



A case study of early brain metastasis in locally advanced breast cancer

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ABSTRACT

Breast cancer metastases to the central nervous system (CNS) include the clinically distinct situations of multiple brain metastases (78%), solitary brain metastasis (14%), and leptomeningeal metastases (8%). CNS metastases reported till now in 10%16% of stage IV patients (pts.) while in ~30% of pts. in autopsy series. Here we present an interesting case report of 33years old female diagnosed as triple receptor-negative invasive ductal carcinoma right breast(T3N1M0), treated with neoadjuvant chemotherapy followed by surgery, pt. was due for adjuvant radiotherapy which was scheduled 1 month post-surgery but in the meantime pt. developed brain metastases in left temporo-parietal region.

INTRODUCTION

Development of brain metastases is one of the major challenges in pts. with stage III and IV breast cancer. In a recent study, brain metastases-free survival differed significantly between breast cancer subtypes and was shortest in pts. with triple receptor-negative breast cancer (TNBC). A large study in pts with TNBC showed that 9.6% of those with initial stages III disease developed brain metastases as first site of recurrence within 5 years. [1] Systemic therapy is needed to control widespread disease outside the brain, while radiotherapy and/or surgical resection typically are used to treat brain metastases[2,3]. Approximately 10-20% of breast cancers develop brain metastasis with increasing trend, which usually represent a late event for the pts [4,5].

CASE REPORT

A 33years old premenopausal lady with no comorbidity, presented in Surgical Oncology department of our institute with lump in right breast since last 6 months in March 2015 (cT3N1M0). Contrast enhanced computed tomography (CECT) scan thorax and abdomen (25/3/15) reveals right breast mass lesion with right axillary lymphadenopathy. Fine needle aspiration cytology (FNAC) from right breast (13/03/15) was suggestive of ductal carcinoma. Bone scan (31.03/15) showed no evidence of skeletal metastasis. Mammogram (09/03/15) showed mass in right breast with ipsilateral axillary mass. Onclinical examination, normal neurologic status and unremarkable medical and family history was found.

Patient was treated with 8 cycle neoadjuvant chemotherapy (4 cycles of Epirubicin and cyclophosphamide followed by 4 cycles of paclitaxel 3 weekly) last on 19/08/15 followed by surgery with right modified radical mastectomy (MRM) with lymph node dissection on 08/09/15. Post operative (Post-op) histopathology (HPE) revealed as intraductal carcinoma (IDC)-NOS, Nottingham grade II, margins clear, 7/13 lymph node metastasis positive (pT3N1), lymphovascular invasion present, no perineural extension. Immunohistochemistry (IHC)-reported as TNBC. Then she was referred to our department on 23/09/2015 for radiation therapy. Patient developed neurological symptom (headache, vomiting, and vertigo) on 14/10/2015. CECT head (14/10/2015) revealed multiple ring enhancing lesions in left temporo-parietal region with intraventricular extension in occipital horn of left lateral ventricle- most likely cerebral metastases. (Figure 1). Here she received palliative RT to brain with dose 30Gy in 10 fractions from 17/10/15 to 30/10/15 and tolerated the treatment well.

DISCUSSION

Breast cancer is second after lung cancer as the most common cause of brain metastasis, occurring in 10-16% of pts. suffering from breast cancer. [5]IDC is the most common type of breast carcinoma, constituting approximately 70-85% of allinvasive breast carcinoma. Breast cancer to the brain is usually a late event. The median time from diagnosis of breast cancer to metastatic brain disease or leptomeningeal involvement is usually 2-3years. In the majority of pts., spread to CNS occurs after other

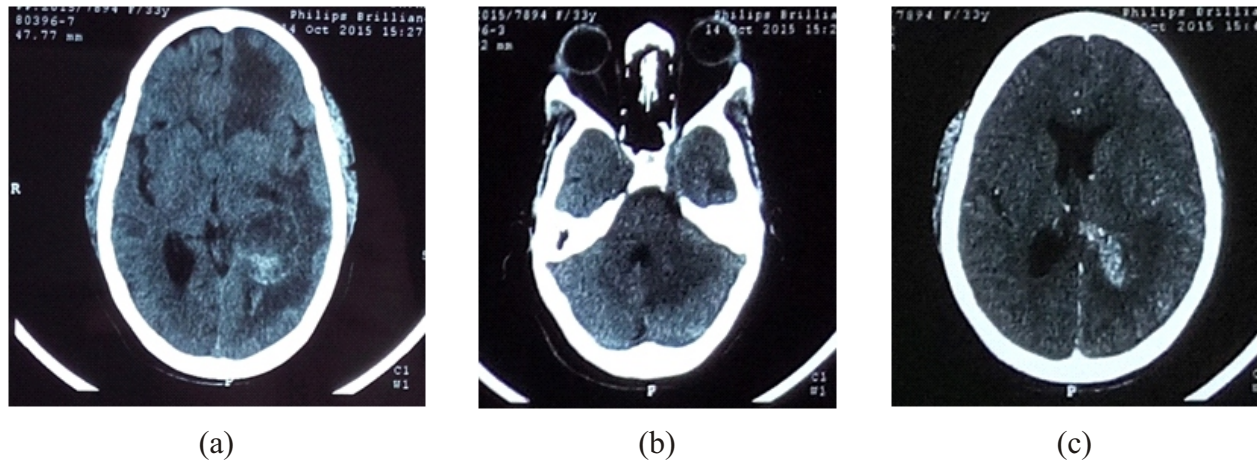


Figure 1. : CECT scan axial section showing multiple brain metastases in left frontal, temporo-parietal region (a) & cerebellum (b), mass is compressing and displacing the left lateral ventricle (c).

systemic metastases to lung, liver or bone are diagnosed. [6]

We are presenting this case to report the early development of brain metastases as a first site of recurrence. Several studies have looked at the incidence of brain metastases among women with stage III breast cancer and have attempted to identify risk factors for this site of metastases.

Pestalozzi et al reported an overall 2-year incidence of central nervous system metastases as a first site of recurrence of 0.5% with women who had estrogen receptor-negative disease (2-year incidence of 1.1%) and those having HER2-positive disease (2-year incidence of 1.2%) being at higher risk. [7]

In a single-institution study of more than 3000 women, Heitz et al reported higher odds of developing brain metastases among women with TNBC compared to other breast tumor subtypes. [8] Following a diagnosis of brain metastases, several studies have documented poor survival outcomes across all subtypes of breast cancer, with TNBC exhibiting a worse outcome.

CONCLUSION

Our case highlights that the women with stage III TNBC have a high early risk of developing brain metastases as the first site of recurrence. As described above, TNBC in itself is a heterogeneous disease encompassing a number of poor prognostic subgroups, including the basal-like, HER2-enriched, that could perhaps further refine high-risk TNBC. In these groups of women preventive strategies is required. Examination of CNS should be done in all pts. of TNBC to rule out brain metastasis before giving adjuvant treatment.

REFERENCES

1. Dawood S, Lei X, Litton JK, Buchholz TA, Hortobagyi GN. Incidence of brain metastases as a first site of recurrence among women with triple receptor-negative breast cancer. *Cancer*. 2012;118(19):4652-4659.
2. S. Ohno, K. Tanaka, C. Koga. Can patients with metastatic breast cancer be cured after introduction of newer and more effective agents. *Breast Cancer*, vol. 19, pp. 212217, 2012.
3. Han, T. M. Kim, et al. Clinical outcome of central nervous system metastases from breast cancer: differences in survival depending on systemic treatment. *Journal of Neuro-Oncology*, vol. 106, no. 2, pp. 303313, 2012

4. Lin NU, Bellon JR, Winer EP. CNS metastases in breast cancer. *J Clin. Oncol*. 2004; 22: 3608-3617. C.
5. Shao MM, Liu J, Vong JS. A subset of breast cancer predisposes to brain metastasis. *Med. Mol. Morphol*. 2011; 44: 15-20.
6. Justin L, Kaplan JL, Barbara P, Vogel VG. *Breast Disorders Merck Manual of Diagnosis and Therapy*. 2008.
7. Pestalozzi BC et al. Identifying breast cancer patients at risk for central nervous system (CNS) metastases in trials of the International Breast Cancer Study Group (IBCSG). *Ann Oncol* 2006; 17: 935944.
8. Heitz F, PH et al. Cerebral metastases (CM) in breast cancer (BC) with focus on triple-negative tumors. *J Clin Oncol* 2008; 26: (Abstr 1010).