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Visual outcome after endovascular intervention in Takayasu arteritis

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Abstract:

Takayasu arteritis is a chronic multisystem vasculitis which has been known to be associated with myriad of ophthalmological manifestations. Steroids and immunomodulators are the mainstay of medical management in early stages of disease. We report the case of a 15-year-old girl with complaints of diminution of vision in both the eyes. Her ophthalmic examination suggested a diagnosis of Takayasu retinopathy with posterior ischemic optic neuropathy in her left eye and ocular ischemic syndrome in the right eye. Digital subtraction angiography revealed a significant narrowing of major vessels originating from the arch of aorta and the left vertebral artery. She underwent left subclavian artery and left vertebral artery balloon angioplasty followed by left vertebral artery stenting. Her vision improved significantly postprocedure, suggesting that endovascular intervention in the later stages of disease is a promising treatment modality for Takayasu retinopathy.

Keywords:

Balloon angioplasty, endovascular technique, Takayasu arteritis

Introduction

Takayasu arteritis (TA) is an idiopathic, chronic granulomatous large-vessel vasculitis predominantly affecting the aorta and its major branches. Visual symptoms may arise from occlusion or stenosis of the carotid, vertebral, or ophthalmic arteries.^[1,2] The ophthalmological manifestations includes Takayasu retinopathy, ocular ischemic syndrome, and hypertensive retinopathy.^[2]

The mainstay of medical treatment involves immunosuppression (high-dose corticosteroids and newer immunosuppressive agents). Medical management is however not much effective in the later fibrotic stages of the disease. Surgical intervention in the form of bypass grafting or percutaneous angioplasty with stenting plays a role in revascularization of the obliterated and stenotic vessels. Till date, improvement of vision in TA following endovascular revascularization

has been very infrequently reported in literature.^[3-5] Herein, we report a case of Takayasu retinopathy with retinochoroidal and optic nerve hypoperfusion who improved following percutaneous endovascular revascularization with the stent. Informed consent was obtained from the patient for the publication purpose.

Report of Case

A 15-year-old girl diagnosed as TA was referred to our neuro-ophthalmology outpatient department with complaints of diminution of vision in both the eyes for 2 months. On examination, there was no light perception in the right eye, and the left eye had a visual acuity of finger counting at 3 meters. There was circumciliary congestion, iris, and angle neovascularization with complete opacification of the lens in the right eye, whereas the left eye had normal anterior segment findings. There was no reaction to light and near in the right eye, while the pupillary reaction in the left eye was sluggish. Posterior segment findings in the

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right eye were unremarkable due to opacification of the lens. There was mild disc pallor in the left eye along with dot and blot hemorrhages and multiple microaneurysms over the mid peripheral retina [Figure 1a]. Dilatation and tortuosity of blood vessels, arteriovenous anastomosis, and venous beading were also noted. The macula however was normal. Intraocular pressures recorded were 7 mm and 11 mm of Hg in the right and left eyes, respectively. Fluorescein angiography revealed marked ischemia of the retina and choroid at the posterior pole, midperipheral, and peripheral retina in the left eye. Hyperfluorescent spots of microaneurysms, staining of blood vessels along with extensive capillary dropout areas, and arteriovenous anastomosis were also noted on fluorescein angiogram [Figure 1b]. Computed tomography angiogram demonstrated circumferential wall thickening with luminal narrowing in all major branches of arch of aorta starting from their origin. Digital subtraction angiography showed diffuse high-grade narrowing of the brachiocephalic trunk, proximal right common carotid artery, and right subclavian artery along with the proximal part of the right vertebral artery. There were multiple collaterals supplying and reconstructing distal right common carotid and right vertebral artery. The left common carotid artery was markedly narrowed and again some reinforcement from collaterals was noted, but no significant intracranial flow was seen. The left subclavian artery showed narrowing at its ostium and proximal segment with narrowing at the origin of left vertebral artery [Figure 2a]. Bilateral posterior cerebral arteries were normal with prominent bilateral posterior communicating arteries.

She underwent left subclavian and vertebral artery balloon angioplasty followed by left vertebral artery

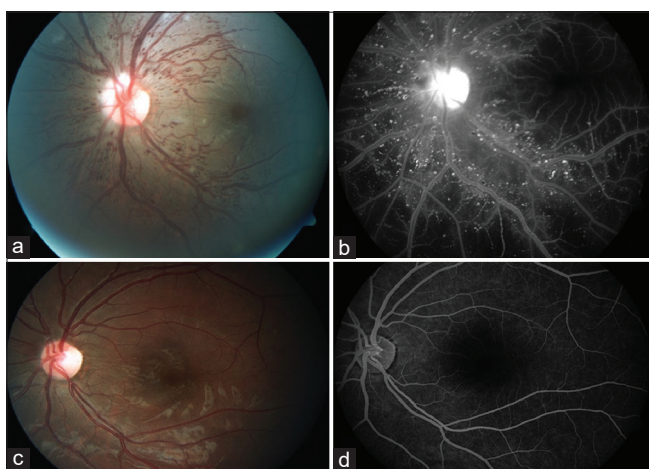


Figure 1: (a) Fundus photograph of a patient with Takayasu retinopathy showing mild disc pallor, dot and blot hemorrhages and multiple microaneurysms over the mid peripheral retina. (b) Fluorescein angiogram showing hyperfluorescent spots of microaneurysms, staining of blood vessels along with extensive capillary drop-out areas. (c) Resolution of fundus signs after endovascular stenting. (d) Repeat Fluorescein angiogram showing good perfusion of retina

stenting [Figure 2b-e]. Postprocedural color Doppler scan showed patent left vertebral artery with adequate in-stent flow and distal flow. On follow-up visit after 2 months, the patient showed improvement in vision in the left eye to 6/18. Fundus examination showed disappearance of the microaneurysms and dilation of blood vessels [Figure 1c]. Her repeat fluorescein angiography showed good perfusion of choroid and retina [Figure 1d].

Discussion

Endovascular procedures for revascularization are being increasingly considered in the management of vascular anomalies. However, rarely, it has been reported in the management of ocular complications associated with TA. It is a safer and lesser invasive surgical alternative compared to bypass grafting in the amelioration of symptoms in the occlusive stage of TA.^[3] A recent case series reported 3 cases, all of whom underwent endovascular revascularization procedures resulting in visual improvement.^[3] They also highlighted the need for earlier detection of the disease before complete vascular occlusion has developed, for this procedure to be more effective. Dogra *et al.* in their retrospective study of five patients also highlighted the effectiveness of percutaneous endovascular stenting in the reversal of retinopathy associated with TA and also reiterated the need for early initiation of endovascular revascularization for better visual outcomes.^[4] An earlier report of a 37-year-old female of TA with retinopathy and diminution of vision also documented an improvement in symptoms after percutaneous angioplasty and stenting.^[5]

In our case, posterior ischemic optic neuropathy due to Takayasu disease along with Takayasu retinopathy was probably the reason for reduced vision in the left eye and angioplasty with stenting of vertebral artery probably improved the blood flow in the internal carotid artery through the circle of Willis, which resulted in the reperfusion of the retina and choroid with improvement of vision as seen by fluorescein angiography. Normally, the circle of Willis does not play an active role but in a situation of reduced blood flow it helps improve the blood circulation from the contralateral side. Thus, although the effectiveness of endovascular procedures in amelioration of visual symptoms in TA has not been extensively documented in literature, similar to all the previous ones, our report reestablishes its role in the management of ophthalmic manifestations of TA.

Conclusion

Endovascular intervention in retinopathy associated with TA appears to be a promising treatment modality in the later stages of disease. A large case series is required to establish its role further.

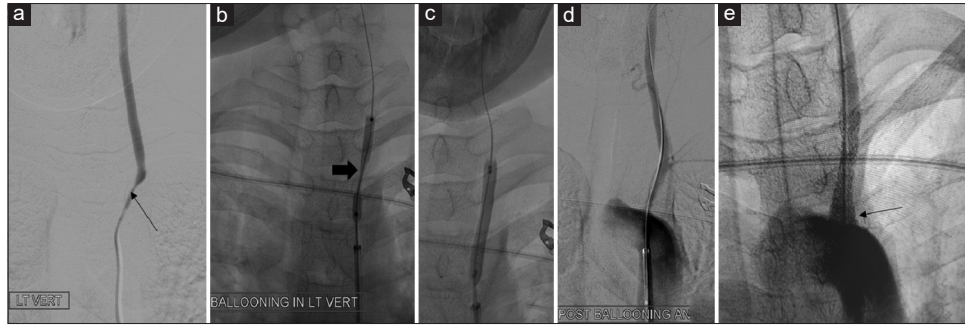


Figure 2: Digital subtraction angiogram with percutaneous endovascular intervention: (a) Showing more than 90% stenosis of left subclavian artery (arrow in a) extending up to left vertebral ostia, balloon angioplasty done (b) and (c) with balloon placed in vertebral artery via subclavian with fig (b) arrow showing waist during angioplasty. Postballoon angioplasty angiogram (d) showing residual stenosis at the subclavian ostia which was relieved after stent placement (arrow in e) showing good dilatation of subclavian ostia

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

The authors declare that there are no conflicts of interests of this paper.

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