

A wide skull osteolytic metastasis in advanced breast cancer

Sebastiano Buti¹, Anselmo Alessandro Palumbo², Angelica Sikokis¹

¹Medical Oncology Unit, University Hospital of Parma, Parma, Italy

²Department of Radiology, University Hospital of Parma, Parma, Italy

Summary. *Background.* We present a case report of a large and deep osteolytic metastasis radiologically documented involving the skull in a woman affected by advanced breast cancer during endocrine therapy

Key words: Breast cancer; osteolytic metastasis; skull

Introduction

Like all bones, the skull is a common site of metastases from systemic cancer. In particular skull-base metastasis from distant tumors occurs in 4% of cancer patients especially those affected by breast, lung and prostate cancers (1).

These kind of metastases are generally a late event in the course of the disease at a stage where many patients already have disseminated disease, particularly other bone metastases (2).

For this reason historically stage IV breast cancer has been viewed as incurable, with a 10-year survival less than 1% (3).

In this case-report we present a case of a wide and quite symptomatic osteolytic metastasis involving the skull which appeared during endocrine therapy in a woman affected by advanced breast cancer.

Case-report

A 48-years-old woman was diagnosed with adenocarcinoma of the left breast with lymph-node involvement in May 1997.

She underwent to surgery and standard adjuvant chemotherapy for six cycles of treatment. Then she started adjuvant endocrine therapy with tamoxifen until October 1998.

In October 1998 she developed a second tumor in the right breast for which she has been treated with sur-

gery, chemotherapy and radiotherapy. Then she started a regular follow-up with no evidence of disease recurrence.

In May 2011 a magnetic resonance imaging (MRI) of the spine and a total body computed tomography (CT) documented a bone and lymph-nodes relapse; therefore the patient underwent to a vertebroplasty to better control back pain and spine stabilization, and started a new endocrine therapy with aromatase inhibitor letrozole associated with intravenous zoledronic acid one time every 28 days.

In December 2011 for further radiological documented (total body CT and positron emission tomography) disease progression, the patient started a new endocrine therapy with fulvestrant. In December 2011 for uncontrolled pain she also underwent to analgesic radiotherapy on the spine with good response on the symptom.

After one month from the therapy beginning she developed ptosis and diplopia involving the left eye. A brain and facial bones CT (**Figure 1**) with multiplanar reconstructions (**Figure 2**) revealed a meningeal thickening involving the left orbital region and frontal convexity associated with a wide fronto-parietal area of osteolysis. By physical examination it was possible to appreciate a large flat area with loss of normal convexity in the corresponding region.

From February to April 2012 the patient was treated with a new chemotherapy regimen with oral capecitabine and vinorelbine for four cycles of treatment.

In April 2012 a MRI scan of the brain revealed a further disease progression with appearance of meningeal carcinomatosis.

Because of the patient's poor clinical conditions and worsening of the symptoms, she stopped every oncological treatment and she underwent to best supportive care (BSC) at home until death.

Discussion

Metastatic sites for advanced breast cancer can include lymph-nodes, lung and pleura, liver, adrenals, ovaries, intracranial spread to brain or dura and bones including the skull.

In our case-report we present a case of a large osteolytic metastasis involving the skull without the in-

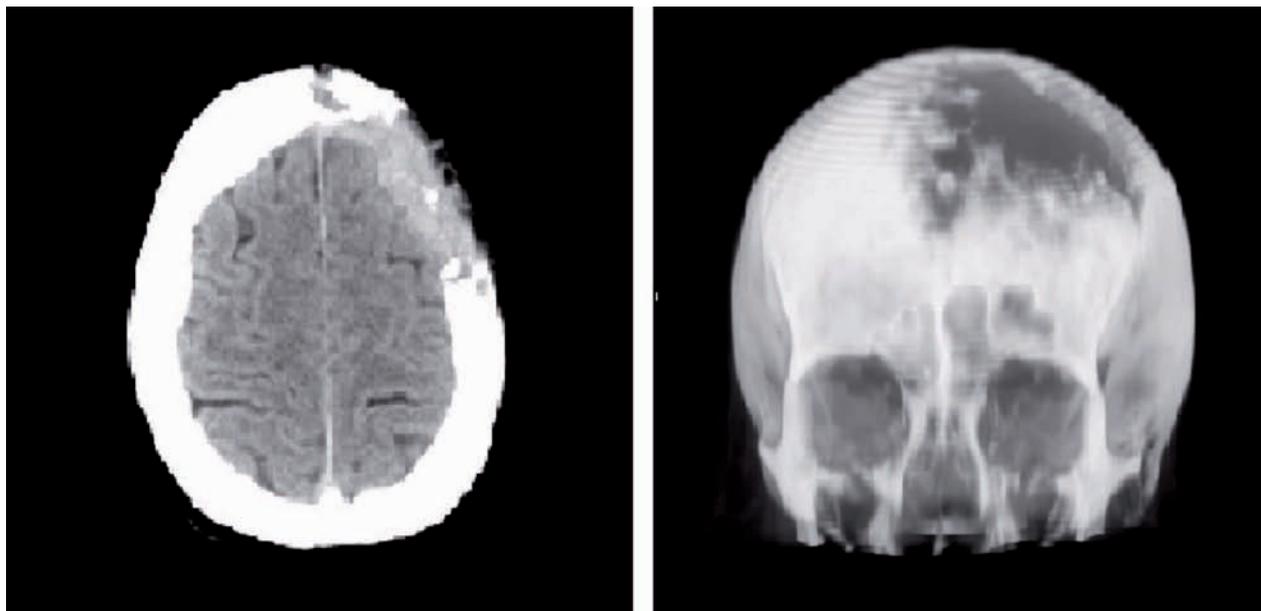


Figure 1. Computed Tomography revealing wide fronto-parietal area of osteolysis

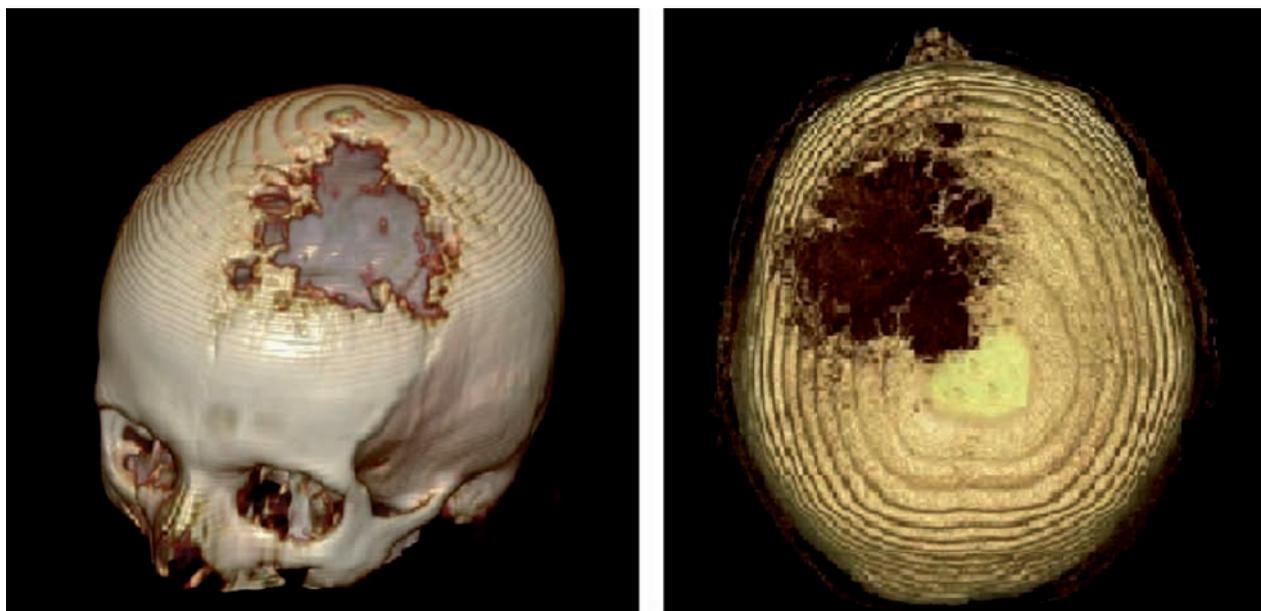


Figure 2. Multiplanar reconstructions of the Computed Tomography to underline the extension of the metastatic lesion

involvement of the brain and which became symptomatic very late during its growth.

In our experience it's quite atypical and rare to see a so large and deep osteolytic area affecting the skull. Unfortunately the literature is poor of such examples and we found few articles about these kind of metastases and about their treatment.

The skull metastases may be clinically silent or becoming symptomatic when their growth produces pain or cranial nerves palsies (2) and clinical manifestations depend upon metastatic site. The signs and symptoms arise from the stretching of the dura, compression of cranial nerves and irritation (with resulting edema) of the adjacent brain tissue.

Of course the treatment depends on the nature of the underlying tumor and therapy for such patients is generally accepted as palliation; surgical treatment has been reserved for patients with better long term prognosis and chance for cure.

In addition to symptomatic treatments with steroids and analgesics, radiotherapy is generally the standard treatment while some patients with chemosensitive or hormonosensitive lesions benefit from chemotherapy or hormonal therapy (4). In particular chemotherapy and hormonal therapy are most often used in combination with radiotherapy and may produce clinical improvement, especially in some cases of prostate and breast carcinomas (4). However in our case radiotherapy was excluded because of the excessive extension of the metastatic lesion.

In some cases metals, calcium ceramics and polymers such as methylmethacrylate can be used to cover intracranial contents and restore calvarial contour when defects are large or when autologous material is not available (5). However the poor clinical conditions of our patient didn't allow to perform surgery on the metastatic lesion.

During chemotherapy she progressed very rapidly and it was not possible to perform another chemotherapy regimen because of the patient's poor performance status and the limited therapeutic options.

In our opinion this case-report is of interest not only to underline the lacking data to better treat so

wide skull metastases but also for the particular features of this metastatic lesion. According to our knowledge the literature is poor of examples of so wide and large osteolytic metastases involving the skull also in patients with a substantial bone involvement by advanced breast cancer.

For the future it will be of great interest to better understand the histological and pathological features of these kind of metastatic lesions in order to find the best medical and local treatment to be offered to the patient.

References

1. Greenberg HS, Deck MD, Vikram B, Chu FC, Posner JB. Metastasis of the base of the skull: clinical findings in 43 patients. *Neurology* 1981, 31: 530-537
2. Stark AM, Eichmann T, Mehdorn HM. Skull metastases: clinical features, differential diagnosis and review literature. *Surg Neurol* 2003, 60: 219-225
3. Parker S, Tong T, Bolden T, Wingo PA. Cancer statistics, 1997. *CA Cancer J Clin* 1997, 47:5
4. Ripa Saldias SM, Ayuso Blanco T, Delpon Perez E, Sarria Octavio de Toledo L. Involvement of cranial pairs as manifestation of prostatic cancer. *Actas Urol Esp* 1994, 18: 911-914
5. Freund RM. Scalp, calvarium and forehead reconstruction. In S. J. Aston, R. W. Beasley and C. H. Thorne (Eds.), *Grabb and Smith's Plastic Surgery*, 5th Ed. Philadelphia : Lippincott-Raven, 1997
6. Sieveking NE, Turk AE, Beck CE, Harsh G. Cranial reconstruction for metastatic breast cancer. *Plastic&Reconstructive Surgery* 2000, 105(5) : 1737
7. Dmuchowska DA, Krasnicki P, Obuchowska I, Kochanowicz J, Krzyzanowska AS, Mariak Z. Ophthalmic manifestation of skull base metastasis from breast cancer. *Med Sci Monit* 2012, 18(11) : 105-108
8. Laigle-Donadey F, Taillibert S, Martin-Duverneuil N, Hildebrand J, Delattre JY. Skull-base metastases. *Journal of Neuro-Oncology* 2005, 75 : 63-69

Correspondence:

Angelica Sikokis,
Medical Oncology Unit, University Hospital of Parma,
Parma, 43100, Italy
Tel 0039 349 4966720
E-mail: angelicasikokis@live.it