

Asymptomatic iris metastasis of small-cell lung cancer

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Abstract A 70-year-old man was diagnosed with small-cell lung cancer (SCLC) of the left upper lobe, with a TNM classification of cT4N3M1b (PUL, OSS, BRA, HEP). A single asymptomatic brain metastasis 1 cm in diameter was also identified. The patient underwent four cycles of cisplatin plus irinotecan therapy, with a total effect of partial response. Complete remission of the brain metastasis was also achieved, and whole-brain radiation therapy (WBRT) was postponed at the request of the patient. Six months after diagnosis, he was admitted to our hospital with a major complaint of dizziness. Computed tomography showed enlargement of the primary lesion and multiple brain metastases. WBRT was started, but performance status did not improve. While undergoing WBRT, the patient complained of blurred vision. The ophthalmologist found a metastasis on the right iris by chance, although blurred vision was caused by detachment of the left retina. Two months later, the patient died of respiratory failure. Autopsy histologically confirmed the iris metastasis of SCLC. Cases of iris metastasis diagnosed before death are rarely reported. Iris metastases are estimated to account for 9 % of uveal metastases. This may suggest that many iris

metastases have few clinical signs and are difficult to diagnose. Asymptomatic iris metastases, particularly among patients with SCLC, are thus likely to be underdiagnosed. Ocular metastasis should be considered when a cancer patient complains of visual disturbance.

Keywords Small-cell lung cancer · Iris metastasis · Diagnosis

Introduction

Small-cell lung cancer (SCLC) is a tumor with poor prognosis characterized by rapid progression and early metastasis. Ocular metastasis is not uncommon in autopsy cases, but is rarely diagnosed before death. We report a rare case of iris metastasis diagnosed premortem in a patient with SCLC, and discuss with reference to the literature.

Case report

A 70-year-old man presented to a local hospital with a 1-month history of non-productive cough and chest pain. The patient had smoked 25 cigarettes daily for 50 years. A tumor in the left upper lobe was seen on computed tomography (CT) and transbronchial lung biopsy (TBLB) revealed SCLC. SCLC was diagnosed with a TNM classification of cT4N3M1b (PUL, OSS, BRA, HEP).

The patient reported intermittent pain in the right chest and subcutaneous bleeding in the left upper arm. Performance status (PS) was 2. Laboratory data showed elevated levels of carcinoembryonic antigen, neuron-specific enolase, and pro-gastrin-releasing peptide. A single, asymptomatic brain metastasis, measuring 1 cm in diameter, was identified.

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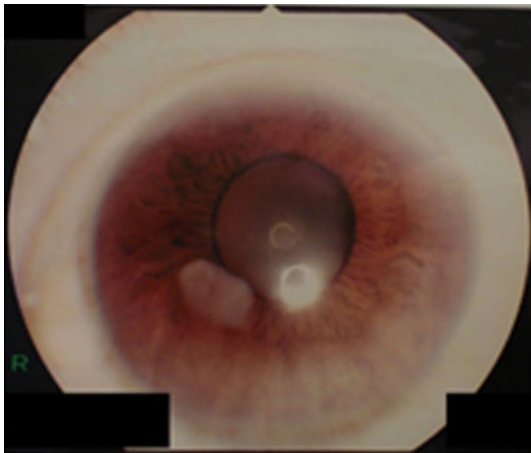


Fig. 1 A pale yellow lesion with irregular margins, 2 mm in size, at the 1 o'clock meridian on the right iris

The patient was referred to our hospital, then underwent 4 cycles of chemotherapy comprising cisplatin (60 mg/m^2) plus irinotecan (60 mg/m^2). The total effect of chemotherapy was partial response. Complete remission of the brain metastasis was also achieved, and whole-brain radiation therapy (WBRT) was postponed at the request of the patient.

Six months after initial diagnosis, he was admitted to our hospital with a major complaint of dizziness. CT showed enlargement of the primary lesion and multiple brain metastases. WBRT (30 Gy) was therefore performed, with administration of corticosteroids and glycerol infusion, but performance status did not improve. Further chemotherapy was therefore suspended and palliative treatment was initiated.

While undergoing WBRT, the patient complained of blurred vision. The ophthalmologist found detachment of the retina in the left eye, which was regarded as the cause of blurred vision. By chance, a pale yellow lesion with irregular margins was found at the 1 o'clock meridian on the right iris (Fig. 1). Visual acuity was 0.15 oculus dexter (OD) and 0.4 oculus sinister (OS). Intraocular pressure (IOP) was 13 mmHg OD and 12 mmHg OS. Results of electroretinography were normal. Although no malignant cells were detected in the anterior humor aqueous of the right eye, the ophthalmologist diagnosed the lesion as iris metastasis of SCLC on the basis of its characteristic appearance.

The iris tumor was followed closely without treatment, because the lesion appeared asymptomatic. The iris metastasis increased in size, but symptoms did not worsen. Two months later, a total of 10 months after initial diagnosis of SCLC, the patient died of respiratory failure due to carcinomatous lymphangiosis. Autopsy was performed with the consent of his attorney, and the diagnosis of iris

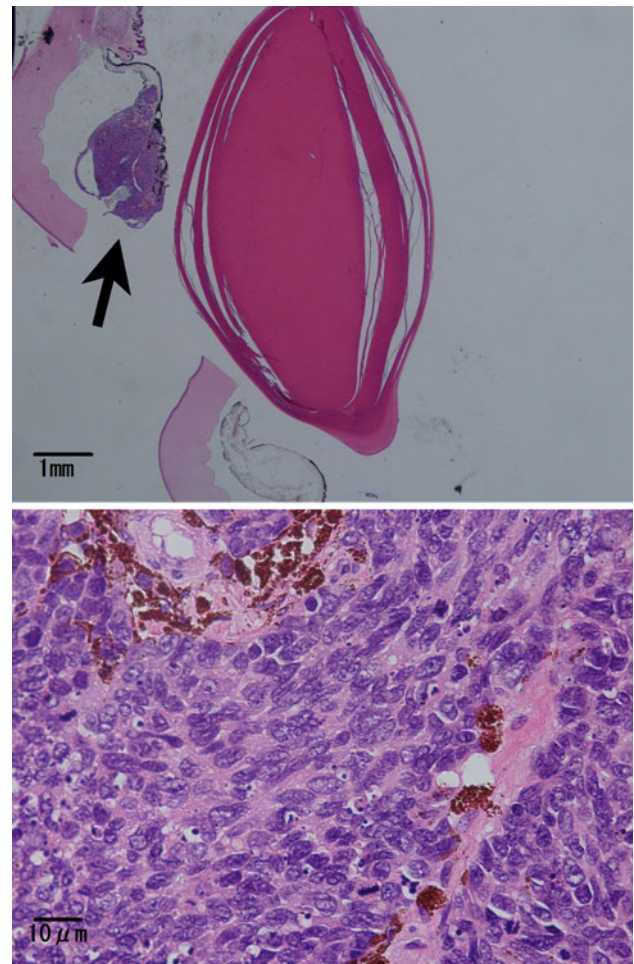


Fig. 2 Histopathology of the iris metastasis. H&E stain, $\times 40$ (top) and $\times 400$ (bottom)

metastasis was confirmed histologically (Fig. 2). In addition, choroidal metastasis was found in the right eye.

Discussion

Ocular metastases are seen on autopsy in 9–12 % of patients with any type of cancer [1, 2]. Uveal metastases are the most common ocular metastases, and choroidal metastases account for 88 % of all uveal metastases [3]. Iris metastases are estimated to account for 9 % of uveal metastases [4]. Metastases on the anterior segment of the eye (iris or ciliary body) occur much less frequently than those on the choroid, because the arterial distribution to the posterior uvea is more abundant. The most common sources of iris metastases are lung and breast cancers [5].

Symptoms of metastatic ocular tumor include decreased vision, visible mass, redness of the eye, pain, and secondary glaucoma [6]. Iris metastasis often appears as a yellowish-white nodule in the inferior quadrant. The

Table 1 Iris metastases of lung cancer reported in the past 10 years

Author	Number of patients	Histology	Symptoms
Chen [10]	1	Adenocarcinoma	Pain, blurred vision
Sui [11]	1	Adenocarcinoma	Blurred vision, discomfort
Harvey [12]	1	Adenocarcinoma	Pain, blurred vision
Soysal [13]	2	Unknown	Unknown
Moura [14]	1	SCLC	Pain
Roenhorst [8]	1	SCLC	None
Kesen [15]	1	SCLC	Pain
Alacacioğlu [16]	1	SCLC	Pain
Nakashima [9]	1	SCLC	Blurred vision
Fukui ^a	1	SCLC	None

Only articles written in English are included on this table

SCLC small-cell lung cancer

^a This case

differential diagnosis of iris tumor includes amelanotic melanoma, amelanotic nevus, granulomatous iritis, lymphoma, leukemia, and leiomyoma [5].

Diagnosis of metastasis is comparatively easy if the patient has already been diagnosed with cancer. If a patient with an iris nodule has not been diagnosed with cancer after full examination, fine needle biopsy would be useful [7]. For patients with SCLC who present with visual disturbance, carcinoma-associated retinopathy (CAR) syndrome, paraneoplastic optic neuritis, visual disturbance caused by brain metastasis, and chemotherapy-induced optic neuropathy should also be considered as differential diagnoses. In this case, no findings indicated these complications.

Treatment of iris metastasis varies according to the systemic control of primary cancer. In general, systemic chemotherapy is the first choice in most cases. If local control of iris metastasis is not achieved after chemotherapy, or iris metastasis is the only the lesion indicating progression, radiotherapy to the iris metastasis may be a rational choice. A case with iris metastasis of SCLC successfully treated by external beam radiotherapy has already been reported [8]. Enucleation is recommended only if the eye becomes blind and painful [5]. Intravitreal bevacizumab, a monoclonal antibody against vascular endothelial growth factor, has been reported as effective for iris metastasis of SCLC with neovascular glaucoma [9]. Median survival for patients with iris metastasis from lung cancer is 4 months (range 1–18 months) [5].

Few cases of iris metastases diagnosed before death have been reported (Table 1), although 7.1 % of lung cancer patients reportedly show choroidal metastases at autopsy [17]. SCLC cases diagnosed with asymptomatic iris metastasis before death are extremely rare. This may be because many ocular metastases cause no symptoms.

In conclusion, we speculate that cases of iris metastasis are likely to be underdiagnosed. Asymptomatic iris metastases are rarely diagnosed before death, and metastasis to the eye should be considered when a cancer patient complains of visual disturbance.

Conflict of interest The authors declare that they have no conflict of interest.

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