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Invasive Ductal Carcinoma with Choroidal Metastases

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Abstract **Case Report**

Choroidal metastases, along with choroidal melanoma, are common ocular malignancies. We report a case of a 47-year-old woman with metastatic breast carcinoma to the bone and lung, undergoing chemotherapy, who presented with a rapidly declining visual acuity in her right eye. The diagnosis of right unilateral choroidal metastasis was confirmed using fluorescein angiography, ocular ultrasound, and magnetic resonance imaging. Choroidal metastases typically manifest in advanced stages of disseminated disease and have a poor prognosis. Early detection and appropriate management are crucial for these patients. The treatment approach remains palliative, focusing on systemic disease control and preserving vision when possible.

Keywords: Choroidal Metastases, Breast Carcinoma, Magnetic Resonance Imaging.

INTRODUCTION

Along with choroidal melanoma, choroidal metastases are the most common ocular malignancies [1]. The uvea is the preferred site for their occurrence due to its rich vascular supply. In the majority of cases, choroidal metastases originate from pulmonary sources in men and mammary sources in women [2]. Choroidal metastases typically manifest in the advanced stages of the disease and are associated with a poor prognosis [3]. We report the case of a 47-year-old patient with ductal carcinoma of the breast metastatic to the bone and lung, undergoing chemotherapy. The patient presented with a right unilateral choroidal metastasis and the diagnosis was confirmed using fluorescein angiography, coupled ocular ultrasound, and magnetic resonance imaging.

CASE REPORT

The patient was a 47-year-old woman undergoing chemotherapy for metastatic breast carcinoma to the bone, lung. She presented with a rapidly progressive decline in visual acuity in her right eye. Biomicroscopic examination of the anterior segment was normal. Fundus examination revealed a temporomacular, amelanotic choroidal mass associated with a serous retinal detachment. B-mode ocular ultrasound revealed a posterior pole lesion measuring 6 mm in diameter and 4 mm thick, with no choroidal excavation. Fluorescein angiography showed hypo fluorescence in early arterial phases, with hyperfluoresence in the late venous phases.

A cerebral and occulo-orbital MRI revealed a nodular choroidal thickening in the right eye's upper external quadrant with T1 iso-signal and T2 hyper-signal and diffusion restriction. The lesion was homogeneously enhanced by Gadolinium and measured 13x3mm (Fig. 1), with respect to intra and extra-conical fat, orbital muscles, and optic nerve. On the cerebral level, nodular lesions were observed above and below the tentorial surface with hypo T1 signal, hyper T2 signal with diffusion restriction, which took up Gadolinium and were the site of areas of necrosis. These lesions were surrounded by a finger-shaped para-lesional edema, with no signs of involvement, and evidence of leptomeningeal thickening.

Given the context of metastatic breast neoplasia, the secondary origin of the choroidal mass and other lesions was attributed to the orbital and cerebro-meningeal involvement of the metastatic breast carcinoma.

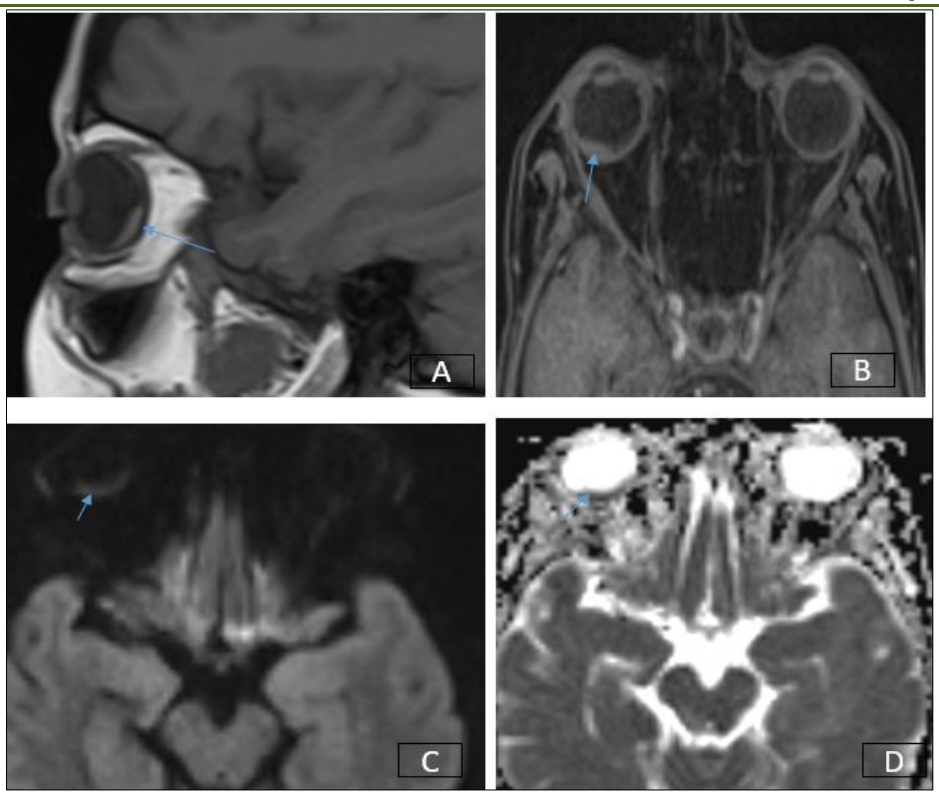

Figure 1: Occulo-orbital MRI with T1-weighted sequence (A) and T1-weighted sequence with gadolinium contrast (B), diffusion-weighted imaging (C) with apparent diffusion coefficient (ADC) mapping (D), revealed nodular choroidal thickening in the upper external quadrant of the right eye (arrow). The lesion demonstrated iso-intensity on T1-weighted imaging and diffusion restriction. It exhibited homogeneous enhancement with gadolinium contrast and measured 13x3mm

DISCUSSION

Choroidal metastases are the most common ocular malignancies [4], affecting the choroid in 88% of cases among patients with uveal metastases. They often cause blurred vision, while less common symptoms include flashes, floaters, and pain. Some patients may be asymptomatic and have lesions discovered during routine ocular examination [4, 5]. In our case, a rapid drop in visual acuity was observed.

Breast carcinoma, like our case is the most common primary source of choroidal metastasis, accounting for 40-53% of cases, and is often associated with concurrent systemic metastases [6]. Lung cancer is the second most common source, accounting for 20-29% of cases [7]. Other less common primary tumors causing choroidal metastases include gastrointestinal tract carcinoma, prostate carcinoma, kidney carcinoma, and skin carcinoma. Rare primary carcinomas metastasizing to the choroid include tumors arising from the submandibular gland, thyroid, contralateral choroid, testes, ovaries, urothelial tract, neuroendocrine tumors, and sarcoma [6-8].

Choroidal metastases typically appear as yellow subretinal masses with subretinal fluid, and occasionally may have an orange or brown-gray appearance [8]. Most cases involve a single focus located posterior to the equator, with the choroidal metastases being distributed laterally, superiorly, inferiorly, nasally, or macularly. Bilateral, multifocal metastases are more common in breast cancer, while unilateral, unifocal metastases are more common in lung cancer [10]. In contrast to the case report described earlier, the metastatic involvement of breast carcinoma was only evident on ophthalmological and radiological examination of the right eye, with no evidence of metastasis in the left eye.

In the majority of cases, patients with choroidal metastases have a known primary systemic cancer at the time of eye diagnosis [7]. This was also the case in the patient described, where metastatic involvement in the bone and lung was already identified and labeled. However, in about 34% of cases, the choroidal metastasis is detected before the systemic cancer is diagnosed [7]. For patients without a known primary tumor, lung cancer and breast cancer are the most common sources [7-9].

The differential diagnosis of choroidal metastases includes choroidal melanoma, hemangioma, gran uloma, osteoma, and sclerochoroidal calcification. In cases without a history of a primary malignancy, diagnosis can be difficult, especially with roughly one-half of cases with no detectable primary tumor [11].

Magnetic resonance imaging (MRI) often shows a well-demarcated choroidal mass that appears isointense on T1-weighted images and hypointense on T2-weighted images [12, 13]. However, De Potter *et al*., have documented an unusual presentation of a metastasis on MRI, describing the lesion as a thin, diffuse choroidal mass, more consistent with a choroidal melanoma with optic nerve involvement. The lesion was hyperintense on T1 and hypointense on T2. After enucleation, pathology revealed the mass to be a mucin-secreting adenocarcinoma [13].

The treatment of choroidal metastasis depends on the systemic status, number of choroidal tumors, location, and laterality. Observation is preferred in patients with poor systemic status; systemic chemotherapy, immunotherapy, hormone therapy, or whole eye radiotherapy if the metastases are multifocal and bilateral; plaque radiotherapy, transpupillary radiotherapy, or photodynamic therapy (PDT) for solitary metastasis; and enucleation for blind painful eyes.

CONCLUSION

Choroidal metastasis is the most common intraocular malignancy in the adult population and breast cancer is the most common primary neoplasia in women. The diagnosis of metastasis is made on the basis of the patient's background, particularly if there is a known history of cancer, and the appearance of the lesion on imaging. Choroidal metastases frequently occur in the later stages of disseminated disease and are considered a poor prognostic sign and the treatment remains palliative.

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