

Research Letter

Puerperal breast abscess caused by oxacillin-resistant *Staphylococcus aureus* successfully treated by aspiration and antimicrobial therapy

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The most common pathogen isolated from cases of puerperal mastitis is *Staphylococcus aureus*, representing 35–50% of isolates and being associated with a higher risk of abscess formation [1]. Recently, oxacillin-resistant *S aureus* (ORSA) has been reported to be the main pathogen in puerperal mastitis [2]. In the study of all cases of postpartum mastitis that were culture positive for *S aureus*, 44% isolates were oxacillin resistant [2]. Traditionally, a breast abscess was drained with surgical incision under general anesthesia followed by regular wet dressing and secondary wound closure [3]. However, the considerable pain and hospitalization often leads to early weaning from breastfeeding. A less invasive alternative is ultrasound-guided needle aspiration using local anesthesia [4]. Here, we present a case of ORSA puerperal mastitis with abscess formation successfully treated with aspiration and antimicrobial therapy.

A 27-year-old woman had her first baby born via a vaginal delivery, and she expressed milk with a breast pump for feeding. Five weeks after delivery, a tender mass was found in the left upper quadrant of her right breast; and the skin became red and warm. Amoxicillin-clavulanate was prescribed by her obstetrician as empiric treatment. Because the local heat and redness progressed in the following 2 days, she came to our clinic for a second opinion.

The redness was measured as being 15 cm wide. Breast sonar revealed two breast abscess loci. The shallower one was about 3 cm wide but the deeper one was beyond the limitations of our linear ultrasound probe (20 MHz; Toshiba, Japan). Under the guidance of ultrasound, 3 mL of pus was aspirated from the shallower abscess. The deeper abscess was difficult to be approached (Fig. 1). The empiric antimicrobial agent was shifted to a combination of amoxicillin-clavulanate and

trimethoprim-sulfamethoxazole. Four days later, a culture of the pus yielded growth of ORSA. The culture of expressed milk showed mixed growth of ORSA and oxacillin-resistant coagulase-negative staphylococcus. By the disc diffusion method, both strains were susceptible to trimethoprim-sulfamethoxazole, fusidic acid, teicoplanin, and vancomycin. Trimethoprim-sulfamethoxazole was maintained according to the susceptibility test. Breastfeeding continued after confirming her baby was not suffering from glucose-6-phosphate dehydrogenase (G6PD) deficiency by newborn blood screening at the birth of the baby.

At her follow-up visit 1 week later, the redness and local heat of the right breast had decreased and the tender area shrunk. The shallower abscess had disappeared (Fig. 2) and the width of the deeper abscess remained about 4 cm (Fig. 3). The deeper abscess was aspirated and the culture also showed growth of ORSA.

At her follow-up visit 2 weeks later, the skin redness had disappeared and only a 1 cm nontender anechoic area was found by ultrasound on the previous lesion. The fluid content of the anechoic area was aspirated under guidance of ultrasound. Minimal blood-tinged yellowish fluid was aspirated and culture did not yield growth of bacteria. No abscesses or skin change were detected at the 4-week follow-up visit.

Puerperal mastitis is not an uncommon complication among breastfeeding women. Only 10–15% of patients with puerperal mastitis require medical intervention, such as antimicrobial therapy, and about 10% of puerperal mastitis cases progress to abscess formation.

In the guideline provided by World Health Organization (WHO) of treating puerperal mastitis, the main principles of treatment of mastitis include supportive counseling, antibiotic therapy, symptomatic treatment, and effective milk removal. Besides, abscesses must be drained to improve outcome [5]. In WHO guideline, breastfeeding should be continued by keeping baby with the mother both before and after surgery,

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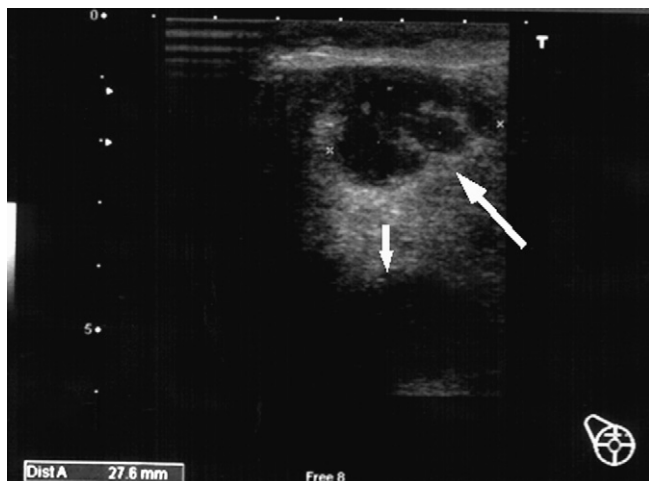


Fig. 1. Breast ultrasound: An abscess in width of 2.76 cm (big arrow) and another deeper abscess was beyond the detection of the ultrasound probe (small arrow).

expressing maternal milk, and trying feeding from the affected side as far as the pain of the wound allows [5]. In the present case, the deeper abscess that could not be approached also showed a response to the effective antimicrobial agent. Adequate antimicrobial therapy is therefore important for patients with abscesses that cannot be drained completely. Compared with traditional incision and drainage, ultrasound-guided needle aspiration is less invasive and with better cosmetic outcomes. In addition, breastfeeding is considerably easier for a patient without a retained open wound.

In puerperal breast abscesses, *S aureus* is the most frequent pathogen [1]. Penicillinase-stable penicillins, such as oxacillin, have become the mainstay of treatment of staphylococcal infections [6]. According to the recommendations of the WHO, empiric therapy often starts with dicloxacillin, cephalixin, amoxicillin, or erythromycin [5].

Because of cross-resistance, ORSA is often resistant to all β -lactam antibiotics, such as cephalosporins; penicillins, including amoxicillin; and even in combination with a β -lactamase inhibitor [6]. Among *S aureus* isolates from



Fig. 3. Breast ultrasound: The deeper abscess shrunk 1 week after needle aspiration (arrow).

patients with soft tissue infections, the prevalence of ORSA has been reported to be around 60% and there is little difference in rates of oxacillin resistance between community and hospital strains [7,8]. In a study on patients with puerperal mastitis requiring hospitalization, 59% of cultures from cases with breast abscesses were proven to be ORSA [9]. Fortunately, community-acquired ORSA strains are usually susceptible to oral non- β -lactam agents, such as clindamycin, erythromycin, trimethoprim-sulfamethoxazole, and fusidic acid.

Trimethoprim-sulfamethoxazole is a cost-effective alternative weapon against ORSA [10]. On the aspect of neonatal risk, the American Academy of Pediatrics' Committee on Drugs considers trimethoprim-sulfamethoxazole to be compatible with breastfeeding, but caution should be taken against sulfamethoxazole use in infants with known G6PD deficiency [11]. Thus, newborn blood screening for G6PD deficiency, also known as favism, provides important information for antimicrobial selection.

In conclusion, ORSA has emerged as a potential pathogen in puerperal mastitis, especially for those who do not respond to empiric β -lactam therapy or in the formation of abscesses. Puerperal mastitis complicated by abscess formation can be cured by needle aspiration and adequate antimicrobial therapy. Culture-proven ORSA infection should be treated with a non- β -lactam agent based on susceptibility results.

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Fig. 2. Breast ultrasound: The shallower abscess was measured at a width of 1.2 cm 1 week after needle aspiration (arrow).

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