Branch Retinal Arterial Occlusion

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ABSTRACT
Retinal arterial occlusion is an ocular emergency in which visual prognosis is poor mostly due to late presentation of the patient and macular involvement. The case described, in this report is an incidence of Branch Retinal Arterial Occlusion in a 22 year old female with grade II Mitral Regurgitation. The patient presented with complaint of painless, diminution of vision in the right eye. She also presented with perception of black shadow in the superior visual field of the same eye for five days. There was no significant systemic or personal history. Her visual acuity at presentation was 6/60 and 6/6 in the right and left eyes, which did not improve with glasses or pin-hole. Anterior segment including papillary reaction was normal in both eyes while Fundus examination of the right eye revealed retinal whitening inside the inferotemporal vascular arc that was encroaching foveolar avascular zone. Visual field defect was detected at superonasally inside arcade but Fundus Fluorescence Angiography was normal. An echo-cardiograph revealed grade II Mitral Regurgitation. The patient was kept on observation and after two days of follow-up, vision in the right eye was improved to 6/6 unaided but visual field defect was remained same.

Key Words
branch retinal arterial occlusion, cardio valvular disease, visual field defect.

INTRODUCTION
Retinal arterial occlusive disease is an ocular emergency which can manifest in a number of clinical fashions such as central retinal arterial occlusion (CRAO), branch retinal arterial occlusion (BRAO), cilio-retinal arterial occlusion, combined CRAO and veins occlusion, and cotton-wool spots. Among the cases of acute retinal arterial obstruction, CRAO accounts for approximately 57%, BRAO for 38%, and cilio-retinal artery occlusion for 5%¹. The visual prognosis in eyes with BRAO is usually quite good unless the foveola is completely surrounded by retinal whitening. Such a condition need treatment with aggression as in CRAO. Patients with retinal arterial occlusions should undergo detailed systemic evaluation including cardio-valvular.

CASE REPORT
A 22 year old female presented to the retina clinic of Nepal Eye Hospital had a chief complaint of painless sudden diminution of vision and perception of black shadow in the right eye since 5 days. It was not associated with redness, photophobia, watering, pain on ocular movement, floaters and flashes of light, or colored haloes. She had no similar episodes in the past. The visual history of ocular trauma, glaucoma, diabetes mellitus, hypertension, cardiovascular disease, bleeding disorders, or high myopia. The patient was not under any medication which may have contributed to her condition. On general examination, she was of average built and well oriented to time and surroundings. Her blood pressure was 100/80 mmHg with regular pulse of 72 beats per minute. Examination revealed that there was no extra-ocular movement, convergence and cover test was normal. Unaided visual
acuity was 6/60 and 6/6 in the right eye (RE) and left eye (LE) respectively and was not improving with glasses or pin-hole. Slit-lamp examination of anterior segment revealed normal findings in both eyes (BE) with normal papillary reactions. Slit-lamp bio-microscopic examination with +90.0 D lens revealed clear ocular media in BE with normal fundus findings of the LE but on RE fundus it revealed normal disc with milky white retina encroaching the foveolar vascular zone around the infero-temporal vascular arcade (Figure 1).

There was no retinal haemorrhage, exudates or arteriolar attenuation. Goldmann visual field showed paracentral relative and absolute scotoma in supero-nasal region, partially involving the macular area (Fig 2a). On Goldmann applanation, intraocular pressure (IOP) was 1 mm of Hg in BE. Colour vision was tested with Ishihara polychromatic plates and it was normal in BE. A diagnosis of right eye infero-temporal branch retinal arterial occlusion was made.

AB blood tests such as Total count (8000/mm²), differential count (neutrophil -70%, lymphocytes -27%, eosinophil 3%), haemoglobin (12 gm%), erythrocyte sedimentation rate (14 mm/ 1st hour Wintrobe method), blood sugar (fasting -70 mg% and postprandial -130 mg%) was normal. Rheumatoid factors and antinuclear antibody were negative. Lipid profiles showed cholesterol -143 mg%, HDL -36 mg%, LDL -79 mg% and Triglyceride -139 mg%. The cardiac consultation revealed normal ECG and grade II Mitral Regurgitation in echocardiography. Two days after the cardiac consultation, the patient followed up at a different eye hospital and underwent a visual acuity and Goldmann visual field test again. These tests showed improvement of right eye visual acuity from previously being 6/60 to 6/6 unaided, while the previously present relative scotoma (visual field defect) had subsided, though paracentral absolute scotoma was persistent.

This case is reported for rarity of visual improvement after a week of BRAO in young women.

**DISCUSSION**

Retinal arterial occlusive (RAO) disease is an ocular emergency associated with profound visual loss due to the macular involvement and is most often diagnosed cases are painless and sudden. There are several ocular and systemic conditions associated with RAO. The most common conditions are as follows:

- Abnormalities contributing to embolus formation e.g. cardiac valvular disease, systemic arterial hypertension, carotid atherosclerosis, or left ventricular hypertrophy.
- Traumas such as retrobulbar injection, or orbital fractures.
- Coagulopathies such as sickle-cell disease, homocystinuria, oral contraceptives, platelet abnormalities, protein S deficiency, or protein C deficiency.
- Collagen vascular disease.
- Ocular conditions such as increased intraocular pressure, toxoplasmosis, optic neuritis, optic disc drusen, pre-papillary arterial loops etc.

There are reported cases of BRAO in syphilis (third stage) and cases also been reported after intra-vitreal injections of Lucentis and Avastin (Anti VEGF). Similarly, BRAO is observed in patients who suffer from migraines, hypotension or use nasal oxymethazoline.

The causes of RAO in patients under the age of 30 years often differ from those in patients older. Some of the disease entities which more commonly cause RAO in young individuals include migraines, cardiovascular disorders, trauma, sickling hemoglobinopathies, ocular abnormalities (optic nerve drusen and pre-papillary arterial loop), protein C and S abnormalities and antithrombin III.

Overall, patients with acute RAO who are younger than 45 years of age are three times more likely to have had cardiac disease that requires anticoagulation or cardiac surgery. In CRAO the visual acuity may range from counting fingers to light perception. Overall, in 90% of eyes, the visual prognosis is poor. But in BRAO the visual prognosis is still relative both at presentation and at the final visit.
unless foveolais involved. Approximately 80% of patients’ eyes eventually improve to 20/40 or better, although the residual field defects generally remain. A similar result was observed in our case; the vision was improved to 6/6 (unaided) without treatment while the visual field defect was persistent. Retinal arterial occlusion involving maculais an ocular emergency and it requires immediate treatment to reduce the IOP as soon as possible. These treatments are ocular massage, para-centesis, intravenous mannitol, inhalation of mixture of O2 (95%) with CO2 (5%), use of Anti-fibrinolytic agent and trans-luminal Nd-YAG embolysis/embolectomy.

Although the visual outcome is determined by factors such as the cause of arterial occlusion, nature of occlusive emboli and duration of retinal ischemia, aggressive treatment may re establish retinal circulation and improve the visual outcome.

**CONCLUSION**

The causes of retinal arterial occlusion in young adults are different from those of older individuals among which cardio-valvular disease is an important factor. Visual prognosis is good in BRAO.

**REFERENCES**


**Figure 2a.** Visual field on the day of presentation absolute scotomassurrounded by relative scotoma which is further surrounded by absolute scotoma in the superonasal visual field

**Figure 2b.** Visual field taken after seventh day showing absolute scotoma in superonasal region

**Figure 3.** RE Fluorescein angiography showing thrombus near the inferior margin of the disc with perfused macula