

COMBINED CENTRAL RETINAL ARTERY AND VEIN OCCLUSION COMPLICATING ORBITAL CELLULITIS

OO Komolafe , AO Ashaye

Department of Ophthalmology, University College Hospital, Ibadan, Oyo State. Nigeria.

ABSTRACT

Orbital Cellulitis is a dreaded ophthalmologic disease. It may destroy vision and the eye and may even become life threatening. Often visual loss is the result of exposure and subsequent destruction of ocular tissue commonly the cornea and the uvea.

We report a case of combined central retinal artery and vein occlusion complicating orbital cellulitis in a 35 year old patient who was 37 weeks pregnant resulting in loss of vision in the affected eye. There have been few case reports of this type of complication of orbital cellulitis.

Keywords: Combined, Central Retinal Artery and Vein Occlusion, Orbital Cellulitis, Pregnancy.
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INTRODUCTION

Orbital cellulitis is an infection of the soft tissues of the orbit posterior to the orbital septum. It usually occurs as an extension of infection from the periorbital structures especially the paranasal sinuses or from direct inoculation of infective matter from trauma or surgery or as a result of haematogenous spread from bacteraemia. Prior to the antibiotic era, patients with orbital cellulitis had a mortality rate of 17%¹. Among the survivors 20% were blind in the affected eye¹. Permanent visual loss may occur from corneal damage secondary to exposure or neurotrophic keratitis, destruction of intraocular tissues, secondary glaucoma, central retinal artery occlusion, direct compressive optic neuropathy and compression of optic nerve vasculature^{2,3}. Combined central retinal artery and vein occlusion is an uncommon but well recognized phenomenon^{4,5}. The causes of combined retinal vascular occlusion are varied but most often occur from systemic disorders⁶. There had been very few reported cases of combined central retinal artery and vein occlusion complicating orbital cellulitis^{7,8} more so in a pregnant patient.

CASE PRESENTATION

A thirty five year old gravida five, para four woman presented at the Eye Clinic of the University College Hospital, Ibadan, Nigeria in May, 2005. Her major complaints were itching in both eyes followed by a boil on the right lower lid of 2 weeks duration following which she noticed protrusion and blurring of vision of the right eye 11 days prior to presentation. Protrusion of the right eye had been

progressive. There was associated redness and discharge from the eye with fever. Ocular symptoms were preceded by history of nasal discharge of 3 weeks duration. There was associated generalized throbbing headache but no vomiting or impairment of sensorium.

Initial care was at a general hospital where she was hospitalized and had parenteral antibiotics, the names of the antibiotics were not known to the patient. The patient was referred from the general hospital to the University College Hospital as a result of poor response to treatment.

She had enjoyed good health and was not a known diabetic or hypertensive. She was 37 weeks pregnant. Antenatal care was at the general hospital from where she was referred. Antenatal period had been uneventful except for the present eye problem.

On examination, she was found to have a visual acuity of light perception in the right eye and $\frac{6}{5}$ in the left eye using the Snellen's visual acuity chart. There was marked lid edema, ecchymosis with restriction of extraocular muscle movement in all directions of gaze and a 10mm non axial proptosis in the right eye. The proptosis was directed infero - temporally. The left eye showed mild lid edema but full extraocular muscle movement.

Pupillary reaction on the right eye showed relative afferent pupillary defect but normal reaction on the left eye.

Fundoscopy on the right eye revealed generalized retinal whitening, a pale swollen disc with poorly defined margins. The supero nasal retina showed cotton wool spots, there were attenuated arterioles, engorged venules with segmentation and some empty vessels. Also blot, dot, and flame shaped haemorrhages were present in all quadrants of the retina. There was macula edema. (No facility for

Correspondence: Dr O O Komolafe
Email :kopeyemi@yahoo.co.uk

fundus photograph in this centre at the time of reporting this case). Intraocular pressures were 12mmHg in the right eye and 10mmHg in the left eye.

Full blood count analysis showed the packed cell volume was 35% (Hb of 11.2g/dl); White blood count total was 9,300/cm (Neutrophil-66%; Lymphocyte-26%; Eosinophil-2%; Monocyte-6%). Erythrocyte sedimentation rate was 55mm/hr (Westergreen). These laboratory results were all within normal limit. X-ray of the paranasal sinuses showed opacification of the right ethmoidal sinuses. Culture of the nasal discharge, eye discharge and pustule discharge showed no growth. A diagnosis of right orbital cellulitis with combined central retinal artery and vein occlusion (secondary to right ethmoidal sinusitis) was made. An ethmoidal sinusitis was thought to be the predisposing factor. She was jointly managed by the Ophthalmology, Otorhinolaryngology and Obstetrics teams. She was commenced on Intravenous Ceftriazone (1g daily); Metronidazole (500mg every 8 hours) and Gutt. Ciprofloxacin q.i.d to the affected eye. There was considerable improvement in her clinical condition within 48 hours of commencing treatment as demonstrated by reduction in fever, degree of proptosis and improved extraocular muscle motility. However vision in the right eye remained at light perception.

Antibiotic was changed to oral Ceftazidime (500mg tds) after 5 days of parental antibiotics. Patient was discharged 2 weeks after hospitalization.

On her first clinic visit 10 days after discharge, visual acuity in the right eye was no light perception with total afferent pupillary defect. Fundoscopy showed more marked disc pallor and more cotton wool spots between 1 and 5^oclock in the peripapillary region. Proptosis and facial swelling had completely resolved with full extraocular muscle movement and she had remained afebrile since discharge. The symptoms of the nasal infection had cleared. The left eye had also remained normal.

DISCUSSION

Orbital cellulitis is generally an infection seen in children and young adults². This patient was 35 years old and falls within the young adult age group. This is not an unusual age for orbital cellulitis and commonly it is as a result of extension of infection from the paranasal sinuses. Patients with orbital cellulitis usually have proptosis, impaired ocular motility, ocular pain aggravated by ocular movement. Reduction of visual acuity and relative afferent pupillary defect are suggestive of complications relating to the optic nerve³. All these

symptoms and signs were present in this patient including proptosis and ophthalmoplegia which are the cardinal symptoms and signs of orbital cellulitis.¹ In addition there was fever, which showed dramatic response to antibiotic therapy. The most common cause of orbital infection is extension from the paranasal sinuses which is seen in 65% of cases¹. Extension from ethmoidal sinusitis is the most common cause in all age groups accounting for about 90% of cases². This patient had symptoms referred to the nose and this was corroborated by the radiological finding of opacified ethmoidal sinus on the right. The source of infection however may have been from the pustular lesion on the right lower lid⁷. Combined occlusion of the central retinal artery and vein encompasses the clinical finding of both arterial and venous obstruction^{5, 9}. These include superficial retinal whitening with a cherry red spot, dilated and tortuous retinal veins with haemorrhages, optic disc edema. All these were present in our patient except the macular cherry red spot. It has been demonstrated that following orbital inflammation, occlusion may occur at the level of the central retinal artery¹⁰ or occasionally the ophthalmic artery¹¹. In those cases due to occlusion at the level of central retinal artery, there is typically a cherry red spot at the macula^{4, 10} but there tends to be more of retinal whitening and edema at the posterior pole if due to ophthalmic artery occlusion⁴. The proposed theories for central retinal vascular obstruction are multifactorial.^{3, 8, 12} One theory suggests that obstruction of the central retinal vein may result in decreased venous return and subsequent arterial obstruction. Another postulates a reduction in perfusion within the central retinal artery which may result in vascular stasis and venous thrombosis.

Combined vascular occlusion have been reported following retro bulbar anaesthesia attributable to injury and distension within the optic nerve sheath¹³. Other reports have been following retrobulbar neuritis¹⁴, septic orbital cellulitis⁷ and orbital inflammatory pseudotumour⁸.

It is known that pregnancy represents a hyper coagulant state, a risk factor for occlusive vascular disorder. A case of combined retinal artery and vein occlusion had been reported in a pregnant woman but with a preexisting systemic lupus erythematosus and antiphospholipid syndrome¹⁵. Though our case had no clinical signs to suggest presence of these disorders, we may not be able to completely exclude them as she was not screened for these conditions. Such screening could include assaying the serum level of anticardiolipin antibody, antinuclear

antibody, stranded DNA antibody and complement C3 and C4 level,¹³ facilities for these tests were not available in our hospital.

Even in the presence of good imaging facilities it may still have been difficult to pinpoint the possible underlying mechanism in this patient since she presented about 11 days after the onset of proptosis. However, the clinical picture in our patient was strongly suggestive of an orbital cellulitis, combined retinal artery and vein occlusion. An ethmoidal sinusitis could have been the risk factor for the orbital cellulitis. An orbital compression and hypercoagulable state might have predisposed to the vascular occlusion. A negative culture could be as a result of the use of antibiotics prior to presentation to our hospital. The need for good and longer follow up is important because eyes affected by vascular occlusion typically have a poor visual outcome and tend to develop such complications as rubeosis iridis and neovascular glaucoma⁵.

CONCLUSION

Irreversible visual loss may follow orbital cellulitis complicated by central retinal artery and vein occlusion. Though this is not a frequently encountered complication, a high index of suspicion is needed so that such complications are not missed in patients with orbital cellulitis. The importance of visual acuity measurements pupillary response and good funduscopy in patients with orbital cellulitis for diagnostic purpose was well demonstrated in this case report.

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