

# Isolated Orbital Metastasis from Breast Carcinoma: A Case Report

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## Abstract

Breast cancer with isolated orbital metastasis is a rare clinical entity. This report presents a case of a 35-year-old premenopausal woman with a known history of right-sided breast carcinoma. She underwent a right modified radical mastectomy in 2017, with final histopathology revealing pT2N2M0, hormone receptor-positive, and Her2-negative disease. She received adjuvant chemotherapy (8 cycles of standard dose) consisting of 4 cycles of cyclophosphamide and Adriamycin followed by 4 cycles of paclitaxel, and subsequent local radiation therapy. She was then initiated on tamoxifen 20 mg once daily for 4 years. In July 2021, she presented with a one-month history of sudden decreased visual acuity and diplopia in her right eye. Ophthalmological examination confirmed these findings, with decreased visual acuity of 6/36 in the right eye, while the left eye remained normal. A computed tomography (CT) scan of the orbits revealed a 28 × 18 mm heterogeneous enhancing soft tissue mass in the right orbital compartment, extrabulbar, occupying the postero-superior quadrant and inseparable from the lateral rectus muscle with optic nerve effacement. A positron emission tomography-computed tomography (PET-CT) scan did not detect any other metastatic lesions. She underwent surgical oophorectomy followed by a switch to aromatase inhibitor therapy. The patient achieved a complete response to treatment and has remained disease-free for the past two years.

**Keywords:** ER (Estrogen receptor)- PR (Progesterone receptor)- CT (Computer tomography)

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## Introduction

Breast cancer with isolated orbital metastasis is a rare clinical entity. Recently due to advancements in diagnostic imaging and treatment options, long-term survival of patients with metastatic disease with an increasing frequency of ocular involvement is diagnosed. It occurs in up to one-third of breast cancer patients [1, 2]. Bone metastases as a sole metastatic site in breast cancer portend a good prognosis, frequently seen in ER/PR (+) Her2/Neu (-) disease. A high index of suspicion is required for its urgent treatment as they are in close proximity to neighboring sensitive structures such as the spine or the eye.

## Case Report

A 35-year-old premenopausal lady with a known case of carcinoma breast right side (who underwent right modified radical mastectomy in the year 2017 with a final histopathology of pT2N2M0, hormone receptor-positive and Her2-negative disease. She completed adjuvant 8 cycles of standard-dose chemotherapy with 4 cycles of Cyclophosphamide, Adriamycin followed by 4 cycles of Paclitaxel followed by local Radiation therapy. She was initiated on hormonal therapy with tablet Tamoxifen 20 mg once daily and continued the same for 4 years. In July 2021, she complained of a sudden decrease in visual acuity and diplopia of the right eye lasting for the last 1 month. Ophthalmologic examination confirmed the

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findings with decreased visual acuity of right eye with vision of 6/36. Left eye examination was normal. CT scan of orbits revealed a 28 × 18 mm heterogeneous enhancing soft tissue mass in the right orbital compartment, extrabulbar, occupying the postero-superior quadrant, inseparable from the lateral rectus muscle with optic nerve effacement. A PET-CT scan was performed, which revealed no metastasis elsewhere in the body (Figure 1). A CT guided orbital mass biopsy was performed by an interventional radiologist.

## Results

The final histopathology report of the right orbital mass was consistent with infiltrative carcinoma, with the immunohistochemical report showing tumor cells positive for estrogen/progesterone receptor. The final diagnosis of orbital metastasis from breast carcinoma was established. On further evaluation, her serum follicle-stimulating hormone /luteinizing hormone ratio was in premenopausal range, for which she was counseled for bilateral salpingo-oophorectomy. She underwent laparoscopic bilateral oophorectomy in August 2021 and was switched to another hormonal agent, an Aromatase inhibitors (Tablet Letrozole 2.5mg Once daily) since then. We offered her local intense modulated radiation therapy to the right orbit, but she refused owing to financial constraints. She was followed up every 3 months and showed improvement in eye symptoms since then. Her vision in the right eye gradually improved after initiation of therapy. Now, the patient has remained free from ocular symptoms for the last 12 months with improvement in vision and correction of diplopia. CT scan of the orbits revealed a significant reduction in tumor volume in orbital structures (Figure 2). PET-CT scan revealed non-FDG avid uptake over the right eye and elsewhere in the body.

## Discussion

Breast carcinoma is by far the most common primary site, accounting for the majority of orbital metastasis

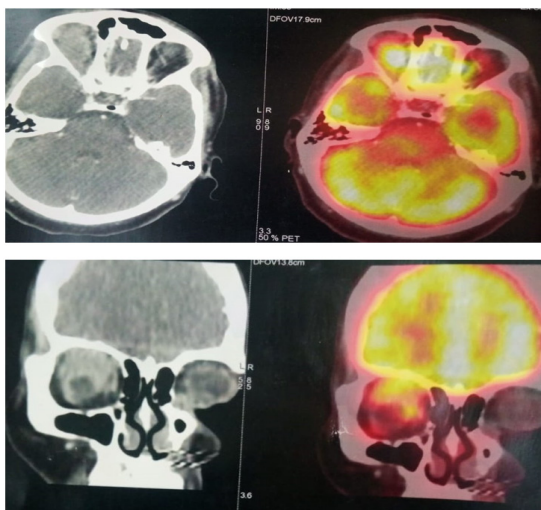


Figure 1. PET-CT Scan Showing Right Sided Orbital Metastasis-July 2021

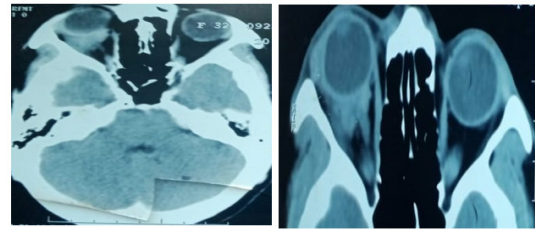


Figure 2. CT Scan Orbit Showing Good Response after Oophorectomy and Aromatase Inhibitors -April 2023

cases followed by lung, prostate, gastrointestinal, kidney, and skin cancers [1-5]. Usually, there is unilateral disease with predominant involvement of the lateral and superior quadrants of orbit [1]. Though the isolated orbital metastasis in breast cancer is a rarely diagnosed condition. High index of suspicion is required to diagnose it. Orbital metastasis usually present in the background of disseminated disease with a long time interval of 4.5 -6.5 years from the primary diagnosis of breast cancer [6]. Symptoms include diplopia (most common) followed by proptosis, visible mass, pain, ptosis, and blurred vision. Enophthalmos, if present, shows a distinctive sign of orbital infiltration by breast carcinoma [1, 5, 7, 8]. Though biopsy is required to get definitive diagnosis of orbital mass but in patients with known metastatic cancer, it can be avoided if there is a past history of cancer and strong clinico-radiological suspicion for metastatic disease [1]. In our case report, CT-guided biopsy from the orbital mass was performed by an interventional radiologist to rule out if it was metastasis from breast carcinoma or a second primary cancer, even though she had a past history of breast carcinoma.

The treatment modality of both these entities would be different, so it would be prudent to take a biopsy from the suspected lesion as far as possible. Biopsy of the orbital mass was consistent with infiltrating carcinoma with immunohistochemical markers of estrogen and progesterone receptors positive for tumor cells. Immunohistochemical findings made definitive diagnosis of orbital metastasis from breast carcinoma than second primary in orbit. Treatment for orbital metastases is usually palliative as orbital metastases are considered to be part of disseminated disease. Surgical intervention is performed only for diagnostic purposes (biopsy) in patients with no previous history of cancer or as a palliative procedure in the form of tumor resection or enucleation for uncontrolled local symptoms [1, 9-12]. The main treatment modality remains radiotherapy, with high rates (60%–80%) of clinical improvement in local symptoms and vision. External-beam irradiation is the most common modality given with a total dose of 20–40 Gy delivered in fractions over 1–2 weeks [1, 5]. Stereotactic radiation therapy has recently evolved as an alternative modality in such anatomically constrained regions with high precision and a shorter duration of treatment, leading to a better quality of life [13]. But in our patient, patient refused radiotherapy due to lack of family support and financial constraints. Also patient was having hormone receptor positive disease, she was offered

bilateral salpingo-oophorectomy followed by initiation of Aromatase inhibitors. She is now disease free with improvement in vision from last 2 years and is on regular follow up with us.

Usually, the prognosis of patients with metastatic orbital tumors is poor, with a median survival ranging from 22 to 31 months for breast cancer [1, 5]. But there are rare case reports which showed long-term survival of patient with breast carcinoma with orbital metastasis [14].

Our case report is unique as we could establish the diagnosis of isolated orbital metastasis with a proper biopsy. The standard role of induced menopause and endocrine therapy with aromatase inhibitors has definite role in improving the survival of patients with hormone receptor subset of disease. Our patient showed good response to treatment and is on regular follow up with frequent interval PET-CT scan showing good resolution of disease from last 2 years.

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