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Case Report

Choroidal Metastasis in Stage IV Lung Adenocarcinoma

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Abstract

It is known that the incidence of lung cancer is increasing rapidly in both men and women. While no ocular findings may be observed in the early stage, ocular involvement may be observed in the advanced stage. The choroid is the most common site of intraocular metastasis in adults due to its rich vascularisation. In this report, a 52-year-old woman was referred to our clinic because of retinal detachment detected in an external center with complaints of flashes of light in the left eye 3 months ago and decreased vision for the past week. It was learned that she was diagnosed with advanced stage (stage IV) adenocarcinoma of the lung and received chemotherapy at regular intervals due to distant metastasis (liver and bone). Biomicroscopic fundus examination, B-Mode ultrasonography, fundus fluorescein angiography, and orbital magnetic resonance imaging revealed a choroidal mass. The current clinical picture was interpreted as distant metastasis of lung adenocarcinoma, no surgical intervention was planned for the secondary exudative retinal detachment, and the patient was consulted by the oncology clinic. In addition to chemotherapy, three cycles of radiotherapy were given within 1 week and the mass disappeared at the follow-up visit 2 months later. In the differential diagnosis of retinal detachment, metastasis of a diagnosed primary tumor should be considered as in our case. Early detection of these metastatic lesions and appropriate treatment strategies will prevent unnecessary vitreoretinal surgeries and complications.

Keywords: Choroid, lung cancer, metastasis, retinal detachment

Introduction

Uveal metastases constitute the most common intraocular tumors (1,2). Due to its unique vascular architecture, the choroid is an important tissue with high blood flow. Therefore, it is the most susceptible ocular region to metastases (3). In cases of exudative retinal detachment (ERD) secondary to choroidal metastasis, decreased visual acuity may be observed in most cases, whereas no change may be observed in 15–20% of cases (4,5). These asymptomatic cases are diagnosed by detailed scanning of the retina during routine examination. Inflammation, neoplastic, and vascular causes are involved in the pathophysiology of ERD (6). It is known that the incidence of lung cancer is increasing rapidly in both men and women (7). In these neoplastic pathologies, different organs may be affected by metastasis. Metastasis occurs from the primary organ through the circulatory or lymphatic pathway (5). Therefore, a detailed anamnesis should be obtained in patients with ERD. Systemic diseases and malignancies should be interrogated and the cases should be followed up with a multidisciplinary approach together with oncology clinics. In a review on uveal metastases, it was reported that the histopathological type of most lung cancers was non-small cell type (8).

In this case report, we report a case of ERD secondary to choroidal metastasis in a female patient who was referred from an external center for retinal detachment surgery but was diagnosed with lung adenocarcinoma after detailed anamnesis.

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Case Report

A 52-year-old woman was admitted to our clinic with the complaint of flashes of light in the left eye 3 months ago and decreased vision for the past week. She had a history of advanced-stage (stage IV) lung adenocarcinoma and was receiving chemotherapy at regular intervals due to distant metastasis (liver and bone).

Ophthalmological examination revealed best corrected visual acuity (BCVA) of 0.8 in the left eye and 0.8 in the right eye. On biomicroscopic examination, bilateral lids and anterior segment appeared normal. Direct and indirect light reactions were normal and color vision was normal bilaterally. A dilated fundus examination revealed a normal right eye, retinal detachment in the inferior retina with preserved macula, and a pigmented, raised lesion in the superior retina in the left eye.

B-mode ultrasonography (USG) showed a hyperechoic choroidal mass in the superior retina with no shadow in the left eye except for the inferior detached area (Fig. 1). Fundus fluorescein angiography (FFA) was normal in the right eye, but the left eye showed hyperfluorescent mottled areas with smooth borders covering almost half of the upper half of the eye (Fig. 2). Brain magnetic resonance imaging (MRI) was normal and orbital MRI was interpreted as a choroidal mass in the posterior part of the bulbus oculi in the left eye, extending superiorly (Fig. 3). The patient was interpreted as distant metastasis of lung adenocarcinoma and no surgical intervention was planned for the secondary ERD and the patient was consulted to the oncology clinic. The patient was given three courses of radiotherapy within 1 week in addition to the chemotherapy received by the oncology clinic. At the ophthalmological examination performed 2 months later, BCVA was 0.8 in the right eye and 0.8 in the left eye, dilated fundus examination revealed that the right eye was normal, the left eye retina was flat, the superior choroidal mass regressed and was replaced by hyperpigmented spots in the hypopigmented area (Fig. 2). MRI of the orbit showed that the choroidal mass disappeared (Fig. 3). The patient is being followed up by oncology and ophthalmology clinics. Optical coherence tomography scans were performed at the time of diagnosis and follow-up after treatment, but no clear image through the mass could be obtained and is shown in Figure 4.

Discussion

The choroid is the most common site of intraocular metastasis in adults because of its rich vascularisation (3). In this case report, the management of a patient diagnosed with retinal detachment in an external center and referred to our clinic for surgery, the importance of detailed anamnesis, and the prevention of unnecessary vitreoretinal surgery and its complications will be emphasized.

Choroidal metastases secondary to malignancies may present with symptoms such as decreased visual acuity, blurred vision, pain, light flashes, and floaters. It has been reported that 80% of cases may have decreased visual acuity, while 15–20% may not have any symptoms (4,5). In our case, although there was no significant decrease in visual acuity, there was a long-standing complaint of flashes of light. This symptom shows the importance of detailed fundus scanning. At the same time, questioning the patient's systemic diseases is very important in diagnosis and treatment management. As in this case, ocular pathologies may develop secondary to malignancies. Although lung cancer is the most common primary tumor in terms of choroidal metastasis in males, it

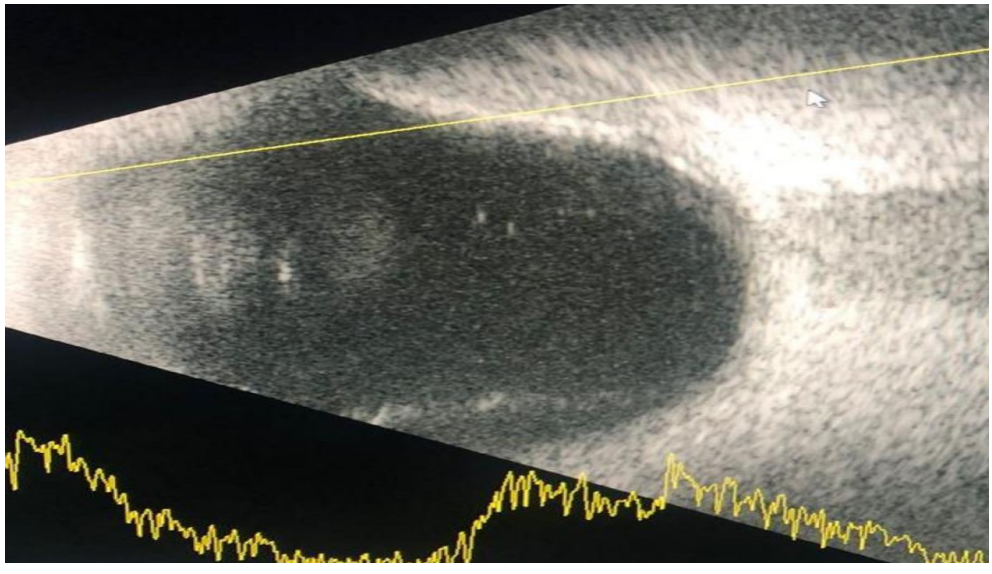

Figure 1. Initial examination B-mode ultrasonographic mode.

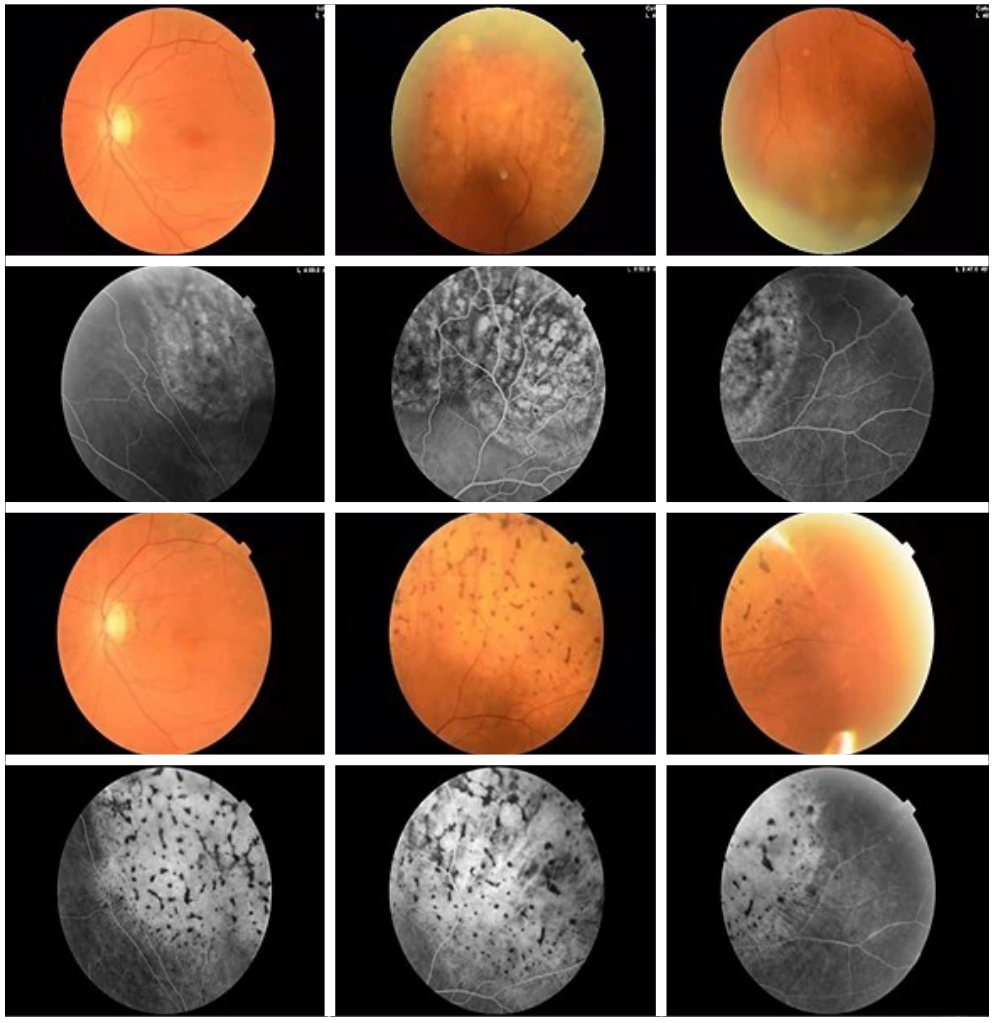

Figure 2. Color fundus photograph and fundus fluorescein angiography taken at the first examination and 2 months after treatment.

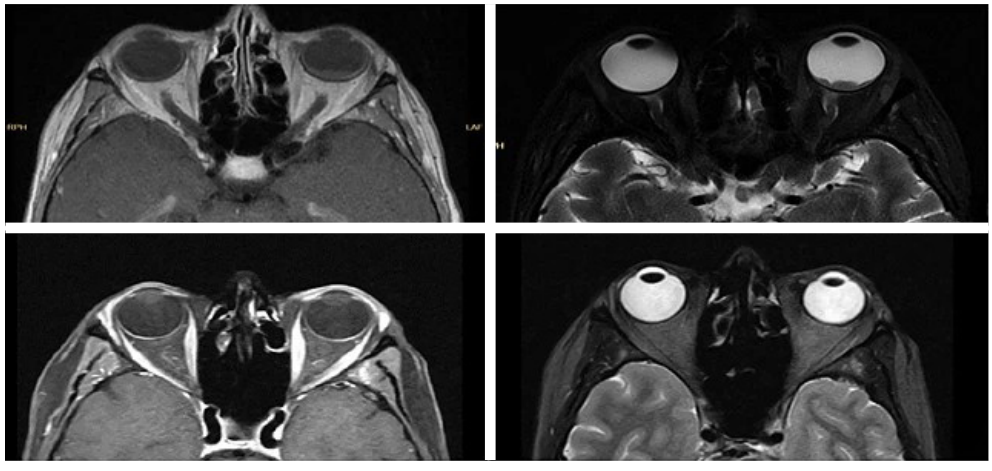

Figure 3. T1 and T2 sequence, axial section magnetic resonance imaging (MRI) taken at the initial examination, T1 and T2 sequence MRI taken 2 months after treatment.

may also be observed in female patients (9). The frequency of ocular metastasis in postmortem ocular examinations of lung cancer patients was found to be 6.1% (2). It is known that the incidence of lung cancer is increasing rapidly in both men and women all over the world. While no ocular findings may be observed in the early stage, ocular effects may be

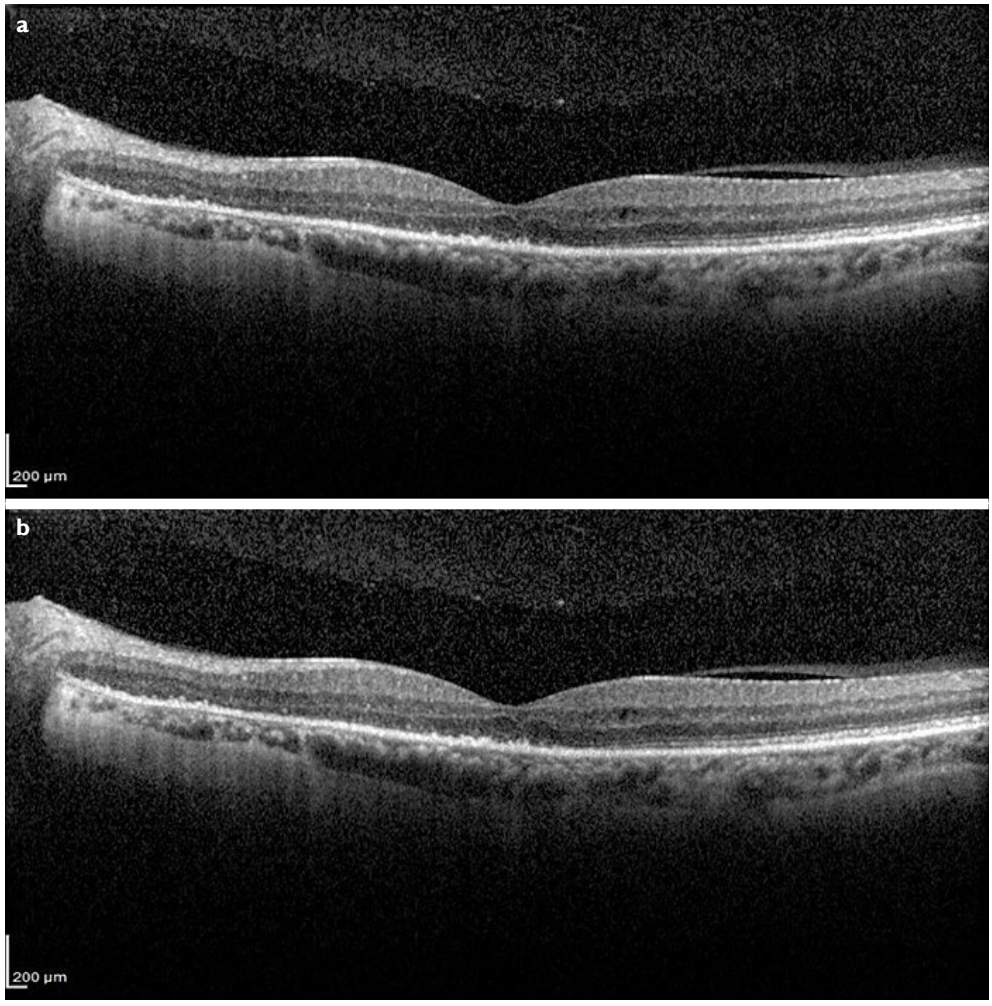

Figure 4. Optical coherence tomography images before **(a)** and after **(b)** treatment.

observed in the advanced stage. In our case, stage 4 lung adenocarcinoma with ocular involvement was observed. Lung cancers are classified as small cells or non-small cells. In a review by Shah et al., 194 patients with uveal metastasis due to lung cancer were analyzed and it was reported that non-small cell lung cancer was the most common type of lung cancer as in our case. In the same review, tumor location was most commonly seen in the choroid (88%) and it was reported that visual acuity remained stable or improved in 59% of eyes (8). In this case, the tumor location was choroid and no loss in visual acuity was observed.

In the diagnosis of retinal detachment, B-mode USG and optical coherence tomography are used in addition to fundus examinations. In addition to these imaging modalities, FFA and indocyanine green angiography are also used in the detection of choroidal metastases (4). In addition, MRI should be performed for the exclusion of orbital and cranial involvement or follow-up in the presence of a mass. In our case, no pathology was found on the brain MRI, but a solid mass was present on the orbital MRI and disappeared after treatment. Choroidal tumors usually show a hypofluorescent pattern in the early stage and a hyperfluorescent pattern in the late stage of FFA. Choroidal metastases may show hyperfluorescence in the early phase and hypofluorescence in the late phase on FFA, or hypofluorescence in all phases (2,5).

Choroidal metastases can be seen due to different malignancies. Although the images of ERD due to these malignancies are similar, the images of metastatic lesions may be different. Choroidal hemangioma and melanoma are the most commonly confused lesions in the differential diagnosis of choroidal metastases (11). Choroidal melanoma usually spreads along Bruch's membrane and appears larger in size on B-mode USG compared to metastases (12). Choroidal hemangioma is hyperfluorescent in the early phase of FFA and the blood vessels in the lesion are clearly and densely defined. In the later stages of FFA, the dye is rapidly cleared and empty vessels are visualized (7). Another difference between choroidal metastases from other choroidal lesions is that they are usually detected as multifocal lesions in both eyes or in one eye. In the literature, no specific signs and

symptoms are reported for the differential diagnosis of choroidal metastases due to different malignancies, but detailed anamnesis is important in this case.

The most important limitation of our study is the absence of fine needle biopsy for definitive diagnosis and indocyanine green angiography which provides more detailed information about the choroid. However, the advanced stage of lung cancer, fundus, and other examination findings support our diagnosis. In addition, the disappearance of the lesion with the treatment given for metastasis of the primary malignancy strengthens our diagnosis of choroidal metastasis.

Conclusion

Choroidal metastases may be seen in lung cancer due to high blood flow. For this reason, metastasis of a diagnosed primary tumor should be considered in the differential diagnosis of retinal detachment. Early detection of these metastatic lesions and appropriate treatment strategies will benefit the patient and the physician. In addition, choroidal evaluation with B-mode USG should be performed in every retinal detachment case before considering surgical intervention. In addition to showing an additional choroidal pathology, it will also protect the patient from unnecessary vitreoretinal surgeries and complications. In addition, it will reduce health costs in the long term by preventing unnecessary interventions.

Disclosures

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

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Conflict of Interest: None declared.

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