

Can Long-term Corticosteroids Lead to Blindness? A Case Series of Central Serous Chorioretinopathy Induced by Corticosteroids

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Abstract

Introduction: Long-term, high-dose corticosteroid therapy is well-known to cause systemic and ocular complications. A lesser known complication is chronic central serous chorioretinopathy (CSCR). Although idiopathic central serous chorioretinopathy (CSCR) is known to be mild with spontaneous recovery and minimal effects on the final visual acuity, chronic CSCR as a complication of long-term steroid therapy behaves differently, and may cause irreversible visual impairment. **Clinical Picture:** Three cases of chronic, recurrent CSCR were precipitated by long-term corticosteroids prescribed for post-renal transplant immunosuppressive therapy, post-pituitary surgery and pemphigus vulgaris. **Treatment and Outcome:** Two cases resolved with tapering of corticosteroids while one case was treated by focal laser photocoagulation. Two eyes had severe impairment of vision as a result of subretinal scar formation while the other 4 eyes had mild reduction of visual acuity from retinal epithelium pigment atrophy. **Conclusion:** Long-term corticosteroid therapy can be complicated by severe, chronic and recurrent CSCR and occasionally peripheral exudative retinal detachment. This may result in subretinal fibrosis and permanent loss of vision.

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Introduction

Central serous chorioretinopathy (CSCR) is an idiopathic disorder characterised by serous detachment of the macula, retinal pigment epithelial (RPE) detachment and areas of RPE atrophy that may represent sequelae of previous episodes. CSCR can arise secondary to chronic treatment with steroids.^{1,2} Multiple routes of administration of corticosteroids have been implicated to cause CSCR and include oral, intravenous, inhaled, intranasal, epidural and intra-articular forms.^{3,4} Patients on long-term corticosteroid therapy may develop a chronic and recurrent form of CSCR, which may cause permanent visual loss. We present 3 cases of chronic CSCR secondary to long-term steroid therapy to illustrate this potentially blinding complication and the importance of co-management with the primary physician.

Case Series

Case 1

A 50-year-old Indian male had undergone transsphenoidal resection of a pituitary adenoma in 1993, with subsequent hormone replacement therapy with cortisol and thyroxine. Ten years later, he complained of a “dark ring” in the central vision of the left eye for 3 months. His visual acuities were 20/30 and 20/80 in the right and left eyes, respectively. There was a serous neurosensory detachment of the posterior pole associated with underlying RPE atrophy in the left eye. Fundus fluorescein angiography (FFA) demonstrated a typical “ink blot” type leakage of fluorescein (Fig. 1). Failing resolution after 3 months, focal argon photocoagulation was successfully performed with resorption of the subretinal fluid and improvement of vision to 20/50 without further recurrence.

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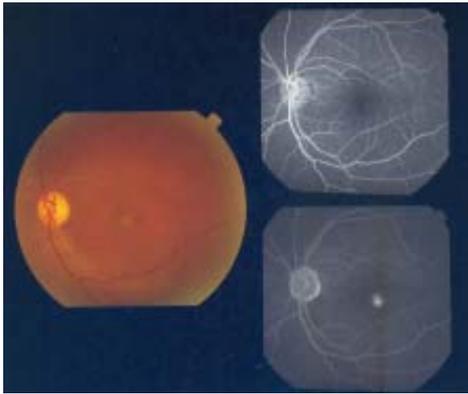


Fig.1. Left colour fundal photo shows a blister of neurosensory detachment about 5 disc diameters in size, with central exudates and underlying retinal pigment epithelial (RPE) atrophy. Fundus fluorescein angiography (FFA) demonstrates focal leakage of dye from an area inferio-temporal to the fovea, with a typical “ink-blot” appearance.

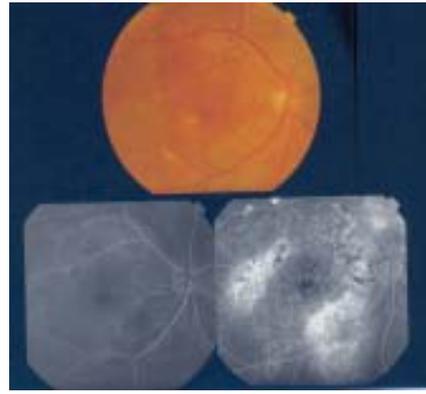


Fig. 2. The right eye shows areas of neurosensory detachment with subretinal fibrin. FFA shows multi-focal areas of leakage and widespread window defects corresponding to RPE atrophy.

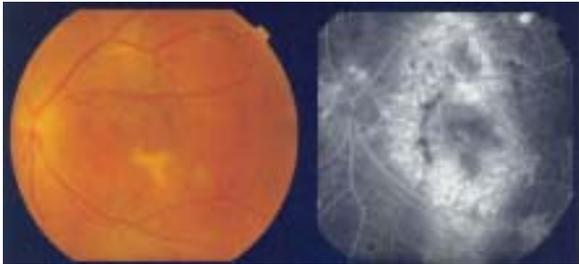


Fig. 3. The left eye has a subretinal fibrotic scar. FFA demonstrates staining of the subretinal scar and widespread RPE atrophy.

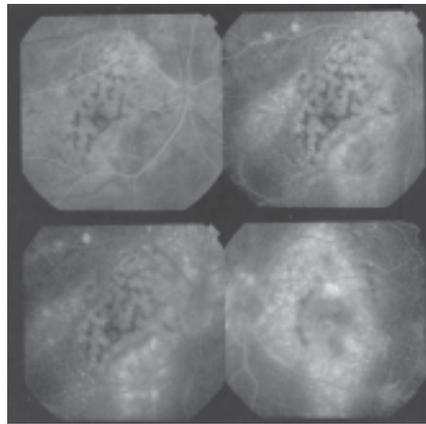


Fig. 4. FFA shows marked decrease in leakage of fluorescein in the right eye following tapering of oral corticosteroids. The appearance of the left eye remains stable.

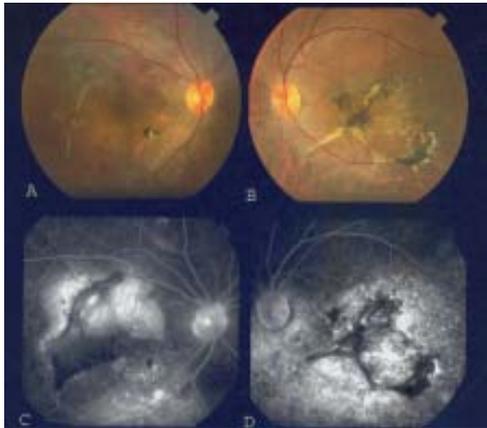


Fig. 5. Colour fundal photographs and fluorescein angiography at initial presentation.

- A. Serous retinal detachment of the right retina involving the macula with focal areas of chorioretinal scarring.
- B. Subretinal fibrosis in the left macula
- C. Fundal fluorescein angiogram of the right macula showing extensive hyperfluorescence and leakage of fluorescein dye into the serous detachment.
- D. Staining of the subretinal scar in the left eye by fluorescein.

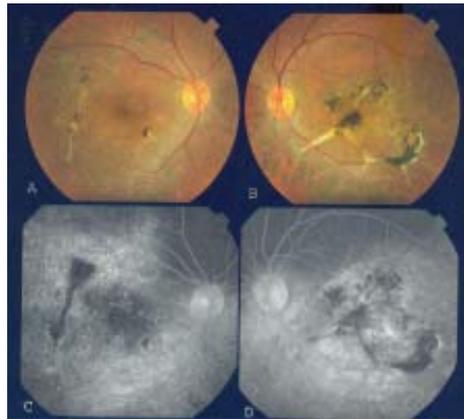


Fig. 6. Colour fundal photographs and fluorescein angiograms at 4 years after presentation.

- A. The right macula has quiet chorioretinal scars, with no serous retinal detachment.
- B. The left macula scar is the same as at presentation.
- C & D. Fluorescein staining of the areas of chorioretinal scarring in both maculas. There is absence of serous retinal detachments.

Case 2

A 55-year-old Chinese male had undergone renal transplantation for hypertensive nephropathy in 1990. His immunosuppression regime included prednisolone 10 mg/day and cyclosporine A. He presented with decreased vision in the right eye. His visual acuity was 20/40 in the right eye and counting fingers in the left eye. Examination revealed right areas of neurosensory detachment with subretinal fibrin and an inferior serous retinal detachment (Fig. 2). There was a subretinal scar in the left macula associated with a shallow neurosensory detachment (Fig. 3). FFA revealed multiple focal areas of leakage associated with a background of widespread RPE atrophy in the right eye (Fig. 2) and a staining scar in the left eye (Fig. 3). After co-management with the nephrologist, the prednisolone was reduced from 10 mg/day to 8 mg/day. However, during this period, he suffered 2 recurrences of the CSCR. Further discussion with the nephrologist led to a further dose reduction of the prednisolone to 3 mg/day with the addition of mycophenolate mofetil to achieve adequate immunosuppression. This resulted in resolution of the CSCR (Fig. 4) and stabilisation of the right vision at 20/40 with mild residual metamorphopsia.

Case 3

A 36-year-old Malay male complained of bilateral progressive blurring of vision over the previous 3 months. He had a 7-year history of pemphigus vulgaris, requiring long-term high-dose prednisolone of up to 120 mg/day. At presentation, he was receiving prednisolone prescribed at a maintenance dose of 10 mg/day and azathioprine 100 mg/day. His visual acuities were 20/200 and counting fingers in the right and left eyes respectively. There was an inferior serous retinal detachment in the right eye extending into the macula while a subretinal scar was present in the left macula. FFA revealed leakage of fluorescein into the area of serous detachment in the right eye and extensive window defects in the left eye (Fig. 5). Following discussion with the attending dermatologist, prednisolone was tapered to 5 mg/day, with resolution of the right CSCR. After 4 months, the patient suffered a relapse of pemphigus vulgaris, requiring an increase in dosage of prednisolone to 40 mg/day. Within a week, the right CSCR recurred. In addition, he developed diabetes and osteoporosis. In view of these steroid-induced complications, prednisolone was replaced with cyclophosphamide and dapsons. The CSCR in the right eye subsequently resolved and vision returned to 20/40 after 6 months (Fig. 6).

Discussion

Long-term, high-dose corticosteroid therapy is well-known to cause systemic and ocular complications. Cataract formation, open-angle glaucoma and reactivation of viral

infections are some of the more commonly encountered adverse effects.⁵ A less well-known but potentially blinding complication is chronic CSCR.

Classic CSCR is acute and unilateral, manifesting as a blister of serous detachment of the neurosensory retina, usually involving the macula. This is typically transient and spontaneous resolution occurs without significant permanent visual impairment.⁶ However, this is often not experienced in chronic CSCR. Chronic CSCR occurs in approximately 5% of patients. Chronic CSCR is often bilateral, multifocal, recurrent and may be associated with subretinal fibrin formation within the blister.⁷ Often, a retinal pigment epitheliopathy surrounding the blister(s) is present. Areas of atrophy of the retinal pigment epithelium can be found in the areas of the blisters in the macula, as well as in the form of vertical tracts extending from the macula towards the inferior retina. These arise as the subretinal fluid tracks inferiorly secondary to the effects of gravity. In severe cases, large inferior bullous exudative detachments of the neurosensory retina may develop.⁸ The subretinal fibrin can lead to subretinal fibrosis, scarring the macula, causing permanent loss of visual function.⁹

There have been several reports and case series published in the literature describing chronic CSCR as a complication of oral, intravenous, intramuscular, topical, inhaled and intranasal administration of glucocorticoids.^{3,4,10-12} The 3 cases described illustrate the occurrence of chronic CSCR with long-term steroid therapy. Case 1 required lifelong cortisol replacement after the resection of a pituitary adenoma. It would not have been possible to enforce a dose reduction as there is no available replacement drug. Hence, focal laser treatment to the leaking site was necessary to cease further leakage. Cases 2 and 3 required long-term corticosteroids for immunosuppression for renal transplantation and severe pemphigus vulgaris, respectively. In both cases, the prednisolone was reduced gradually and replaced by another agent to achieve the necessary immunosuppression as well as to invoke resolution of the chronic CSCR.

The underlying pathogenesis of CSCR secondary to steroid therapy is controversial. There have been several postulates alluding to the effects of glucocorticoids on the blood retinal barrier, choriocapillaris and the retinal pigment epithelium, resulting in focal areas of increased hyperpermeability with alteration of ion and water transport across epithelia and accumulation of subretinal fluid.¹³⁻¹⁵ Gass^{14,16} has also suggested that there is increased permeability of the choriocapillaris, which could allow entry of large proteins (such as fibrinogen) into the sub-RPE and subretinal spaces. The accumulation of fibrin then acts as a support for cellular growth and contraction, with formation of subretinal fibrosis.¹⁷ The damage to the retina

and underlying retinal pigment epithelium-choroid complex can result in permanent loss of vision.

Gass¹⁶ has established that glucocorticoids exacerbate the serous detachment when used to treat CSCR. It can cause large bullous exudative retinal detachments and lead to confusion of the diagnosis, particularly Vogt-Koyanagi-Harada disease, which would require systemic steroid therapy. Steroid use should be contraindicated in the presence of CSCR. Reduction in steroid dose and/or its elimination is necessary for resolution of the condition.

An important issue to recognise is the importance of early detection and co-management with the primary physician. Early detection and steroid dose adjustment can reverse the CSCR and prevent chronicity and permanent visual loss.

Conclusion

These cases illustrate the need for physicians to be aware of CSCR as a possible sight-threatening complication of long-term high-dose corticosteroid therapy. Visual impairment may be prevented if detected early, with co-management between the ophthalmologist and physician.

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