CASE REPORT

Atypical case of ecthyma gangrenosum mimicking a breast cancer recurrence

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SUMMARY

A 68-year-old woman with a history of breast cancer presented with skin lesions and sternal pain. Clinical examination revealed ulcerative lesions on mastectomy scar and CT scan showed contiguous sternal osteolysis. The main hypothesis was a breast cancer recurrence; however, cutaneous and bone biopsies did not reveal any cancer cells. Skin tissue culture detected *Pseudomonas aeruginosa*, suggesting ecthyma gangrenosum despite the absence of bacteraemia in our patient and despite her immunocompetence. Surgical treatment was performed, followed by a long course of antibiotherapy.

BACKGROUND

In patients with breast cancer history, cutaneous ulcers appearing on a breast surgery scar are highly suspect of cancer recurrence, particularly when associated with osteolysis. However, other causes should be excluded, such as uncommon infectious processes.

Ecthyma gangrenosum (EG) is a rare cutaneous infection classically associated with *Pseudomonas aeruginosa* bacteraemia and usually occurring in immunocompromised patients.^{1–4} We describe an atypical case of EG that closely mimicked breast cancer recurrence; this EG appeared in the absence of bacteraemia in an immunocompetent patient with a history of breast cancer, and was associated with bone osteolysis. EG should thus be suspected in atypical lesions appearing after surgery and could be associated with a bone infection mimicking a cancer lesion.

CASE PRESENTATION

In March 2015, a 68-year-old woman presented with skin lesions and thoracic pain. Her medical history included left breast cancer 15 years prior, which had been treated with tumourectomy and radiotherapy, as well as with chemotherapy (6 anthracycline-based chemotherapy courses) and endocrine therapy (tamoxifen). In December 2013, she was diagnosed with localised ipsilateral breast cancer recurrence. Work up, including bone scan, did not show any suspect lesion. A mastectomy was performed, followed by endocrine therapy (letrozole).

Cutaneous lesions appeared progressively, within 2 weeks. These lesions were initially erythaematous, nodular and painless, and were located only on the mastectomy scar (figure 1). They changed rapidly, displaying a haemorrhagic and necrotic centre after a few days (figure 2). The patient also described

continuous and increasing sternal pain that had started 1 month before the skin lesions appeared. This pain was amplified with sternal pressure. There was no fever and no chills; the patient's general status was not altered and she did not describe any other symptoms. Cardiac and pulmonary auscultations were normal and there was no clinically palpable lymph node. No other cutaneous lesion was observed.

INVESTIGATIONS

Owing to the recent breast cancer history, initial work up was carried out, including blood tests, thoracoabdominal CT and bone scan.

C reactive protein was moderately increased (30 mg/L). All other laboratory values were within normal ranges; haemogram was normal including leukocytes, lymphocytes and neutrophils. Electrolytes, and liver and renal functions were normal. Thoracoabdominal CT showed an important sternal osteolysis; there was no abnormal lymph node, and no lung or liver lesion (figure 3). The bone scan confirmed a unique and intense sternal fixation.

Multiple cutaneous biopsies showed dermic oedema associated with neutrophilic infiltration but excluded presence of cancer cells (figure 4). Bone biopsies also excluded tumour infiltration.

DIFFERENTIAL DIAGNOSIS

In the context of nodular and ulcerative lesions appearing in a non-immunocompromised patient after a recent breast cancer history and associated with bone lysis, our initial hypothesis was breast cancer recurrence and multiple cutaneous biopsies were rapidly performed. The absence of cancer cells in the tissue samples led us to enlarge our hypothesis. Differential diagnosis included a

Figure 1 Initial skin lesion located on mastectomy scar.

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Figure 2 Rapid evolution of nodular lesions to ulceration.

bacterial infectious process. Skin biopsy sent for tissue culture grew colonies of *P. aeruginosa* sensitive to ceftazidime and ciprofloxacin. Repeated blood cultures remained sterile, suggesting absence of *P. aeruginosa* bacteraemia.

TREATMENT

Ceftazidime-based antibiotherapy was rapidly started. Owing to the bone involvement, extended surgical curettage of the sternum was performed and completed by vacuum-assisted closure (VAC) therapy. For a second time, the mastectomy scar was debrided and covered with a pectoralis muscle flap and skin grafts. Antibiotherapy was continued with oral ciprofloxacin for 3 months.

OUTCOME AND FOLLOW-UP

Six months after the surgery, our patient is well and infection free. The surgical wound has completely closed and does not reveal any abnormality. Work up will be frequently performed, as infectious recurrence can occur.

DISCUSSION

EG is an uncommon cutaneous infection usually observed in immunocompromised patients (patients with organ transplant, those with severe burns and patients with neoplasms treated with chemotherapy). EG skin lesions are usually red macules that evolve rapidly into nodular or ulcerative lesions with a central area of necrosis surrounded by erythema. EG is classically associated with *P. aeruginosa* bacteraemia, and the skin

Figure 3 Sternal osteolysis at CT scan.

Figure 4 Dermic oedema associated with neutrophilic infiltration.

lesions represent a seeding site of this pathogen.¹⁻⁴ Although less frequent, other pathogens have been described, including *Escherichia Coli*, *Morganella morganii*, etc.⁵⁻⁷

In our patient, this *P. aeruginosa* infection mimicked cancer lesions; it occurred in a patient with a history of cancer, appeared on the mastectomy scar and was associated with bone lytic lesion in the absence of bacteraemia. Other differential diagnosis included local bacterial infection or non-bacterial infection such as deep fungal infection or viral infection. In our case, cancer recurrence was excluded by repetitive biopsies and *P. aeruginosa* infection was confirmed by tissue culture.

EG has already been described to occur as a localised skin disorder without systemic infection, resulting from a breakdown of mechanical defensive barriers.^{8,9} In our patient, we hypothesise that *P. aeruginosa* contaminated sternal bone during the mastectomy procedure performed 1 year before. As local defence mechanisms were suppressed by the radiotherapy treatment she received 15 years prior, the infectious process developed and progressively released pathogens in surrounding tissue. This could explain the delay between the sternal pain onset and the appearance of skin lesions.

This case of EG thus clearly appears atypical, as it occurred in a non-immunocompromised patient, in absence of bacteraemia and in association with osteolysis. After aggressive surgery and a long course of antibiotherapy, our patient appears infection free at 6 months, although the follow-up is so far relatively short.

Learning points

- ▶ Ecthyma gangrenosum (EG) can appear in the absence of bacteraemia and can be associated with bone lesions.
- ▶ EG should be suspected in patients with skin ulceration and a history of recent surgery, as surgery can facilitate skin or bone intrusion by pathogens.
- ▶ Tissue culture should routinely be performed in cases of suspected ulcerative lesions.

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