



# Bilateral Iris Metastasis in a Patient with Small Cell Lung Carcinoma: A Case Report

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## Abstract

Small cell lung carcinoma (SCLC) is a neuroendocrine tumor with high probability of early disseminated disease and paraneoplastic syndromes. Choroid is the most common uveal tissue affected by metastatic disease followed by iris and ciliary body. Herein, we present a 46-year-old male with bilateral multiple iris metastasis. Once diagnosed, the patient already had diagnosis of SCLC with cranial and bone metastases.

**Keywords:** Chemotherapy, iris metastasis, small cell lung carcinoma

## Introduction

Small cell lung carcinoma (SCLC) accounts for approximately 13% of all newly diagnosed lung cancers. It is a neuroendocrine tumor with high proliferative rate, strong predilection of early disseminated disease, and paraneoplastic syndromes. It is mostly seen in elderly patients with a history of smoking (1). The pleural cavity, bone, brain, adrenal glands, and liver are the most typical places for lung cancer to metastasize (2). Clinical investigations have shown that 0.2–7% of patients with lung cancer develop ocular metastases (3,4). In general, metastatic tumors of the eye from lung cancer are found in the uvea, mostly in the post-equatorial choroid followed by iris and ciliary body (5). While 90% of uveal metastases in patients with lung cancer are choroidal metastases, the rarest location is the ciliary body which is seen in approximately 2% of cases (5). Although the exact prevalence of iris metastasis

in patients with lung cancer is not known, 9–10% of uveal metastasis of lung cancer constitutes iris metastasis (5,6). Iris metastases are relatively rare and generally associated with low survival rate (7,8).

Only 16% of lung cancer patients with uveal metastases were found to have small cell lung cancer as the histopathological type in a retrospective investigation of 194 patients (5). In a review of 92 patients with intraocular metastases from lung cancer, Maller et al. (9) reported that 12 (13%) of the patients had a diagnosis of SCLC. Among the patients with the diagnosis of SCLC with ocular metastasis, 6 (50%) of them had iris metastasis. Of the 80 patients diagnosed with non-SCLC (NSCLC), only 3 (3.7%) had iris metastasis. Although the number of patients in the SCLC subgroup was quite limited in that review, iris metastasis seems more common compared to NSCLC patients.

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The main treatment modality for metastatic small cell lung cancer is systemic chemotherapy. Although the initial response of this chemosensitive tumor is frequently favorable, recurrence usually manifests itself over time. Surgical resection and adjuvant chemotherapy are treatment of choice for early-stage disease. Radiotherapy is usually administered in the case of cranial metastases or its prophylaxis.

Herein, it is aimed to present a 46-year-old male with bilateral multiple iris metastasis with the diagnosis of SCLC.

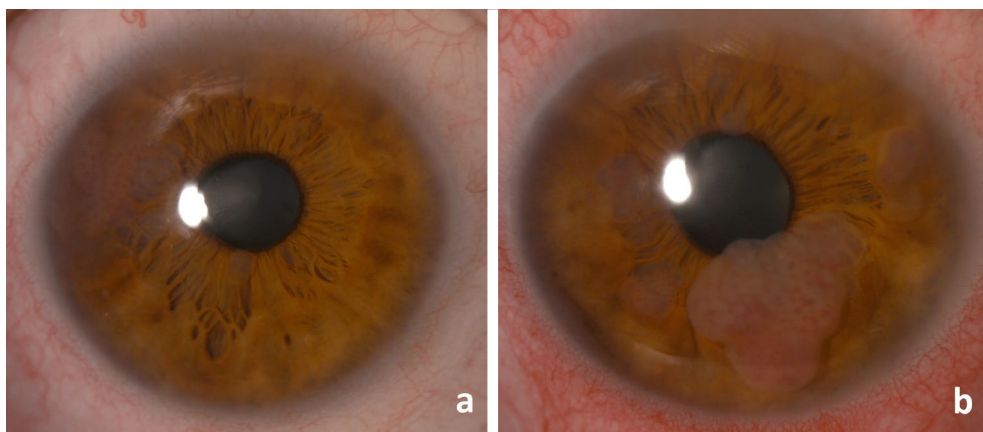
## Case Report

A 46-year-old male with a history of 60 pack-year smoking was referred to our clinic with bilateral multiple vascularized iris mass. His medical history revealed chronic cough for the past 8 months. Right hilar mass surrounding the intermediate bronchus and multiple pathological lymphadenopathies in paratracheal, paraaortic, and supraclavicular regions were detected on thorax computed tomography (CT) imaging about 6 months ago. After failure to reach the lesion bronchoscopically, the patient was diagnosed with SCLC by supraclavicular lymph node biopsy. Whole body positron emission tomography-CT (PET-CT) screening revealed increased 18-F fluorodeoxyglucose uptake in bilateral adrenal glands, multiple bones including vertebra, sternum, sacrum, left parietal bone, bilateral femoral bones, and multiple lymph nodes in mediastinum indicating metastasis. Contrast-enhanced cranial magnetic resonance imaging revealed multiple cranial metastases. The patient was therefore put on chemotherapy with carboplatin plus etoposide every 21 days for 9 cycles and immunotherapy

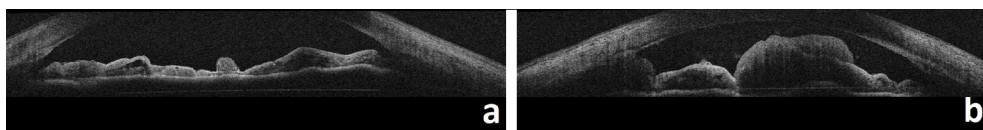
with atezolizumab. He additionally received a total of 30 Gy of cranial radiation.

After completion of 9 cycles of chemotherapy, the patient complained of photophobia for about 1 week before referral to ophthalmology department. His best corrected visual acuities of right and left eyes were 0.10 and 0.00 log-MAR, respectively. On slit lamp anterior segment examination, bilateral multiple vascularized iris masses with nodular configuration were detected (Fig. 1). Mass lesions detected on slit lamp examination were also demonstrated in anterior segment optical coherence tomography (AS-OCT) (Fig. 2). Intraocular pressure was 12 mmHg in both eyes and no secondary glaucoma was detected. Posterior segment examination was bilaterally normal. Biopsy was planned from the left eye with the preliminary diagnosis of iris metastasis in the patient with a diagnosis of lung cancer. Aspiration biopsy was performed under sedative anesthesia due to the fragile nature of the tissue. The patient received topical tobramycin and dexamethasone QID following the procedure. Biopsy resulted in malignant tumor infiltration consisting of small-sized cells with narrow cytoplasm and hyperchromatic round nucleus confirming the preliminary diagnosis (Fig. 3). Immunohistochemical examinations could not be performed properly because of an insufficient amount of biopsy material.

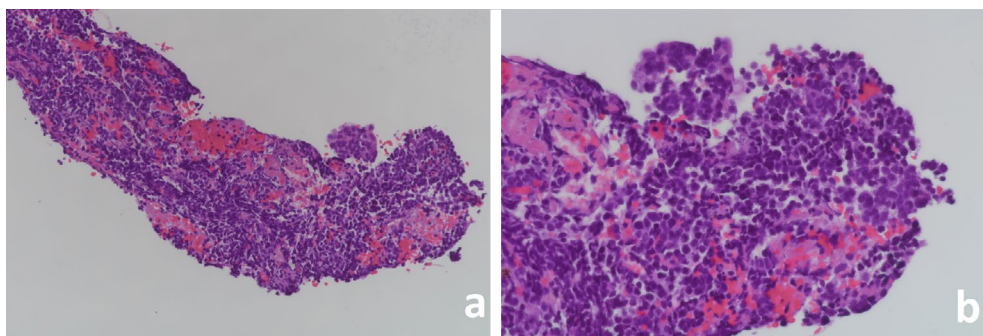
No regression of primary and metastatic foci was detected in PET-CT which was taken after completion of chemotherapy. The patient experienced tonic-clonic seizure due to cranial metastases 2 weeks following iris biopsy, which led to the development of paraplegia. He was hospitalized for palliative care when his symptoms progressed while he was under



**Figure 1.** Right (a) and left (b) eye anterior segment photography demonstrating multiple gray-brown nodular iris metastasis.



**Figure 2.** Right (a) and left (b) eye AS-OCT images showing multiple metastatic lesions of iris.



**Figure 3.** Histopathologically small roundish tumor cells with inconspicuous cytoplasm at the iris (H&E  $\times 100$  (a) and  $\times 200$  (b), respectively)

treatment. After a short period of time, the patient's general health deteriorated, and 2 months after iris metastases were detected, the patient passed away from respiratory failure.

## Discussion

The most frequent ocular location for hematogenous spread of metastatic tumor is the uveal tract due to its rich blood supply (10). Among uveal tract, choroid is the most common site to metastasis. Metastatic tumors of the iris are less commonly encountered in clinical practice. In a study of 520 eyes with uveal metastases, only 9% of eyes were reported to have metastases to the iris (11). Even though it varies in different series, the most common primary tumors with iris metastasis are lung carcinoma and breast carcinoma (7,8). In lung cancer patients with uveal metastases, the histopathological type is mostly NSCLC, and the frequency of SCLC varies between 16 and 23% in accordance with primary cancer incidence (5,12).

SCLC is an aggressive malignancy with high proliferative rate and high risk of early metastasis. Approximately two-thirds of patients have metastatic disease at initial diagnosis. The brain, liver, adrenal glands, and bone are among the most frequently metastasized sites of SCLC (13). Despite the high metastasis rate of SCLC, there are limited number of reports in the literature regarding iris metastases in SCLC patients (14-16).

Ocular metastasis, particularly in tumors with high probability of early metastasis, may be the earliest indication of malignancy. In a retrospective analysis of 194 lung cancer patients with uveal metastases, it was reported that 44% of the patients had no known history of malignancy (5). Despite the fact that the patient in our case had already been given a stage 4 cancer diagnosis, it should be kept in mind that patients with early metastasizing tumors like SCLC may first be detected in the ophthalmology clinics.

In general, patients with iris metastasis complain about blurred vision and pain (7,8). In a study including 104 patients with iris metastases, it was reported that only 2% of the patients had a complaint of photophobia (8). Although the

extent of the metastatic lesion in the presented case who complained about photophobia was not small, particularly in the left eye, there was no discernible impact on visual acuity. As a result, any ocular complaints in patients with a history of primary malignancy should be taken into account, and an ophthalmology consultation should be requested.

Histopathological diagnosis is required to confirm the diagnosis, although it is not always attainable. In a retrospective analysis of 133 eyes, 51% of patients were diagnosed clinically without pathological examination (7). Histopathological samples can be obtained by fine-needle aspiration biopsy (FNAB), iridectomy, aqueous humor sample, and evisceration or enucleation material (7). Because of its relative simplicity, FNAB is the most frequently utilized histopathological examination technique, as in the present case.

Treatment options for iris metastasis include systemic chemotherapy, external beam radiation therapy, local interventions such as plaque radiotherapy and intravitreal bevacizumab, surgical excision, and observation (8). In each patient, treatment should be decided on a patient-by-patient basis, taking into account the patient's general condition, ocular symptoms, extent of local disease, and estimated life expectancy. In the presented case, it was decided to continue systemic chemotherapy because the patient had active systemic metastases and multifocal iris metastases that did not cause any complaints other than photophobia. Shah et al. (5) reported that they followed up with systemic chemotherapy in 13% of 16 lung cancer patients with iris metastasis. Huang et al. (14) reported that irinotecan and anlotinib caused regression in iris metastasis in a SCLC patient resistant to first-line chemotherapeutic agents. In the presented patient, since the general condition deteriorated rapidly, different treatment regimens could not be applied.

Despite the fact that iris metastasis is a rare clinical entity, its relation to low survival rate makes it important. The average survival time of patients with iris metastasis was reported at rates between 6 and 24 months (7,8). The shorter survival rate in the present case can be explained by the high proliferative rate of the patient's primary tumor, SCLC.

## Conclusion

Physicians should be aware of this rare site of metastasis in the course of SCLC. It should be known that it is associated with a low survival rate and any ocular symptom in these patients should be considered and they should be examined carefully. Multidisciplinary evaluation of these patients is mandatory.

## Disclosures

**Informed consent:** Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** None declared.

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