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Case Report

Bilateral Choroidal Metastases as the Presenting Manifestation of Lung Adenocarcinoma in a Young, Non-Smoking Female

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Abstract

Initially believed to be rare, metastases to the eye are the most common ocular malignancy. The choroid's high perfusion rate not only makes it the most susceptible ocular site for tumour seeding, but also promotes its growth. The cancers most frequently responsible for choroidal metastases originate from the breast and lung, although a significant proportion have unidentified primaries at the time of presentation. It is of paramount importance to recognise the features of choroidal metastases and consider a previously undiagnosed neoplastic process. This case demonstrates an unusual presentation of bilateral choroidal metastases and exhibits several characteristic clinical features.

Keywords: *Bilateral Choroidal Metastases; Lung Adenocarcinoma; Non-Smoking Female*

Introduction

Initially believed to be rare, metastases to the eye are the most common ocular malignancy.

Case Report

We report a case of a 34-year-old presenting with a one month history of visual distortion in both eyes, more severe with the right. On presentation to her local optician, reduced visual acuity in the right eye was noted (6/10 right eye 6/6 left eye, no improvement with pinhole) along with a large lesion on posterior fundal examination. It was suspected to be a choroidal naevus and referred to our ophthalmology department and reviewed the following week.

Detailed ocular history was significant for painless blurred vision and metamorphopsia in both eyes, particularly the right eye. She had not suffered from floaters, flashes or shadows. Her past ocular history, past medical history and family history were unremarkable. She was of South American origin, had never smoked, rarely drinks alcohol and has an office job. She was married with three healthy children.

On examination, visual acuity was 6/36 right eye and 6/12 left eye. Intraocular pressure was measured at 18mmHg bilaterally, using Goldmann applanation tonometry. Anterior segment examination was normal. Anterior chamber and vitreous were quiet bilaterally. Optic

discs were normal bilaterally. On examination of the right fundus, a large choroidal lesions (2.5 disc diameter) was noted temporal to the optic disc and inferior to the macula (Figure 1). Similar changes were also noted in the left macula (Figure 2), no RAPD was noted. Her haemodynamic status was normal, with a blood pressure of 110/65mmHg and a radial pulse rate of 55 beats per minute.

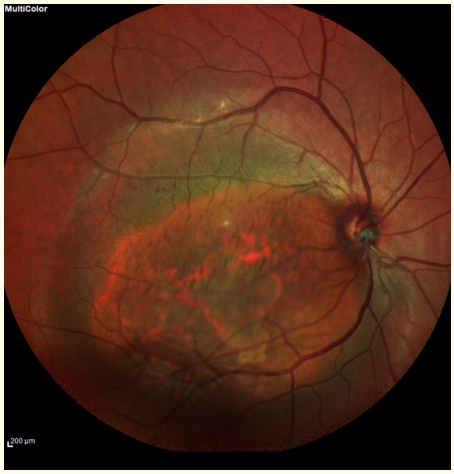

Figure 1: *Colour fundus photo of the right eye.*

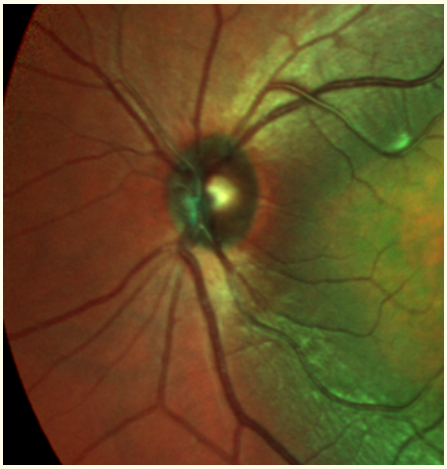

Figure 2: *Colour fundus photo of the left eye.*

Optical coherence tomography (OCT) of the macula demonstrated choroidal masses bilaterally, with accompanying subretinal fluid (Figure 3 and 4). Fundus fluorescein angiography FFA in both eyes demonstrated no leakage (Figure 5 and 6), fundus autofluorescence FAF images were taken to demonstrate the size of the lesions, Indocyanine green ICG showed no leakage in both eyes as well (Figure 7 and 8).

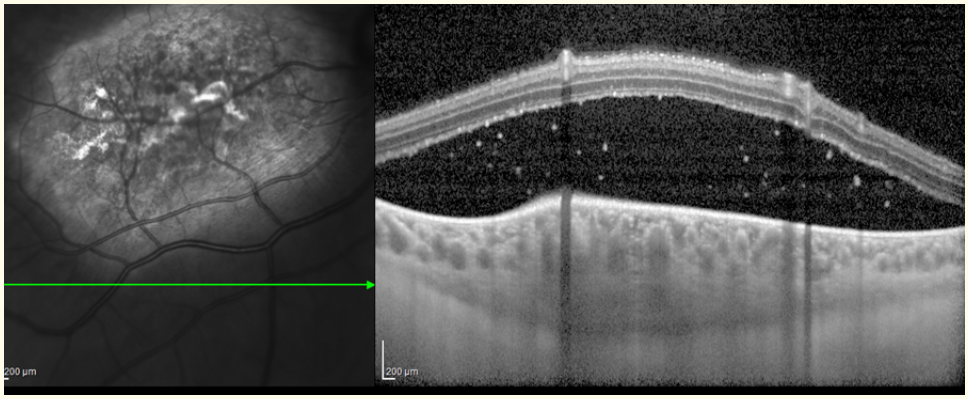

Figure 3: *OCT scan of the right eye.*

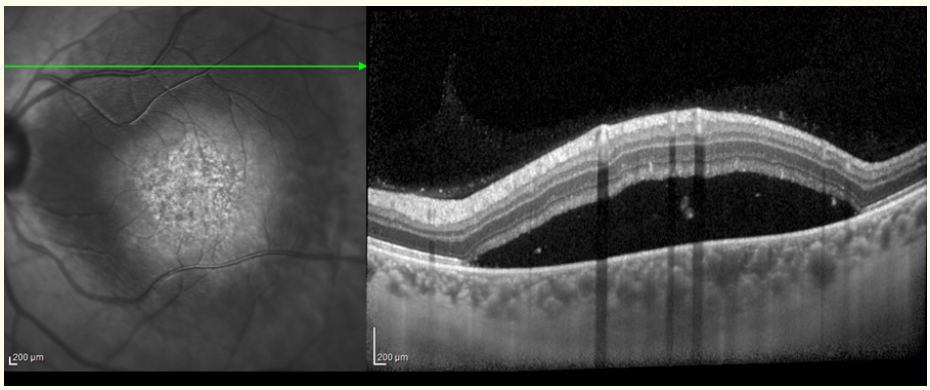

Figure 4: *OCT scan of the left eye.*

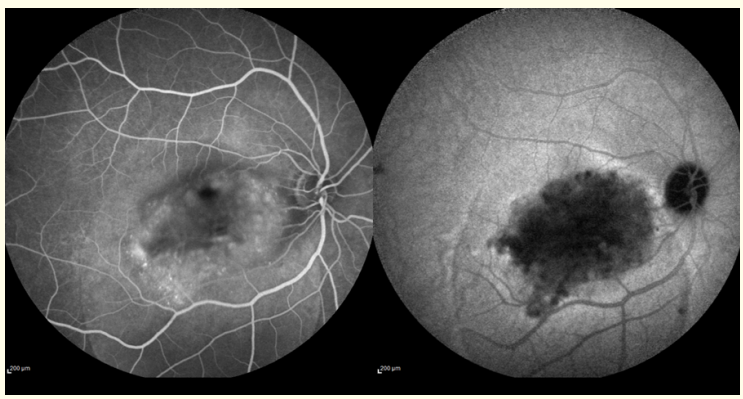

Figure 5: *Right eye FFA and FAF.*

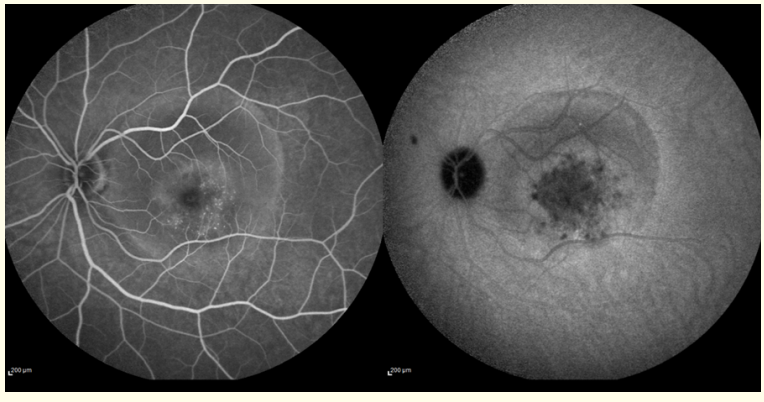

Figure 6: *Left eye FFA and FAF.*

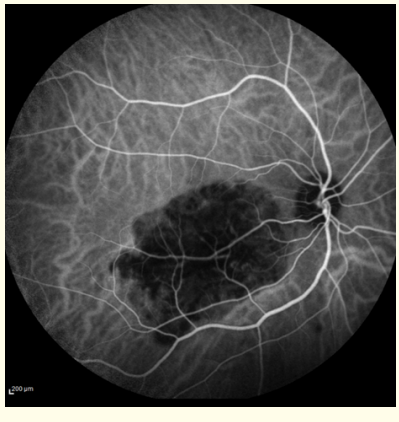

Figure 7: *ICG right eye.*

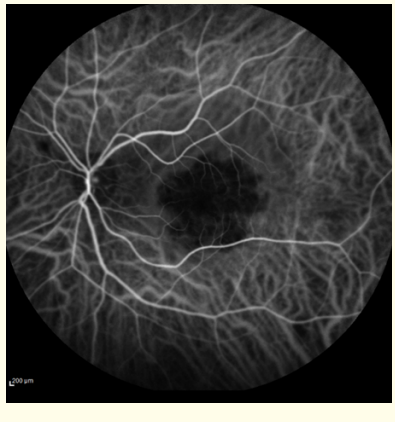

Figure 8: *ICG left eye.*

Peripheral blood count and film were normal, as were renal and liver function tests. Peripheral blood vasculitis screen was normal and tests for infectious aetiology (Quantiferon, anti-toxoplasmosis antibodies, anti-toxocara antibodies) were also unremarkable.

Within two weeks of presentation to our ophthalmology department, her acuity had reduced substantially to counting fingers bilaterally, with improvement to 6/60 in the left eye with pinhole. She was commenced on oral prednisolone (40 mg daily).

She was also referred for imaging of the thorax. Significantly, computerised tomography of the thorax demonstrated numerous lesions consistent with a neoplastic process (including a 2.9 cm diameter irregular mass at right lung apex, with hilar and subcarinal lymphadenopathy). An endobronchial ultrasound-directed biopsy confirmed TTF1 positive metastatic pulmonary adenocarcinoma. She was urgently referred to the medical oncology department.

On further questioning, she had noted a fortnight of deteriorating lethargy and lower thoracic back pain. She was admitted to hospital and staging imaging was performed, including a CT of the abdomen and pelvis, and MRI of the spine and brain. Metastases were demonstrated in the brain (parietal and frontal lobes), vertebrae (T11 and S2), right iliac bone, left sacrum, right proximal femur and right kidney. In view of the brain metastases, oral prednisolone was changed to oral dexamethasone (8 mg BD) and slowly weaned.

Concurrently, EGFR exon 19 deletion was identified on circulating tumour DNA (PD-L1 negative, ALK negative), prompting the medical oncology team to commence afatinib, a tyrosine-kinase inhibitor.

Two weeks after commencing afatinib, her vision improved to 6/60 right eye and 6/24 left eye (no improvement with pinhole). Her intraocular pressure was mildly elevated at 25 mmHg and the dexamethasone wean was accelerated.

The following month, visual acuity had improved to 6/24 right eye and 6/5 left eye. Intraocular pressure was 19 mmg right eye and 20 mmHg left eye. Posterior fundus examination revealed regression of the choroidal lesions and resolution of macular subretinal fluid in both eyes. There was residual scarring in the right eye and retinal pigment epithelium changes in the left eye.

Discussion

Our case demonstrates the importance of considering metastases as a cause of a choroidal lesion patients. Appropriate and thorough, history-taking, examination and investigations may be required in order to deduce the underlying cause. Our case is unusual in view of the choroidal lesion being the primary manifestation of the metastatic lung cancer in a young patient with no known risk factors.

Choroidal metastases typically present with symptoms of painless blurred vision or vision loss, photopsia, metamorphopsia and floaters.

Seeding may occur in clusters (unilateral or bilateral). Lung cancer metastases are more common to be unifocal and unilateral. The vast majority of metastases are post-equatorial, with up to 40% of choroidal metastases located in the macular region. The lesion itself may be a variety of colours, most commonly creamy white or pale yellow. Imaging with OCT characteristically demonstrates an undulating anterior tumour profile with associated subretinal fluid, whereas a choroidal melanoma is more typical to be dome-shaped and smooth, unless there is penetration of Bruch's membrane, leading to a mushroom-shape.

Other differentials include choroidal osteoma, choroidal haemangioma, choroidal neovascularisation and posterior scleritis [1-4].

Conclusion

Early recognition of choroidal metastases is important as it is often the first sign of tumour dissemination and will prompt earlier treatment with systemic medications such as chemotherapy, immunotherapy, targeted therapy or hormonal therapy. If systemic treatment fails to control the ocular tumour, then local therapies, such as external beam radiotherapy, photodynamic therapy and transpupillary thermotherapy may be utilised. The prognosis of patients with choroidal metastases is generally unfavourable, although therapeutic advances have led to significant improvements in life expectancy.

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