Case Report
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Orbital Metastasis as the Presenting Feature of Carcinoma Breast

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Abstract

Orbital metastasis is very infrequent in breast cancer; more so as an initial and sole presenting feature. The authors report a case of orbital metastasis of occult breast carcinoma in a 46-year-old woman, who presented with restricted eye movement and right orbital swelling in June 2015. A biopsy from the orbital mass was suggestive of neoplastic etiology (metastatic adenocarcinoma). Following this a breast lump was identified in July 2015 which was suggestive of invasive micropapillary carcinoma.

Keywords: Orbital Metastasis; Breast Cancer; Metastatic Adenocarcinoma.

Introduction

Breast cancer can metastasize to many sites, but the orbit is an infrequent location and a comparatively rare site of distribution among the ocular area structures. Longer survival of patients with metastatic disease as well as advances in diagnostic imaging may explain the increasing frequency of ocular involvement [1] that occurs in up to one third of breast cancer patients[2].Bone metastases as a sole metastatic site in breast cancer portend a good prognosis as opposed to visceral disease and are seen frequently in the estrogen, progesterone positive and Her2 Neu negative subset of the disease. Nevertheless, they may present a particular clinical problem if they are neighboring sensitive structures such as the spine or the eye, as in this case, and may need urgent treatment to preserve patient's quality of life and function.

Metastasis to the periocular soft tissue of the orbit is a rare manifestation of systemic cancer [3]. Symptoms include ptosis, eye lid swelling and diplopia. Often, the possibility of an inflammatory process is raised [3]. Computed tomography or magnetic resonance imaging may show a thickening of the extraocular muscle or an ill-defined orbital mass[3]. In the context of a clinical history of cancer, an excision biopsy often confirms the seemingly improbable diagnosis of an orbital metastasis (OM).

There are no solid statistical data concerning the frequency of OMs in cancer patients. Shields and colleagues have reported 100 cases encountered at the Jefferson University, Philadelphia, within a period of 25 years [3]. Henderson et al. have reported 83 cases seen at the Mayo Clinics, Rochester, in 40 years [4]. Valenzuela et al. have described 80 cases collected from 4 Australian centers, seen in 22 years [5]. This implies that histologically confirmed OMs are diagnosed once or twice per year at larger clinical centers. Accordingly, with exception of the three studies mentioned above, the literature on OMs is mainly restricted to case reports describing single cases. Of note, statistics on OMs do not arise from autopsy series, since enucleation of the bulbus oculi is no routine procedure during necroscopy.

Case Report

A 48 year old female patient presented with complaints for restricted eye movement of right eye initially and then later felt a palpable right orbital mass in June 2015.Patient did not have any history of diplopia or blurring of vision.

MRI Orbits with multiplanar multi echo sequences of the orbits using 3.0 Tesla Philips Ingenia Scanner

revealed diffusely bulky medial and lateral rectus muscles on the right side with a small focal iso-hypointense focus in the intraconal compartment abutting the optic nerve. This nodular focus along with the bulky rectus muscles show significant post contrast enhancement. Significant fat stranding is seen involving the right orbit. Mild axial proptosis is also seen. There was mild soft tissue swelling involving the infra orbital soft tissue on the right side (Figure 1 & Figure 2). There was no loss of vision in involved eye and visual acuity was 6/6.

The patient underwent excision of the space occupying lesion from the right orbit. Histopathology was suggestive of neoplastic etiology and immunohistochemistry revealed expression of cytokeratin, EMA, CK-7, E-cadherin, ER and PR and negative for CD 20, CD 3, CD 5, CD 10, CD 23, CD 138, CD 43, CD 34, c-Kit &TTF-1 which was suggestive of Metastatic Adenocarcinoma.

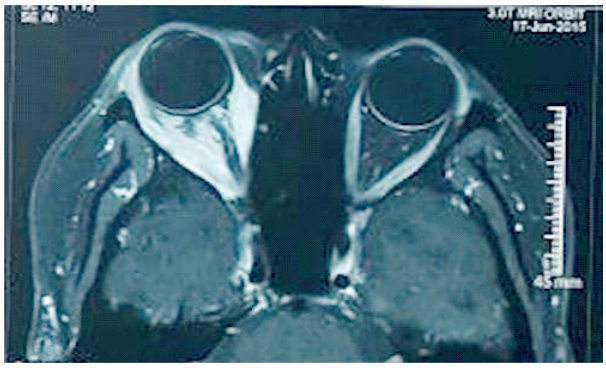

Fig. 1: MRI showing bulky medial and lateral rectus muscles

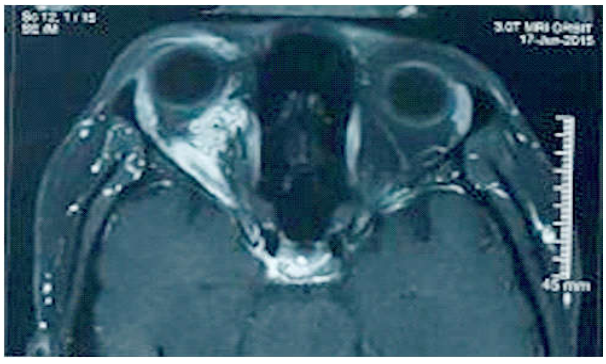

Fig. 2: MRI showing intraconal involvement abutting optic nerve

Retrospective examination of the patient's breast revealed a palpable mass 4x4 cm in right breast. A true cut biopsy from the mass showed atypical cells suggestive of lobular carcinoma. Patient then received a cycle of neoadjuvant chemotherapy with 5FU, epirubicin, cyclophosmamide based regimen and then was taken up for Right modified radical mastectomy. The histopathology report was suggestive of multiple foci of infitrative carcinoma, features of invasive micropapillary carcinoma. Surgical base is free of tumour. 10 out of 14 axillary lymph nodes showed metastasis with extranodal extension and lymphatic infiltration. It was ER-Positive, PR- Negative, Her-2-Neu- Negative. She then received three cycles of chemotherapy with Epirubicin, 5FU, Cyclophosphamide based regimen followed by four cycles of three weekly Docetaxel every three weeks. Patient has then received local radiotherapy to the chest wall 50Gy in 25 fractions in 5 weeks and 50 Gy in 25 fractions in 5 weeks to the right orbit on linear accelerator with 6MV photons. Her whole body PET CT Scan done in January 2016 showed no disease in either breast or orbit or at any other site. Presently she is on hormonal therapy with letrozole 2.5mg daily along with calcium and vitamin D3 suppliment.

Discussion

Orbital metastases represent a small but increasing percentage of all orbital tumors, reported in different case studies and series to have an incidence of 1% to 13%. Breast cancer is by far the most common primary site, accounting for 28.5%–58.8% of cases of orbital metastases, followed by lung, prostate, gastrointestinal, kidney and skin (melanoma) cancers [1,2,6-8]. Unilateral disease is the usual presentation while intra-orbital anatomical distribution involves predominantly the lateral and superior quadrants [1]. Orbital metastatic lesions usually present in patients with established diagnosis of disseminated cancer and there is a long median interval of 4.5–6.5 years from diagnosis for breast carcinoma. The longest intervals from the diagnosis of primary breast cancer to the presentation of orbital metastasis are 25 and 28 years respectively [9,10]. However, in up to 25% of cases, orbital metastasis is the initial finding of a previously undetected primary cancer [1,11–15].

Metastatic tumor accounts for the most common ocular malignancy [10]. The uveal tract is considered to be one of the most favored sites where breast cancer metastases develop [11]. The incidence of ocular breast cancer metastatic disease presents variations among different studies, with rates between 5 and 30% [12, 13], attributed to the asymptomatic nature of ocular metastatic foci, in contrast to metastatic disease in other organs [14]. Metastatic foci of the disease in the lungs, central nervous system, or bones are usually detected prior to diagnosis of ocular metastases [15, 16]. In fact, the only significant risk factor for the development of ocular malignant foci in patients with breast cancer is the dissemination of the disease in

lungs and brain [14]. In rare cases ocular metastasis can represent the initial manifestation of an undiagnosed breast tumor [17]. The survival rate of patients with ophthalmic metastatic disease depends on the level of organ dysfunction caused by dissemination of the tumor [18].

Definite diagnosis of an orbital lesion requires a biopsy. Metastatic lesions to the orbit usually present as irregularly shaped masses on non-contrast CT which are isodense to muscle. With contrast injection, they show slight enhancement. Orbital bony wall involvement is also a common finding, especially in prostate cancer. On MRI, metastatic disease is usually hypointense to fat on T1-weighted images (T1WI) and hyperintense to fat on T2WI. This appearance may help to differentiate it from an orbital pseudotumor, which is usually isointense to fat on T2WI. When hyperintense lesions are seen on T1WI, a very vascular metastasis (e.g. thyroid, renal) or melanoma metastasis should be suspected [19]. The combined involvement of the orbit and adjacent structures, such as the paranasal sinuses, is a rare condition revealed by imaging studies.

In addition to metastasis, differential diagnosis of an orbital process should include inflammatory lesions, benign tumors (such as hemangiomas) and lymphoproliferative disorders. Idiopathic orbital inflammatory syndrome (IOIS or orbital pseudotumor), sarcoidosis and Wegener granulomatosis are inflammatory conditions that may present in similar manners. Given that inflammatory signs are common in orbital metastases from breast cancer, they could be misdiagnosed as thyroid orbitopathy, cellulitis, myositis, scleritis or endophthalmitis. The distinguishing feature of orbital metastases is a rapid onset and progressive course with combined motor and sensory deficits, non-responding to antibiotics or steroids [21,22].

Treatment for orbital metastases is inevitably palliative, given that hematogenous spread of cancer to the orbit is a sign of systemic disease and involvement of other sites. Surgical intervention is generally not recommended, unless it is performed for diagnostic purpose in patients with no previous history of cancer [23-31] or as palliation (tumor resection or enucleation) in cases of unmanageable local symptoms [1].

The main treatment option is radiotherapy, with high rates (60%–80%) of clinical improvement of local symptoms and vision. External-beam irradiation is the most common and accessible modality, with a total dose of 20–40 Gy delivered in fractions over 1–2 weeks [1,6-8].

Due to the fact that most patients have concomitant progressive systemic disease, chemotherapy followed by hormone therapy in cases of hormone-sensitive tumors is indicated in patients with good performance status. A contribution to the palliative result obtained by radiotherapy can be expected with systemic treatment [25]. The present patient also underwent excision of orbital lesion followed by mastectomy, chemotherapy and radiotherapy. Presently she is receiving hormonal therapy with letrozole 2.5mg daily and her disease is under control.

Prognosis of patients with metastatic orbital tumors is rather poor, with a median survival ranging from 22 to 31 months for breast cancer [1,8]. Nevertheless, rare cases of long-term survival after the diagnosis of breast cancer presenting as an orbital mass have been reported [13,14,21].

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