

## Pigmented cutaneous metastasis of breast carcinoma: florid case with zosteriform distribution

### *Metástase cutânea pigmentada de carcinoma mamário: caso exuberante e com distribuição zosteriforme*

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### Abstract

This case report presents a rare manifestation of a pigmented cutaneous metastasis of breast carcinoma with a zosteriform distribution. A 77-year-old woman, previously diagnosed with invasive ductal carcinoma of the breast, exhibited pigmented lesions resembling shingles on the left thoracodorsal region. Dermoscopic and histopathological examinations confirmed invasive carcinoma of mammary origin associated with melanocytic colonization. The zosteriform pattern, though rare, has been reported in cases of cutaneous metastasis from breast cancer. Treatment options include addressing the primary tumor and direct approaches such as surgery or radiotherapy for skin lesions. This report highlights the importance of clinical suspicion, histopathological evaluation, and immunohistochemical examinations for accurate diagnosis, enabling timely and appropriate treatment for improved patient outcomes.

**Keywords:** Breast neoplasms. Neoplasm metastasis. Skin pigmentation. Pathology. Immunohistochemistry.

### Resumo

Este relato de caso apresenta uma manifestação rara de metástase cutânea pigmentada de câncer de mama com distribuição zosteriforme. Uma mulher de 77 anos, previamente diagnosticada com carcinoma ductal invasivo de mama, apresentava lesões pigmentadas semelhantes a herpes-zóster na região toracodorsal esquerda. Os exames dermatoscópico e histopatológico confirmaram carcinoma invasivo de origem mamária associado à colonização melanocítica. O padrão zosteriforme, embora raro, já foi relatado em casos de metástases cutâneas de câncer de mama. As opções de tratamento incluem abordar o tumor primário e abordagens diretas, como cirurgia ou radioterapia para lesões cutâneas. Este relatório destaca a importância da suspeita clínica, avaliação histopatológica e exames imuno-histoquímicos para um diagnóstico preciso, permitindo um tratamento oportuno e apropriado para melhores resultados dos pacientes.

**Palavras-chave:** Neoplasias mamárias. Metástase neoplásica. Pigmentação da pele. Patologia. Imunohistoquímica.

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## Introduction

Breast cancer is the malignancy with the highest incidence and mortality between women worldwide<sup>1</sup>. These tumors may complicate with metastasis, including rare cutaneous metastasis. In fact, after melanoma, breast cancer has the highest incidence rate of cutaneous metastasis among the solid malignancies<sup>2</sup>. Usually, cutaneous metastasis presents as a nodular disease, even though inflammatory, cicatricial, and bullous presentations are possible<sup>2</sup>. Zosteriform distribution of cutaneous secondary neoplasia is a rare clinical presentation<sup>3</sup>. In this paper, we report a case of a florid pigmented cutaneous metastasis of breast carcinoma with a zosteriform clinical presentation.

## Clinical case

A 77-year-old woman, born in Manaus, state of Amazonas, Brazil, with a previous diagnosis of invasive ductal carcinoma of the left breast in 2015, underwent a total mastectomy following chemotherapy in the same year. In 2022, she was referred to the dermatology clinic due to pigmented lesions present for 2 years, initially on the bed of the mastectomy, which progressively spread to the entire left hemithorax and ipsilateral back. During this period, the diagnosis of shingles (herpes zoster) was suggested, but the patient did not have any clinical improvement despite antiviral therapy.

Dermatological examination revealed extensive infiltrative blackish papules and plaques, with a hard consistency. There were some flaccid blisters with serohematic content. The lesion was following a zosteriform distribution in the left thoracodorsal region, more specifically dermatomes T2 through T8 (Figs. 1 and 2). No lymphadenopathies were detected at clinical examination.

The main dermoscopy findings were peripheral dots, globules and some radiating striae, with irregular distribution, over an amorphous area, in addition to areas with the appearance of a blue-white veil, suggestive of a melanocytic lesion (Fig. 3). Thorax, abdomen, and pelvis CT scan (CT-TAP) and bone scintigraphy did not show any signs of metastatic disease.

Histopathology showed atypical epithelioid neoplastic cells, arranged in cords in the superficial and deep dermis, reaching the hypodermis. The presence of intracytoplasmic melanin pigment was observed in the atypical cells located in the superficial dermis (Fig. 4A and B). The lesion was positive for AE1/AE3, ER and GATA-3. Melanocytic markers (Melan-A and S100) were negative.



**Figure 1.** Extensive infiltrative blackish papules and plaques, with increased consistency, and some flaccid blisters with serohematic content.



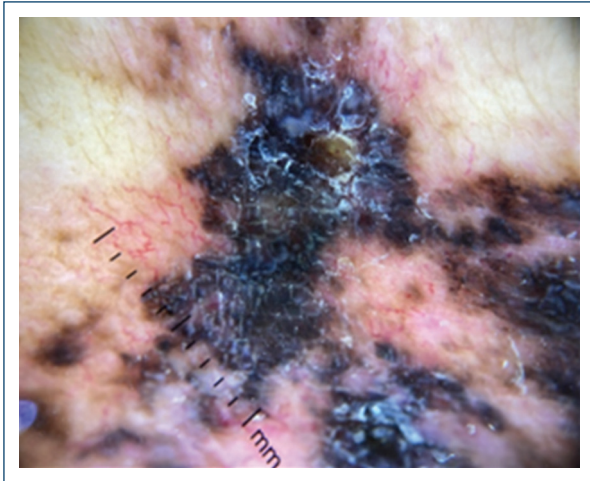
**Figure 2.** Zosteriform distribution pattern of skin lesions.

Based on these findings, the diagnosis of skin infiltration by invasive carcinoma of mammary origin associated with melanocytic colonization was established.

At the moment, the patient is undergoing follow-up at the oncology outpatient clinic, undergoing chemotherapy.

## Discussion

First described by Azzopardi and Eusebi (1997), pigmented cutaneous metastases are rare and atypical manifestations of breast carcinoma. The lesions can mimic melanoma lesions and are generally found in the

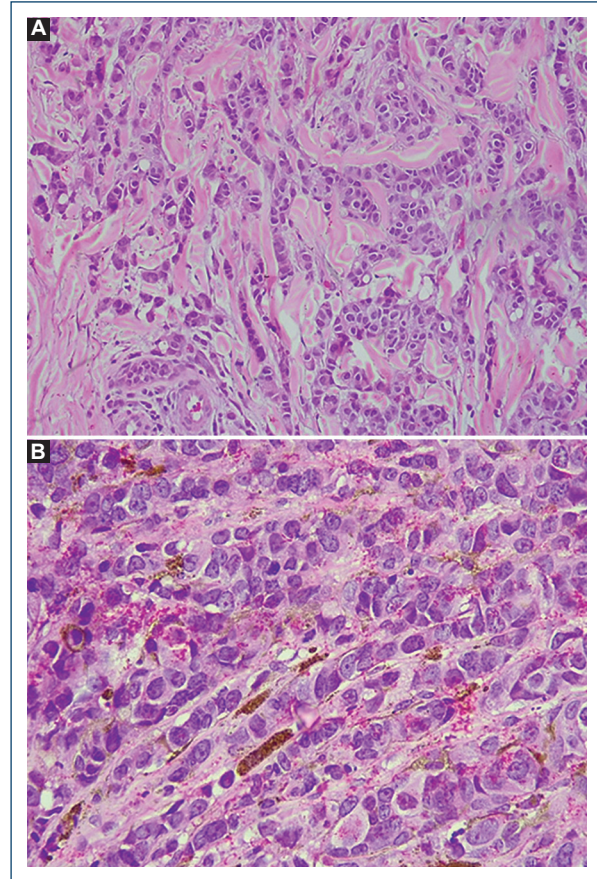


**Figure 3.** Dermoscopy: peripheral dots, globules, and some radiating striae in irregular distribution over an amorphous area and areas with a blue-white veil.

thoracoabdominal region, especially on the site of the scar from a previous mastectomy<sup>3,4</sup>. Initially, Azzopardi and Eusebi (1997) proposed that pigmentation would be related to the rupture of the basement membrane secondary to tumor invasion, determining pigment spillage, dermal melanophages, and migration of epidermal melanocytes<sup>3</sup>. Secretion of growth factors by malignant cells would be related with the migration and survival of these dendritic melanocytes<sup>5</sup>.

However, cases without pagetoid involvement demand other explanations to justify the presence of melanocytes in the metastatic tumor stroma<sup>5</sup>. There is evidence that multipotent dermal stem cells are capable of differentiating into melanocytes. Melanoblasts residing in the bulb region of hair follicles can also differentiate into dermal melanocytes<sup>6</sup>. Therefore, melanocytic colonization of cutaneous metastases from breast carcinoma can also occur by melanocytes of non-epidermal origin.

The zosteriform distribution of cutaneous metastasis of breast carcinoma is rare, with few cases reported in literature, the first being described in 1933<sup>7,8</sup>. A review of the literature of zosteriform cutaneous metastasis showed that, among 15 total cases, four were from patients with primary breast malignancy, being the most frequent primary tumor associated with this manifestation<sup>9</sup>. The pathophysiological explanation to the zosteriform disposition of these metastases is not well understood, but there is some hypothesis of possible mechanisms: lymphatic dissemination of locoregional tumors, köbnerization of previous sites of



**Figure 4. A:** neoplastic cells with rounded, hypertrophic, hyperchromatic nuclei, with evident nucleoli, forming small nests and cords in desmoplastic stroma. H/E. Magnification =  $\times 200$ . **B:** intracytoplasmic and stromal melanin deposits. H/E. Magnification =  $\times 400$ .

varicella-zoster, iatrogenic seeding of malignant cells, and neural dissemination through dorsal ganglia<sup>8</sup>.

Successful treatment of the primary tumor is often sufficient for regression of the skin lesions. However, a direct approach to the cutaneous lesion can help reduce tumor burden, improve quality of life, and increase functionality. Treatment modalities include direct surgical excision, radiotherapy, laser or radiofrequency ablation, cryotherapy, and alpha-interferon injections<sup>10</sup>.

Unusual forms of cutaneous metastases from breast carcinoma, as described in this case report, become real diagnostic challenges. For such cases, clinical suspicion, associated with histopathological and immunohistochemical examinations, is essential. With an accurate diagnosis, appropriate treatment can be carried out more immediately, guaranteeing a significant improvement in the quality of life of our patients.

## Conclusion

Breast cancer's rare cutaneous metastasis, such as the pigmented zosteriform type described here, poses diagnostic and treatment challenges. Understanding these manifestations is critical for accurate diagnosis and timely intervention. Multidisciplinary collaboration and advanced diagnostic tools play pivotal roles in optimizing patient care. Further research is needed to refine management strategies for such atypical presentations.

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## Conflicts of interest

None.

## Ethical disclosures

**Protection of people and animals.** The authors declare that the procedures followed were in accordance with the regulations established by those responsible for the Clinical Research and Ethics Committee and in accordance with those of the World Medical Association and the Declaration of Helsinki.

**Data confidentiality.** The authors declare that they followed the protocols of their work center regarding the publication of patient data.

**Right to privacy and written consent.** The authors declare that they have received written consent from the

patients and/or subjects mentioned in the article. The corresponding author must be in possession of this document.

**Use of artificial intelligence to generate texts.** The authors declare that they did not use any type of generative artificial intelligence in writing this manuscript, nor to create figures, graphs, tables, and/or their respective captions.

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