A Case of Central Serous Retinopathy
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Abstract

Introduction: Clinicians frequently prescribe systemic and topical steroids. However, many are unaware of the potential ocular side effects, including central serous retinopathy (CSR). Additionally, patients displaying multiple retinal cotton wool spots (CWS) must have blood pressure measurements to eliminate uncontrolled / inadequately treated systemic hypertension. This case illustrates how vigilance in both these areas is paramount.

Case Report: Examination of a 56-year-old type II diabetic gentleman twelve months post uncomplicated left eye cataract surgery revealed bilateral new retinal findings suggestive of CSR. Further questioning revealed the use of topical steroid cream in addition to the prescribed postoperative steroid eye drops. Whilst the CSR resolved spontaneously, CWS were noted bilaterally. As his eyes demonstrated minimal other signs of diabetic retinopathy, attention reverted to his poorly controlled systemic hypertension.

Conclusion: CSR is an important side effect of topical steroids. Systemic hypertension should be excluded from the differential diagnosis of CWS, even in diabetic patients.

Keywords: Central serous retinopathy, cotton wool spots, diabetic retinopathy, steroids, hypertension.

Introduction

Central serous retinopathy (CSR) is a rare, usually temporary condition characterised by subretinal fluid accumulation, which may result in macular retinal detachment and blurring or distortion of central vision. It may also be associated with a retinal pigment epithelial detachment. While systemic steroid use is one of the most common risk factors associated with this pathology, type A personality disorder, and psychosocial stress have also be linked with this condition.1 Epidemiological studies have shown that incidence rates are three to six times more likely in men with 31% of patients experiencing a recurrence within an 18 month follow up time.2,3,4

Lifestyle stress-reducing changes and tapered cessation of systemic or topical steroids are recommended along with observation as often this condition can resolve spontaneously, albeit can take many months.3 In addition, photo dynamic therapy is an option that may be considered for CSR having not resolved by six months.5

We describe an interesting case of a patient who developed bilateral CSR following the use of topical steroid eye drops (in one eye) as well as topical steroid cream on the face. The clinical picture was
further complicated with the discovery of retinal CWS, which were initially diagnosed as a consequence of diabetes. However, further examination detected little other diabetic retinopathy (only dot haemorrhages) and blood pressure (BP) measurement revealed inadequately controlled hypertension. Thus, the diagnosis of CWS from hypertensive retinopathy was made and the patient was referred for further medical management of his hypertension and other cardiovascular risk factors.

Case Presentation
A 56-year-old Type II diabetic, non-smoker gentleman was referred for cataract assessment from the diabetic retinopathy screening programme. He complained of blurred vision in his left eye, and his left fundus photographs were noted to be ungradable due to poor image quality. On examination, visual acuity was 6/6+4 with glasses in the right eye and 6/36 with glasses in the left eye, with normal intraocular pressures (IOP) of 16mmHg bilaterally. Dilation showed left sided visually significant nuclear sclerotic and posterior subcapsular cataract. Dilated fundoscopy revealed very mild bilateral background diabetic retinopathy, with no maculopathy on examination with a slit lamp (Figure 1). Optical Coherence Tomography (OCT) scan was not performed at this assessment. Two months later he underwent uncomplicated left phacoemulsification and intraocular lens implant, with postoperative dexamethasone 0.1% eye drops four times daily prescribed for one month and chloramphenicol 0.5% eye drops four times daily for one week. Random blood sugar on day of surgery was 13.0mM. The BP on the day of surgery was measured as 155/89 (PR 87bpm) pre-op and 162/100 post-op (PR 72bpm). The patient had forgotten to take his BP and diabetic medication on the day of surgery.

At his routine three-week post-operative review, examination revealed a significant improvement in visual acuity to 6/9 (best corrected). However, interestingly new bilateral retinal changes of elevated retina localised inferior temporal to the fovea within the macula on the right and at the fovea in the left were noted. Furthermore, this patient underwent multiple OCT examinations of his retina revealing a left pigment epithelial detachment and a right extrafoveal retinal elevation typical of CSR. The following week, the diagnoses were confirmed on fluorescein angiography and the presence of a possible choroidal neovascular membrane was excluded. Along with steroid eye drops, further questioning revealed the use of topical steroid cream on the face for eczema, used intermittently for a minimum of nine years. The face cream was stopped, the steroid eye drops were rapidly tapered to cessation and Acular three times a day was added instead for 1 month to the left eye.

Over the following 12-18 month period, further episodes of subretinal fluid and pigment epithelial detachments were noted in both eyes with best-corrected vision settling at 6/6 right, 6/9 left by October 2013 (almost two years following left cataract surgery).

Fourteen months post-op, retinal examination revealed an increase in the number of CWS, but importantly a scarcity of other signs suggestive of diabetic retinopathy. Therefore, the differential diagnosis of CWS due to hypertensive retinopathy, rather than diabetic retinopathy, was considered and confirmed on BP measurement. The patient was immediately referred for medical management of poorly controlled systemic hypertension.
Investigations

Post operatively, OCT revealed retinal fluid between the retinal pigment epithelium and photoreceptors suggesting central serous retinopathy in the right fundus (Figure 2A) and fluid between the retinal pigment epithelium and Bruch’s membrane suggesting a pigment epithelial detachment (PED) (Figure 2B). Fluorescein angiography showed extrafoveal hyperfluorescence in a ‘smoke stack’ pattern in the right eye suggestive of CSR (Figure 3A and 3B) and excluded the presence of possible choroidal neovascularisation in either eye.

Differential Diagnoses

The most common causes of subretinal macular fluid seen on fundoscopy include clinically significant macular oedema (which may be associated with diabetic maculopathy) and post-uveitic cystoid macular oedema characterized by intra-retinal oedema. PEDs are typically associated with age-related macular degeneration.

Cotton wool spots are caused by ischaemia of the retinal nerve fibre layer. They most commonly occur with diabetic retinopathy, systemic hypertension, retinal vein occlusion and HIV retinopathy.

Outcome & Follow-up

This patient was advised to arrange an appointment with his GP to further address his systemic hypertension. Without treatment, he was at significantly increased risk of ophthalmic complications such as retinal vein or artery occlusion. He was also at increased risk of systemic complications such as a stroke or heart attack.

The CWS were still present at follow up despite his BP having been lowered to acceptable levels, specifically 137/77. However, the persistence of the CWS does not unduly concern us as research suggests that they have a half life of 17.2 months in patients over 40. The presence of cotton wool spots indicates grade 3 hypertensive retinopathy or moderate retinopathy which is strongly associated with stroke, coronary artery disease, cognitive decline and death. Any patient with cotton wool spots should have their blood pressure measured and fasting glucose tested. If both of these are normal, a HIV test could be considered.

Discussion

CSR has an incidence of 9.9 per 100,000 for men below the age of fifty and is seldom seen as a result of ocular surgery. However, research shows that patients older than fifty years are more likely to develop CSR bilaterally due to decompensation of the retinal pigment epithelium, which may also lead to secondary choroidal neovascularization.

The most recognised trigger factor is the use of corticosteroids. Interestingly, this patient developed bilateral CSR while using steroid eye drops post-operatively for three weeks in one eye as well as a steroid face cream given to him for his eczematous face rash. Steroids taken for at least one month, (inhaled, oral, intra-articular or intravenous) have been reported as a significant risk factor towards the development of CSR. Given the suggested association between steroids and CSR, any proposed future use of steroids for this patient should be carefully assessed against the risks of developing a recurrence of CSR.
In this patient, both the detachment of neuro-sensory retina and PED were seen as part of the clinical picture of CSR. It is thought that these arise from an initial, as yet uncharacterised, disturbance of the choroidal circulation, leading to a focal ‘blow-out’ causing the characteristic ‘smoke stack’ appearance seen on fluorescein angiography (Figure 3A).

Conclusion
Cotton wool spots on a background of mild diabetic retinopathy should alert a clinician to question the aetiology of this clinical sign. While the most notable cause can be attributed to diabetic retinopathy, hypertension, amongst other causes, should be considered in these instances. Additionally, hypertensive retinopathy, even in patients with seemingly well controlled blood pressure, is an important risk factor for other co-morbidities such as stroke and cerebral abnormalities.17

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References


LEARNING POINTS

- Pertinent consideration of differential diagnoses such as systemic hypertension or HIV retinopathy is required when investigating cotton wool spots on a background of only mild diabetic retinopathy.
- Clinicians should be aware of the ocular side effects of steroids, such as raised intraocular pressure, cataract, herpetic keratitis, and central serous retinopathy.
- Central serous retinopathy should be considered in any patient prescribed steroids (especially systemic) and complaining of visual deterioration.