (RCA).<sup>3</sup>

**Comment**

We report the detailed visualization of RCA on serial SD-OCT imaging. The visualization of the retinal arteriole noted on B-scan images is notably similar to the histology images presented by Green and Gass<sup>4</sup> (case 5 of their series). Such an anastomoses can result from RAP or disciform scar formation.<sup>1,3,4</sup> Identification of such an anastomoses by SD-OCT may guide treatment.

**Conflict of interest**

The authors declare no conflict of interest.



**Figure 3** The serial near-infrared and SD-OCT B-scan images (23 to 25/49) show an enlarged view of the area of interest. On near-infrared images (a, c, and e), the white dashed arrow points toward the scar tissue (white, bright lesion) and the white solid arrow points to the branch retinal arteriole that is seen penetrating the scar tissue. The white dashed arrows on the B-scans (b, d, and f) identify a retinochoroidal anastomotic vessel.

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## Sir, Congenital ptosis associated with combined superior rectus, lateral rectus, and levator palpebrae synkinesis: the first reported case

Superior rectus (SR) to levator palpebrae superioris (LPS) synkinesis has recently been described in patients with congenital or longstanding ptosis.<sup>1,2</sup> However, aberrant innervation between lateral rectus (LR) and LPS has not been previously reported. We report a combined SR and LR to LPS synkinesis in a patient with congenital ptosis.

## Case report

A 22-year-old man presented for ptosis assessment in his left eye. The ophthalmic history referred to a previous unsuccessful operation for correction of his unilateral, congenital ptosis. No history of squint or trauma was reported. His medical history was unremarkable.