

Case Report of Ocular Ischemic Syndrome, Taif, Saudi Arabia

Abdulmohsen Hamad Hamed Alhamyani¹, Sami Awd Alharthi, Sara Hussein A Gebril², Mohamed Ahmed Siddig, Osama A Alhaj, Nuha Mohamed Ahmed², Talal Abdulrahman Althomali³
Taif medical college¹, King Faisal hospital², Taif university³, Taif, Saudi Arabia

ABSTRACT

Background: Ocular ischemic syndrome (OIS) is more prevalent among male aged more than 50 years. Various disorders such as diabetes, hypertension, and peripheral vascular diseases are major risk factors responsible for OIS in aged male.

Case report: This case study involves a 57-year-old male patient having history of diabetes, hypertension, slurred speech, hemiparesis and hypoesthesia of the right side of the body. The patient came with complain of red eye, pain and decreased vision in left eye. Complete left internal carotid artery obstruction, rubeosis iridis of the left eye, dots of hyphema of the left eye, bilateral hard exudates, significant macular edema and non-proliferative diabetic retinopathy were observed in the patient. In this case, in consultation with ophthalmology, surgery and medicine departments multidrug treatment procedure was followed. This multi-drug based therapy successfully controlled the condition of patient and improved the vision of patient.

Keywords: Ocular ischemic syndrome, left internal carotid obstruction.

INTRODUCTION

Ocular ischemic syndrome (OIS) affects vision and if not timely treated it may cause vision loss [1]. Diabetes, stroke, cardiac vascular diseases, hypertension, peripheral vascular and carotid artery diseases are some major causes for development of ocular ischemic syndrome [2]. This disease is mainly characterized by the presence of ischemic signs in both anterior and posterior segments of eye [3]. OIS is also associated with occlusion of the common carotid artery (CCA) or internal carotid artery (ICA) [4]. The following case study involves analysis of OIS patient as well as considering the input of patient and case history. Furthermore, after the evaluation of pathological condition of patient, the treatment strategy was determined with consultation of ophthalmology, surgical and medical departments to control the condition.

CASE PRESENTATION

57 years old male patient known case of hypertension and diabetes type 2, presented to our hospital at 25/12/2017 complaining from left eye redness and pain with decreased vision. The patient had history of slurred speech, hemiparesis and hypoesthesia of the right side of the body. The patient was conscious and oriented to time, place and persons. Blood pressure and oxygen saturation were 150/80 mmHg and 95% respectively. Sodium and potassium were within normal range and their values were 135 mmol/L and 4.26 mmol/L respectively. Other clinical factors such as blood urea (35 mg/dL) and creatinine (1.11 mg/dL) random blood glucose 136.2 mg/dL, hemoglobin A1c 10.036%, partial thromboplastin time 22.70 second and

prothrombin time 13.7 second were also determined to get comprehensive view of clinical status of the patient. Complete blood count is shown in table (1). Liver function tests and cardiac enzymes were within normal range and are summarized in table (2) and (3) respectively. Eyes examination showed that visual acuity was 6/36 right eye and counting fingers left eye. Intraocular pressure was 9 mmHg right eye and 12 mmHg left eye. Anterior and posterior segments examination of both eyes are shown in table 4. Optical coherence tomography of macula revealed increased macular volume of the right eye 11.7 mm³ and increased macular volume of the left eye 10.9mm³. Foveal thickness of the right eye equal to 373 μm and foveal thickness of the left eye equal to 256 μm. Optical coherence tomography of optic disc revealed bilateral normal retinal nerve fiber layers thickness. Average cup /disc ratio .42 in the right eye and average cup / disc ratio .51 in the left eye. Ultrasonographic assessment revealed complete left internal carotid artery obstruction by thrombus with picture of atherosclerotic changes (Figure 1). This was also detected by computer tomography with contrast (Figure 2). Dilated funduscopy revealed bilateral clinically significant macular edema, non-proliferative diabetic retinopathy and hard exudate (figure 3 and 4). B-scan ultrasonography of both eyes showed bilateral vitreous changes (Figure 5 and 6). After consultation with ophthalmology, general surgery and medical departments, therapeutic drugs, dose and frequency were determined. The patient received insulin injection, aspirin (81 mg once daily), ranitidine (150 mg twice in a day) and atorvastatin (20 mg

once daily). The patient also received maxitrol (1 drop four times daily), prednisolone acetate (1 drop four times daily) and atropine (1 drop 2 times daily). These drugs were effective to control the clinical situation of patient. On discharge 3/1/2018 the visual acuity in the left eye improved from counting fingers to 6/60, also the hyphema subsided.

Table (1): Complete blood count

| Test name | Result |
|------------|----------------|
| WBC | 6.4 K/ μ l |
| RBC | 6.07M/ μ l |
| Hemoglobin | 16.10 g/dL |
| MCV | 79.20 fL |
| MCHC | 33.5 g/dL |
| MCH | 26.5 pg |
| Platelets | 43 K/ μ l |

Table (2): Liver function test

| Test name | Result |
|------------------------|-------------|
| Alanine transaminase | 16 U/L |
| Aspartate transaminase | 17 U/L |
| Alkaline phosphatase | 67 U/L |
| Bilirubin | 0.694 mg/dL |

Table (3): Cardiac enzymes

| Test name | Result |
|-----------------------|---------|
| Cardiac kinase | 81 U/L |
| Aspartate saminase | 17 U/L |
| Lactate dehydrogenase | 199 U/L |

Table (4): Ocular examination of right and left eyes

| Ocular examination of anterior segment | | |
|---|---|---|
| | Right eye | Left eye |
| Lid | No abnormality detected | No abnormality detected |
| Conjunctiva | No abnormality detected | Mild conjunctival injection |
| Cornea | No abnormality detected | Haziness |
| Pupil | Central , reactive and round | Not fully dilated with posterior synechia |
| Iris | No abnormality detected | Rubeosis iridis |
| Anterior chamber | No abnormality detected | Dots of hyphema |
| Lens | Posterior subcapsular cataract | Posterior sub capsular cataract |
| Ocular examination of posterior segment | | |
| | Right eye | Left eye |
| Dilated funduscopy | 1-Moderate non-proliferative diabetic retinopathy. 2- Clinically significant macular edema. 3-Hard exudate. | 1-Moderate non-proliferative diabetic retinopathy. 2- Clinically significant macular edema. 3-Hard exudate. |

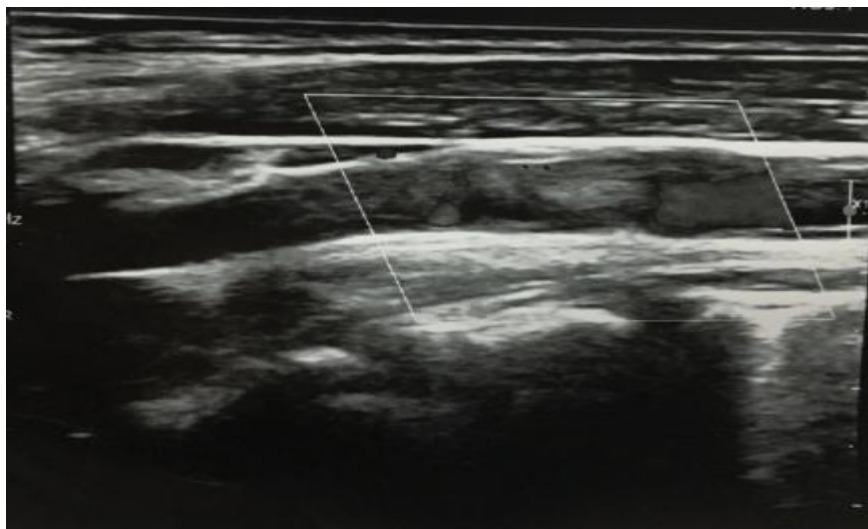


Figure (1): Left internal carotid artery obstruction.

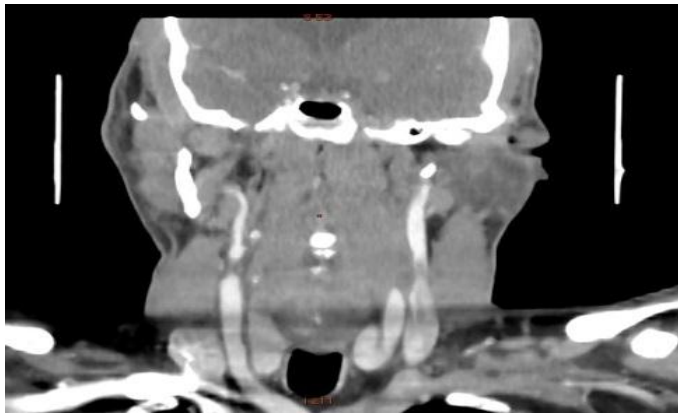


Figure (2): Computed tomography with contrast showing left internal carotid obstruction.

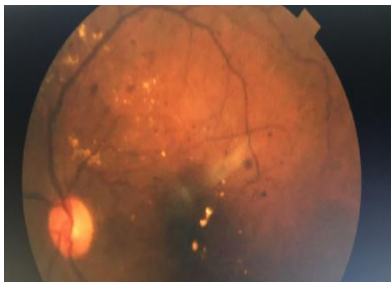


Figure (3): Fundoscopy of left eye.



Figure (4): Fundoscopy of right eye



Figure (5-A): Scan of right eye

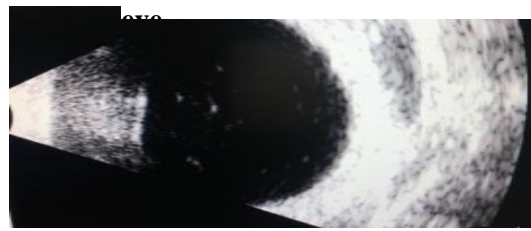


Figure (5-B): Scan of left eye.

DISCUSSION

A patient with earlier history of hypertension and type 2 diabetes visited the hospital with problems of redness in left eye along with pain and decrease in vision. Historical and pathological record of patients showed earlier complications related such as slurred speech, hemiparesis and hypoesthesia of the right side of the body. Clinical investigation showed high blood pressure yet oxygen concentration was normal along with complete blood count. Only platelet count was observed at below normal range. Level of electrolytes such as sodium and potassium were also reported within normal range. Liver function tests and examination of cardiac enzymes activity were normal. Counting figure in left eyes and poor vision in right eye were also observed. Intraocular pressure was low for right eye while it was within normal range for left eye. Rubeosis iridis, dots of hyphema in anterior chamber and posterior sub capsular cataract in lens of left eye. These changes might

be associated with blurred vision, redness and pain in left eye of patient. Development of clinically significant macular edema, bilateral hard exudates and non-proliferative diabetic retinopathy were observed during the optical coherence tomography (OCT) examination. If properly not treated, patient may loss his vision. OCT is widely used modern instrument to determine early condition of glaucoma and associated thickness of retinal nerve fiber layers to the glaucoma [5-6]. B-scan ultrasonography also indicated bilateral vitreous changes. After consultation with ophthalmology, medical and surgery departments, insulin, aspirin, ranitidine, atorvastatin, maxitrol and prednisolone acetate were recommended for the treatment. This treatment successfully controlled diabetic condition and restored visual activity in the left eye along with reduction in hyphema.

A case study for OIS was reported and hypoperfusion retinopathy was observed by chronic arterial hypoperfusion. A 63 years old

patient had earlier history of diabetes (type 2), hypertension, and hypercholesterolemia. The patient was earlier diagnosed with ischemic cerebral stroke and bilateral obstruction of internal carotid arteries leading to visual impairment in both eyes. Besides, image analysis of the patient indicated the carotid occlusion, ocular hypertension, rubeosis iridis in right eye, optic atrophy in both eyes and superior altitudinal visual field defect in left eye; these symptoms confirms OIS in both eyes and neovascular glaucoma in left eye. Anterior ischemic optic neuropathy and laser panphotocoagulation were recommended for left and right eye respectively [3]. Reduced blood flow and enhancement in retrobulbar circulation resistance led to development of condition of chronic hypoxia in central retina, iris and ciliary arteries and bodies. Furthermore, reduction in humor production is mainly associated to hypotony in ciliary bodies. This phenomenon was observed in vivo by using ultrasound [7].

In another study, among 23 diabetic patients, two patients were suffering from bilateral OIS, whereas optic atrophy (ischemic optic neuropathy) was observed among four patients. In addition to this, fractional visual loss due to hypoperfusion retinopathy and cataract was observed among six and two patients respectively. There was 11 case of iris neovascularization with significantly reduced visual activity. Moreover, asymmetrical ocular manifestation was reported among five patients. Finally in this study, carotid reconstruction surgery and ophthalmological interference were not able to recover visual activity significantly in OIS patients. The age group of patient was 50-75 years, and they were mostly male [8]. In another semantic study, 66 years old patient with hyperlipidemia reported pain and redness in his left eye since last three days. During examination visual activity was 6/18 along with intraocular pressure of 30 mmHg, with marked anterior chamber flare, unreactive dilated pupil and rubeosis of the angle. Furthermore, fundus examination established cotton wool spots and marked venous stasis. Whereas, Doppler ultrasonography and CT-angiography reported complete occlusion of both internal carotid arteries. The laser photocoagulation treatment

procedure was used to restore the visual activity. However, after one year neovascular glaucoma and development of cataract was observed yet visual activity of right eye was stable [9].

These clinical investigations were important for determination of the treatment procedures and establishment of OIS among patients. This case study indicates that personalized approach and advanced practices will be helpful to improve and manage the OIS associated with diabetes and other diabetic complexity.

REFERENCES

1. **Biouesse V (1997):** Carotid disease and the eye. *Curr Opin Ophthalmol.*, 8: 16-26.
2. **Gologorsky D, Mohsenin A (2016):** Ocular Ischemic Syndrome. In: Medina CA, Townsend JH, Singh AD, editors. *Manual of Retinal Diseases: A Guide to Diagnosis and Management*. Cham: Springer International Publishing, pp: 351-354.
3. **Mendrinós E, Machinis TG, Pournaras CJ (2010):** Ocular ischemic syndrome. *Surv Ophthalmol.*, 55: 2-34.
4. **Alizai AM, Trobe JD, Thompson BG, Izer JD, Cornblath WT et al. (2005):** Ocular ischemic syndrome after occlusion of both external carotid arteries. *J Neuroophthalmol.*, 25: 268-272.
5. **Zeried FM, Osuagwu UL (2013):** Changes in retinal nerve fiber layer and optic disc algorithms by optical coherence tomography in glaucomatous Arab subjects. *Clinical Ophthalmology (Auckland, NZ)*, 7: 1941-1949.
6. **Larrosa JM, Moreno-Montañés J, Martínez-de-la-Casa JM, Polo V, Velázquez-Villoria Á et al. (2015):** A Diagnostic Calculator for Detecting Glaucoma on the Basis of Retinal Nerve Fiber Layer, Optic Disc, and Retinal Ganglion Cell Analysis by Optical Coherence Tomography. *Investigative Ophthalmology & Visual Science*, 56: 6788-6795.
7. **Furino C, Guerriero S, Boscia F, Ferrari TM, Cardascia N et al. (2007):** In vivo evidence of hypotrophic ciliary body in ocular ischemic syndrome by ultrasound biomicroscopy. *Ophthalmic Surg Lasers Imaging*, 38: 505-507.
8. **Ino-ue M, Azumi A, Kajiura-Tsukahara Y, Yamamoto M (1999):** Ocular ischemic syndrome in diabetic patients. *Jpn J Ophthalmol.*, 43: 31-35.
9. **Godina-Kariž S, Kariž S, Cveticanin B (2010):** Ocular ischemic syndrome as initial manifestation of bilateral internal carotid artery occlusion. *Zv j.*, 79: 181-184.