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Case report

Management of recalcitrant polypoidal choroidal vasculopathy by feeder vessel laser photocoagulation

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ABSTRACT

Purpose: To describe management of residual branch vascular network (BVN) in polypoidal choroidal vasculopathy (PCV) by thermal laser photocoagulation of feeder vessel.

Observations: Case report of sixty-four year old female with polypoidal choroidal vaculopathy (PCV) with moderate response to seven doses of intravitreal ranibizumab, six doses of intravitreal bevacizumab and one session of photodynamic therapy (PDT). The patient has resolved polyps but persistence of disease activity due to residual BVN and large pigment epithelial detachment (PED). Patient underwent thermal laser photocoagulation of feeder vessel of BVN identified on indocyanine green angiography (ICGA). There was complete resolution of residual BVN and large PED, which was confirmed on ICGA.

Conclusions and Importance: Recalcitrant cases of PCV without polyps but having BVN with feeder vessel can be managed by ICGA guided thermal laser photocoagulation. The case report illustrates the importance of utilizing multimodal imaging such as video indocyanine green angiography (ICGA) for identification of feeder vessel and its deployment for optimal management of refractory PCV.

1. Introduction

Polypoidal Choroidal Vasculopathy (PCV) is a clinical entity first described by Yannuzzi et al. in 1982,[1] characterized by subretinal polypoidal vascular lesions associated with serous and hemorrhagic pigment epithelial detachments (PED). With advancement in retinal imaging and formulation of new diagnostic criteria, PCV is being increasingly recognized as an important cause of exudative maculopathy in Asian eyes. Multiple studies have documented the prevalence of PCV amongst patients diagnosed with neovascular age related macular degeneration to be as high as 24.5%[2] –54.7%[3] in Chinese and Japanese population respectively, 49% in the Taiwanese[4] and 24.6% in the Korean populations[5] compared to 4% to 9.8%in Caucasians.[5–7]

Clinically the classical features of PCV include presence of sub-retinal reddish orange nodules and serosanguineous maculopathy, with the exudation being disproportionately larger than the size of lesion. Other findings include hemorrhagic pigment epithelial detachment, submacular hemorrhage and neurosensory retinal detachment in the peripapillary or macular retina.[8] According to current recommendations, indocyanine green angiography (ICGA) is the gold standard for detection and evaluation of PCV.[9] Existing treatment modalities for PCV include photodynamic therapy (PDT), anti-vascular endothelial growth factor (anti-VEGF) agents and thermal laser (TL). However, none of these treatment modalities, either singularly or in combination, may achieve complete regression of disease activity. This calls for continual assessment of each patient with application of multimodal imaging to individualize the treatment strategy. The choice of specific treatment modality and prognosis depends upon multiple factors such as the location and size of PCV lesion, presence or absence of polyp with residual abnormal vascular network (AVN), amount of submacular hemorrhage, presence or absence of leakage on fundus fluorescein angiography (FFA), visual acuity, and so on.

We report a case of recalcitrant PCV non-responsive to standard anti-VEGF therapyadd, in whom regression of disease activity was achieved by indocyanine green angiography (ICGA) guided thermal laser photocoagulation of feeder vessel.

2. Case report

A sixty-four year old lady of Asian origin presented to our clinic in August 2013 with complaint of metamorphopsia in right eye of one week duration. At presentation, her best-corrected visual acuity (BCVA) was 6/9, N8 with presence of a massive sub-foveal serous pigment epithelial detachment (PED) and shallow serous macular detachment (SMD) which was confirmed on spectral-domain optical coherence tomography (SD-OCT) (Fig. 1B) (Spectralis HRA + OCT, Heidelberg

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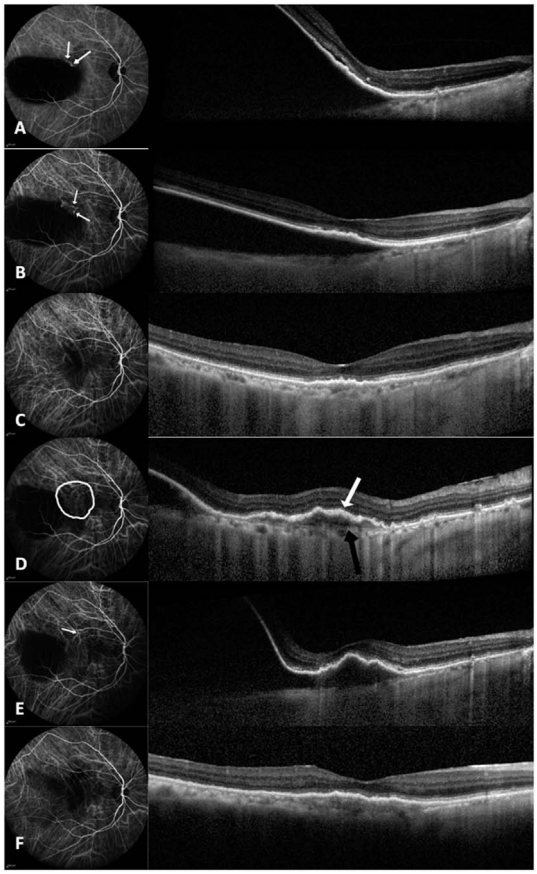

Fig. 1. Sequential imaging of progression and management of right eye of the patient on spectral-domain optical coherence tomography (SD-OCT) and indocyanine green angiography (ICGA). **1A, 1B.** Baseline ICGA showing cluster of polyps on ICGA (White arrows, 1A) at the superonasal margin of large hypofluorescent area corresponding to huge serous pigment epithelial detachment (PED) on SD-OCT. **2A, 2B.** Reduction in PED height on SD-OCT but persistence of polyps on ICGA (White arrows, 2A) after patient underwent seven doses of intravitreal ranibizumab and two doses of intravitreal bevacizumab. **3A, 3B.** Complete resolution of polyps and PED on ICGA and SD-OCT respectively after single session of full fluence photodynamic therapy (PDT). **4A, 4B.** Recurrence of PCV with presence of branch vascular network (BVN) on ICGA (White circle, 4A) but absence of polyps. SD-OCT showing characteristic "Double-layer sign" formed by shallow undulated RPE (White arrow) above and intact Bruch's membrane (Black arrow) below with moderate hyperreflectivity interspersed between them. **5A, 5B.** Persistence of BVN (White circle) with feeder vessel (White arrow) on ICGA and PED on SD-OCT. **6A, 6B.** Feeder vessel photocoagulation was executed with intravitreal bevacizumab following which there was complete resolution of BVN on ICGA.

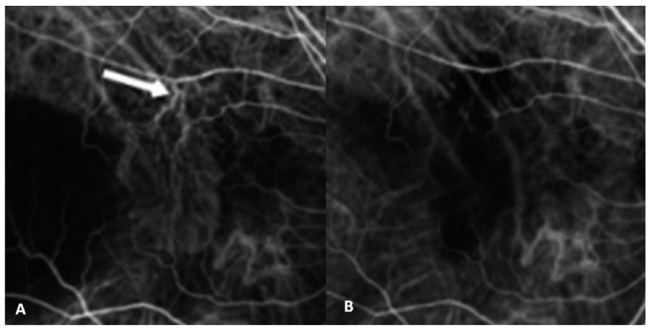

Fig. 2. Indocyanine green angiography (ICGA) images showing large branch vascular network (BVN) with feeder vessel (White arrow) (2A) and complete resolution of entire BVN after thermal laser photocoagulation (2B).

Engineering, Heidelberg, Germany). Indocyanine green angiography (ICGA) showed blocked fluorescence corresponding to the PED and presence of nodular hyperfluorescence at the nasal margin of PED

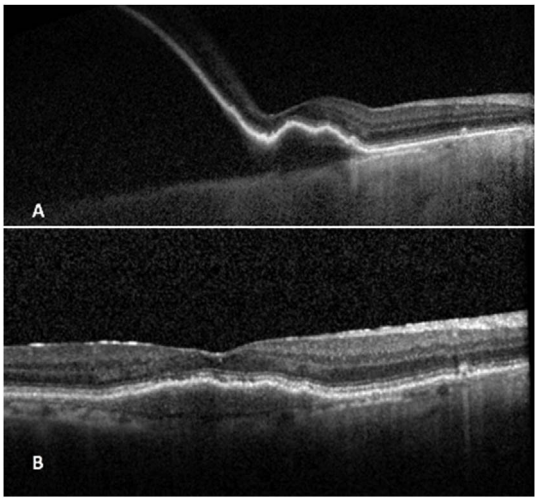

Fig. 3. A: SD-OCT image prior to thermal laser photocoagulation demonstrating presence of huge serous pigment epithelial detachment (PED) while Fig. 3B shows complete resolution of PED with minimal irregular RPE elevation 12 months post thermal laser photocoagulation.

confirming the presence of Extrafoveal polyps (Fig. 1A). In view of presence of massive PED and good visual acuity, PDT was deferred and subsequently, patient underwent seven doses of intravitreal ranibizumab and two doses of intravitreal bevacizumab, with modest response in form of slow progressive reduction in PED height, but there was persistence of polyps on ICGA (Fig. 2A and B). Once the height of PED reduced appreciably, PDT was deemed to be safe and hence patient underwent a session of full-fluence PDT. The patient responded drastically and there was complete resolution of PED and SMD which was confirmed on ICGA (Fig. 3A and B). However, six months later, the patient presented with recurrence of PED. Repeat dynamic ICGA done showed absence of polyp but presence of large branch vascular network (BVN) with feeder vessel. There was presence of double-layer sign (DLS) corresponding to the location of BVN. Since the patient had good visual acuity (6/9) in absence of polyp, she underwent three doses of intravitreal bevacizumab with minimal response. Dynamic ICGA was repeated again, which showed persistent BVN with feeder vessel. Since the location of the feeder vessel was extrafoveal, we performed ICGA guided thermal laser photocoagulation (power 150 mW, duration 0.1 ms, spot size 100 μm) in combination with intravitreal bevacizumab. The patient responded dramatically with complete resolution of PED, DLS and SMD on SD-OCT. Likewise, ICGA too demonstrated absence of the large BVN network with disappearance of large hypofluorescent area corresponding to PED. Fig. 2 shows a detailed view of ICGA before and after laser photocoagulation of the feeder vessel. The patient's final BCVA improved to 6/6, N6. The patient has been followed-up regularly for over 12 months with stable visual acuity and no recurrence (Fig. 3).

3. Discussion

Management of PCV remains to be a conundrum for practicing retinal physician due to its variable clinical presentation and response to therapy. Although international guidelines have been proposed for systematic evaluation and management of PCV, they are based on the literature present upto March 2012.[8] The treatment of PCV is primarily based on its location, and whether it is active or inactive. Inactive PCV can be safely monitored and observed.[9] For active lesions, the options available include PDT, anti-VEGF therapy and thermal laser photocoagulation. Landmark trials for management of PCV, including the EVEREST study,[9] the LAPTOP study[10] and the FUJISAN trial,[11] have compared the efficacy of anti-VEGF agent ranibizumab, either as