Case Report

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Radiation-induced angiosarcoma of the breast: a case report

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Introduction: Breast angiosarcoma is a rare, aggressive tumour affecting adult women. It can occur in two forms, primary form and secondary forms or radiation-induced breast angiosarcoma affecting patients with history of breast or chest radiotherapy.
Case presentation: The authors report a new case of breast angiosarcoma in 52-year-old women, with history of invasive ductal carcinoma, and reporting a discoloration of her breast skin. The patient did undergo a mastectomy of right breast and adjuvant chemotherapy.
Conclusion/discussion: Surgery with total excision associated or not to adjuvant chemotherapy remains the treatment of choice in breast angiosarcoma.

Keywords: breast angiosarcoma, breast cancer, breast surgery, breast radiation, case report

Introduction

Angiosarcoma (AS) is a high grade malignant and a rare tumour, that ordinary originates from the endothelial cells of blood or lymphatic vessels[1]. AS can affect any organ, nevertheless the skin remains the most affected area[2]. Breast AS represents less than 1% of the mamillary neoplasm[3]. They can occur spontaneously and then are called primary AS or secondary to breast or chest irradiation therapy which are called secondary AS or radiation-induced breast AS (RIAS)[4].

Case report

We report a new case of breast AS, in 52-year-old women, who has received a conserving surgery with axillar lymph node dissection back in 2015 to her invasive high grade ductal carcinoma with adjuvant combination therapy of chemotherapy and radiotherapy. The chemotherapy regimen received consisted of 6 cycles of Doxorubicin: 100 mg/m^2 and 1000 mg/m^2 of Endoxanes plus 125 mg/m^2 of Docetaxel. The patient underwent for irradiation therapy of her right breast with 50 Gray plus 12.5 Gray as boosting charge. Three years later, the patient did notice discoloration of her right breast skin with palpable nodule of the same breast (Fig. 1). A surgical biopsy was performed of her skin lesion showed an AS in the histopathological examination (Fig. 2). Although, the computed tomography scan findings did not find any second location of the AS. The patient underwent for right mastectomy without reconstructive surgery and adjuvant chemotherapy with no postoperative course was uneventful. Currently, 9 months after her breast surgery and chemotherapy, the patient is in a good health with no evidence of disease. This case has been reported following the SCARE criteria[5].

HIGHLIGHTS

- The breast angiosarcoma is a rare, aggressive tumour affecting adult women.
- This case report may help more to diagnosis this skin tumour.
- The treatment consists on mastectomy associated or not to chemotherapy.

Discussion

Epidemiology

Breast AS are an aggressive and rare tumour[1]. Primary forms, which occur spontaneously represents less than 0.04% of all malignant breast neoplasm, it is observed in women without a history of breast irradiation during their third or fourth decades[3]. The secondary form represents less than 0.05% of all malignant tumours of the breast, it is observed in elderly women who have benefited from mammary radiotherapy[3]. The

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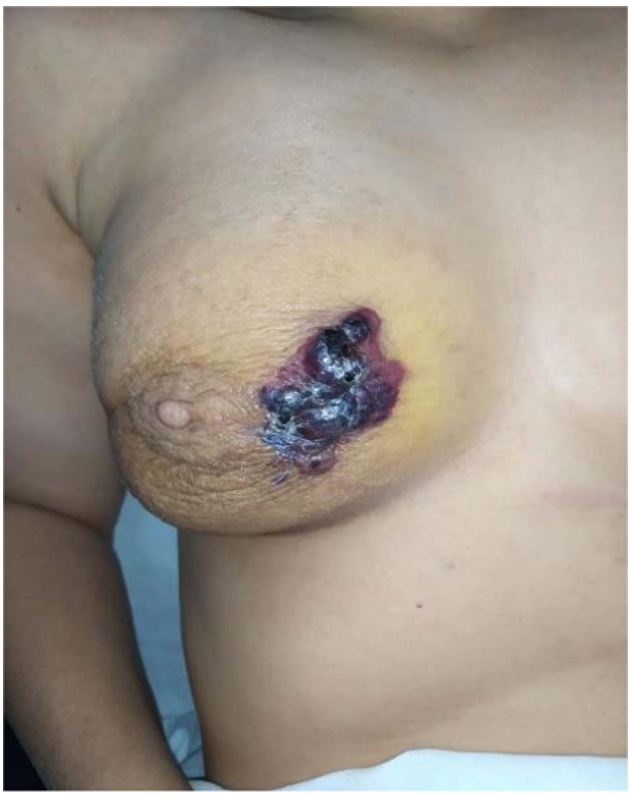

Figure 1. The appearance of the tumour with blackish-purple cutaneous lesion.

incidence of RIAS may vary from 0.14 to 0.5% in women who have received surgical treatment associated with radiotherapy[3].

Diagnosis

The clinical presentation of AS is diverse, it can form as a single or multiples nodules, as a papules or vesicles lesions, however, one third of the patients present only a tumour. Therefore, the discoloration of the breast skin or the appearance of a tumour within radiation field should be alarming sing must lead to a biopsy for histological proof[6]. Generally, the primary form of AS is like a nodule, nevertheless, for the secondary form it is a violaceous skin spot[7]. With regard to breast imaging, mammography and/or MRI have a limited place for positive diagnosis, but MRI is lightly more efficient in the detection of AS[8–10].

Histology

RIAS and AS have similar histological features[11,12]. It is a poorly limited invasive tumour infiltrating the dermis and often the subcutaneous tissue[13]. It contains an irregular and anastomotic vascular network, with increased sized endothelial cells containing a rare cytoplasm showing different degrees of nuclear atypia[13,14]. AS is classified into three grade, low, intermediate and high grade[3], depending on cytological atypia, the number of mitoses, endothelial proliferation and the presence of necrosis or haemorrhage[4,10].

Immunohistochemistry has an interest in undifferentiated forms or when histological diagnosis is not clear[15]. The AS express, especially, the following endothelial markers, CD31,

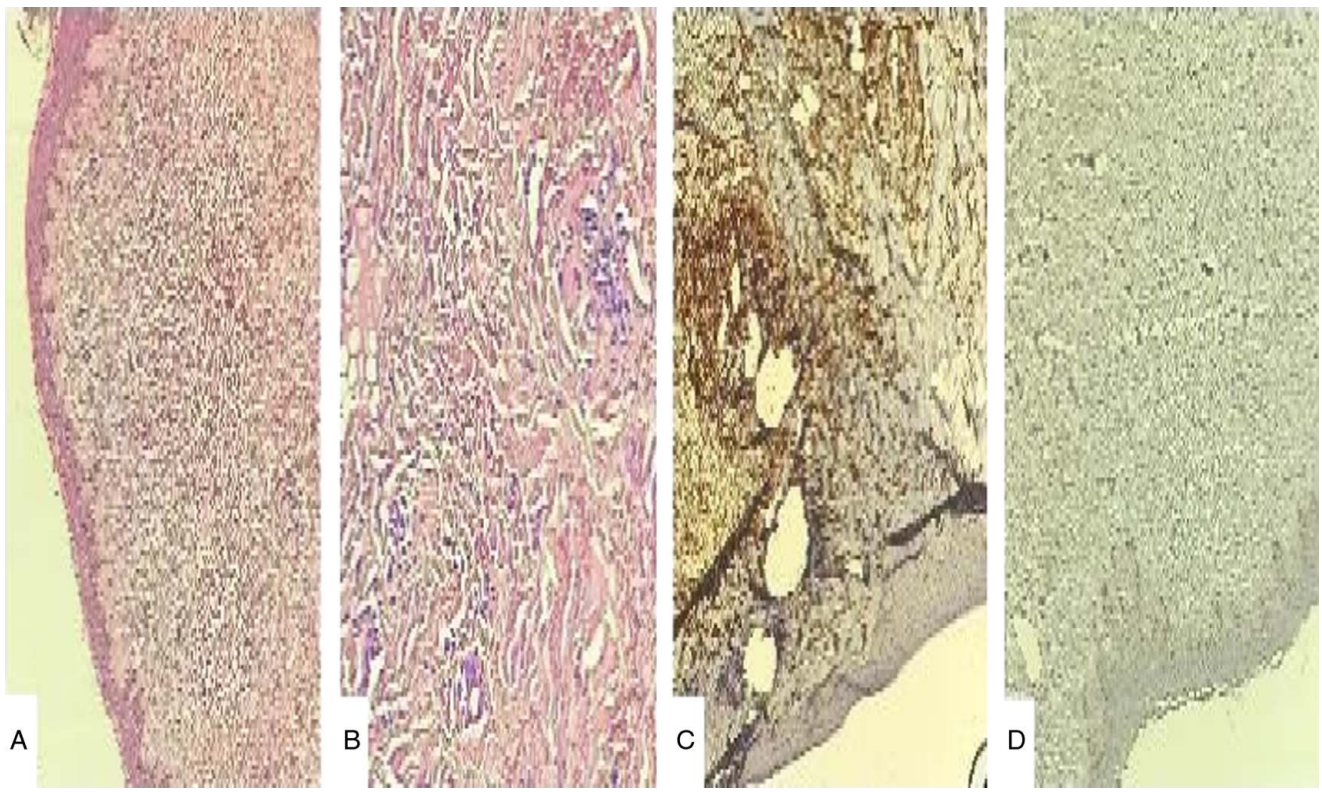

Figure 2. Microphotography showing: (A) The dermis contains ill-defined tumour composed of angulated and irregular vascular spaces associated to blood lakes. (B) Vessels are lined by atypical, multilyring and hobnailing endothelial cells. (C) Tumour shows strong and diffuse membranous CD31 positivity. (D) CK expression is absent.

CD34, FLI1 and ERG[15]. ERG, an ETS family transcription factor, is considered the most sensitive and specific marker for endothelial differentiation[15]. Some lymphatic markers including D2-40, PROX-1 and VEGFR-33, can be observed in certain cutaneous AS[16,17].

Treatment

As for as the treatment is concerned, there is no agreement for its modalities[18]. The main treatment consists of surgery, with local excision to mastectomy[2]. A mastectomy with negative margins is recommended[2]. The recurrence rate remains high, although with negative margins, with can vary from 54 to 92%[19]. Lymphadenectomy is not systematically recommended because the lymph nodes are rarely touched[3]. The excision of lymph nodes associated with radiotherapy is recommended when the tumour is extensive and near to draining nodes[20].

The indication of radiotherapy is controversial, especially in patients who have developed RIAS[21].

Nevertheless, after a conserving surgical treatment of breast the adjuvant radiotherapy must be indicated given the low risk of the occurrence of a RIAS after breast irradiation[22].

The role of chemotherapy has not been clearly defined. Several studies have shown an important role of taxanes and anthracyclines in the treatment of ASs with a response rate from 20 to 60%[23]. Neo-adjuvant chemotherapy is indicated if there is a surgical delay for any reason, to reduce the progression of tumoral cells[24].

Prevention

Clinical suspicion is the major key to the diagnosis of post-radiation AS[25]. During breast cancer observation, especially in patients who have received conserving chirurgical treatment and radiotherapy, any skin lesion in the irradiated area should draw the practitioner's attention and lead to a biopsy for histological examination.

Conclusion

RIAS remains a rare malignant affection, which must be known by any practitioner. Its diagnosis is based on a biopsy with histopathological examination. Surgery remains the treatment of choice with total excision associated or not with adjuvant chemotherapy.

Ethical approval

Not applicable, no ethical approval was needed for this work.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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All authors have contributed equally in writing this paper.

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