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Oncology

CHOROID OF EYE INVOLVEMENT IN CARCINOMA BREAST: UNUSUAL SITE METASTASIS

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ABSTRACT **Introduction:** Metastatic breast carcinoma, a commonly encountered disease in regular practice, can involve any organ in the body. However, choroid of eye involvement is relatively uncommon in breast cancer with around 7% cases documented in literature. Here, we reported a case of contralateral choroid metastasis in breast carcinoma. **Case Summary:** A 61-year-old, postmenopausal female presented with a lump in left breast of 1-month duration and diagnosed as a case of triple negative breast cancer. Patient was managed with chemotherapy, radical surgery and adjuvant EBRT. 6-month after completion of primary treatment, patient presented with decreased vision in right eye. PET scan revealed right choroidal along with multiple other sites metastasis. Patient was treated by salvage chemotherapy. Post chemotherapy follow-up scan revealed resolution of choroid and multiple metastatic lesions. **Conclusion:** This case report showed without any local therapy only systemic chemotherapy yielded a good partial response in choroid metastasis. Further studies with different management approach will enlighten about standard protocol in management of such patients.

KEYWORDS : Breast carcinoma; choroid metastasis; salvage chemotherapy

Introduction

Breast carcinoma, the most common cancer in world, is considered as a systemic disease. After successful primary therapy, a majority of patients presented with local recurrence or distant metastasis. However, the usual distal sites involved are bones, chest wall, lymph nodes, lungs and liver. Choroid of eye involvement in breast carcinoma is relatively infrequent. Here, we are reporting a case of contralateral choroid metastasis in a triple negative breast carcinoma patient occurring 6-months after primary treatment.

Case Summary

A 61-year-old, postmenopausal female, without any comorbidities, presented to our department with a lump in left breast of 1-month duration which was a size of small lemon, painful and not associated with any abnormal nipple discharge. Patient had no history of any lump in opposite breast, weight loss, anorexia, abdominal discomfort or bone pain. General physical and systemic examination was within normal limits. Local examination revealed mass of 6.0 × 4.0 cm size in upper inner quadrant of left breast, which was hard, fixed and mildly tender along with peau-d-orange appearance of skin; without any palpable axillary lymph node [clinical stage T4bN0, IIIB] (Figure1).

Tru-cut biopsy of lump suggested infiltrating duct carcinoma, with negative staining for estrogen/progesterone receptor (ER/PR) and Her2neu indicating triple negative breast cancer (TNBC). As the lesion was initially unresectable, patient was given 4-courses of neoadjuvant chemotherapy with intravenous AC (adriamycin 40 mg/m2 and cyclophosphamide 750 mg/m2 on day 1, repeat every 3-weekly) regimen. Then patient underwent left MRM (modified radical mastectomy), followed by 4-cycles of chemotherapy with taxane (docetaxel 100 mg/m2 on day 1, repeat every 3-weekly). Biopsy of surgical specimen revealed tumor of size 3.0 × 2.0 × 2.0 cm with 6/10 dissected lymph node positive for tumor [pathological stage yT2N2, IIIA] and confirmed triple negative status by immunohistochemistry. Patient then received adjuvant external beam radiotherapy (42 Gy in 16 fractions) to left chest wall and axilla by Cobalt-60 tele-therapy machine. After that patient was on regular follow-up.

6-months after completion of treatment, patient was complaining of decreased vision in right eye along with moderate body ache. Whole body positron emission tomography (PET) scan revealed right choroidal metastasis with mild retinal detachment and multiple metastasis to other sites including lung, multiple lymph nodes & bone. Opinion from ophthalmologist was taken for local therapy but they referred back the patient due to diffuse metastasis. She was then given 6-cycles of salvage chemotherapy with intravenous TP (paclitaxel 175 mg/m2 on day 1 and carboplatin AUC 5 on day 1, repeat every 3-weekly) regimen. -Post chemotherapy ophthalmoscopy of right eye revealed correction of retinal detachment. Follow-up scan showed resolution of choroid and multiple, but not all, previous metastatic lesions (figure 2). Patient was advised for further chemotherapy in view of residual metastatic lesion, but she denied and opted for 'drug holiday'.

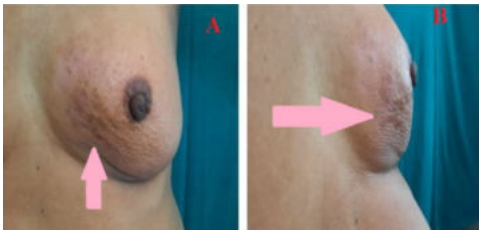

Figure 1: Clinical image showing peau-d-orange appearance in a patient of left breast carcinoma; (A) Anterior view and (B) Left lateral view

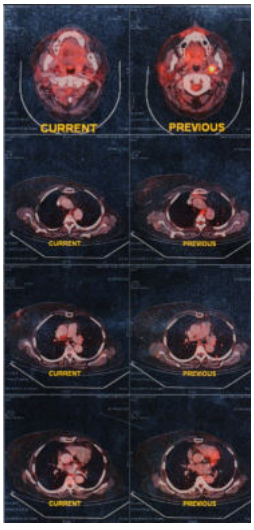

Figure 2: Whole body 18-FDG PET CT scan showing partial response to salvage chemotherapy in metastatic breast carcinoma patient

Discussion

Uvea, the vascular middle layer of the eye, is made up of ciliary body, choroid and iris. Secondary cancers metastasize to uvea is more common than primary uveal cancer. It is, overall, an uncommon site for cancer metastasis seen in regular practice; however, cases of uveal particularly choroidal metastasis secondary to other solid tumors are increasing over the past decades. Among uveal metastasis, involvement of the choroid occurs in nearly 90% of cases. [1] Choroid provides a vascular avenue for tumor emboli, that comes through hematogenous spread from primary lesion, to sequester and at the same time allows a micro-environment receptive to grow the tumor. Choroidal metastasis (CM), first illustrated by Perls in 1872, is found to be initial presentation up to one-third patients of other primary malignancy. [2]

More than half cases of choroidal metastasis reported in literature are from primary breast carcinoma, followed by lung cancer.[3] The less frequent primary tumors metastasizing to the choroid are cancers of gastro-intestinal tract, prostate, kidney, and skin.[2,3] Among the rarest primary metastasizing to choroid, male with metastatic esophageal cancer having choroid involvement after 2-years of primary treatment was also reported.[4] To consider breast as a primary site of cancer, choroid metastasis occurs in 2-7% of the cases and presents mostly as bilateral and multifocal, however unilateral cases are also seen in literature.[5]

Choroidal metastases grow quickly due to highly vasculogenic nature of uvea. They are symptomatic in majority of the cases and symptoms of local disease as well as primary tumor burden and other involved metastatic sites also seen simultaneously. Among the local ocular symptoms of choroidal metastasis, the most frequents are blurred or decreased vision, floaters, photopsia and less frequently, pain. [6] As mentioned earlier, a few cases of metastatic tumor can present with only ocular symptoms and thorough evaluation & work up reveal the primary site of cancer. According to a few studies, involvement of the left eye was found to be somewhat more, which has been considered to be related to a more direct supply to the eye by the left common carotid, originates from the aorta.[1,7] Metastases originating from breast tumor are typically yellowish, plateau-shaped, associated with subretinal fluid and located at the posterior pole.[8] Commonly choroid metastases are non-pigmented, poorly circumscribed and associated with retinal detachments; however, spicules of pigment can be seen on their surface.[9]

Choroid metastasis accounts for 1% of all intraocular malignant tumors. [10] The differential diagnosis of choroidal metastases includes choroidal melanoma, lymphoma, hemangioma, granuloma, and osteoma. Symptoms of choroidal or eye involvement in a known patient of malignancy should arise the probable diagnosis of choroidal metastasis. Imaging and other test to confirm diagnosis include color photography, autofluorescence imaging, angiography, ultrasonography, optical coherence tomography, MRI, CT scan, ocular tumor biopsy. [11] Fluorescein angiography may reveal a typical, "starry sky" of hyper-fluorescent micro-aneurysms. [9]

Treatment strategies, depends on the extent of metastatic disease; include systemic therapy (chemotherapy, hormonal manipulation and targeted therapy); radiation therapy (tele- or external beam therapy, brachytherapy or to be precise episcleral plaque therapy, and modern-days stereotactic radiosurgery or proton beam therapy); local treatment (photodynamic therapy, transpupillary thermothrapy & intravitreal anti-angiogenic agents) and surgical resection.[12,13] Factors, to consider treatment strategy as local or systemic, are the general status of the patient, number of lesions, location & laterality, and obviously, involvement of other distant sites.[14] The most commonly used treatment is external beam radiation therapy (EBRT) which saves the vision and the globe and provides quick tumor regression.[15] Different dose fractionation schedules is used in EBRT; a popular one is 40 Gy in 20 fractions.[5] Response rate of EBRT is around 80% to preserve vision but if untreated leads to blindness.[15] Episcleral plaque therapy is considered for solitary lesion; patients with short life expectancy and to improve the quality of life. Given over a short period of 3-4 days, this focal plaque therapy has considerable control, even in refractory cases. [16] Enucleation, surgical removal of entire eyeball, is recommended in case of severe and intolerable pain. [1,2]

Systemic medications are also frequently employed with effective control of choroidal metastases. Patients whose life expectancy is shorter, regression of the choroid metastasis and sufficient temporary relief in visual symptoms can possibly be achieved by systemic therapies. Systemic therapy of metastatic breast cancer may include chemotherapy, endocrine therapy, and targeted therapies. Majority of breast cancers in postmenopausal women express estrogen or progesterone receptors. So, endocrine therapy with tamoxifen and aromatase inhibitors (anastrozole, letrozole, and exemestane) also plays an important role in treatment of hormone positive metastatic breast carcinoma. Triple negative breast cancer (as in our case) that mean negative estrogen and progesterone receptor status as well as lack of human epidermal growth factor receptor 2 (Her2) expression represents 10–15% of all breast cancers and is very heterogenous. They are very aggressive and considered to be chemo, particularly platinum sensitive. Her2 positive cases show good response to trastuzumab but no systemic agent can produce that effect in triple negative breast cancer. A study has showed a good response rate with docetaxel and carboplatin in triple negative metastatic breast cancer. [17] The systemic and localized therapy gives a good outcome resulting in regression of lesion in 94% of cases and preservation of vision in 75% cases. [14]

The prognosis of choroidal metastasis depends upon the type of primary tumor. Skin tumors have the worst prognosis (survival time of around 1-2 months) and the best prognosis is seen in breast tumors (7 to 31 months).[18] The median survival after choroidal metastasis in patients with breast cancer is more in early stage cancer than locally advanced or metastatic breast cancer at presentation (28.7 months in stage I/II breast cancer versus 4.6 months with stage III/IV disease).[14] As depicted in literature choroid metastasis is observed on a median time period of 3 years after the diagnosis of the primary malignancy, but a long time interval of 34 years, which is surprisingly too long, is also documented. [19,20]

Conclusion

Metastatic breast carcinoma, virtually, can involve any organ of body. Choroid involvement, although unusual, but not very rare in metastatic breast carcinoma. The goal of treatment includes disease control, palliation of symptoms and improve survival with maintaining quality of life. Generally, triple negative breast cancer metastasizing to other organ have poor outcome. However, in our patient, systemic chemotherapy with taxane and platinum yielded a good partial response with resolution of vision loss. Further studies with different management approach will enlighten about standard protocol in management of such patients.

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