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Lung Cancer Revealed by Choroidal Metastasis: About Two Cases

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Abstract | **Case Report**

The most common site of ocular metastasis is the choroid. We report two cases of choroidal metastases (CM) revealing lung cancer. The first case is a 66-year-old patient consulting for reduced visual acuity. The fundus reveals a posterior pole choroidal mass. Ultrasound shows a weakly hyperhecogenic choroidal mass. Chest CT revealed the primary lung tumor. The second case is a 62-year-old woman consulting for reduced visual acuity in whom the fundus found a choroidal mass with sero-retinal detachment opposite. Fluorescein angiography, OCT, and ultrasound were in favor of choroidal metastasis. The lung CT scan revealed a lung tumor. Although uncommon, CM can be the initial manifestation of lung cancer. Their diagnosis is based on a range of clinical and paraclinical arguments. The treatment of CM with chemotherapy combined or not with ocular radiotherapy is often effective in disabling eye disorders. The aim of this work is to summarize the current knowledge on choroidal metastases, with an emphasis on epidemiology, diagnosis and treatment.

Keywords: Choroid, metastasis, lung.

INTRODUCTION

Lung cancer is the most common cause of choroidal metastasis (CM) in men. In women, lung cancer is responsible for only 12% of CM. It is usually discovered at the terminal stage. CM can be the initial manifestation of lung cancer. Diagnosis is based on a range of clinical and paraclinical arguments. Treatment of CM by chemotherapy combined or not with ocular radiotherapy is often effective on disabling eye disorders; it aims to save vision and improve life quality. This work is to report two cases of choroidal metastases secondary to lung cancer.

OBSERVATIONS

The first case is a 66-year-old woman with a history of diabetes and high blood pressure. She presented for a reduced visual acuity associated with severe headaches and heaviness in lower limbs. The clinical examination found better visual acuity in the left eye, corrected from counting the fingers of 2 meters, eye tone at 12 mmhg, a clear cornea, a lens with a cortical and subcapsular cataract. The fundus reveals a raised yellowish choroidal mass located at the posterior pole (Figure 1). Ultrasound shows a weakly hyperhecogenic choroidal-looking mass measuring 3.48 mm by 10.92 mm without associated choroidal excavation (Figure 2). CT and orbital-brain MRI showed choroidal injury in the left eye with a metastatic-looking brain injury (figure 3). A pulmonary CT scan and a mamaography were ordered to search for the primary localization. The mammogram was normal while lung CT showed a heterogeneously enhanced irregularly contoured lung mass measuring 50 mm by 60 mm (Figure 4). Patient has evolved with Glasgow deterioration and died in intensive care.

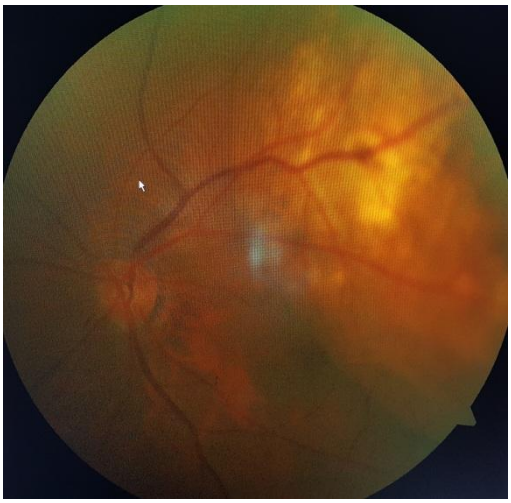

Figure 1: Color retinophotography of the left eye, showing a yellowish raised posterior pole choroidal lesion encompassing the macular area

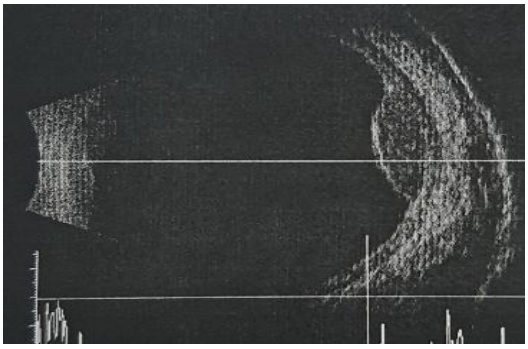

Figure 2: Ultrasound shows a weakly hyperechoic choroidal-looking mass measuring 3.48 mm by 10.92 mm with no choroidal excavation

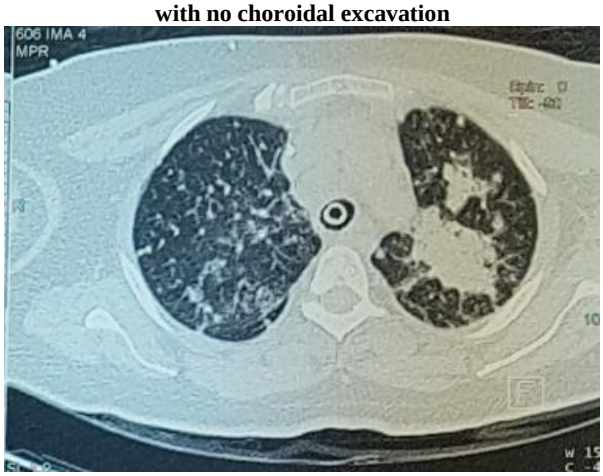

Figure 3: Lung CT shows a heterogeneously enhanced, irregularly contoured lung mass measuring 50 mm by 60 mm

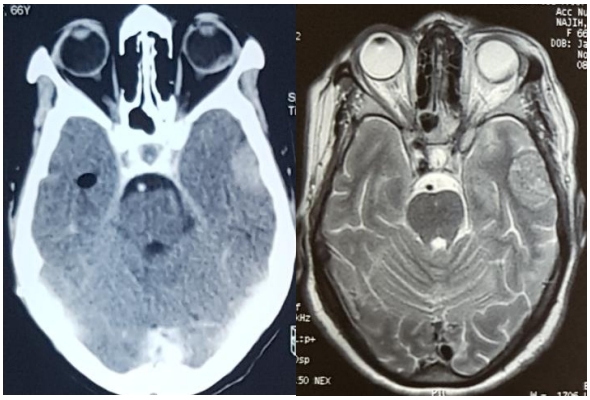

Figure 4: a) CT and b) orbito-cerebral MRI showing a choroidal lesion in the left eye with a metastatic brain lesion

The second case is a 62-year-old patient with a history of untreated chronic cough. She presented for a visual acuity problem. The ophthalmologic examination found in the right eye, better visual acuity corrected by counting the fingers closely, with a normal anterior segment. The fundus shows a pale yellow choroidal mass with sero-retinal detachment encompassing the macula (Figure 5). In fluorescein angiography, a hypofluorescent mass is observed in early stages surrounded by hyperfluorescent lesions in pinpoints; in the late stages, the flurescence of the pinpoints increases in intensity (Figure 6). OCT shows significant retinal serous detachment (RSD) associated with convex bulging of the pigment epithelium induced by the choroidal mass (Figure 7). The B-mode ocular ultrasound shows a hyperechoic mass, measuring 2.5mm by 14mm, without choroidal excavation (Figure 8). A pulmonary CT scan was requested as a the cough. It came back in favor of a pulmonary tumor process. The extension workup revealed hepatic and bone metastases (Figures 9 and 10). Chemotherapy was indicated but the patient died a few days later.

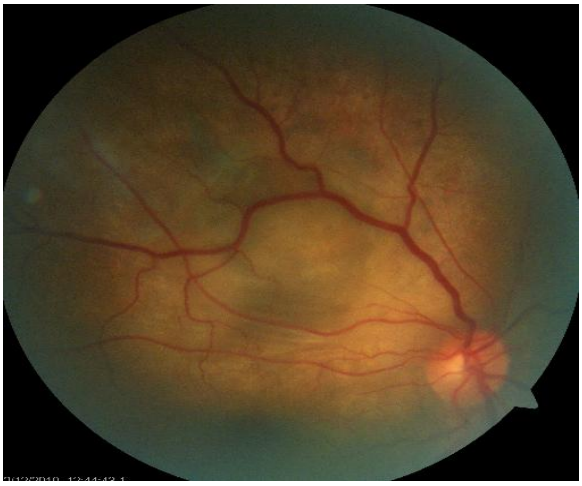

Figure 5: Color retinophotography of the right eye showing a pale yellow choroidal mass with sero-retinal detachment in view encompassing the macula.

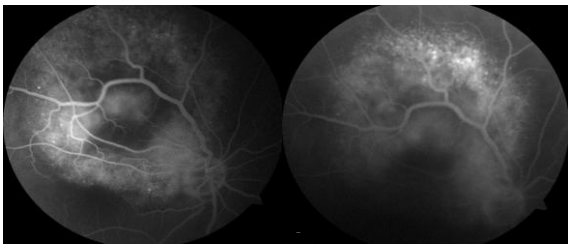

Figure 6: In angiography, we observe, a) in the early stages, a hypofluorescent mass with a few hyperfluorescent areas at the head of a pin (pin-point) throughout the macular area; b) at late times, the pinpoints increase in intensity

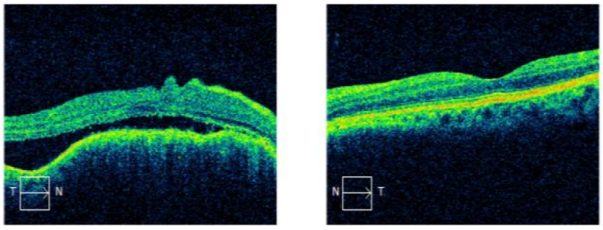

Figure 7: OCT shows significant retinal serous detachment, associated with convex bulging of the pigment epithelium induced by the choroidal mass

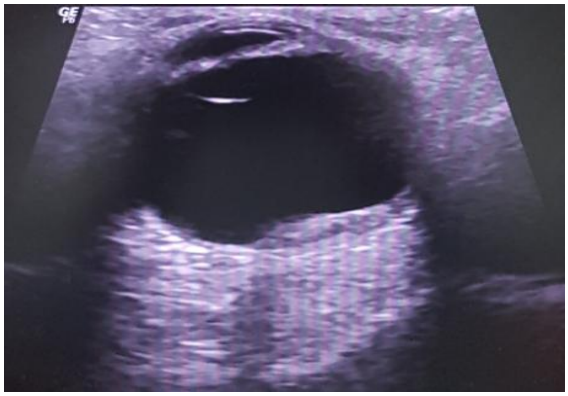

Figure 8: B-mode ocular ultrasound of the choroidal lesion, showing a hyperechoic mass, measuring 2.5mm by 14mm, with no choroidal excavation

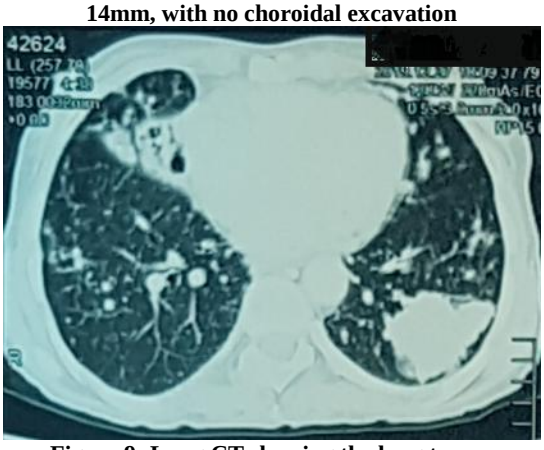

Figure 9: Lung CT showing the lung tumor

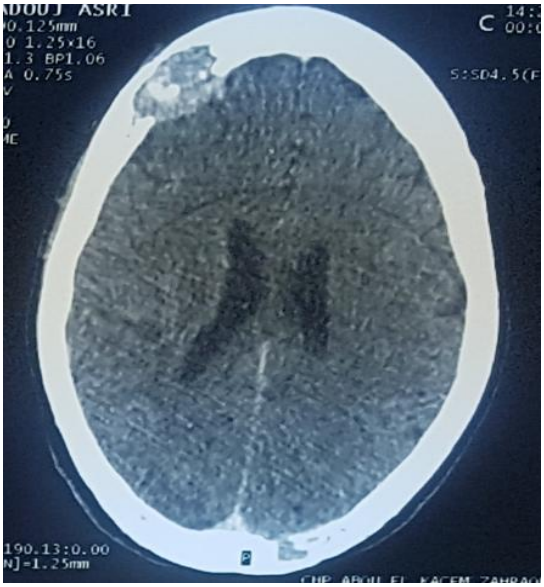

Figure 10: Brain CT showing cranial metastasis

DISCUSSION

The most common site of ocular metastasis is the choroid [1]. Systemic cancer is discovered when CM are diagnosed; but in 8-30% of cases, the diagnosis of CM precedes that of primary cancer. In these cases, a complete assessment revealed lung cancer in 35 to 59% of cases [2-4].

Visual disturbance occurs in 55 to 70% of the eyes. It is often linked to macular or juxtapapillary retinal damage or to a detachment of the exudative retina with foveal extension [3; 4]. Phosphenes and floaters are less frequent than in choroidal melanoma (12% of CM cases) [3]. 15 to 20% of patients remain asymptomatic [3, 5]. CM usually appear as creamy white or pale yellow masses associated with subretinal exudation. Some CM have an orange lipofuscin pigment on the surface, similar to choroidal melanoma, or dark pigment spots resembling “leopard skin” [4]. The most common associated characteristic of MC is the RSD. Most CM is posterior to the equator (80%) [4] and up to 40% has been reported to be localized in the macular region [3].

On ultrasound, choroidal metastases are characterized by a flat or slightly domed mass with moderate to high inhomogeneous reflectivity, unlike choroidal melanomas that are more often domed with low to medium homogeneous reflectivity [6; 7]. In addition, CM are often multilobular with an irregular surface [6]. Peritumoral or gravitational exudative detachment of the retina can be observed [8, 7]. Associated choroidal detachment is rare [9].

Choroidal excavation is created by the difference in reflectivity between the abnormal tissue that replaces the choroid and the underlying normal choroid. About two-thirds of melanoma lesions are associated with choroidal excavation, while it is only found in up to one-fifth of CM [10]. Vascular features, such as hypovascularization, with a dominant central vessel with blood flow are generally associated with choroidal melanoma, while hypervascularization in the absence of a dominant vessel is generally associated with CM. [11].

Fluorescein angiography (FA) is generally not decisive for the diagnosis of CM [12] because almost all choroidal tumors have the same angiographic characteristics: generally hypofluorescent in the early phase and heterogeneously hyperfluorescent in the late phase. Unlike FA, Indocyanine green (ICG) helps in the differential diagnosis of choroidal tumors.

EDI-OCT and more recently source-scanned OCT have provided detailed information on the morphological characteristics of choroidal tumors [13-15]. In EDI-OCT, CM has low internal optical reflectivity, with an enlarged suprachoroidal space [16]. EDI-OCT is also more sensitive for the detection of very small CM before it is clinically visible [17-19]. In addition to tumor thickness, OCT helps visualize specific patterns associated with CM. The most notable feature is the irregular or "lumpy" anterior surface of the lesion, despite an apparently smooth surface on ultrasound [17]. Another frequently associated sign is RSD which is found in 67 to 95% of cases [17, 13, 20]. The optical density or reflectivity of the RSD substance can also be measured by OCT, and may be indicative of

the cause of the DSR [21, 22]. This density was found to be significantly lower in CD than in melanoma [23].

Computed tomography (CT) is rarely useful for eye tumors. Magnetic resonance imaging (MRI) shows a well-defined choroidal mass that appears iso-intense on T1-weighted images and hypointense on T2-weighted images [24].

Up to a third of patients with intraocular metastases have no known history of cancer [3, 4]. It is therefore important to manage the systemic workup to identify the primary site of the neoplasia. If no primary tumor has been found, a biopsy for cytological or histopathological analysis should be considered. Intraocular biopsy may increase the risk of dissemination of malignant cells, and presents a risk of severe ocular complications, which may explain its limited use [25]. Intraocular tumors are generally accessible for sampling via transscleral or trans-vitreous fine-needle aspiration biopsy (FNAB) [26-29].

Most patients have a limited life expectancy. However, recent advances in systemic therapy have improved the survival of some patients. Although external beam radiation therapy is the most used treatment, more advanced forms of radiation therapy associated with fewer side effects are used in some cases. In patients with shorter life expectancies, systemic therapies such as those targeting oncogenic factors or immunotherapy may induce regression of CM and may be sufficient to decrease visual symptoms. However, CM often develop resistance to systemic therapy, and ocular relapse usually requires radiation therapy for lasting control. Less invasive in-office treatment, such as photodynamic and intravitreal therapy with anti-VEGF injection, may also help preserve vision [30].

CONCLUSION

Ophthalmologists should be familiar with diagnostic features and general workup of CM, allowing prompt treatment of primary cancer. The goals of all treatments are to preserve or improve vision, prevent enucleation and maintain life quality. To this day, radiotherapy remains the treatment of choice for CM. It can be performed alone for ocular metastases, or combined with chemotherapy on disseminated metastasis. Local irradiation techniques used to treat primary eye tumors may be considered for the management of CM, such as plaque brachytherapy or proton beam therapy (PBT). Other topical treatments, such as photodynamic therapy (PDT) or intravitreal anti-VEGF, are available and may decrease the need for irradiation and its side effects.

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