

Ocular ischemic syndrome after long-term radiotherapy for nasopharyngeal carcinoma: a case report

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Abstract

• **AIM:** To report a case of bilateral ocular ischemic syndrome (OIS) with bilateral common carotid artery complete occlusion in a patient after long-term radiotherapy for nasopharyngeal carcinoma.

• **METHODS:** Interventional case report. A 57-year-old man presented with a 6-month history of amaurosis fugax in his left eye and ocular and periorbital pain, diagnosed with bilateral OIS. Bilateral panretinal photocoagulation (PRP), cataract surgery, carotid endarterectomy and an Ahmed valve implant were performed consecutively.

• **RESULTS:** After PRP and uneventful cataract phacoemulsification administered, the conditions of bilateral eyes were stabilized. However after bilateral carotid endarterectomy, the intraocular pressure (IOP) was increased, accompanied by the visual acuity reduced to counting fingers at six inches.

• **CONCLUSION:** The management of bilateral OIS with bilateral common carotid arteries complete occlusion after long-term radiotherapy for nasopharyngeal carcinoma is frustrating and the prognosis for vision is poor.

• **KEYWORDS:** ocular ischemic syndrome; nasopharyngeal carcinoma; radiotherapy; carotid artery

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INTRODUCTION

Patients who underwent irradiation of the neck and head for more than 5 years were at a higher risk for developing significant carotid stenosis^[1]. When carotid stenosis is greater than 90%, the risk of ocular ischemic syndrome (OIS) is remarkably increased^[2]. Here we reported a case of bilateral OIS with bilateral common carotid arteries complete occlusion after long-term radiotherapy for nasopharyngeal carcinoma.

CASE REPORT

A 57-year-old man was referred to the hospital with several episodes of amaurosis fugax in the left eye for 6 months

duration, accompanied by ocular and periorbital pain. Postural factors such as suddenly standing upright could provoke these symptoms. This patient received external irradiation to the head and neck area for the treatment of nasopharyngeal carcinoma five times every week, with the total dose 124Gy 10 years ago. He had extensive postradiation skin atrophy and fibrosis of tissues overlying the radiation region. The pharyngeal tumor did not recur subsequently. The patient's family history was unremarkable for cancer or eye diseases.

The ophthalmic examination showed visual acuity of RE: 20/16 and LE: 20/80. Intraocular pressure (IOP) was RE: 11.0mmHg and LE: 18.0mmHg. There were dilated episcleral vessels, anterior chamber cells and flare(+), neovascularization in the rim of the irises in the temporal and nasal sides, a mid-dilated poorly reactive pupil and clear lens in both eyes. Gonioscopy revealed extensive synechial angle closure in both eyes. Ophthalmoscopic examination showed cotton-wool spots along the temporal vascular arcades, venous dilatation with tortuosity and retinal arteriolar narrowing (Figure 1).

Fluorescein angiogram demonstrated delay of the central retinal artery filling, which was first seen at 21 seconds post dye injection, areas of mid-peripheral retinal capillary non-perfusion with capillary microaneurysms. Staining of both retinal arterioles and veins was seen in the late phase (Figure 2). Both irises showed fluorescein leakage, especially in the left eye (Figure 3). Dynamic contrast enhanced MR angiography showed no blood flow in both common carotid artery from the proximal to the carotid bifurcation and well-developed collaterals of bilateral blood from the carotid bifurcation to the intracranial internal carotid arteries (Figure 4).

The patient was treated with argon laser panretinal photocoagulation (PRP). In the first follow-up month, there was significant clearing of the anterior chamber reaction and regression of the iris neovascularization. Visual acuity was RE: 20/20 and LE: 20/125. IOP was RE: 11.3mmHg and LE: 12.3mmHg. However, three months later he complained of decreased vision in both eyes and cataracts developed. Visual acuity was 20/400 OU. An uneventful phacoemulsification with posterior chamber lens implantation was performed separately in both eyes. Visual acuity was RE: 20/16 and LE: 20/80.

Two years later, the patient underwent a left carotid endarterectomy without any intraoperation complication. Twelve days following surgery, left ocular pain was reported, with RE: 17.3mmHg and LE: 37mmHg of IOPs. The left ocular

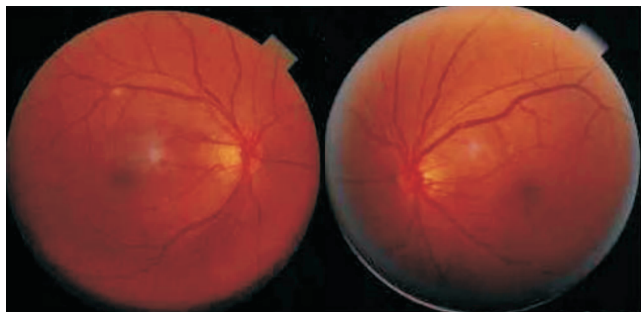


Figure 1 Bilateral fundus photos showing significant engorgement of retinal veins and cotton-wool spots (Left: Right eye; Right: Left eye).

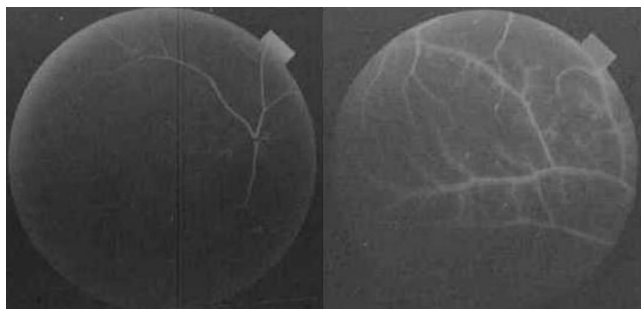


Figure 2 Right fundus fluorescein angiogram (Left: Delay of the central retinal artery filling at 21 seconds post dye injection. Right: mid-peripheral retinal capillary non-perfusion with capillary microaneurysms).

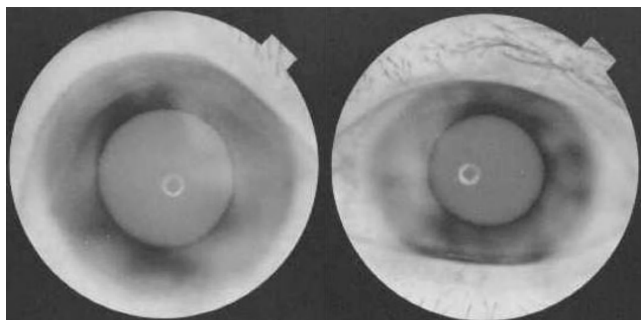


Figure 3 Bilateral iris fluorescein angiogram showing abnormal fluorescein leakage, especially in the left eye (Left: Right eye; Right: Left eye).

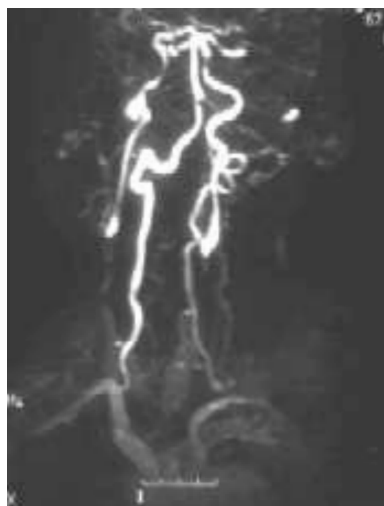


Figure 4 Dynamic contrast enhanced MR angiography showing bilateral complete occlusion of the common carotid arteries and filling of bilateral internal carotid arteries through well-developed collateral vessels.

episcleral vessels became significantly dilated. There was 3+ aqueous flare in both eyes. Although patients were treated with timolol, dipivefrin and acetazolamide, their IOPs still fluctuated between 20 and 35mmHg. Left internal carotid artery color doppler flow imaging(CDFI) showed peak systolic flow velocity significantly improved from 0.46m/s to 1.71m/s. The right external carotid artery CDFI showed flow direction changed from reverse to antegrade.

Three months following surgery, a right carotid endarterectomy was performed. One day postoperatively, IOPs were RE: 39.3mmHg and LE: 12.7mmHg. Medical therapy was not effective in controlling IOP in the right eye. Then an Ahmed valve implant was performed on OD. Two days following this surgery, IOPs were RE: 4.1mmHg and LE: 19.3mmHg. There was severe fibrinous exudate in anterior chamber. After medical treatment, the OD anterior chamber inflammation was reduced. Six months later, visual acuity was counting fingers at six inches, and IOPs were RE: 14.3mmHg and LE: 14.7mmHg. There was capsular contraction with fibrotic and hyperplastic capsules OU. The IOLs were asymmetry and lipid precipitate was on the anterior surface OU. Bilateral irises were atrophic. Funduscopic examination showed a full pale optic discs with cup to disc ratio RE:0.9 and LE: 0.8.

DISCUSSION

Several studies have suggested that there is an increased incidence of carotid occlusive disease following therapeutic irradiation of the neck^[1]. The interval from radiation to the onset of cerebrovascular attacks ranged from one and a half to thirty years with a total radiation dose to the cervical field of 41 to 120 Gy^[3]. Radiation-induced angiopathic lesions of the carotid artery are usually longer and more adherent to the vessel wall than shorter atherosclerotic lesions of the carotid bifurcation. OIS is a severe form of chronic ischaemia of both anterior and posterior segments of the eye as well as other orbital structures supplied by the ophthalmic artery^[4]. It is thought to be due to chronic hypoperfusion when carotid artery stenosis is greater than 90%^[1]. We have not found any documented cases of OIS after long-term radiotherapy for nasopharyngeal carcinoma reported.

To successful preservation of the visual and brain function, the physician should employ measures to control ischemia and neovascularization, in addition to improving blood flow to the eye using vascular reconstructive techniques. In this case, PRP did not prevent OIS from progressing but rubeosis iris regressed. The quickly development of cataract may be due to chronic ocular hypoperfusion. It is a dilemma for cataract surgery and Ahmed valve implant for that an eye with poor perfusion may not be able to sufficiently recover from breakdown of the blood-aqueous barrier following ocular surgery. This would precipitate the development of iris neovascularization which may lead to neovascular glaucoma. A review of the literature on OIS said that carotid endarterectomy combined with PRP could improve blood flow to the eye and had some benefit in stabilizing or improving vision in patients with OIS due to carotid artery stenosis^[5]. But as

this case presented, acute glaucoma may be a devastating complication of carotid endarterectomy in patient with active neovascularization and secondary angle closure. In this patient, the normal IOP before carotid endarterectomy was most likely due to poor ciliary body perfusion because of poor circulation in the carotid and ophthalmic arteries. Following carotid endarterectomy, increased aqueous humor production combined angle closure with peripheral anterior synechiae may cause a sharp rise in IOP. IOP was elevated in both eyes following the left-sided carotid endarterectomy, indicating improvement of perfusion in both eyes through collateral vessels, even though there was bilateral carotid occlusion. During the right-sided carotid endarterectomy and Ahmed valve implantation, the bilateral IOPs fluctuated dramatically, which may due to the unbalanced perfusion of bilateral ophthalmic arteries. The IOPs were hard to control, which made the biocular condition deteriorated.

We hope the case of this report may remind ophthalmologist of that there is a later onset ocular damage such as OIS after long-term radiotherapy for nasopharyngeal carcinoma. It is important to recognize the early stages of OIS in order to adopt appropriate intervention.

REFERENCES

- 1 Cheng SW, Ting AC, Lam LK, Wei WI. Carotid stenosis after radiotherapy for nasopharyngeal carcinoma. *Arch Otolaryngol Head Neck Surg* 2000;126(4):517-521
- 2 Cohen R, Padilla J, Light D, Diller R. Carotid artery occlusive disease and ocular manifestations: Importance of identifying patients at risk. *Optometry* 2010;81(7):359-363

3 Horimoto M, Kodama N, Takamatsu H. Bilateral internal carotid artery disease secondary to cervical radiation. A case report. *Angiology* 1996;47(6):609-613

4 Mendrinos E, Machinis TG, Pournaras CJ. Ocular ischemic syndrome. *Surv Ophthalmol* 2010;55(1):2-34

5 Rose L, Zamir E. Reversible anterior segment ischaemia after carotid endarterectomy. *Clin Experiment Ophthalmol* 2007;35(1):94-95

鼻咽癌长期放射治疗后双眼缺血综合征 1 例

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摘要

目的:报道 1 例因接受放射治疗后出现双侧颈总动脉完全闭塞和双眼缺血综合征(ocular ischemic syndrome, OIS)的患者。

方法:病例报告。1 例 57 岁男性患者主诉左眼一过性黑矇伴有眼部和眶周疼痛 6mo,诊断为双侧 OIS,依次给予双侧全视网膜光凝(panretinal photocoagulation, PRP)、白内障手术、颈动脉内膜剥脱术和 Ahmed 青光眼阀植入术。

结果:经过 PRP 和白内障超声乳化手术治疗,双侧眼部病情稳定。但患者行双侧颈动脉内膜剥脱术后出现眼压升高,视力降至指数。

结论:鼻咽癌放射治疗后出现的双侧颈总动脉完全闭塞和双眼 OIS 的治疗比较困难,预后不佳。

关键词:眼缺血综合征;鼻咽癌;放射治疗;颈动脉