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A case report of primary necrotising fasciitis of the breast: A rare but deadly entity requiring rapid surgical management

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ABSTRACT

INTRODUCTION: Necrotising fasciitis of the breast is a rare entity with very few cases reported in the literature. It is rapidly progressive and can lead to sepsis and multi-organ failure without prompt medical and surgical management.
PRESENTATION OF CASE: We describe a case of a non-diabetic 23-year-old female with primary necrotising fasciitis of the right breast. She presented in septic shock with gross breast discolouration and nipple discharge. Immediate resuscitation followed by muscle-sparing mastectomy within 3 h of her presentation was performed. She was managed postoperatively in intensive care. Complications included myocardial infarction and anuria requiring continuous renal replacement therapy. She eventually recovered with close to normal cardiac function and was discharged home after skin grafting of her mastectomy wound.
CONCLUSION: This is the youngest patient with primary necrotising fasciitis of the breast described in the literature. Prompt resuscitation and an aggressive surgical approach are critical to the successful management of this life threatening pathology.

1. Introduction

Necrotising fasciitis is an aggressive and severe soft tissue infection, most commonly affecting the abdominal wall, perineum and extremities. Necrotising fasciitis of the breast is extremely rare. Mortality rates have been reported as high as 73%, but can be reduced with early diagnosis and prompt institution of appropriate management strategies [1]. To date, just twelve case reports detailing necrotizing fasciitis of the breast exist in the literature. Of these, only six reports feature primary, idiopathic necrotizing fasciitis of the breast in previously well, non-lactating women [2–7]. We present a case of primary necrotizing fasciitis of the breast in a healthy 23 year old female. To our knowledge, this is the youngest patient reported in the literature.

2. Case presentation

A 23-year-old female presented to the Emergency Department (ED) of a tertiary hospital with a 12-h history of a painful and swollen right breast. The breast was entirely discoloured and an offensive nipple discharge was noted. This occurred in the context of a 3-day history of breast pruritus near the inframammary fold. The patient also complained of dizziness, nausea, and several episodes of vomiting, and denied any history of trauma to the breast. Her medical history includes obesity (BMI 34.7) and polycystic ovarian syndrome. She is not on any regular medications, is a non-smoker and drinks small amounts of alcohol socially.

On presentation, the patient was alert and oriented, with a blood pressure of 80/60 mmHg, heart rate of 130 beats/min and saturations of 95% on room air. Her temperature was 35.8 °C. Breast examination revealed a grossly swollen and markedly tender right breast with discolouration and erythema to the margins, along with associated bullae. Examination of the left breast was unremarkable.

Blood tests were consistent with severe sepsis with end organ dysfunction. Her initial laboratory results revealed a white cell count of 27.85×10^9/L with neutrophilia (23.6×10^9/L) and a C-reactive protein of 400 mg/L. An arterial blood gas identified a metabolic acidosis with pH of 7.06 and lactate of 8.8 mmol/L. Creatinine was elevated at 394 umol/L, with an estimated glomerular filtration rate of 13 mL/min.1.73 m^2. Her international normalised ratio was 1.8 and activated partial thromboplastin time 44 s.

Over the next few hours, the patient received 5 L of intravenous crystalloid resuscitation along with inotropic support, including boluses of metaraminol (2 mg total) and adrenaline (1.1 mg total). She remained anuric during this time. A noradrenaline infusion was commenced in ED via a central line, with a peak pre-operative rate of 1.5 mg/h. With advice from ICU, a vasopressin infusion was also commenced at 4 units/h. In light of a reported possible penicillin allergy, renal-adjusted doses of IV meropenem, IV clindamycin and IV vancomycin were administered after consultation with the infec-

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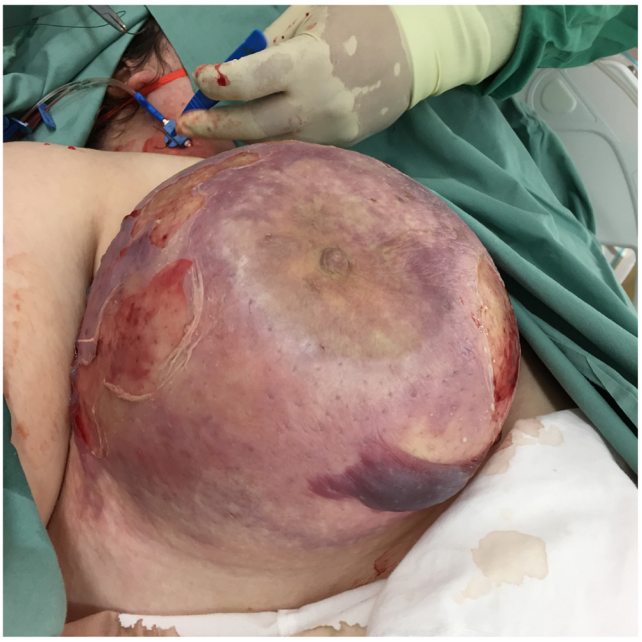

Fig. 1. Appearance of breast preoperatively, during central line insertion. Marked erythema, bruising and ischaemic skin changes with de-epithelialization.

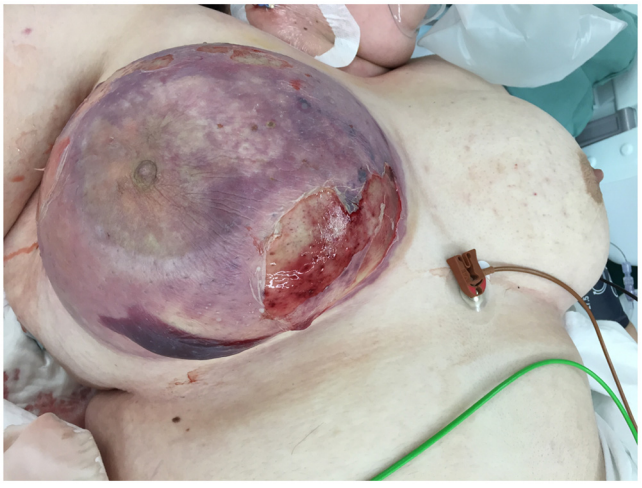

Fig. 2. Appearance of the breast preoperatively, showing a large area of ulceration.

tion control team. The patient was taken to the operating theatre within 3 h of her presentation and underwent an emergency right mastectomy and debridement of all necrotic tissue including pectoralis major fascia, preserving pectoralis major. A haematologist was consulted with regard to the patient's coagulopathy and 2 units of fresh frozen plasma were administered intraoperatively to prevent excessive haemorrhage. The wound was packed and covered with a vacuum assisted closure (VAC) dressing, and the patient was transferred to the intensive care unit for post-operative care where she remained intubated and sedated. Continuous renal replacement therapy (CRRT) was commenced Figs. 1–5 .

Overnight however, the patient developed a troponin-I rise to 20,203 ng/L with ST elevation in inferior leads. Troponin-I ultimately peaked at >40,000 ng/L. Adrenaline and vasopressin were gradually weaned and 2 units of packed cells were transfused in light of a haemoglobin of 83 g/L. Although likely sepsis driven myocardial ischaemia, aspirin and an IV heparin infusion were commenced following consultation by a cardiologist.

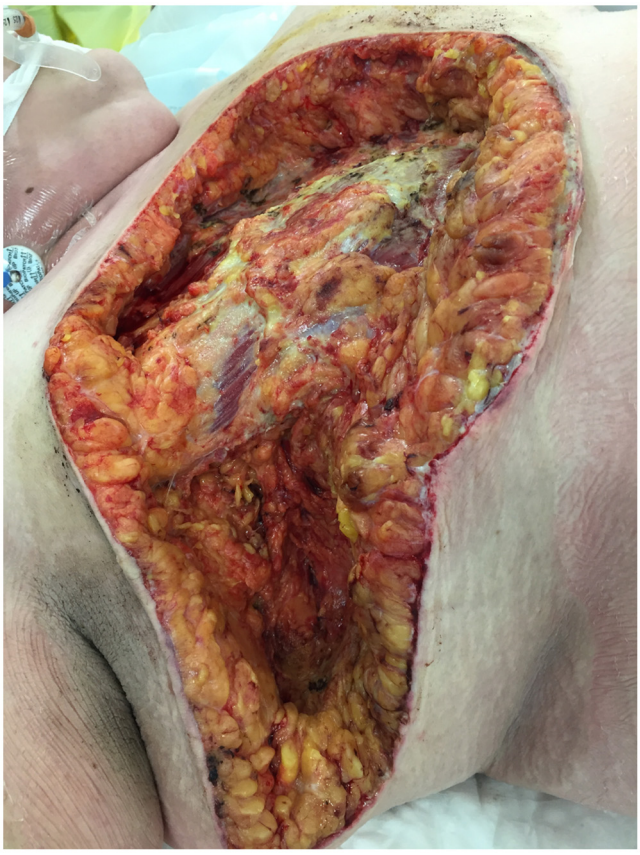

Fig. 3. Appearance of the chest wall post mastectomy.

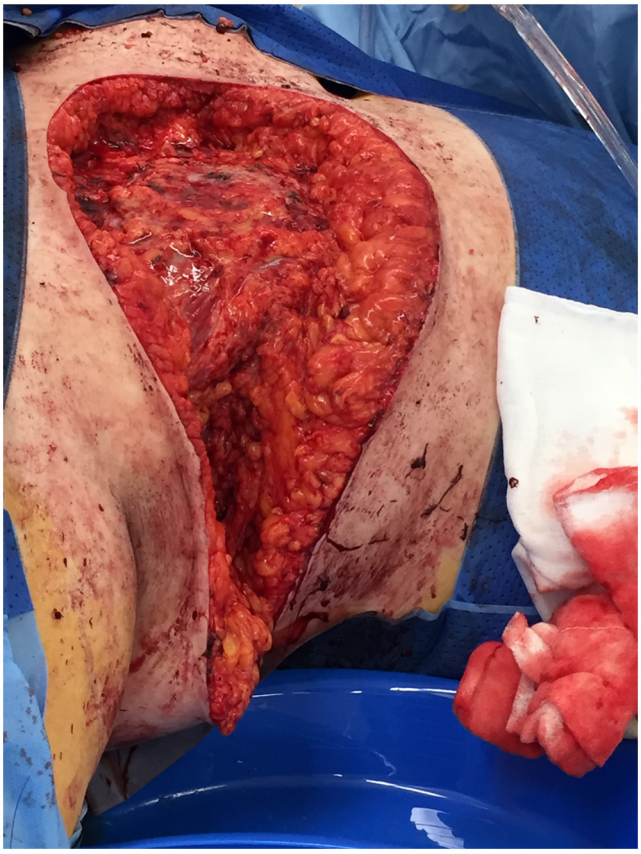

Fig. 4. Healthy bleeding tissue post second debridement.

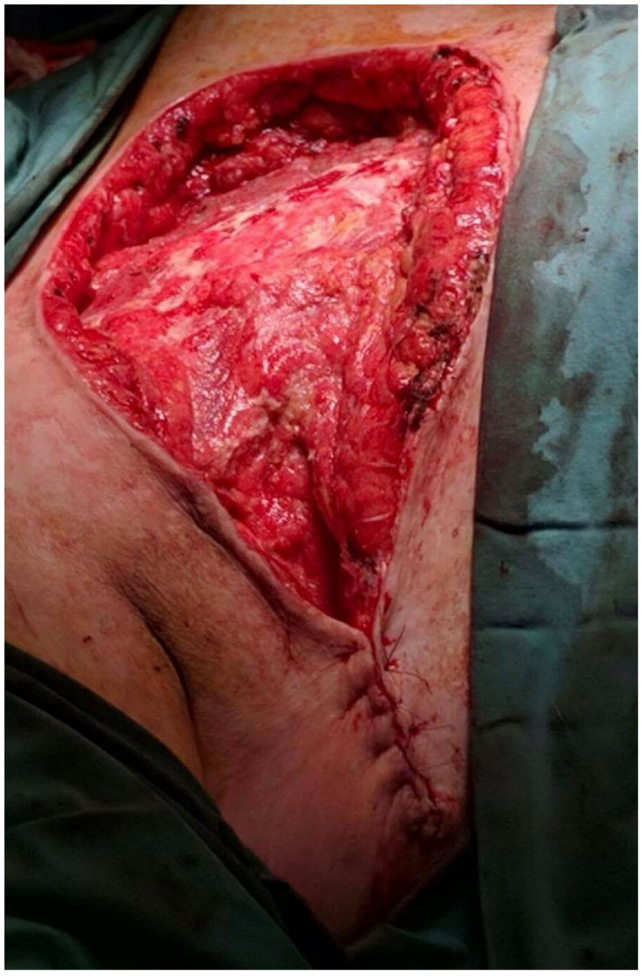

Fig. 5. Appearance of wound following negative pressure dressing change.

The noradrenaline infusion rate peaked at 3 mg/hour in ICU and was weaned from 6 h post-operatively, with ultimate cessation on day 2 post-op. CRRT was ceased after 12 h in view of improving urine output and renal function. The patient was eventually extubated on day 8 of her admission, following 3 further wound debridements and VAC applications on days 1 and 5, and 9. Tissue culture returned a positive result for streptococcus pyogenes. On day 5, the patient was confirmed to have no allergies, and antibiotic therapy was changed to benzylpenicillin. Inflammatory markers gradually improved, and on day 5 she was afebrile. She was eventually stepped down to oral amoxicillin for a total of 19 days as per recommendations made by the infection control team.

Repeat electrocardiograms demonstrated resolving ST elevation, and a transthoracic echocardiogram revealed an ejection fraction of 55% with normal systolic function, a small sized septal and inferior wall motion abnormality with mild hypokinesis of segments. Follow up CT coronary angiograms are due to be completed as an outpatient. The patient remained in ICU for a total of 12 days until she was deemed safe to go to the ward. On day 16 of her admission, the patient was transferred to a tertiary hospital with a plastic surgery service for further debridement and skin grafting of her wound from her left thigh. By this time, all blood parameters had normalised. The patient remained stable for the duration of her admission under the plastics team, and was ultimately discharged home.

Table 1
Existing case reports of PNFB in non-lactating, previously healthy women.

Author (year)	Patient age	Treatment
Rajakannu et al. (2006)	50	Mastectomy
Wong et al. (2008)	38	Quadrantectomy
Keune et al. (2008)	47	Mastectomy
Soliman et al. (2011)	61	Debridements
Yang et al. (2015)	30	Debridements
Marongiu et al. (2016)	39	Debridements + hyperbaric oxygen

3. Discussion

Necrotising fasciitis is a rare but aggressive soft tissue infection most commonly affecting the abdominal wall, perineum and extremities. It is characterised by widespread fascial necrosis with relative sparing of skin and muscle, and occurs more commonly in patients with comorbidities such as immunocompromise, alcoholism, intravenous drug use and diabetes mellitus [8]. Streptococcus pyogenes is the most commonly implicated organism, and is cultured in approximately one third of cases [9]. The infection carries a significant risk of mortality and is higher in patients with comorbidities such as diabetes and immunocompromise, as well as those older patients and those who develop streptococcal toxic shock syndrome [1,10]. Mortality can be reduced by up to 10% with the institution of appropriate treatment, such as adequate surgical debridement, antibiotic therapy and intensive care support [1,11].

Although it can occur at any site on the body, necrotising fasciitis of the breast is extremely rare. It was first described in the literature by Shah et al. in 2001, and only a handful of cases have since been published [12]. Of these, there are only 6 reports of primary necrotizing fasciitis of the breast (PNFB) occurring in non-lactating, previously healthy women [2–7] (Table 1). The most recent of these reports have utilized staged debridements rather than immediate mastectomy as a treatment strategy.

This case of PNFB affected a healthy 23 year old female, the youngest to date in the literature. Despite this, her presentation clearly demonstrated a rapidly progressive infection causing sepsis with multiorgan dysfunction. Given such a clinical picture, the decision was made to perform a mastectomy as opposed to more conservative debridement. This is in line with previously published recommendations favouring early radical resections in severe cases of necrotizing fasciitis [12,13].

The patient went on to have a myocardial infarction as evidenced by a significant troponin rise, ST elevation and abnormalities on echocardiogram. Given the patient's age and lack of risk factors, this was extremely unusual and indicates that the degree of end-organ hypoperfusion was immense. However, despite her critical presentation with severe acidosis and the subsequent myocardial infarction, the patient went on to have a full recovery without further complications. This case is a reminder that although there is often a tendency for tissue preservation and cosmesis, as evidenced in the recent literature on PNFB, the role of mastectomy cannot be ignored and needs strong consideration in certain clinical situations.

4. Conclusion

This case demonstrates that even in young and previously healthy patients, necrotizing fasciitis of the breast can be a rapidly progressive and destructive entity. Prompt diagnosis and rapid surgical intervention is crucial and can mean the difference between life and death in these critically ill patients.

Conflicts of interest

None.

Funding

None.

Ethical approval

Ethics approval has not been requested for this study, as according to hospital protocol, it is not required for a case report.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Kimberley Fayman, Kejia Wang, Richard Curran. All of the above authors participated in concept design, research and writing of the paper.

Guarantor

Kimberley Fayman and Kejia Wang.

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References

[1] A. Subramanian, G. Thomas, A. Lawn, P. Jackson, G. Layer, Necrotising soft tissue infection following mastectomy, J. Surg. Case Rep. 2010 (2010) 4.
[2] M. Soliman, E. Ayyash, A. Aldahham, S. Asfar, Necrotizing fasciitis of the breast: a case managed without mastectomy, Med. Princ. Pract. 20 (2011) 567–569.
[3] J.D. Keune, S. Melby, J.P. Kirby, R.L. Aft, Shared management of a rare necrotizing soft tissue infection of the breast, Breast J. 15 (2009) 321–323.
[4] C.-H. Wong, B.-K. Tan, Necrotizing fasciitis of the breast, Plast. Reconstr. Surg. 122 (2008) 151e–152e.
[5] B. Yang, S. Connolly, W. Ball, Necrotising fasciitis of the breast: a rare primary case with conservation of the nipple and literature review, JPRAS Open 6 (2015) 15–19.
[6] M. Rajakannu, V. Kate, N. Ananthakrishnan, Necrotizing infection of the breast mimicking carcinoma, Breast J. 12 (2006) 266–267.
[7] F. Marongiu, F. Buggi, M. Mingozzi, A. Curcio, S. Folli, A rare case of primary necrotising fasciitis of the breast: combined use of hyperbaric oxygen and negative pressure wound therapy to conserve the breast. Review of literature, Int. Wound J. (2016).
[8] R.J. Green, D.C. Dafoe, T.A. Raffin, Necrotizing fasciitis, Chest J. 110 (1996) 219–229.
[9] M. Dworkin, M. Westercamp, L. Park, A. McIntyre, The epidemiology of necrotizing fasciitis including factors associated with death and amputation, Epidemiol. Infect. 137 (2009) 1609–1614.
[10] A. Golger, S. Ching, C.H. Goldsmith, R.A. Pennie, J.R. Bain, Mortality in patients with necrotizing fasciitis, Plast. Reconstr. Surg. 119 (2007) 1803–1807.
[11] A. Flandrin, C. Rouleau, C.C. Azar, O. Dubon, P.L. Giacalone, First report of a necrotising fasciitis of the breast following a core needle biopsy, Breast J. 15 (2009) 199–201.
[12] J. Shah, A.K. Sharma, J.M. O'Donoghue, B. Mearns, A. Johri, V. Thomas, Necrotising fasciitis of the breast, Br. J. Plast. Surg. 54 (2001) 67–68.
[13] R. Ward, M. Walsh, Necrotizing fasciitis: 10 years' experience in a district general hospital, Br. J. Surg. 78 (1991) 488–489.
[14] R.A. Agha, A.J. Fowler, A. Saeta, I. Barai, S. Rajmohan, D.P. Orgill, et al., The SCARE statement: consensus-based surgical case report guidelines, Int. J. Surg. 34 (2016) 180–186.