



Challenging Ophthalmic Complications of Diabetic Hypertension

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Case Report

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Abstract

To report challenging ophthalmic complications in a diabetic-hypertensive patient. Diabetes is a progressive disease that adversely affects on multiple organ systems, with hypertension being a common comorbidity. The eyes, sometimes, are indicators of the systemic diseases like diabetes and hypertension. Both conditions adversely affect the macrovascular and microvascular systems. Systemic complications of these diseases are sometimes complicated and complex. In this case report, carotidocavernous fistula (CCF), pupil involving third cranial nerve palsy and clinically significant macular edema (CSME) coexisted in a single patient, presenting diagnostic and therapeutic challenges.

Keywords: Diabetes; Hypertension; Carotidocavernous Fistula; Clinically Significant Macular Edema; Pupil Involving Third Cranial Nerve Palsy

Abbreviations

CCF: Carotidocavernous Fistula; CSME: Clinically Significant Macular Edema; IVB: Intravitreal Bevacizumab; BCVA: Best Corrected Visual Acuity; CTA: CT Angiogram; BP: Blood Pressure; DR: Diabetic Retinopathy.

Introduction

Diabetes mellitus is an important problem that induces earnest complications and it causes significant morbidity owing to specific microvascular complications such as retinopathy, nephropathy and neuropathy, and macrovascular complications such as ischemic heart disease, and peripheral vasculopathy [1].

Apart from poor glycaemic control, blood pressure (BP) has been shown to be an important risk factor for Diabetic Retinopathy (DR). Evidence from clinical trials has demonstrated beneficial effect of tight BP control on risk of DR in patients with diabetes and hypertension [2].

Not only is hypertension more common in patients with diabetes but also diabetes is also more common in hypertensives than in the general population. Therefore, there is a chicken-egg relationship between hypertension and diabetes. To this point, hypertension occurs in 50% to 80% of patients with type 2 diabetes, who make up over 90% of the diabetic population versus $\approx 30\%$ of patients with type 1 diabetes who develop hypertension [3].

In adults, the most common causes of ocular motor palsy are aneurysm, microvascular disease (such as diabetes mellitus), and trauma. In patients with DM, ocular motor nerve palsy is a common cause of acquired diplopia and/or ptosis. In diabetics, the calculated incidence of cranial nerves palsies is 5-10 times higher than in non-diabetics. Approximately 1-4% of diabetics have ocular motor nerves palsies during the course of the disease. In diabetic patients, ocular motor nerve palsies showed a propensity for the third and the sixth nerves, with relative sparing of the fourth. Type 2 DM patients with diabetic retinopathy were most frequently affected [4].

Carotidocavernous fistula (CCF) is an abnormal communication between the cavernous sinus and the carotid system. CCFs can be classified by etiology (traumatic vs spontaneous) and anatomy (direct vs indirect or dural). The dural CCF may be due to congenital arteriovenous malformation that develops spontaneously, often in the setting of atherosclerosis, systemic hypertension, or connective tissue disease. It consists of a communication between cavernous sinus and one or more meningeal branches of the internal carotid artery, external carotid artery, or both. The posteriorly draining dural CCF most commonly presents with cranial nerve palsies. The onset of the paresis is sudden, and only one of the ocular motor nerves is affected. The third nerve is most often affected, and the resulting paresis may be complete with involvement of the pupil or incomplete with or without pupil involvement. But almost all cases are associated with ipsilateral orbital pain [5].

Case Presentation

A 56 years old diabetic hypertensive lady presented with reduced vision right eye for two weeks. She denied any history of head or eye injury. The best corrected visual acuity (BCVA) was 6/9 in the right eye and 6/6 in the left eye.

Examination of the posterior segment of right eye revealed retinal hemorrhage, hard exudates and macular edema. The patient was diagnosed with Clinically Significant Macular Edema (Figure 1). She received intravitreal bevacizumab (IVB) (1.25mg/0.05 mL) administered at six-week intervals for three doses.



Figure 1: Clinically Significant Macular Edema (CSME) right eye.

Four weeks after the third IVB dose, the patient developed pupil involving 3rd cranial nerve palsy on the right side. The right eye was deviated downward and outward, with a

dilated pupil that did not react to direct light stimulus. Other cranial nerve functions were normal. A CT Angiogram (CTA) was performed to look for intracranial aneurysms, but no positive findings were detected (Figure 2). Patient was under observation and 3rd cranial nerve palsy recovered without any intervention.

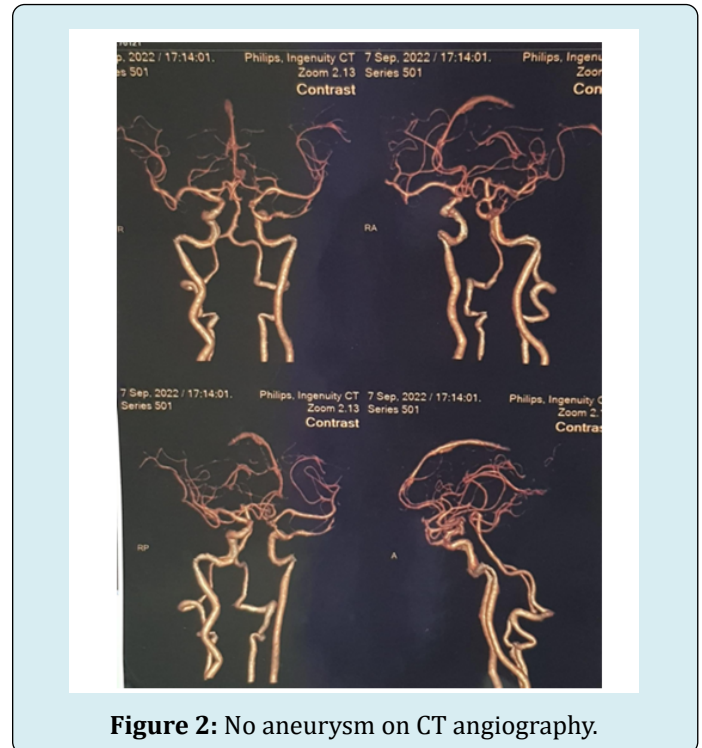


Figure 2: No aneurysm on CT angiography.

Six months later, she presented with proptosis and red eye in the same right eye. Cockscrew conjunctival vessels and axial proptosis were detected, leading to a clinical diagnosis of spontaneous carotidocavernous fistula (Figure 3).

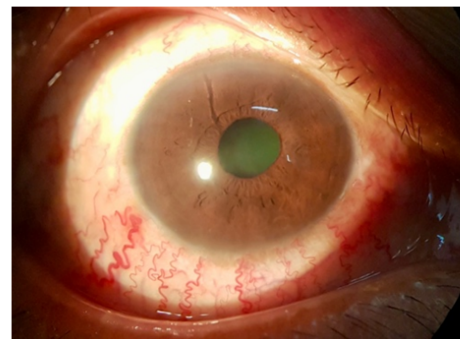


Figure 3: Cockscrew conjunctival vessels (right eye).

To confirm the diagnosis, CT (head and orbit) was performed and enlarged superior ophthalmic vein on right side was detected (Figure 4).



Figure 4: Axial CT head scan with contrast demonstrates right sided superior ophthalmic vein dilatation.

Discussion

This case presented initially with visual impairment from CSME in right eye. Subsequently, pupil involving third cranial nerve palsy occurred in her right eye. The most common cause of isolated third nerve palsy with pupillary involvement is an aneurysm in the posterior communicating artery [6]. Therefore, CTA was performed to find out the aneurysm, but none was detected. The patient was under observation and third cranial nerve palsy spontaneously recovered completely. She later presented with red eye, conjunctival cockscrew vessels and axial proptosis in the same eye. CCF was suspected and distended superior ophthalmic vein was detected on CT.

Causes of dural fistula includes hypertension and post-menopausal women are most commonly affected [7]. Our patient is post-menopausal hypertensive and diabetic woman with poor control of both diseases. All the vascular complications of diabetes and hypertension were developed sequentially in our patient, with the presentation being unusual as CCF features developed after spontaneous

complete recovery of the third cranial nerve palsy.

Conclusion

Diabetes mellitus and hypertension are prevalent non communicable diseases. Strict control of both diseases is difficult for patients as they are chronic incurable diseases. Lack of patient awareness and barriers to accessing quality healthcare impede effective management in Myanmar. Ophthalmic complications would be preventable with proper control of diabetes and hypertension.

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