Takayasu retinopathy associated with HIV infection

DB McClunan MBChB(SU), DipOphth(SA), MMed(UCT), FCOphth(SA);
Sessional Consultant, Groote Schuur Hospital, Department of Ophthalmology, University of Cape Town, South Africa
CG Tinley MBChB, FRCOphth(London);
Head of Paediatric Ophthalmology, Red Cross Children's Hospital, University of Cape Town, South Africa

Corresponding author: Dr DB McClunan, 30 Eden Road, Walmer Estate, Cape Town 7925; email: drmcclunan@gmail.com; cell: 0846047600

Abstract

Takayasu arteritis is a rare, yet well-known form of occlusive arteritis with a preference for the aorta and its main branches. Visual symptoms are common and may occur as a result of hypertensive retinopathy, retinal ischaemia or amaurosis fugax. A cell-mediated autoimmune mechanism has been strongly implicated in the aetiology of Takayasu. HIV infection causes B-cell upregulation and T-cell dysregulation. We present two cases of rapidly evolving Takayasu retinopathy associated with HIV infection.

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Key words: Takayasu, vasculitis, ischaemic retinopathy, proliferative retinopathy, HIV

Introduction

Takayasu arteritis, otherwise known as 'pulseless disease' is named after the Japanese ophthalmologist Professor Mikito Takayasu, who presented a case of the disease in 1908.[1] It is a well-known, yet rare form of large vessel arteritis, with a preference for the aorta and its main branches. Although still considered idiopathic, a cell-mediated autoimmune aetiology has been strongly implicated.[2] Takayasu mainly affects young females of Mongoloid ancestry in the age group 10–30 years, but has been recognised worldwide in both sexes. Its incidence worldwide is approximately 1 to 2 per million per year and the disease carries a significant mortality rate.[3]

Takayasu arteritis follows a chronic, often relapsing and remitting course, which usually progresses through three stages. The first stage is an early systemic stage during which the patient may complain of constitutional symptoms. The second stage is the vascular inflammatory stage, when stenosis, aneurysms and vascular pain tend to occur. The third stage is the burnt-out stage, when fibrosis sets in after longstanding disease. Inflammatory relapses can occur in patients who were previously in remission.

The American College of Rheumatology has established classification criteria for Takayasu arteritis.[4] The presence of three of six criteria yields a sensitivity of 90.5% and a specificity of 97.8% for Takayasu arteritis. The criteria are as follows:

1. Age of 40 years or younger at disease onset
2. Claudication of the extremities
3. Decreased pulsation of one or both brachial arteries
4. Difference of at least 10 mmHg in systolic blood pressure between arms
5. Bruit over 1 or both subclavian arteries or the abdominal aorta
6. Arteriographic narrowing or occlusion of the entire aorta, its primary branches, or large arteries in the upper or lower extremities that is not due to other causes.

Visual symptoms occur in around 15–45% of patients with Takayasu arteritis due to one of three mechanisms, depending on which arteries are affected. Involvement of the renal artery may cause hypertensive retinopathy. This is the most common ocular complication (16–30%). Occlusive arteritis of the internal carotid artery results in ischaemic ocular manifestations

known as Takayasu retinopathy. Takayasu retinopathy occurs in 13–15% of patients and is classified as follows: distension of veins (stage 1); micro-aneurysm formation (stage 2); arterio-venous anastomoses (stage 3); complications of ischaemia such as neovascularisation, vitreous haemorrhage, ischaemic optic neuropathy, retinal artery occlusion and ocular ischaemic syndrome (stage 4). Lastly, vertebral artery involvement may result in amaurosis fugax.[5,6]

The ischaemic changes in Takayasu arteritis depend on which portions of the carotid arteries become occluded, the rate of development and duration of ocular vascular insufficiency, and the effectiveness of collateral blood supply to the eye. Patients with unrecordable upper limb blood pressures are more likely to have severe ocular ischaemic manifestations. Ocular ischaemia is linked to an increased mortality rate.[7]

Systemic steroids remain the cornerstone of treatment for active Takayasu arteritis and are usually initiated by a rheumatologist. Vascular surgeons play an important role in addressing severe ischaemia due to established arterial stenosis. Due to the frequency of ocular symptoms in the condition, ophthalmologists are often actively involved in the management of Takayasu arteritis.[8-11]

HIV infection causes B-cell upregulation and T-cell dysregulation. This results in an increased incidence of cell-mediated autoimmune diseases of which the vasculitides predominate. Takayasu arteritis is the most common autoimmune vasculitis associated with HIV infection.[12-14]

We present two cases of rapidly evolving Takayasu retinopathy associated with HIV infection.

Case 1 (*Figures 1–4*)

A 23-year-old African woman presented with a history of gradual loss of vision over a 3-month period. She also complained of three episodes of

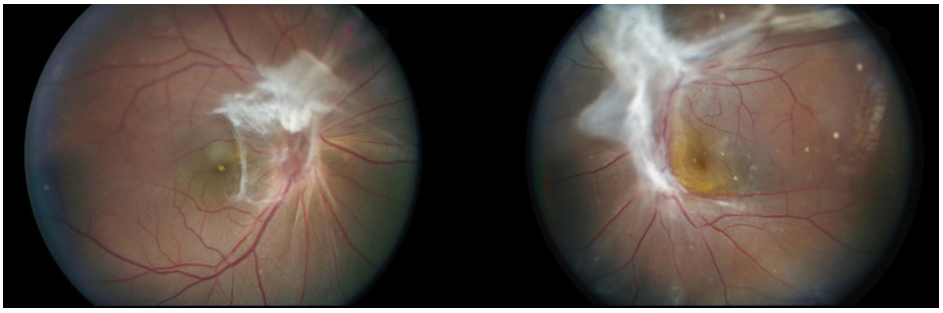

Figure 1. Colour fundus photos demonstrating tractional retinal detachments

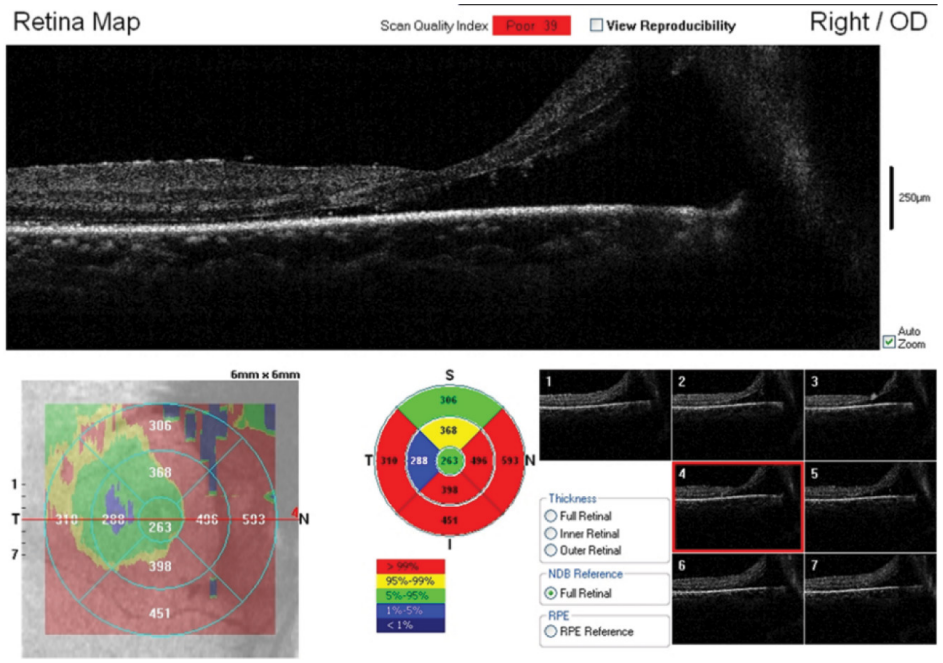

Figure 2. Ocular coherence tomograph confirming macular detachment

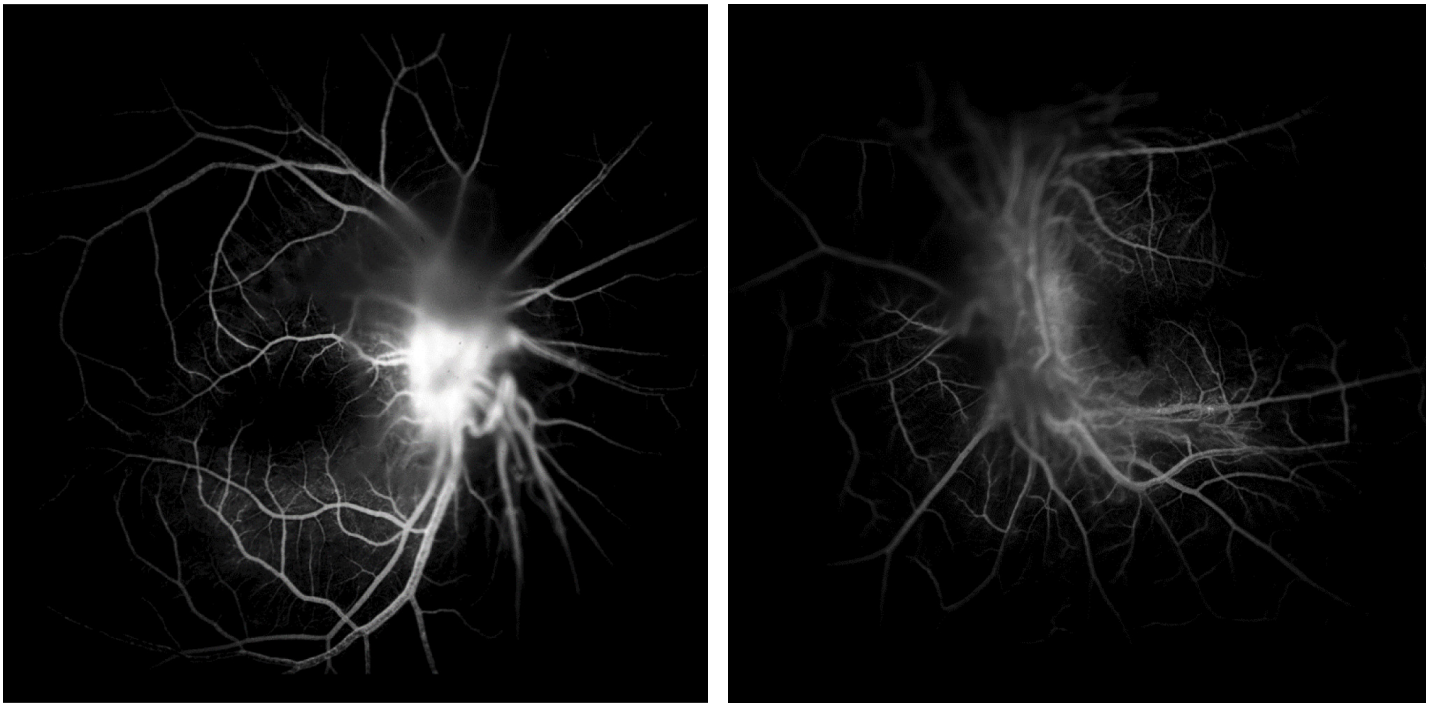

Figure 3. Fundus fluorescein angiogram displaying striking capillary non-perfusion of both retinas

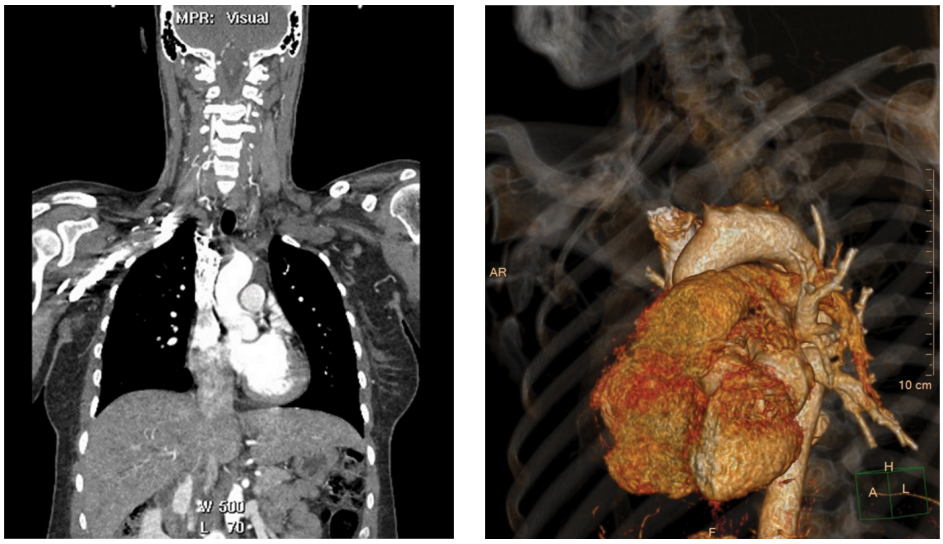

Figure 4. CT angiogram with 3D reconstruction showing extensive arterial occlusion

syncope during this time. She had no other medical or ophthalmic history of note. On examination, her best corrected visual acuity was hand movements in both eyes. Pupils responded sluggishly to light, with no relative afferent pupillary defect. Ophthalmoscopy revealed bilateral tractional retinal detachments involving the discs, maculas and vascular arcades. No active retinitis, vasculitis, haemorrhaging or neovascularisation was present. Anterior segment examination was normal and intraocular pressure by Goldmann applanation tonometry was 10 mmHg in both eyes.

Screening for infective and inflammatory causes revealed the patient to be HIV positive with a CD4 count of 845 cells/mm^3.

The patient underwent right pars plana vitrectomy. Intra-operatively, the patient's blood pressure was recorded as 47/33 mmHg. The anaesthetist elected to cancel the procedure and internal medicine was consulted to work her up for the cause of the hypotension. Here it was noted that the patient had absent arm and neck pulses, but good leg pulses. Her right arm blood pressure was unrecordable, the left arm blood pressure was 40/20, both calf blood pressures were 140/90.

A CT angiogram of the chest and neck vessels confirmed a diagnosis of severe Takayasu arteritis, with complete occlusion of the left common carotid and both subclavian arteries. There was also severe narrowing of the right common carotid and both vertebral arteries. Extensive collateralisation was present.

A diagnosis of grade 4 Takayasu retinopathy, with burnt-out proliferative retinopathy was made. Panretinal argon laser photocoagulation was applied to both ischaemic retinas and the patient was referred to internal medicine for immune suppression. Vascular surgery elected not to intervene, due to the presence of adequate collateralisation.

Case 2 (*Figures 5–7*)

A 26-year-old female presented with a history of loss of vision over a period of one week. She also gave a history of left-sided weakness for 6 months, for which she had not sought treatment. The patient was not known with any prior medical or ophthalmic conditions.

On examination, her visual acuity was counting fingers in both eyes. Slit lamp examination of the anterior segments showed a small hyphaema, with angle neovascularisation in the right eye. Retinal examination revealed distended, tortuous veins and cotton wool spots. Intraocular pressure by Goldman applanation tonometry was 4 mmHg in the right eye and 8 mmHg in the left eye.

The patient was found to be HIV positive, with a CD4 count of 313 cells/mm^3. She had systemic hypertension and absent radial pulses. CT angiogram confirmed occlusion of all major branches of the aortic arch.

A diagnosis of grade 4 Takayasu retinopathy with ocular ischaemic syndrome was made. Panretinal argon laser photocoagulation was applied to both ischaemic retinas and the patient was referred to internal medicine for

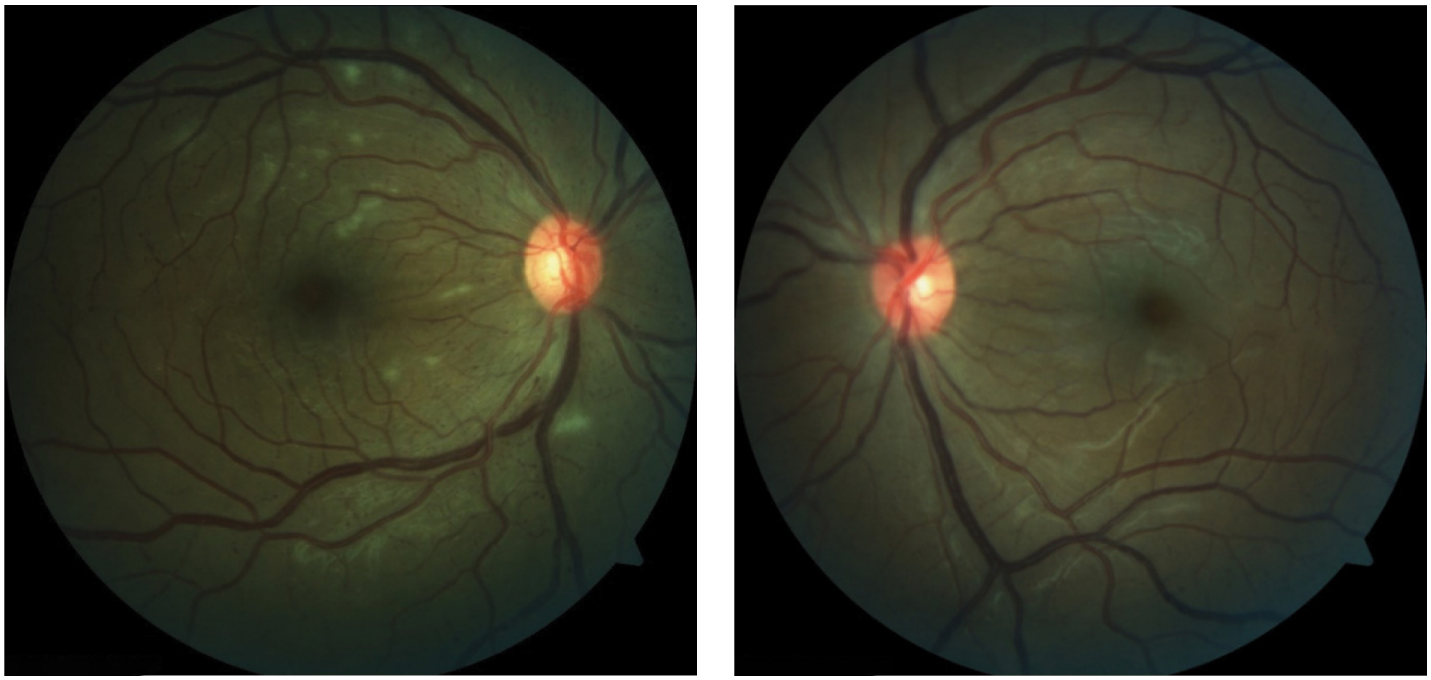

Figure 5. Colour fundus images displaying distended tortuous veins and cotton wool spots

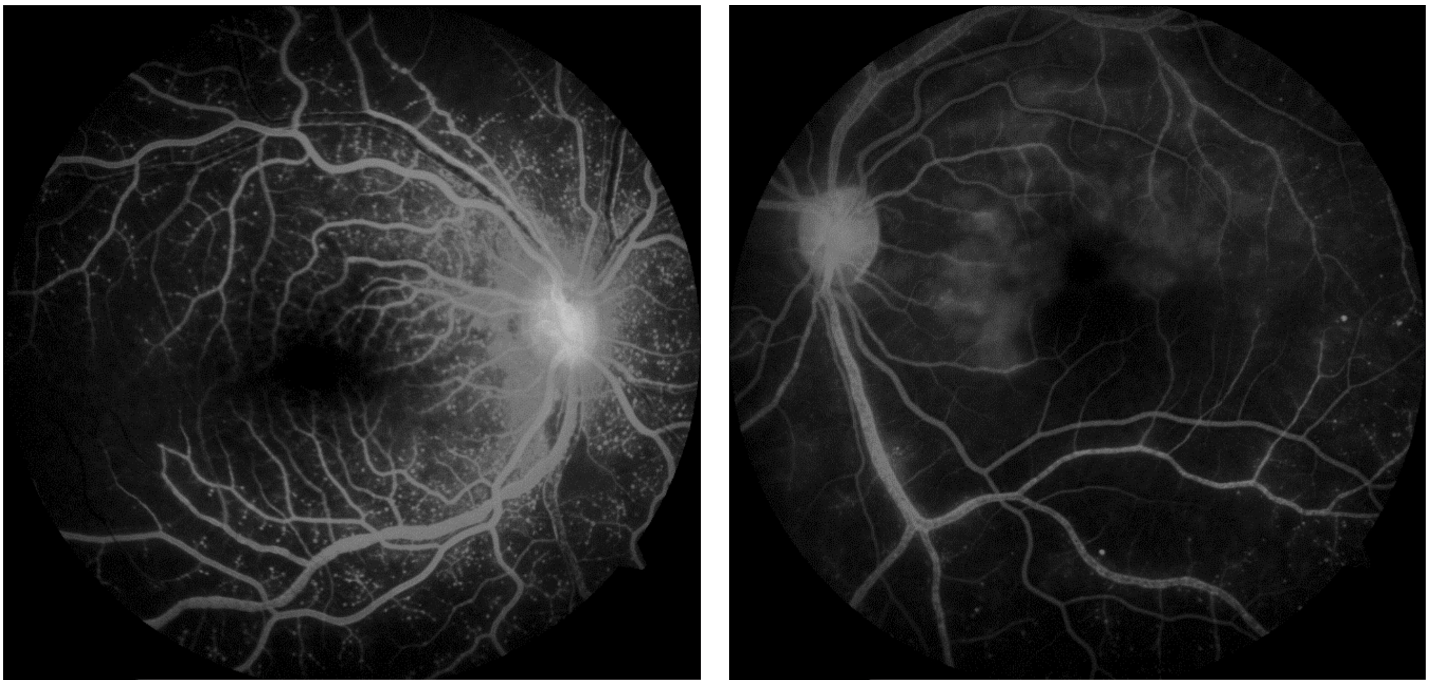

Figure 6. Fundus fluorescein angiogram showing capillary non-perfusion of both retinas, with numerous microaneurysms and areas of leakage

immune suppression and to vascular surgery for arterial stenting.

Discussion

Ocular disease occurs in around one third of Takayasu patients, due to either hypertensive or ischaemic complications. Takayasu should be considered in the differential of young patients presenting with unexplained hypertensive or ischaemic retinopathy. Absent radial pulses are suggestive of the disease. CT angiogram of the head and neck vessels is the gold standard diagnostic investigation.

The role of the ophthalmologist in managing patients is important. Early diagnosis reduces overall disease morbidity and mortality. Laser photocoagulation of ischaemic retina improves visual outcome. Referral to internal medicine and vascular surgery for steroid therapy and stenting are the cornerstones of management.

Grade 4 Takayasu retinopathy has been well described in patients known to have longstanding disease. These two HIV-infected patients presented with grade 4 disease, which appears to have had a rapid onset. There were only three cases describing ocular ischaemic syndrome as the presenting feature of Takayasu arteritis and no other cases describing bilateral retinal detachments as the presenting feature at the time of our literature review.[14-16] These unusual presentations highlight the fact that it is still not well understood what role HIV plays in the pathogenesis of Takayasu retinopathy and other autoimmune vasculitides.

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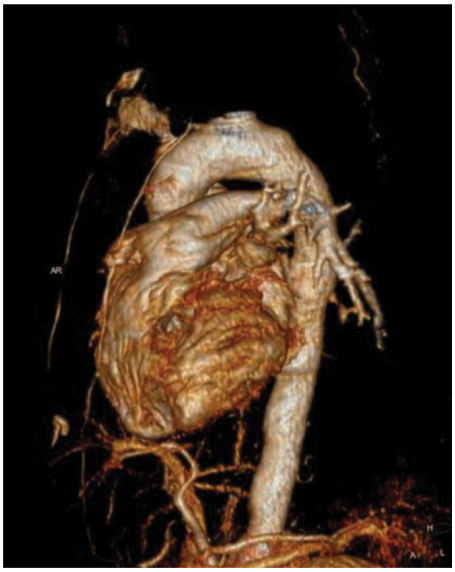

Figure 7. CT angiogram 3D reconstruction showing complete arterial occlusion of the branches of the aortic arch

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