CASE REPORT

Frosted branch angiitis in one eye and impending CRVO in the other: a diagnostic dilemma

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Accepted 29 April 2015

SUMMARY

We present a unique case of frosted branch angiitis in one eye and impending central retinal vein occlusion in other eye of a pregnant woman, which could be an initial manifestation of Behçet's disease. A 28-year-old, 33 weeks pregnant woman presented with sudden diminution of vision in her right eye. Her best-corrected visual acuity was light perception in the right eye and 20/20 in her left eye. The fundus examination revealed frosted branch angiitis in the right eye and impending central retinal vein occlusion in the left eye. After a thorough initial examination, she was administered intravenous methyl prednisolone 1 g once a day for 3 days followed by oral steroids. All extensive work up to find the cause of frosted branch angiitis was negative except for positive human leukocyte antigen B51. Systemic work up was normal. On last follow-up at 6 months, the patient had visual acuity of 20/60 in the right eye and 20/20 in the left eye. Her systemic work up was normal up to follow-up. She still remains a diagnostic dilemma, with Behçet's disease as the closest diagnosis.

BACKGROUND

The term 'frosted branch angiitis' (FBA) was first coined by Ito *et al* in 1976.¹ It presents with severe vasculitis with severe periphlebitis, giving it the appearance of frosted branches of a tree. This disease entity is more common in women, and mostly bilateral, though unilateral cases are also described. As proposed by Kleiner,² the entity can be divided into 'primary idiopathic' and 'secondary' FBA. Secondary FBA is seen in patients with similar retinal appearances but with underlying diseases, that is, lymphoma, leukaemia, viral infections or autoimmune diseases, where FBA is thought to be a clinical sign due to immune complex deposition. This form is more resistant to treatment with worsening of symptoms due to the underlying condition. Behçet's disease is a chronic systemic disease of unknown cause characterised clinically by aphthous ulcers of the mouth and genitalia, intraocular inflammation, non-destructive seronegative arthritis and cutaneous vasculitis including erythema nodosum.^{3 4}

Reynders *et al*⁵ reported a case of a pregnant woman with Behçet's disease, who presented as frosted branch angiitis at 26 weeks of pregnancy. No treatment was given in that case and spontaneous resolution of the lesion occurred over a period of 14 weeks with a subsequent low level of vision.⁵ We present a case of a 33-week pregnant

woman with FBA in one eye and impending central retinal vein occlusion (CRVO) in the other.

CASE PRESENTATION

A 28-year-old primigravida at 33 weeks of pregnancy presented with a 1-week history of sudden onset, painless loss of vision in the right eye. The symptoms were preceded by a history of amaurosis fugax 2 days prior to the present symptoms. Best-corrected visual acuity (BCVA) in the right eye was light perception and 20/20 in the left eye. Intraocular pressure was 12 and 14 in the right and left eyes, respectively, with Goldmann applanation tonometry. Anterior segment examination of the right eye showed 2+ cellular reaction, whereas the left eye was quiet. Posterior segment examination of the right eye revealed disc oedema with macular oedema along with extensive periphlebitis exhibiting frosted branch angiitis (figure 1A). The left eye had venous dilation and tortuosity in the peripapillary region in the superior quadrant with a few superficial haemorrhages in the periphery (figure 2A). There was no vitritis in either of the eyes. Fundus fluorescein angiography (FFA) of the right eye showed hypofluorescent areas pertaining to haemorrhages, and early peripapillary leakage in early phase, and vascular staining and diffuse leakage in the late phase (figure 3A, B). FFA of the left eye showed early disc leakage in the area of optic disc margin blurring, fullness and tortuosity of the superotemporal vein followed by segmental disc staining in the late phase (figure 3C, D).

Ocular coherence tomography (OCT) revealed massive serous macular detachment in the right eye, whereas left eye OCT revealed normal foveal contour (figure 4A, B). We performed a working diagnosis of frosted branch angiitis (FBA) in the right eye and impending CRVO in the left eye.

INVESTIGATIONS

The patient was admitted and extensive work up including blood pressure, blood sugar levels, complete haemogram, renal function test, lipid profile, chest X-ray, Mantoux test, antineutrophil cytoplasmic autoantibodies, antinuclear factor, antiphospholipid antibodies (APLA), human leukocyte antigen (HLA) B51 levels, *Treponema pallidum* haemagglutination (TPHA) test, HIV serology and analysis of coagulation-fibrinolysis system was carried out to rule out all causes of FBA. Systemic evaluation by gynaecologist and internist was also made.

DIFFERENTIAL DIAGNOSIS

We kept the possibility of CRVO presenting as FBA in the right eye and impending CRVO in the

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To cite: Kumar A, Yangzes S, Singh R. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-209073

Figure 1 (A) Montage view of right eye fundus showing extensive venous sheathing seen as typical frosted branch appearance with haemorrhage in posterior pole region. (B) Right eye fundus at 6-month follow-up showing resolution of vascular sheathing and haemorrhages with presence of hard exudates in the posterior pole after treatment with corticosteroids.

left eye. Various investigations were performed to find the cause of CRVO in this young, 33-week pregnant woman.

TREATMENT

After getting clearance from the gynaecologist, the patient was administered intravenous methylprednisolone 1 gm once a day for 3 days followed by tablet prednisolone 1 g/kg body weight, and hourly topical steroids in the right eye. On the 5th day of treatment, the patient delivered a low-birth weight fetus of 1.75 kgs through caesarean section.

OUTCOME AND FOLLOW-UP

On the first follow-up, 11 days after initial presentation, new large disc haemorrhages were noted in the temporal quadrant of the left eye (figure 2B) with 20/20 vision. Intravitreal bevacizumab injection was given in the left eye on the same day, which lead to resolution of the haemorrhages on subsequent visits. All investigations were negative except for positive HLA B51 levels. Repeat internist work up failed to detect any evidence of

systemic Behçet's disease. The periphlebitis and fluid in posterior pole in the right eye resolved with BCVA improving to 20/60 in the right eye (figure 1B) and maintaining 20/20 in the left eye (figure 2C) at 6 months follow-up. OCT revealed complete resolution of macular oedema in the right eye at latest follow-up (figure 4C). Oral steroids were tapered off and stopped at 3 months (figure 4C). The patient was asymptomatic for systemic Behçet's disease up to the latest follow-up and kept under regular follow-up.

DISCUSSION

FBA is a widespread prominent perivascular infiltration that is mostly confined to the major retinal vein. Visual loss can be severe due to macular or peripheral exudative retinal detachment. FBA very often responds to systemic steroids, though most cases have been known to resolve without treatment. However, secondary causes must be ruled out prior to starting steroids.^{6–8} Frosted-branch angiitis can be a feature of Behçet's disease. Behçet's disease manifests as anterior segment and vitreous inflammation in patients with ocular involvement. Oedema of the macula and optic disc, thickened retina, focal accumulations of yellow-white deep retinal exudates, perivascularitis, central and branch venous and arterial occlusions, papilloedema, papillitis and optic atrophy may occur in Behçet's disease.^{9 10}

Kwon *et al*,¹¹ in their meta-analysis, reported seven cases of FBA as ocular manifestation of Behçet's disease, including one of their own cases. In that analysis, three cases initially presented with bilateral involvement. Four cases presented as unilateral cases, out of which one case had second eye involvement after 2 years. All patients had a history of recurrent oral or genital ulceration and five of six cases had a positive HLA-B51. There were three females in the analysis and one was pregnant.⁵ The authors¹¹ recommended use of early immunosuppression in order to prevent the involvement of the contralateral eye. In our case, positive HLA B51 pointed towards possible

Figure 2 (A) Left eye fundus showing dilated and tortuous vein in the superotemporal quadrant with mild blurring of disc margins between 10 and 2 o'clock position. (B) Left eye fundus showing dilated and tortuous vein in the superotemporal quadrant with appearance of haemorrhages on the fundus and disc, day 11 after starting corticosteroids. (C) Left eye fundus photograph at 6-month follow-up showing complete resolution of lesions.

Figure 3 (A) Fundus fluorescein angiography (FFA) of the right eye showing hypofluorescent areas pertaining to haemorrhages, and early peripapillary leakage in early phase. (B) FFA in late phase showing vascular staining and diffuse leakage in the right eye. (C) FFA of the left eye showing early disc leakage in the area of optic disc margin blurring, fullness and tortuosity of superotemporal vein. (D) FFA of the left eye showing segmental disc leakage in the late phase.

Figure 4 (A) Ocular coherence tomography (OCT) of the right eye showing massive retinal thickening in the posterior pole at presentation. (B) OCT of the left eye showing normal foveal contour at presentation. (C) OCT of the right eye showing complete disappearance of macular oedema with foveal atrophy at the last follow-up.

Behçet's disease in the absence of any systemic features. We did not give immunosuppression to the patient up to the latest follow-up in the absence of any systemic lesion. Timely use of intravenous steroids and intravitreal bevacizumab aborted a full blown attack in the left eye of our case.

CRVO associated with pregnancy is also known. Association of diurnal intraocular pressure variation,¹² impaired fibrinolysis,¹³ HELLP syndrome¹⁴ and pre-eclampsia,¹⁵ is known in CRVO and pregnancy. Our case did not have any positive labs except for HLA B-51.

Our patient was treated with oral corticosteroids in view of the sight threatening disease affecting both eyes. Lockshin and Sammaritano,¹⁶ in their study, found that systemic corticosteroids are not teratogenic. Pregnant women receiving corticosteroid treatment suffer the same side effects and enjoy the same advantages as do treated women who are not pregnant. Clinical experience also suggests no abnormalities of children of mothers treated with usual doses of prednisone and methylprednisolone throughout pregnancy, but premature rupture of amniotic membranes and low birth weight babies may result. In our case, we gave prompt treatment with corticosteroids keeping in view the possibility of involvement of the other eye. Intravitreal

bevacizumab was given to take care of the vascular occlusion and tortuosity,¹⁷ as we observed the initial worsening in the left eye with corticosteroids.

We report a rare case of FBA in one and impending CRVO in the other eye in a pregnant woman who responded very well to systemic steroids and intravitreal bevacizumab. However, it still remains a diagnostic dilemma and Behçet's disease is the closest possible diagnosis.

Learning points

- ▶ A case of frosted branch angiitis needs extensive systemic work up to rule out the many possible aetiologies.
- ▶ Frosted branch angiitis responds rapidly to systemic steroids with rapid resolution of the vascular sheathing with good visual recovery.
- ▶ Human leukocyte antigen-B51-positive patients with ocular disease will need close follow-up for systemic involvement, as ocular manifestation can present as initial manifestation of Behçet's disease in 20% of cases.

Acknowledgements The authors thank Professor Amod Gupta and Dr Sabin Sahu.

Contributors AK wrote the manuscript, collected the references, revised the manuscript and approved the finalised manuscript. SY was involved in the planning and writing of the manuscript, and approved the finalised manuscript. RS provided the concept, revised the manuscript and approved the finalised manuscript.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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