

Decrease in Visual Acuity as the Initial Clinical Presentation of Lung Adenocarcinoma: A Case Report

Musallam Mohammed^a, OuiameNabou ^a, Soufiane Afkir ^b, Manal Chafik^b, Rachid Sekhsoukh ^{b,c}, Afafe Thouil ^a, Hatim Kouismi ^{a,c}

^aDepartment of Pneumology, Hospital University Centre Mohamed VI of Oujda, Faculty of Medicine and Pharmacy of Oujda, Mohammed Premier University, Oujda, Morocco.

^bDepartment of Ophthalmology, Hospital University Centre Mohamed VI of Oujda, Faculty of Medicine and Pharmacy of Oujda, Mohammed Premier University, Oujda, Morocco.

^cClinical Research and Public Health Epidemiology Laboratory, Oujda, Morocco

Abstract:-

Introduction:- Primary lung cancer is the leading cause of choroidal metastasis for men, but its revelation by the latter is rare.

Case presentation:- The reported observation treats the case of a 50-year-old man who smoked twenty-four pack-years, with no particular pathological history, who initially consulted for a rapidly progressive decline in the visual acuity of the left eye. The ophthalmic exam and the explorations concluded to the diagnosis of choroidal metastasis of a primary bronchial adenocarcinoma, which was confirmed by the bronchial biopsy.

Clinical discussion:- It is the decline in visual acuity that motivated our patient to consult, which is usually rare since choroidal metastases are often asymptomatic. The diagnosis of choroidal metastasis is usually based on bundle of clinical and radiological arguments. Retinal angiography, ocular ultrasound and MRI visualize non-specific retinal lesions. The aim of the treatment in choroidal metastases is to preserve visual function. Local radiotherapy has proven its effectiveness and allows regression of symptoms.

Conclusion: Before every choroidal metastasis, the search for primary lung cancer must be systematic. The main therapeutic modalities include systemic and local treatments. Currently, the feasibility and effectiveness of various treatment options are controversial around the world.

Keywords:- Metastasis, Choroid, lung cancer, adenocarcinoma, radiotherapy.

I. INTRODUCTION

The incidence of ocular metastases is approximately 8-10% [1]. About 88% of ocular metastases occur in the choroid, [2] holding responsible in the majority of Cases, breast cancer (41%) and lung cancer (21%) [3].

Primary cancer is rarely revealed by ocular metastases; therefore, it has a pejorative prognosis.

The diagnosis is usually established at an advanced stage of the disease, usually during active surveillance of the

primary tumor [4]. However, the opposite can also happen, just as proven by the following study case.

Eye radiation therapy is considered as a standard treatment option for metastatic intraocular tumors. Subsequently, other topical or systemic treatments had gradually emerged as part of well-established cancer therapies, while various treatment modalities and sophisticated combination approaches remain controversial. [5].

II. PRESENTATION OF CASE

A 50-year-old man, twenty-four pack per year history of smoking, with no particular pathological history, who consults for a rapidly progressive decline in the left visual acuity assessed for 2 months.

The initial eye examination indicated: a visual acuity of the right eye at 10/10, the left eye close to counting fingers, the anterior segment without anomalies while the fundoscopic examination revealed multiple suspicious orange brown hyper pigmented lesions associated to an infero-nasal retinal detachment (Figure 1).

The Optical coherence tomography (OCT) noted a disturbance of all the layers of the intermaculopapillary retina, a detachment of the infero-nasal exudative retina together with the macula, and the presence of multiple hyper-reflective deposits affecting the sub-retinal fluid and the border of the exudative detachment (figure 2).

B-mode ultrasound showed a retinal detachment and a hyper echogenic parapapillary choroidal process located at the bilobed inferior nasal site (Figure 3).

The diagnosis of choroidal tumor was established.

The reinterrogation noted a weight loss of 8 kg in 6 months and the presence of a dry cough for the last 4 months.

A thoraco-abdomino-pelvic tomodensitometry was performed in order to determine the metastatic workup of the tumor, detected on the thoracic level, a left postero-basal parenchymal tumor; measuring 47 * 44 * 69 mm with multiple secondary bilateral pulmonary, ganglionic and mediastinal localizations, classified as T4N2aM1a, The abdominal floor clear, without abnormalities. (Figure 4).

The staging of the tumor was completed by a cerebro-orbital magnetic resonance imaging (MRI), identifying in the supratentorial and infratentorial levels, multiple intraaxial nodular lesions in hyper signal T2 flair and hypo signal T2 of which the largest measures * 9mm at the left cerebellar compartment and 11 * 10mm at the left temporal compartment correlated to secondary cerebral localization measuring for the largest 15 mm long axis at the left temporal level.

At the orbital level , a left intraocular tissue lesion affecting the posterior wall of the posterior chamber was signalised ,with irregular contours isosignal T1 , discrete hypersignal T2 with contrast enhancement; associated to a

detachment of the retina measuring 7* 4 mm; respecting the two eyeballs of the right orbit in T1 and T2 (figure 5).

Bronchial fibroscopy revealed an obstruction of the left postero-basal orifice with thickened spur within the left bronchial tree (figure 6); the biopsy confirmed the neoplastic origin manifesting a poorly differentiated adenocarcinoma.

Before this clinical case, the diagnosis of a non-small-cell, multi-metastatic pulmonary adenocarcinoma (cerebral, ganglionic and ocular) was set.

The patient was referred to oncology for palliative radiotherapy followed by combination chemotherapy.

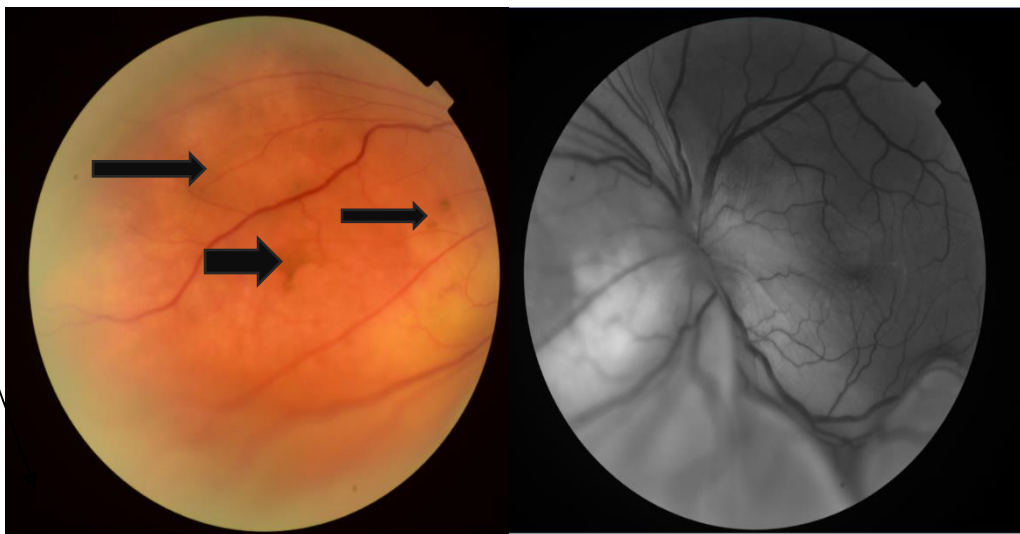


Fig. 1: Color retinography showing multiple suspicious orange brown hyper pigmented lesions (tick arrow) with associated infero-nasal retinal detachment (thin arrow) more marked on the anerythre image.

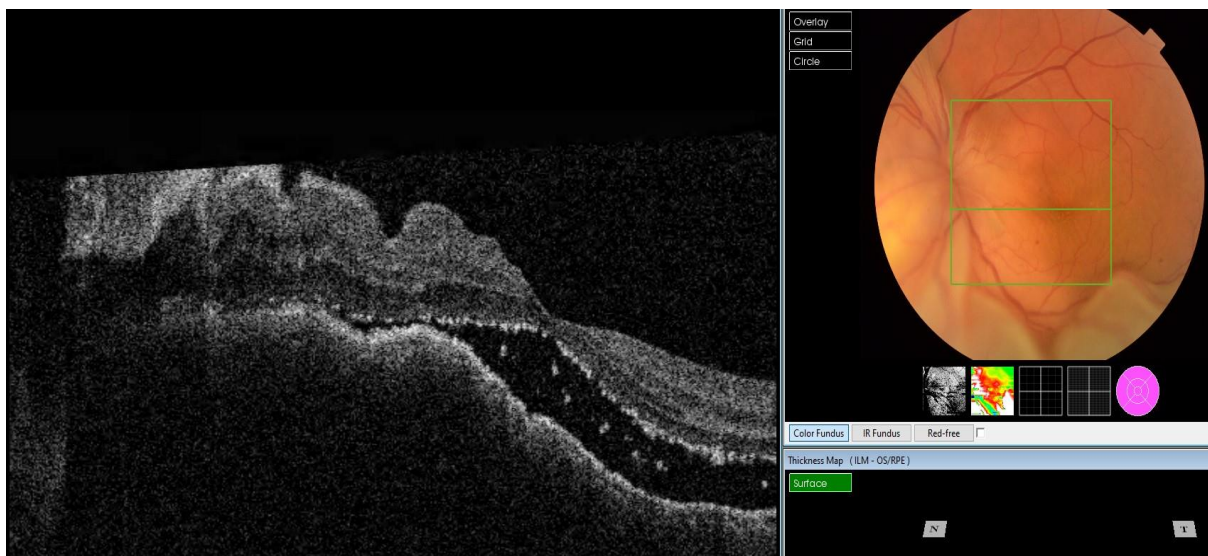


Fig. 2: optical coherence tomography (OCT) of the left eye showing alteration of all the layers of the intermaculopapillary retina; an infero-nasal exudative retinal detachment together with the macula and the presence of multiple hyper-reflective deposits affecting the subretinal fluid and at the border of the exudative detachment (evoking tumor cells).

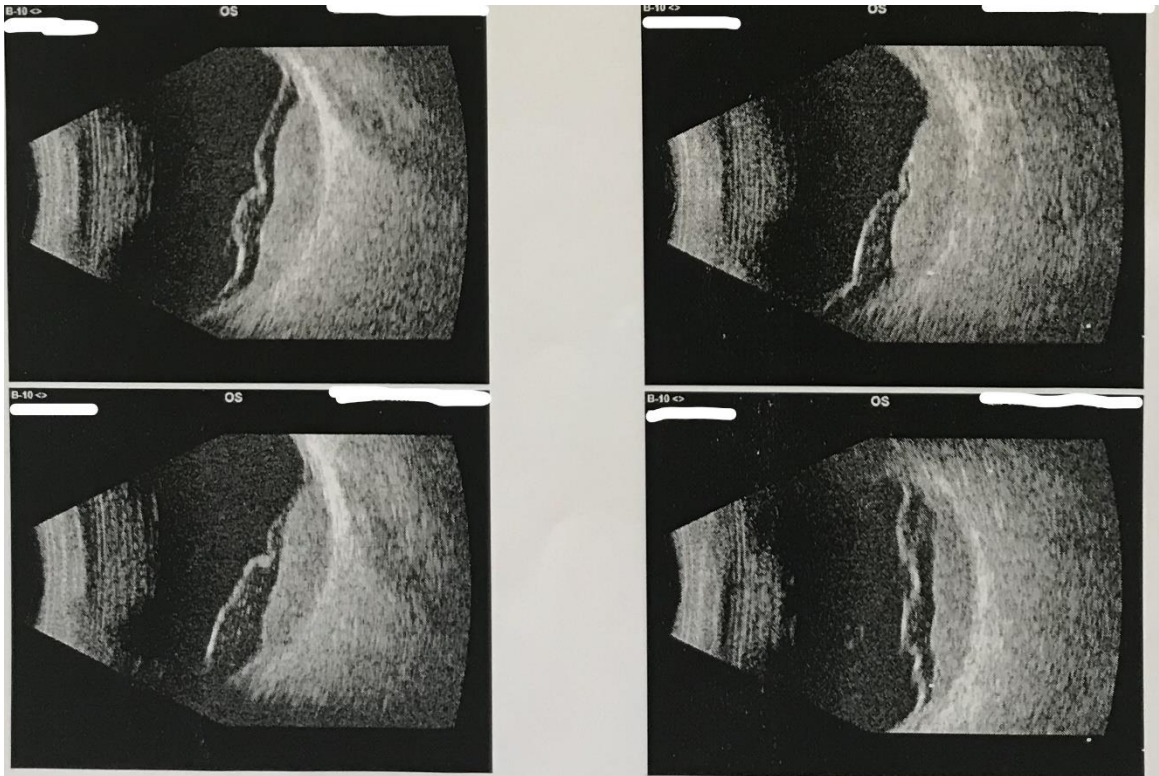


Fig. 3: B-mode ultrasound noting a hyper echogenic parapapillary choroidal process located in the bilobed inferior nasal site associated with retinal detachment.

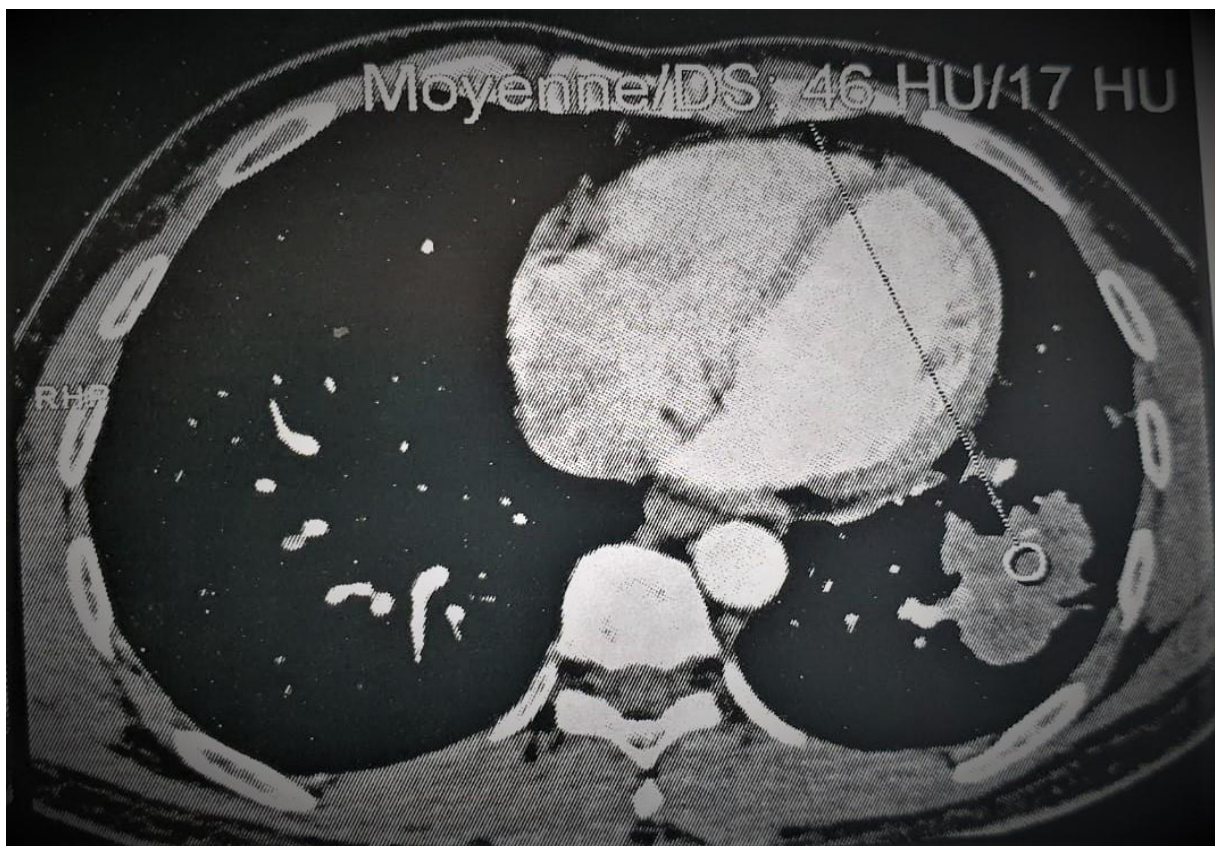


Fig. 4: thoracic computed tomography (CT scan) mediastinal window demonstrating a left postero-basal parenchymal tumor, measuring 47 * 44 * 69mm.

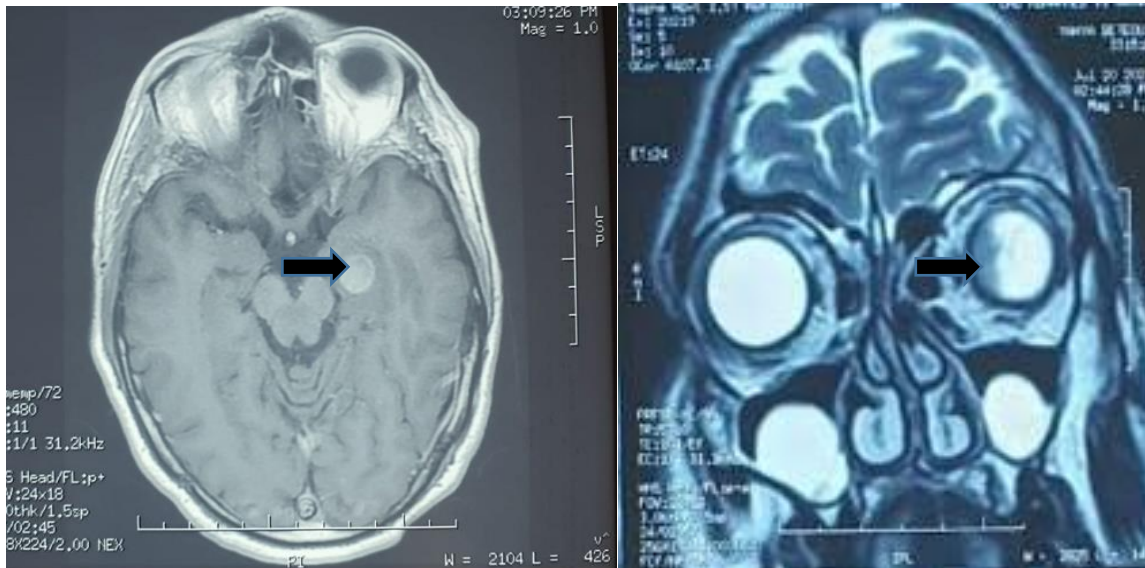


IMAGE A

IMAGE B

Fig. 5: Magnetic resonance imaging (MRI) cerebro-orbital;

- IMAGE A: T1 SEQUENCE AXIAL SECTION AFTER INJECTION OF CONTRAST PRODUCT SHOWS CEREBRAL MESTASTASIS AT LEFT TEMPORAL LEVEL;
- IMAGE B: FRONT CUT SEQUENCE T2 SHOWS a LEFT INTRA-ORBITARY METASTASE.



Fig. 6: bronchoscopic aspect showing an obstruction of the left postero-basal orifice with thickened spur in the left bronchial tree

III. DISCUSSION

We report herein a case of a lung adenocarcinoma with choroidal metastasis as the first presenting sign.

Non-small cell lung cancer (NSCLC) is the leading cause of cancer-related deaths worldwide [7]. Common metastatic sites of lung cancer include the brain, bone, liver, adrenal glands, intrapulmonary sites, and the thorax [8].

Ocular metastases are rare in bronchopulmonary cancer [9]. It can rarely reveal a primary tumor [10], the choroid is the most frequent site of metastasis, especially the posterior pole of the fundus [11]. The prevalence of choroidal metastases in patients with primary lung cancer is low. Yet, Kreusel ETColl [12]. Study case of 84 patients with primary bronchial cancer (PBC), estimated the prevalence of choroidal metastases at 7.1%.

Primary lung cancer is the second leading cause of choroidal metastasis, after breast cancer, Shield and coll study case [2] of 520 patients with ocular metastasis, noted that 21% were carriers of primary bronchial cancer and 47% of breast cancer. The initial tumor could not be identified for about 25% of these patients.

Most of these choroidal metastases occur in late stages of the tumor and are associated with other metastases in 60 - 91% of cases [13], cerebral and ganglionic metastases were ones to figure in our medical report.

It is the decline in visual acuity that motivated our patient to consult. Which is usually rare since choroidal metastases are often asymptomatic [14], more infrequently, choroidal metastasis can be revealed by an ocular syndrome comprising Metamorphopsia, Phosphenes or eye pain. A unilateral blindness, more or less complete, secondary to a metastatic localization in the macula, occurs in 12% of cases. Total retinal detachment is rarely present [2, 15].

Choroidal metastases of primary bronchial cancer manifest in the ophthalmic exam as pigmented homogeneous orange-brown lesions, deposited in a plaque, slightly raised, 3 mm thick and 9 mm large, located preferentially in the posterior part of the superolateral choroid. These choroidal metastases can be single or multiple, unilateral or bilateral, without preferential lateralization [16].

The diagnosis of choroidal metastasis is usually based on a bundle of clinical and radiological arguments. Retinal angiography, ocular ultrasound and MRI visualize non-specific retinal lesions. Ocular computed tomography, even with its image reconstruction techniques, dismisses the analysis of the choroid and therefore, the detection of choroidal metastasis. Practically, choroidal biopsy is recommended in isolated and unique tumor, in the absence of obvious primary neoplasia [17]. In our dossier, the pulmonary endoscopy and the biopsy allowed a histological diagnosis.

The most frequent pathological types of choroidal metastases deriving from lung cancer are, in order, adenocarcinoma, small cell carcinoma, squamous cell carcinoma, large cell carcinoma, and carcinoid tumor [18].

The treatment of CM is usually palliative, because the presence of such metastases suggests hematogenous spread of cancer. This may be achieved with either radiotherapy or chemotherapy. Surgery has not played an important role other than diagnostic biopsy, as surgery carries great potential morbidity and often there is no need for tumor debulking. [19].

The treatment options should be based on various factors, such as the physical condition of the patient, the location and number of primary tumors, the presence or absence of distant metastases, and the location and number of intraocular metastases.

Approximately 22%–32.5% of lung adenocarcinoma patients with CM simultaneously metastasize to the brain [20], conventionally; brain radiotherapy is standard treatment for intracranial metastases. Similar to brain metastases, external beam radiotherapy (EBRT) is also traditional treatment for CM. For patients who concomitantly present brain metastases and CM, whole brain radiation therapy (WBRT) may be considered to encompass the posterior orbit and choroid, and therefore prevent repeated exposure of normal brain tissues to radiation, and to reduce the risk of development of brain metastases [21].

The combination of chemotherapy and radiotherapy can constitute another therapeutic alternative. Transpupillary thermotherapy (TTT) is indicated in small metastatic nodule with a minimal amount of subretinal fluid [2].

IV. CONCLUSION

Bronchopulmonary cancer, often diagnosed at a late stage, is unsuspected in presence of respiratory or extra-respiratory symptoms in a patient with chronic smoking history. The most frequent metastases are cerebral, hepatic and bone metastasis.

Although choroidal metastases are the most frequent ocular metastases, they rarely reveal pulmonary adenocarcinoma signaling an advanced stage of the disease. The treatment of metastatic pulmonary adenocarcinoma is based on palliative radiochemotherapy, in order to improve survival and life quality.

REFERENCES

- [1.] Konstantinidis, Lazaros, and Bertil Damato. "Intraocular metastases—a review." *The Asia-Pacific Journal of Ophthalmology* 6.2 (2017): 208-214.
- [2.] Shields, Carol L., et al. "Survey of 520 eyes with uveal metastases." *Ophthalmology* 104.8 (1997): 1265-1276.
- [3.] Albert, Daniel M., Albert W. Zimmermann, and Irving Zeidman. "Tumor metastasis to the eye. Part III. The fate of circulating tumor cells to the eye." *American journal of ophthalmology* 63.4 (1967): 733-738.
- [4.] Tazi, N., et al. "Métastase choroïdienne révélatrice d'un adénocarcinome bronchique." *La Revue de médecine interne* 27.9 (2006): 699-701.
- [5.] Qu, Z., Liu, J., Zhu, L., & Zhou, Q. (2021). A comprehensive understanding of choroidal metastasis from lung cancer. *OncoTargets and therapy*, 14, 4451.
- [6.] Agha, Riaz A., et al. "The SCARE 2020 guideline: updating consensus surgical Case REport (SCARE) guidelines." *International Journal of Surgery* 84 (2020): 226-230.
- [7.] Siegel, R. L., Miller, K. D., & Jemal, A. (2019). *Cancer statistics, 2019*. CA: a cancer journal for clinicians, 69(1), 7-34.
- [8.] Hoffman, P. C. Mauer, a M., & Vokes, EE (2000). Lung cancer. *Lancet*, 355, 479-85.
- [9.] Niu, Fei-Yu, et al. "Distribution and prognosis of uncommon metastases from non-small cell lung cancer." *BMC cancer* 16.1 (2016): 1-6.
- [10.] Albert, Daniel M., Robert A. Rubenstein, and Harold G. Scheie. "Tumor metastasis to the eye. Part I. Incidence in 213 adult patients with generalized malignancy." *American journal of ophthalmology* 63.4 (1967): 723-726.
- [11.] Chazalon, E., et al. "658 Métastase choroïdienne d'un adénocarcinome bronchique: intérêt de la tomographie à cohérence optique pour la surveillance; à propos d'un cas." *Journal Français d'Ophtalmologie* 30 (2007): 2S337.
- [12.] Kreusel, Klaus-Martin, et al. "Choroidal metastasis in disseminated lung cancer: frequency and risk factors." *American journal of ophthalmology* 134.3 (2002): 445-447.
- [13.] Abundo, Roland E., et al. "Choroidal metastases resulting from carcinoma of the lung." *Journal of the American Optometric Association* 68.2 (1997): 95-108.
- [14.] Zografos, L., et al. "Les métastases de l'uvée et leur traitement." *Ophtalmologie* 6 (1992): 13-19.

- [15.] Finger, Paul T., et al. "Choroidal metastasis from adenoid cystic carcinoma of the lung." *American journal of ophthalmology* 135.2 (2003): 239-241.
- [16.] Shields, Jerry A., Carol L. Shields, and Arun D. Singh. "Metastatic neoplasms in the optic disc: the 1999 Bjerrum Lecture: part 2." *Archives of Ophthalmology* 118.2 (2000): 217-224.
- [17.] De Potter, P., et al. "Manifestations oculaires des cancers: Oncologie oculaire." *Journal français d'ophtalmologie* 25.2 (2002): 194-202.
- [18.] Kreusel, Klaus-Martin, et al. "Incidence and clinical characteristics of symptomatic choroidal metastasis from lung cancer." *Acta ophthalmologica* 86.5 (2008): 515-519.
- [19.] Asteriou, Christos, et al. "Blurred vision due to choroidal metastasis as the first manifestation of lung cancer: a case report." *World Journal of Surgical Oncology* 8.1 (2010): 1-4.
- [20.] Amer R, Pe'er J, Chowers I, Anteby I. Treatment options in the management of choroidal metastases. *Ophthalmologica*. 2004;218 (6):372–377. doi:10.1159/000080939
- [21.] Mathis T, Jardel P, Loria O, et al. New concepts in the diagnosis and management of choroidal metastases. *Prog Retin Eye Res*. 2019;68:144–176.