Rare disease

Breast necrotising fasciitis managed by partial mastectomy

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Summary

We present the case of a 75-year-old woman who presented with extensive breast cellulitis, which was thought to be secondary to a deep breast abscess. On admission the patient underwent debridement of the breast and broad-spectrum intravenous antibiotics were administered. However, during hospitalisation she developed sepsis, acute renal failure and required further debridements for the rapidly spreading necrotising fasciitis. Subsequently, a partial mastectomy was performed and the patient made an overall good postoperative recovery.

BACKGROUND

Necrotising fasciitis (NF) represents one of the most severe and aggressive forms of soft tissue infections. The initial presentation varies from minor/mild soft tissue infections to severe forms of septic shock and multiorgan dysfunction syndrome.¹ Mortality can be as high as 73%, but with the appropriate treatment can be reduced by 10%.^{2–3} To date there are 10 case reports worldwide describing the NF affecting the breast. Furthermore, only three cases (including the present one) reported NF with no earlier breast interventions.² To our knowledge this is the first case report of breast NF successfully managed by partial mastectomy. NF of the breast is rare and can be challenging diagnostically as well as surgically. Prompt assessment and radical debridement in this case allowed for the preservation of breast tissue. Therefore, it is important to report our experience, because misdiagnosis usually leads to a total mastectomy, which has profound physical and psychological consequences.^{2–4}

CASE PRESENTATION

A 75-year-old woman presented with a 5-day history of a painful, red and swollen left breast. She denied any trauma, fever, breast discharge or previous history of any breast problems. Her medical history included hypertension. There were no risk factors such as diabetes, peripheral vascular disease or immunosuppression.

On admission, the patient was noted to be pyrexial with a temperature of 38.5°C. She was also hypotensive with a systolic blood pressure of 97 mm Hg and tachycardic with a heart rate of 105/min. Examination of the cardiovascular, respiratory and gastrointestinal systems was unremarkable. Breast examination revealed a tender breast with extensive cellulitis and no evidence of nipple discharge, skin blisters or necrosis. No fluctuance or masses were palpable. An attempted needle aspiration failed, but subsequently led to spontaneous discharge of purulent fluid at the aspiration site. The patient was taken urgently to the theatre for debridement. On day 2 of the hospitalisation, the patient deteriorated, became septic and developed acute renal failure with a creatinine level of

322 µmol/l and a urea level of 26.6 mmol/l. The patient continued to develop localised areas of breast sepsis and underwent two subsequent debridements culminating in a partial mastectomy.

INVESTIGATIONS

Laboratory tests showed a mildly elevated white cell count of $11.5 \times 10^9/l$ and a C-reactive protein level of 461 mg/l. On admission, biochemical markers, including liver function tests, amylase, urea and electrolytes, were within the normal range as were her haemoglobin and platelet levels.

Microbiology results showed mixed growths of anaerobes, viridans-type *Streptococcus* and coagulase-negative *Staphylococcus*. Her histopathology report confirmed acute and severe inflammation of the breast skin with abscess formation and fat necrosis. No malignant cells were found. Tuberculosis cultures at 6 weeks of incubation were negative.

DIFFERENTIAL DIAGNOSIS

Differential diagnosis included cellulitis, an abscess and breast carcinoma.

TREATMENT

Following fluid resuscitation, high-dose broad-spectrum intravenous antibiotics (Cefuroxime 1.5 g and Metronidazole 500 mg both three times a day) were administered and the patient underwent the first of three debridements.

The first debridement performed on admission revealed a large area of fat necrosis and pus.

A second look performed 24 h later showed spreading breast sepsis across the midline of the chest and involvement of the nipple-areola complex (NAC). All infected tissue was removed including NAC.

At 48 h, wound inspection demonstrated spreading cellulitis and further evidence of fat necrosis was found (figure 1). This led to excision of all the remaining devitalised tissues and partial mastectomy (figure 2).

Further treatment was delivered by vacuum-assisted closure (VAC) (figure 3), intravenous antibiotics according

Figure 1 Left breast at 48 hours post first debridement with spreading cellulitis and further evidence of fat necrosis.

to the obtained sensitivities (Metronidazole 500 mg three times a day and Benzylpenicillin 2.4 g with Flucloxacillin 2 g both four times a day) and intravenous fluids.

At 96 h, wound site was found to be satisfactory and delayed breast closure was performed and VAC was applied to the remaining part of the wound.

OUTCOME AND FOLLOW-UP

The patient made a satisfactory recovery. Her renal function has returned to normal.

Wound review in the outpatient department showed a healed breast with a delayed closure site and healthy granulating tissue over the medial defect on the chest wall (figure 4).

The patient opted to continue with the conservative treatment by VAC.

DISCUSSION

NF is a rapidly developing bacterial infection, which can affect any body site.⁵ It can be idiopathic, but it has been reported to develop in the breast following a core needle biopsy,³ an elective mastectomy² and breast augmentation.⁶ To date two types of NF have been described.

Figure 2 Post partial mastectomy.

Figure 3 Vacuum-assisted closure treatment.

Type 1 is known as a polymicrobial variant, which has been found with a fulminant course of the disease.^{3 7} This type is associated with anaerobes, Gram-positive and Gram-negative bacteria.³ In contrast, type 2 is caused by group A *Streptococcus* and has been frequently found in groups of high risk,⁸ including the obese, patients with diabetes or peripheral vascular disease⁷ and those who are immunocompromised.³

A high index of suspicion is required, as there is usually a considerable amount of breast tissue between the skin and the fascia itself. This subsequently is responsible for the late presentation of skin signs, at which point the breast is usually unsalvageable.⁴

The diagnosis is usually established by a combination of clinical and surgical findings. Some authors also suggest the use of various imaging modalities, such as ultrasound scan (USS), computed tomography (CT) and magnetic resonance imaging (MRI).⁵ USS findings usually reveal a thickening and irregularity of the fascia associated with fluid collections.⁵ CT can demonstrate the presence of subcutaneous gas and fat stranding.¹ Although MRI can reveal the extent of deep tissue involvement in greater detail than any other imaging modality, it has a low specificity (46–86%).^{3 5} Imaging can be a useful adjunct in establishing the diagnosis, but it should not delay the delivery of definitive treatment.

Figure 4 Healed breast delayed closure site and healthy granulating tissue over the medial defect on the chest wall.

A treatment algorithm depends predominantly on the severity of the NF and response to conservative management. General principles include:

1. Resuscitation with intravenous fluids, broad-spectrum antibiotics and intensive care support.⁹
2. Radical debridement of all non-viable tissues until a reasonable healthy bleeding margin is seen in all directions.² Unfortunately, the majority of cases undergo a total mastectomy.
3. VAC dressing can aid in healing by increasing oxygenation of the tissue, fibroblast stimulation and promoting granulation tissue.^{2 3 9}
4. Reconstructive procedures can be performed usually in the form of split skin grafts.^{2 7}

Learning points

- Necrotising fasciitis (NF) can present as a simple abscess, cellulitis, carcinoma or after mastectomy.
- NF requires a high index of suspicion and speedy debridement, which are key elements for a successful outcome.

Competing interests None.

Patient consent Obtained.

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