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SETTING**

BREAST NECROTIZING FASCIITIS: EXPERIENCE FROM A RESOURCE-LIMITED SETTING

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ABSTRACT

Introduction

Necrotizing fasciitis of the breast is an uncommon but life-threatening soft tissue infection that may occur following breast surgery or inadequately treated mastitis. Delayed diagnosis and treatment can result in extensive breast tissue and skin necrosis, severe sepsis, and significant morbidity. This paper describes the clinical presentation, management, and outcomes of breast necrotizing fasciitis in a resource-limited setting and highlight the challenges associated with its management.

Methods

This retrospective study reviewed the records of women managed for breast necrotizing fasciitis between January 2019 and December 2023. Demographic characteristics, clinical presentation, microbiological findings, treatment, complications, and outcomes were analysed using descriptive statistics.

Results

Twenty-six women with a mean age of 27 years were managed during the study period. Most were married, unemployed housewives, and developed necrotizing fasciitis secondary to lactational mastitis (73.1%). All patients presented with ulcerated breast swelling, foul-smelling discharge, and skin necrosis, while breast tissue necrosis occurred in 38.5%. Bilateral breast involvement was observed in 42.3% of patients. *Staphylococcus aureus* was the commonest organism isolated (34.6%). All patients underwent repeated surgical debridement, with mastectomy performed in

five (19.2%) and split-thickness skin grafting in six (23.1%). The mean hospital stay was 22 days, and no mortality was recorded.

Conclusion

Breast necrotizing fasciitis is associated with considerable morbidity, particularly among young women of reproductive age. Early diagnosis, prompt surgical intervention, and appropriate supportive care are essential to minimise complications and improve outcomes.

Keywords: Breast; necrotizing fasciitis; lactational mastitis; *Staphylococcus aureus*; resource-limited setting.

INTRODUCTION

Necrotizing fasciitis is an aggressive, rapidly progressive, and potentially fatal soft tissue infection involving the fascia, subcutaneous tissue, and skin. It most commonly affects the lower limbs in adults and the trunk in children.¹

Breast involvement is rare but may occur following surgical manipulation of the breast parenchyma or inadequately treated mastitis, particularly lactational mastitis. If not recognised promptly and managed appropriately, the disease may progress rapidly, resulting in extensive necrosis of the breast tissue and overlying skin, life-threatening sepsis, and multiple organ failure.

Reports of breast necrotizing fasciitis in the literature are scarce.² Most published studies

are isolated case reports, with only a few case series describing this devastating condition. This study aimed to describe our experience in managing breast necrotizing fasciitis in a resource-limited setting and to highlight the challenges associated with its management.

METHODS

Study Design and Setting

This retrospective study reviewed the records of women managed for breast necrotizing fasciitis between January 2019 and December 2023 at the Federal Teaching Hospital Katsina, Katsina State, Nigeria.

Study Population

The study included all women diagnosed with breast necrotizing fasciitis who were managed during the study period.

Data Collection

Patients' electronic medical records were reviewed to obtain information on:

- demographic characteristics;
- clinical presentation;
- laboratory and microbiological findings;
- treatment received;
- duration of hospital admission;
- complications; and
- treatment outcomes.

Data Analysis

Data were analysed using IBM SPSS Statistics version 27.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarise the data. Continuous variables are presented as means and ranges, while categorical variables are presented as frequencies and percentages. Results are presented in tables and figures.

Ethical Considerations

The privacy and confidentiality of patients' data were maintained in accordance with the principles of the Declaration of Helsinki. Ethical approval for the study was obtained from the hospital's Ethics Committee (Ref Number: FTHKTNHREC.REG.24/06/22C /202).

RESULTS

Twenty-six women with breast necrotizing fasciitis were managed during the five-year study period. The mean age was 27 years (range: 14–54 years). Most patients were married, unemployed housewives with little or no personal income and were financially dependent on their spouses. The sociodemographic characteristics of the patients are presented in **Table 1**.



Figure 1: (A) Ulcerated right breast swelling covered with a local herbal preparation. (B) Left breast showing extensive skin and breast tissue necrosis with foul-smelling discharge.

All patients presented with ulcerated breast swelling associated with foul-smelling discharge (Figure 1). Hypotension at presentation was observed in 13 (50.0%) patients. Eleven patients (42.3%) had bilateral breast involvement, while loss of the nipple–areolar complex occurred in more than half of the patients, including bilateral involvement in four (15.4%). Skin necrosis was present in all patients (100%), whereas breast parenchymal necrosis occurred in 10 (38.5%). The pattern of breast and nipple–areolar complex involvement is shown in Table 2.

Seven patients (26.9%) had no previous breast disease and were therefore classified as having primary breast necrotizing fasciitis.

Table 1: Sociodemographic characteristics of women with necrotizing fasciitis of the breast

Variable	Frequency	Percentage
Age (years)		
< 20	5	19.20
20 – 29	15	57.70
30 – 39	1	3.80
40 - 49	3	11.6
≥ 50	2	7.70
Marital status		
Married	25	96.20
Widow	1	3.80
Occupation		
Unemployed Housewives	20	76.90
Artisan	3	11.50
Civil Servant	1	3.80
Businesswoman	2	7.70
Highest Educational Qualification		
Primary school	12	46.2
Secondary school	5	19.2
Quranic Education only	9	34.6



Figure 2: Bilateral breast necrotizing fasciitis before (A) and after (B) surgical debridement.

Table 2: Clinical Presentation of the Patients

Variable	Frequency	Percentage
Breast involvement		
Both Breasts	11	42.30
Right Breast	9	34.60
Left Breast	6	23.10
Nipple-areolar involvement		
None	12	46.20
Both	4	15.40
Left	4	15.40
Right	6	23.10
Lactation/Pregnancy Status		
Lactating	19	73.08
Pregnant	3	11.54
Not lactating and not Pregnant	4	15.38

The remaining 19 patients (73.1%) developed the disease secondary to lactational mastitis.

Most patients (24, 92.3%) had no documented comorbidity. One patient (3.8%) had diabetes mellitus, while another (3.8%) had scabies. Hyponatraemia occurred in seven patients (26.9%), whereas hypokalaemia was observed in one (3.8%). Leucocytosis was present in all patients. Anaemia was recorded in 23 patients (88.5%), necessitating multiple blood transfusions during admission.

Staphylococcus aureus was the most frequently isolated organism, accounting for nine (34.6%) cases. Other organisms isolated included *Streptococcus pyogenes*, *Escherichia coli*, and *Pseudomonas* species. No bacterial growth was obtained in three patients (11.5%), while culture reports were unavailable for seven (26.9%) patients (Table 3).

Prior to presentation, 14 patients (53.8%) had received oral antibiotics, whereas 18 (69.2%) had used traditional herbal preparations either orally, topically, or both. All patients required at least two surgical debridements before satisfactory wound bed preparation. Mastectomy was performed in five patients (19.2%). Six patients (23.1%) developed wound extension involving the chest and anterior abdominal wall (Figure 3). The mean

Table 3: Micro-organisms isolated from the wounds of the patients with breast necrotizing fasciitis

Micro-organism	Frequency	Percentage
<i>Staphylococcus aureus</i>	9	34.50
<i>Streptococcus pyogenes</i>	3	11.50
<i>Escherichia coli</i>	3	11.50
<i>Pseudomonas</i> spp	1	3.80
No growth	3	11.50
Not available*	7	26.90

Culture reports were not available*

**Figure 3:** Extensive wound extension involving the anterior chest wall and abdominal wall.**Figure 4:** Split-thickness skin graft used for wound coverage following adequate debridement.**Table 4:** Treatment outcomes

Variables	Frequency	Percentage
Mastectomy		
None	21	80.80
Both	2	7.70
Right	1	3.80
Left	2	7.70
Complications		
None	18	69.2
Tetanus	1	3.80
Extension*	6	23.10
Septic shock	1	3.80
Outcomes		
Discharged without wound	6	23.10
Discharged with a residual wound	19	73.10
Discharged against medical advice	1	3.80
Died	0	0.00

duration of hospital admission was 22 days (range: 4–59 days). Split-thickness skin grafting was the only reconstructive procedure performed, although several patients were discharged with residual wounds awaiting definitive wound coverage (Table 4). No deaths were recorded during the study period.

DISCUSSION

Necrotizing fasciitis of the breast is an uncommon but potentially life-threatening infection that requires a high index of suspicion for early diagnosis and prompt intervention. Delayed presentation and treatment often result in extensive tissue destruction, prolonged hospitalisation, and the need for multiple surgical procedures. The findings of this study highlight the considerable morbidity associated with this condition in a resource-limited setting.

The mean age of the patients in this series was 27 years, indicating that breast necrotizing

fasciitis predominantly affected young women in their reproductive years. This finding is comparable to reports from other studies in which the disease occurred mainly among young lactating women. The predominance of married women and unemployed housewives in this study may reflect the sociodemographic characteristics of the study population rather than a direct risk factor for the disease. Financial dependence may also contribute to delayed healthcare seeking, thereby increasing the risk of disease progression before presentation.¹⁻⁵

Lactational mastitis was the most common predisposing factor, accounting for nearly three-quarters of the cases. This finding is consistent with previous reports identifying inadequately treated mastitis as the principal antecedent of breast necrotizing fasciitis. Milk stasis, bacterial invasion through nipple fissures, and delayed initiation of appropriate antimicrobial therapy facilitate rapid spread of infection along the fascial planes.^{2,4,6}

Approximately one-quarter of the patients had no identifiable underlying breast pathology and were classified as having primary breast necrotizing fasciitis. Although uncommon, spontaneous breast necrotizing fasciitis has been reported in otherwise healthy individuals and may pose a diagnostic challenge because of its rarity. Clinicians should therefore maintain a high level of suspicion in patients presenting with severe breast pain that is disproportionate to the apparent clinical findings, particularly when accompanied by systemic features of sepsis.^{7,8}

All patients in this study had extensive skin necrosis, while more than one-third also had breast parenchymal necrosis. Bilateral breast involvement was observed in a substantial proportion of patients, reflecting the severity of disease at presentation. Such extensive tissue destruction has been associated with delayed presentation, inappropriate initial treatment, and the use of traditional remedies before seeking hospital care. Similar observations have been reported in other studies from low- and middle-income countries.⁹⁻¹¹

Staphylococcus aureus was the most frequently isolated organism, although polymicrobial infections are well recognised in necrotizing fasciitis. Culture-negative cases may have resulted from prior antibiotic use before hospital presentation, while unavailable culture reports reflect the challenges encountered in resource-limited healthcare settings. Broad-spectrum empirical antimicrobial therapy should therefore be commenced promptly and subsequently tailored according to culture and antimicrobial susceptibility results whenever available.¹²⁻¹⁴

Anaemia requiring blood transfusion was common in this study, reflecting the extensive tissue destruction, systemic inflammatory response, repeated surgical procedures, and chronic wound exudation associated with the disease. Electrolyte abnormalities, particularly hyponatraemia, were also observed and have been reported as indicators of severe necrotizing soft tissue infection. Appropriate resuscitation and correction of metabolic derangements remain integral components of management.^{15,16}

Repeated aggressive surgical debridement formed the cornerstone of treatment in all patients. Mastectomy was required in selected patients with extensive destruction of the breast parenchyma that precluded breast conservation. This approach is consistent with current recommendations advocating early and repeated debridement until all non-viable tissue has been removed. Delayed or inadequate debridement has consistently been associated with poorer clinical outcomes.¹⁷⁻¹⁹

Split-thickness skin grafting was the principal reconstructive option used in this series. Although more complex reconstructive techniques, including local, regional, and free flaps, have been described, these procedures are often unavailable or unaffordable in many resource-limited settings. Consequently, split-thickness skin grafting remains a practical and effective method of wound coverage following satisfactory wound bed preparation.^{20,21}

Despite the severity of the disease, no mortality was recorded in this series. This

favourable outcome may be attributable to aggressive surgical management, multidisciplinary care, and intensive supportive treatment. Nevertheless, the prolonged duration of hospitalisation and the psychological consequences of breast deformity underscore the substantial burden of this disease on affected women.

The retrospective design and relatively small sample size constitute important limitations of this study and may limit the generalisability of the findings. In addition, incomplete microbiological data in some patients restricted comprehensive evaluation of the bacteriological profile. However, the study contributes valuable information on a rare condition from a resource-constrained environment where published data remain limited.

CONCLUSION

Breast necrotizing fasciitis is a rare but devastating surgical emergency associated with significant morbidity, particularly among young lactating women. Delayed presentation, inappropriate initial treatment, and the use of traditional remedies contribute to disease progression and extensive tissue destruction. Early diagnosis, prompt resuscitation, aggressive surgical debridement, appropriate antimicrobial therapy, and multidisciplinary care are essential for achieving favourable outcomes. Public health education on early presentation for breast infections and improved access to specialist surgical care may further reduce disease-related morbidity.

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