

## Bilateral Choroid Metastasis in a Young Nonsmoker Male: A Rare Site of Metastasis from Squamous Cell Carcinoma Lung

### Abstract

Choroidal metastases from the lung are very rare accounting about 0.1%–7%. The most common site of ocular metastasis is choroid due to its abundant blood supply. Lung cancers commonly metastasize to the liver, bone, brain, and adrenals. Here, we present a very rare case of squamous cell carcinoma lung in a young nonsmoker patient with metastasis only to eye and no evidence of distant metastasis. This is a very rare case as metastasis to eyes itself is a very rare occurrence and has been mainly reported with adenocarcinoma and small-cell carcinoma. The other features which make this case rare are that squamous cell carcinoma is common in smokers and usual age of diagnosis is >50 years of age and this patient was only 38 years of age and nonsmoker. The aim of this case report is to emphasize the importance of thorough patient evaluation and effect of systemic chemotherapy on ocular metastatic lesions.

**Keywords:** : Bilateral choroidal metastasis, squamous cell carcinoma lung, systemic chemotherapy

### Introduction

Choroidal metastasis mostly occurs in advanced stages of cancer and carries a poor prognosis for survival. Majority of choroidal metastases from lung cancer are benefited by either systemic or local therapy, so early recognition and the diagnosis and initiation of treatment are necessary to improve patient's quality of life. Newly developed molecular-targeted therapy has also demonstrated favorable outcomes for ocular tumors. However, further studies are required to explore therapeutic options. We present a very rare case of bilateral choroidal metastasis with squamous cell carcinoma lung in a young nonsmoker patient who was treated with systemic chemotherapy both for primary lung cancer and choroidal metastasis and showed excellent response to metastatic lesions even if the primary malignancy did not respond to systemic chemotherapy.

### Case Report

A young 38-year-old male presented with the chief complain of chest pain right side for 3 months, which was initially mild, dull aching and confined to the right axillary area however later on it progressed to

involve whole of right hemithorax. The pain was nonradiating. It used to aggravate in lying in right lateral position. The patient also complained of dry cough for 3 months with no postural and diurnal variation. The patient complained of breathlessness for the last 2 months, which was gradually progressive. For these complains, he consulted a general practitioner where a chest X-ray was done, and antitubercular drugs were started. He took Anti tubercular treatment (ATT) for 2 months, but no symptomatic improvement was noticed by the patient and presented to our OPD with the similar complains and a repeat chest X-ray was done which showed massive right-sided pleural effusion and patient was admitted for further evaluation [Figure 1]. Ultrasonography (USG) thorax was done which showed around 3 cm of pleural thickening and moderate amount of septated effusion. Pleural fluid cytology came out to be positive for malignancy. ATT was stopped, and contrast-enhanced computed tomography (CT) thorax was done which showed ill-defined heterogeneously enhancing soft-tissue density lesion in the right hilar and para hilar region of size approximately 7 cm × 7.5 cm × 6 cm encasing bronchus intermedius causing lower and middle lobe collapse. Medially the lesion infiltrated into the mediastinum

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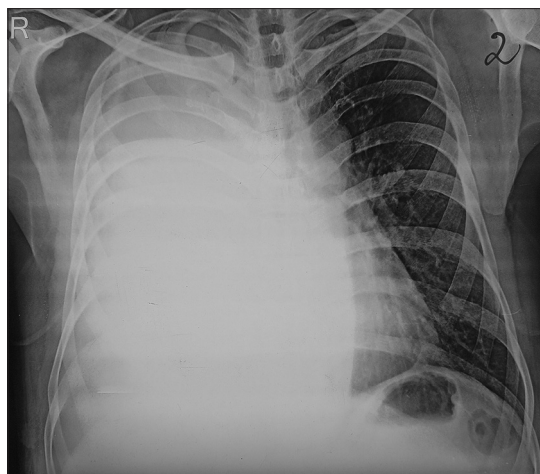
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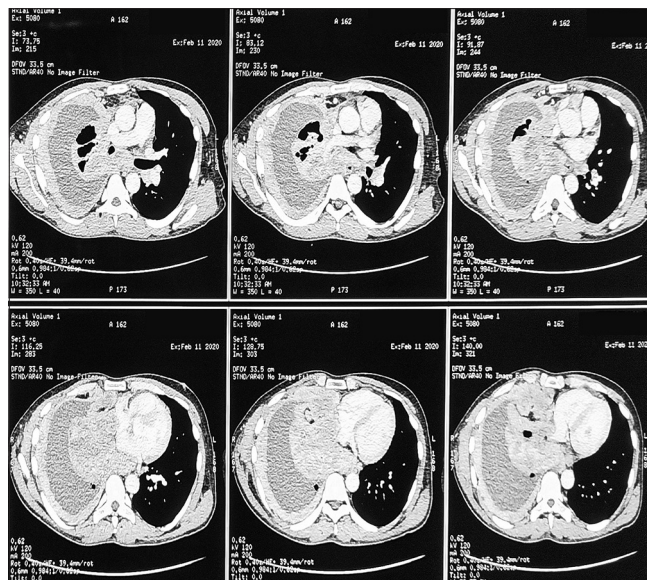




**Figure 1: Chest X-ray showing massive pleural effusion with shift of mediastinum to opposite side**

abutting right and left atria and encasing origin of the right main pulmonary vein and descending branch of the right pulmonary artery. Irregular circumferential thickening of right visceral and parietal pleura involving diaphragmatic, costal and mediastinal pleura with maximum thickness around 3.3 cm with moderate-to-gross pleural effusion was also seen [Figure 2] with bilateral enlarged conglomerated lymph nodes as well as left supraclavicular lymph node was also involved. Pleural thickening along costal pleura focally infiltrated the chest wall with no bony erosion. Medially mediastinal pleural thickening caused the luminal narrowing of superior vena cava.

Fiberoptic bronchoscopy was done, and a small white nodular lesion seen at carina and biopsy was done. H and E stained section showed stratified squamous epithelium along with singly scattered as well as clusters of atypical cells showing pleomorphism, hyperchromasia, increased N: C ratio and eosinophilic cytoplasm with few neoplastic cells with keratinized pearls suggestive of nonsmall-cell carcinoma favoring squamous cell carcinoma. USG-guided fine-needle aspiration cytology was done which was also positive for malignancy favoring squamous cell carcinoma. Molecular analysis for epidermal growth factor receptor was negative. USG-guided aspiration of 750 ml pleural fluid was done. Later Intercoastal tube drainage (ICTD) was done as total fluid was not drained, and the patient complained of dyspnea. Few days after the admission patient complained of black spots in the field of vision. There was no history of pain, redness, photophobia, diplopia, and headache. Ocular movements were not restricted. Hence, a fundus examination was done which showed multiple yellowish spots with irregular margins in the choroid and superficial retina with venous engorgement and arteriolar attenuation in both eyes [Figure 3a and b]. Disc shape, color, and margins were normal. Cup-to-disc ratio was normal, and red glow was present. Further ocular CT was done, which showed the increased choroidal



**Figure 2: Contrast-enhanced computed tomography of the thorax showing lung mass with mediastinal invasion, marked pleural thickening and pleural effusion**

thickness of both eyes [Figure 4a-c] and retinal involvement was due to inflammatory reaction through retinal pigment epithelium. Macula was healthy.

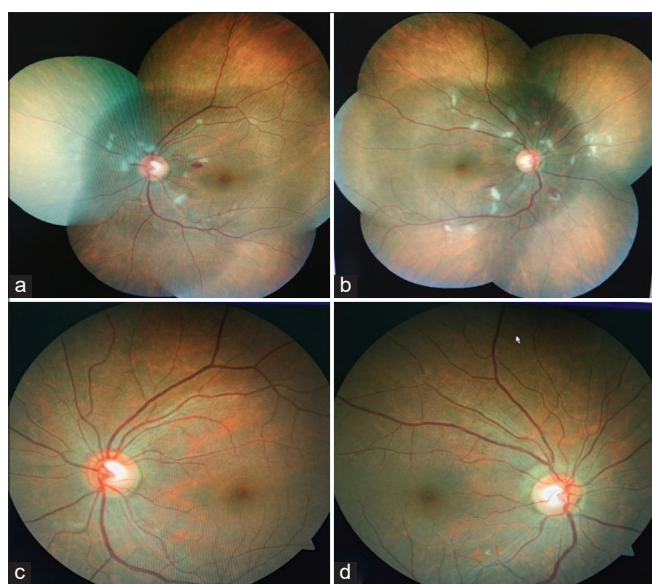
Based on history, clinical, radiological, ophthalmological and cytological reports diagnosis of squamous cell carcinoma lung with choroidal metastasis T4N3M1b TNM Stage IV-A was made. The Eastern Cooperative Oncology Group score of the patient was 1, so systemic chemotherapy was started with cisplatin and paclitaxel in February 2020. Six cycles of chemotherapy were planned at an interval of 21 days. Chemotherapy was well tolerated by the patient; however, there were minor side effects of weight loss and decreased appetite. A repeat fundus examination was done after completion of chemotherapy which showed excellent result with complete resolution of choroidal metastatic lesions of both eyes [Figure 3c and d]. The vision of the patient was 6/6 partial in both eyes at the end of chemotherapy with normal intraocular pressure of both eyes. A positron emission tomography CT was done after six cycles of chemotherapy which did not show any change in the size of primary lung cancer and only a slight reduction in pleural thickening with maximum thickness of 1.8 cm and no evidence of distant metastasis. The patient is in follow-up and is planned for repeat CT scan and the 2<sup>nd</sup> line chemotherapy.

## Discussion

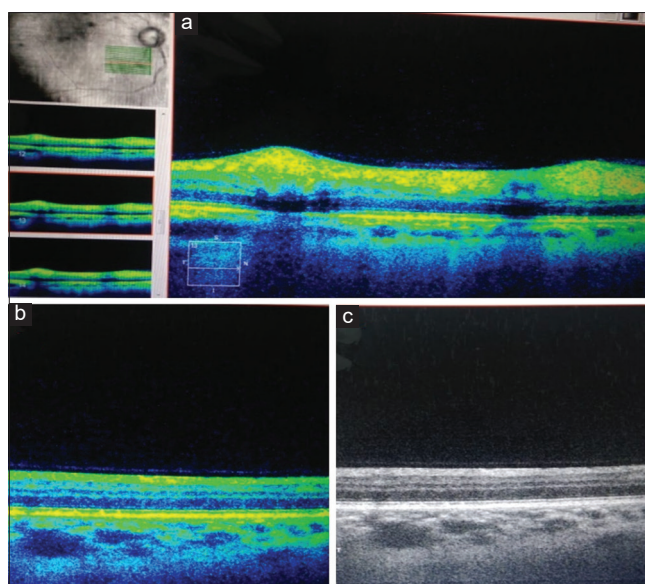
Adenocarcinoma and small cell carcinoma of lung account for highest proportion of metastasis to eye. Overall incidence of metastasis to the eye is a rare phenomenon ranging from 0.1% to 7%.<sup>[1]</sup> The first case of choroidal metastasis was reported by Perls in 1872. Till date, very few cases have been reported of ocular metastasis from squamous cell carcinoma lung as listed in Table 1. In the

**Table 1: Various case reports of ocular metastasis from squamous cell carcinoma lung**

Name of author	Site of lung cancer	Age of patient/sex	Ocular symptoms	Ocular site involvement	Distant metastasis to other organs
Klein R <i>et al.</i> (1977)	Left upper lobe	52 years/ male	Decreased visual acuity	Retina both eyes	Brain, meninges, lymphnodes, liver, adrenals, spleen kidney, heart
Akio Hiraki HK <i>et al.</i> (1998)	Right lower lobe	72 years/ male	Blurred vision, pain in eye	Iris left eye	Brain
Asteriou C <i>et al.</i> (2010)	Right upper lobe	46 years/ male	Blurred vision, diminution of vision	Choroid left eye	Brain, bone, adrenal glands
Archana Prathipati SJ <i>et al.</i> (2016)	Right upper lobe	35 years/ female	Blurred vision, pain in eye	Choroid left eye	None
Yalcinbayir O <i>et al.</i> (2017)	Stage IV squamous cell carcinoma lung	54 years/ male	Blurred vision	Retina left eye	Brain
Guo Y <i>et al.</i> (2018)	Lower lobe right lung	62 years/ female	Blurred vision, pain in left eye	Solitary ocular metastasis	None at diagnosis, later brain metastasis developed
Parmar D <i>et al.</i> (2018)	Mass in distal left main bronchus causing complete collapse of left upper lobe and infiltration of left lower lobe	61 years/ male	Headache, diminution of vision, pain left eye	Choroid left eye	Orbit
Singh P <i>et al.</i> (2019)	Left lower lobe	45 years/ male	Diminution of vision left eye	Choroid left eye	Liver, spleen, malignant pleural effusion, pleural deposits



**Figure 3: (a and b) Fundus image of the left and right eyes, respectively, at the time of diagnosis image (c and d) fundus images of the left and right eyes after the completion of systemic chemotherapy showing complete resolution**



**Figure 4: (a) Optical coherence tomography showing increased choroid thickness of the right eye image (b and c) Optical coherence tomography showing increased choroid thickness of the left eye**

given Table 1 can see that no case of bilateral choroid metastasis from squamous cell carcinoma lung with no other distant organ metastasis has been reported making this case the first reported case of this type. The choroid is the most common site of the eye to be involved by metastasis because of its abundant blood supply from posterior ciliary arteries which makes it more prone to metastasis. Choroidal lesions are diagnosed easily and early because they are more symptomatic.<sup>[2]</sup> In a study done by Shields and

Shields of 420 consecutive patients with uveal metastases, they found tumors were bilateral in 23.80% and unilateral in 76.20% patients, respectively.<sup>[3]</sup> The most common symptom of metastatic carcinoma to the eye is blurred or distorted vision in one or both eyes. Usually, pain is not a sign of metastatic cancer to the eye, except when patients have an extensive intraocular tumor. The characteristic metastatic carcinoma to the choroid from lung shows as a golden yellow to yellowish-white round-to-oval lesion and occur with subretinal fluid and retinal detachment.<sup>[4]</sup>

Two most common primary malignancies to present with choroidal metastasis are breast cancer in females and lung cancer in males.

Left common carotid artery is a direct branch of arch of the aorta, so the incidence of metastasis is high to the left eye than the right eye. It can also be seen in Table 1 that most of the authors have reported the involvement of the left eye. Metastatic lesion to the eye is a poor prognostic sign for long-term survival.

Treatment for ocular metastasis can be either systemic or localized ocular therapy. Systemic medication for lung cancer diffuses into the choroid freely through the fenestrated endothelium of choroid capillaries as choroid lies outside the blood-brain barrier.<sup>[5]</sup> Hence, the standard therapy for metastatic disease is systemic therapy which can be either chemotherapy or targeted therapy. There are several reports of using either gemcitabine<sup>[6]</sup> or pemetrexed with a platinum-based compound leading to complete involution of choroidal metastasis in patients of adenocarcinoma lung with improvement in vision. Bevacizumab has also been studied in patients of adenocarcinoma lung, leading to improvement in survival and vision;<sup>[7]</sup> however, it is not recommended for squamous cell carcinoma lung. Incidence of driver mutations in squamous cell carcinoma is low, but targeted therapies have been reported in choroidal metastasis in adenocarcinoma lung with gefitinib,<sup>[8]</sup> erlotinib, crizotinib,<sup>[9]</sup> and alectinib. Localized ocular therapy in choroidal metastasis aims to restore the visual acuity. The various procedures which have been proposed for the same include laser photocoagulation, cryosurgery, external beam radiotherapy,<sup>[10]</sup> intravitreal bevacizumab<sup>[11]</sup> and surgical resection.

#### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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#### Conflicts of interest

There are no conflicts of interest.

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