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CASE REPORTS

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Unilateral Abducens Nerve Palsy with Ipsilateral Horner's Syndrome as an Initial Manifestation of Recurrent Nasopharyngeal Carcinoma

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ABSTRACT

A 62-year-old man was admitted to our clinic with a two-week history of double vision. Neuro-ophthalmological examination showed a left abducens nerve palsy with an ipsilateral Horner's syndrome. Neuro-imaging identified recurrent nasopharyngeal carcinoma explaining the clinical findings. Co-existence of unilateral abducens nerve palsy and ipsilateral Horner's syndrome is very rare and localises to the posterior cavernous sinus. Therefore, clinicians should be aware of this rare co-existence and perform appropriate neuro-imaging to clarify the underlying aetiology.

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Abducens nerve palsy; Horner's syndrome; internal carotid artery aneurysm; nasopharyngeal carcinoma; posterior cavernous sinus lesions

Introduction

The cavernous sinuses (CS) are structures located laterally to the pituitary fossa between two layers of dura.[1] The CS contains several important neuro-vascular structures including: the oculomotor, trochlear, ophthalmic and maxillary nerves which are embedded in its lateral wall; the internal carotid artery (ICA) with its sympathetic nerve plexus and the abducens nerve passing through the sinus close to its medial wall. This complex anatomical structure is responsible for solitary or combined cranial nerves palsies and post-ganglionic Horner's syndrome in CS pathologies.[1–4] Herein, we report a rare co-existence of unilateral abducens nerve palsy and ipsilateral Horner's syndrome as an initial manifestation of recurrent nasopharyngeal carcinoma.

Case report

A 62-year-old man was admitted to our clinic complaining of double vision. His complaint started suddenly about two weeks previously. His past medical history revealed that he had been diagnosed with nasopharyngeal carcinoma 10 years before and had received radiotherapy. He had been symptom free since. No other pre-existing systemic diseases including hypertension, hyperlipidaemia, diabetes mellitus or chronic drug usage were present. On admission, the general physical examination was normal. On neuro-ophthalmological examination, his eye movements were within normal limits except for prominent restriction of left eye abduction (Figure 1). There was mild ptosis of the left upper eyelid. The vertical height of the palpebral fissure was 10 mm in the right eye (OD) and 8 mm in the left eye (OS). The light and near reflexes were present and a relative afferent pupillary defect was not observed, but there was anisocoria, which was more apparent in dark condition. The pupil diameter was 2.5 mm OD and 1.5 mm OS in dim light (Figure 2a). The best corrected Snellen visual acuity was 10/10 in each eye. Slit-lamp and fundus examinations were normal. After topical 0.5% apraclonidine (Iopidine, Alcon, Fort Worth, TX, USA) application, the left pupil dilated from 1.5 mm to 4 mm in dim light with improvement in the left upper lid ptosis (Figure 2b). Through these clinical and pharmacological findings the patient was diagnosed with left-sided Horner's syndrome and abducens palsy. Comprehensive radiological imaging including chest X-ray, thorax computed tomography (CT),

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Figure 1. Extraocular muscle motility images in nine positions of gaze showing restriction of left eye abduction.



Figure 2. (a) Clinical photographs depicting anisocoria and mild ptosis of the left eye. (b) Pupillary dilatation and improvement in upper lid ptosis in the left eye after topical application of 0.5% apraclonidine.

magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA) of the head and neck and laboratory tests were performed to determine the underlying aetiology. All laboratory tests were within normal limits. On MRA a saccular aneurysmal dilatation of the ICA on the left side was present (Figure 3). However, as also reported by experienced neuro-radiologists the aneurysm was located in the ophthalmic segment (C6) of the ICA, which could not explain the clinical features. An MRI of the neck revealed nasopharyngeal carcinoma located on the left side extending into the left cavernous sinus (Figure 4). The localisation of the lesion was consistent with the clinical findings. It was considered as a tumour recurrence and the patient was referred to the radiation and medical oncologist and otolaryngologist for medical or surgical treatment planning.

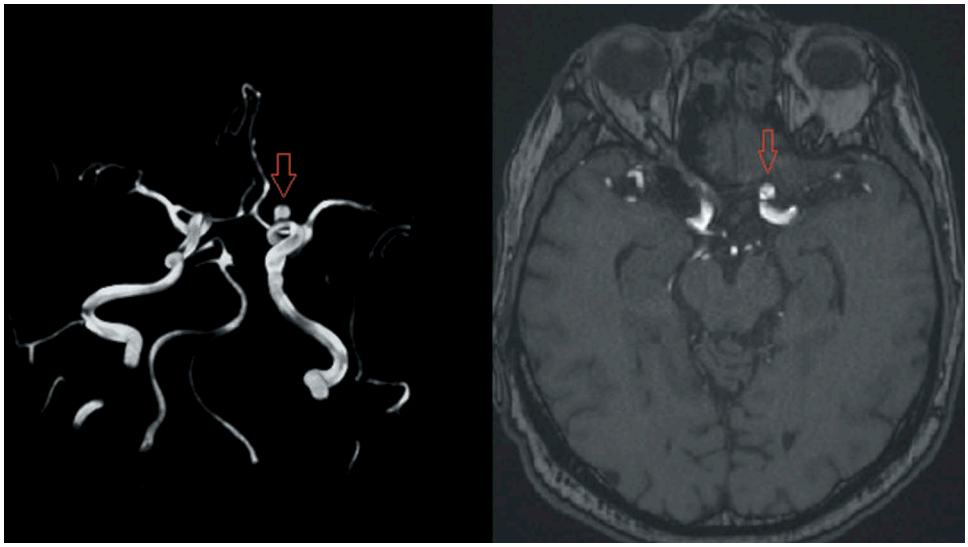


Figure 3. Magnetic resonance angiography of head showing a left ophthalmic segment internal carotid artery aneurysm (red arrows).

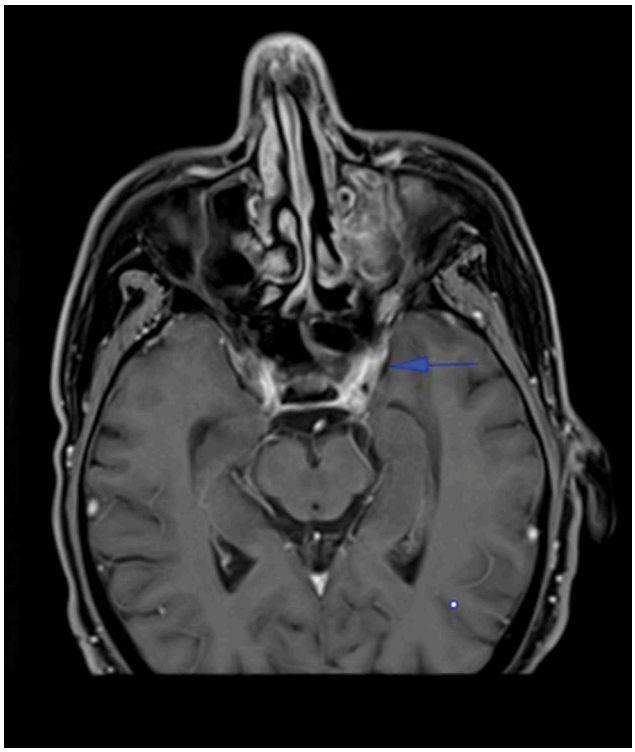


Figure 4. Axial T1 post contrast MRI showing extension of nasopharygeal carcinoma to the left cavernous sinus (blue arrow).

Discussion

The co-existence of unilateral abducens nerve palsy with ipsilateral Horner's syndrome localises the lesion to the posterior CS and is known as Parkinson's syndrome.[2,3] Experimental anatomical studies indicate that an important component of the sympathetic nerve fibres joins the abducens nerve in the posterior CS. Therefore, any of the pathologies that affect this special anatomical region may cause this neurological syndrome.[2–4] The common feature of all cases published in the literature is the localisation of lesions was the same even if the causes were different. The underlying aetiologies in previous reports were infection, tumour, trauma and aneurysms.[5–12] Table 1 summarises the previous cases published in the literature with combined unilateral abducens nerve palsy and ipsilateral Horner's syndrome. CS infections have been reported in two cases in the literature. Pandey *et al.*[7] described thickening and occlusion of the ICA secondary to herpes zoster ophthalmicus resulting in Parkinson's syndrome. Hartmann *et al.*[8] reported this syndrome in a case of facial abscess causing CS infection. Tumours (primary, metastatic or invasive) have occurred in eight cases. Tsuda *et al.*[9] defined a case of intra-CS metastasis secondary to uterine cervical cancer. Kang *et al.*[6] reported a case of nasopharyngeal carcinoma that invaded the CS. Likewise, Hirao *et al.*[10] described three cases with nasopharyngeal carcinoma. Ebner *et al.*[4] described three cases: two meningiomas and one squamous cell carcinoma that had invaded the CS. Trauma associated Parkinson's syndrome was detected in only one

Table 1. Previous cases published in the literature of unilateral abducens nerve palsy with ipsilateral Horner's syndrome.

Study	Patient	Ancillary pharmacological tests	Ancillary imaging techniques	Causes of posterior cavernous sinus lesion
Ebner *et al.*[5]	32 years	Apraclonidine 0.5%	MRI	Cavernous sinus tumour (squamous cell carcinoma)
Ebner *et al.*[5]	27 years	Apraclonidine 0.5%	CT	Metallic foreign body (bullet)
Ebner *et al.*[5]	67 years	Apraclonidine 0.5%	MRA	Carotid-cavernous aneurysm
Ebner *et al.*[5]	58 years	Apraclonidine 0.5%	MRI	Cavernous sinus meningioma
Ebner *et al.*[5]	43 years	Apraclonidine 0.5%	MRI	Cavernous sinus meningioma
Abad *et al.*[4]	18 years Female	Cocaine 4% Epinephrine 0.1% Hydroxyamphetamine 1%	Carotid angiography	Traumatic cavernous carotid aneurysm
Kang et al.[6]	68 years Male	Apraclonidine 0.5%	MRI	Invasive nasopharyngeal squamous cell carcinoma
Pandey *et al.*[7]	24 years Female	NR	MRI MRA	Herpes zoster ophthalmicus arteritis (ICA, ECA, MCA, ACA)
Hartmann *et al.*[8]	20 years Male	Cocaine 10%	CT	Cavernous sinus infection secondary to facial abscess
Tsuda *et al.*[9]	74 years Female	Thylamine 5%	MRI	Cavernous sinus metastasis secondary to uterine cervical cancer
Kal *et al.*[11]	22 years Male	Cocaine 10%	Cerebral angiography	Low flow direct carotid–cavernous fistula
Magnat *et al.*[12]	15 years Male	Cocaine 10%	MRI MRA	Petrous ICA aneurysm

Abbreviations: MRI, magnetic resonance imaging; CT, computed tomography; MRA, magnetic resonance angiography; ICA, internal carotid artery; ECA, external carotid artery; MCA, middle cerebral artery; ACA, anterior cerebral artery; NR, not reported.

case in the literature: Kal *et al.*[11] reported a case of carotid–cavernous fistula developing after head trauma. ICA aneurysms have been reported in two cases: Mangat *et al.*[12] described a child with Parkinson's syndrome caused by a petrous ICA aneurysm and Ebner *et al.*[5] reported a case of cavernous carotid aneurysm causing the syndrome.

In conclusion, posterior CS lesions must be kept in mind in patients with unilateral abducens nerve palsy with ipsilateral Horner's syndrome. A detailed systemic and neuro-ophthalmological examination as well as neuro-imaging should be performed to detect the underlying pathology.

Author contributions

All authors contributed significantly to the creation of this manuscript; each fulfilled criteria as established by the ICMJE.

Declaration of interest statement

The authors declare that they have no conflict of interest.

Patient consent and ethics statement

Authors obtained consent from the patients for publishing the photo.

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