Case Report

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Surgery Section

Antibioma of the Breast in a Non-lactating Woman with Methicillin-resistant Staphylococcus aureus: A Case Report

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ABSTRACT

Antibioma of the breast is a chronic inflammatory pseudotumour that forms when a breast abscess undergoes partial sterilisation by antibiotic therapy in the absence of surgical drainage. It remains poorly documented, and reports involving non-lactating women are scarce. A 22-year-old non-lactating woman presented with a two-month history of left retroareolar breast swelling that had not responded to sequential courses of oral second- and third-generation cephalosporins. Examination revealed a 4×3 cm retroareolar mass with nipple retraction and erythema, raising clinical concern for inflammatory breast carcinoma. Breast ultrasonography confirmed a 3.4×2.2 cm hypoechoic collection with internal debris. Culture from ultrasound-guided aspiration grew Methicillin-resistant Staphylococcus aureus (MRSA), resistant to the beta-lactam agents used in both prior courses and susceptible to ciprofloxacin, which explained the earlier treatment failures. Cytology excluded malignancy. The patient underwent circumareolar incision and drainage under general anaesthesia with breakdown of loculations and wound packing. Ciprofloxacin was administered per the culture sensitivity results postoperatively. Delayed primary closure on day 7 resulted in complete resolution. Histopathology confirmed antibioma. Two features make this case unusual: the patient was a non-lactating woman with nipple retraction mimicking carcinoma, and the causative organism was MRSA and therefore resistant to both prescribed cephalosporin courses from the outset.

Keywords: Antibiotic resistance, Breast abscess, Incision and drainage, Non-lactational mastitis

CASE REPORT

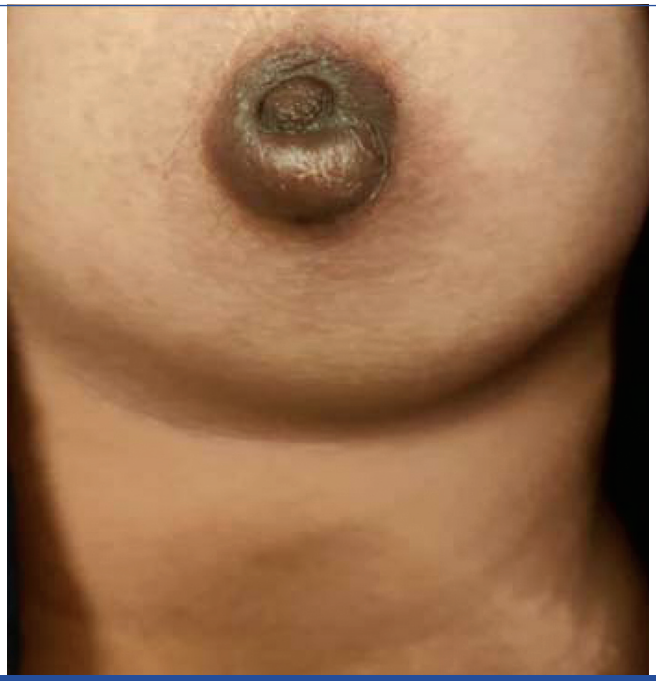
A 22-year-old non-lactating woman presented to a tertiary care hospital with a two-month history of left retroareolar breast swelling. The swelling had begun as erythema and induration of the left breast, for which she was started on an oral second-generation cephalosporin for seven days at a local hospital. The erythema partially settled but the mass did not. The antibiotic was escalated empirically to a third-generation cephalosporin, which was given for two weeks, again without microbiological guidance, with no response. By the time of referral, the mass had become painless.

She had no personal or family history of breast malignancy, and no history of diabetes mellitus, smoking, or breast trauma.

Examination revealed a 4×3 cm retroareolar mass extending into the outer quadrants of the left breast, with overlying erythema and nipple retraction [Table/Fig-1]. There was no spontaneous discharge, axillary lymphadenopathy, or contralateral breast abnormality.

Baseline blood investigations were within normal limits. Breast ultrasonography showed a 3.4×2.2 cm hypoechoic lesion with internal echogenic debris and minimal peripheral vascularity. Ultrasound-guided aspiration was performed before any surgical decision. Culture of the aspirate grew MRSA. Identification and susceptibility testing were performed on an automated VITEK 2 system. The cefoxitin screen was positive, confirming methicillin resistance; the isolate was resistant to benzylpenicillin, oxacillin, erythromycin and clindamycin; the D-test was negative for inducible clindamycin resistance, and the isolate was susceptible to ciprofloxacin, vancomycin, linezolid, gentamicin, trimethoprim–sulfamethoxazole, tetracycline and rifampicin [Table/Fig-2]. Resistance to the beta-lactam agents used in both earlier courses accounted for the treatment failures. Cytology showed acute suppurative inflammation with no malignant cells.

Circumareolar incision and drainage was performed under general anaesthesia [Table/Fig-3]. Approximately 30 mL of gelatinous,

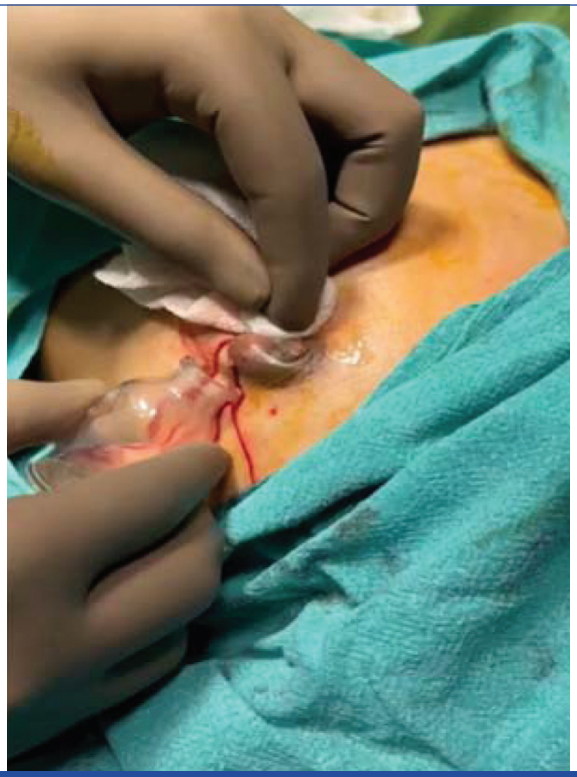


[Table/Fig-1]: Preoperative photograph of the left breast showing nipple retraction with periareolar erythema and induration.

Antimicrobial agent	MIC (µg/mL)	Interpretation
Cefoxitin screen	POS	Positive
Benzylpenicillin	≥0.5	R
Oxacillin	≥4	R
Ciprofloxacin	≤0.5	S
Linezolid	2	S
Vancomycin	1	S
Gentamicin	≤0.5	S
Erythromycin	≥8	R

Clindamycin	≥4	R
Inducible clindamycin (D-test)	NEG	Negative
Trimethoprim–sulfamethoxazole	≤10	S
Tetracycline	≤1	S
Rifampicin	≤0.5	S

[Table/Fig-2]: Antimicrobial susceptibility panel of the Staphylococcus aureus isolate (VITEK 2).
MIC: Minimum inhibitory concentration; R: Resistant; S: Susceptible; POS: Positive; NEG: Negative



[Table/Fig-3]: Intraoperative photograph showing evacuation of organised, gelatinous purulent material through a circumareolar incision.

organised purulent material was evacuated and fibrous loculations systematically broken down. The wound was irrigated and loosely packed. Oral ciprofloxacin (500 mg twice daily for 5 days), to which the isolate was susceptible, was commenced as an agent suitable for outpatient treatment. Daily dressings were continued until healthy granulation tissue covered the wound bed at five to seven days, after which delayed primary closure was performed under local anaesthesia. Immediate primary closure was avoided because closure of a contaminated cavity could potentially predispose to persistent infection or recurrence. Healing by secondary intention, although an accepted option, would likely require prolonged wound care, delay recovery, and result in a less favourable cosmetic outcome in breast tissue. Delayed primary closure therefore represented a balanced approach, combining initial infection control with subsequent definitive wound closure. Histopathological examination of the drained cavity wall showed a dense fibrocollagenous wall with prominent granulation tissue and a chronic inflammatory infiltrate composed mainly of lymphocytes and plasma cells, with scattered neutrophils and focal areas of fibrosis, consistent with an organising abscess. No epithelial lining was identified. There was no granulomatous inflammation and no evidence of malignancy. The findings were consistent with an antibioma.

At two-week follow-up, sutures were removed, wound healing was complete, and the patient was asymptomatic with no clinical evidence of recurrence.

DISCUSSION

Breast infections are common in women of reproductive age. Abscess formation occurs when mastitis or cellulitis is inadequately treated, most commonly in the lactational setting, though non-lactational retroareolar infections tend to be recurrent and diagnostically challenging [1,2]. When antibiotics suppress but do not eradicate infection, and drainage is withheld, the cavity wall organises into granulation tissue and fibrous stroma. The resulting firm, culture-quiet mass may be clinically and radiologically indistinguishable from malignancy [3,4]. The differential diagnosis and basis for exclusion are provided in [Table/Fig-4].

Diagnosis	Features supporting	Features against	Basis for exclusion
Non-lactational breast abscess	Retroareolar collection, S. aureus on culture	No resolution on two antibiotic courses; organised fibrous content	Antibioma is the chronic sequela; confirmed histopathologically
Granulomatous mastitis	Non-lactating, chronic retroareolar mass, nipple retraction	Positive bacterial culture; suppurative, not granulomatous, histology	Excluded on histopathology
Inflammatory breast carcinoma	Nipple retraction, persistent mass, failed antibiotics	No peau d'orange; cytology and histopathology both negative for malignancy	Excluded by dual tissue diagnosis (aspiration cytology + surgical histopathology)
Periductal mastitis	Non-lactating, periareolar location, nipple retraction	Acute bacterial culture; suppurative, not duct ectasia, histological pattern	Excluded on microbiological and histopathological findings

[Table/Fig-4]: Differential diagnosis and basis for exclusion.

Hazarika K et al., reported a gestational antibioma with beta-lactam-sensitive S. aureus, which responded to standard drainage and ampicillin-cloxacillin [5]. The present case differs in three clinically meaningful respects: non-lactating patient, retroareolar location with nipple retraction, and documented methicillin resistance (MRSA).

Antibiomas are usually described as partially sterilised collections, in which antibiotics suppress a susceptible organism without eradicating it [2]. This case sits slightly outside that description. The isolate was resistant to every agent given before referral, so the collection was never effectively treated; the antibiotic courses only marked time while the cavity wall organised. An undrained abscess is also a protected space into which systemic antibiotics penetrate poorly, and breast abscesses seldom resolve on antibiotics alone without drainage. Viable organisms therefore persisted because of both intrinsic antimicrobial resistance and the absence of adequate source control. Histopathology demonstrated an organised fibrous wall with chronic inflammation, supporting the diagnosis of antibioma despite persistence of viable organisms within the cavity.

Several factors predispose to non-lactational breast abscess. Cigarette smoking carries the strongest association and acts largely through periductal inflammation and duct ectasia, while diabetes, obesity, piercing, immunosuppression and hyperprolactinaemia are also recognised [2,6]. This patient had none of these - no diabetes, no smoking, no trauma - leaving the resistant organism and the delay in adequate drainage as the main drivers of her prolonged course.

This case suggests delayed primary closure is a feasible option after adequate debridement in selected patients with breast antibioma, provided infection is controlled and the wound bed is healthy. Whether it offers any advantage over healing by secondary intention or immediate closure is unclear from a single case and requires evaluation in larger series.

CONCLUSION(S)

Methicillin resistance in the causative organism explained both treatment failures and could have been identified earlier had microbiological culture been obtained before antibiotic escalation. Delayed primary closure at seven days provided a satisfactory outcome in this patient and may represent a useful management option after adequate infection control.

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