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Case report

Neonatal breast swelling – not always physiological

Inês Pedrosa[1], Catarina Cordeiro[2], João do Agro[1]

[1]Department of Pediatrics, Centro Hospitalar de Leiria, Leiria, Portugal

[2]Department of Pediatrics, Hospital Pediátrico, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal

Abstract

Neonatal mastitis is a rare condition, usually with a good prognosis and no recurrence. Characteristic clinical findings are unilateral swelling, erythema, warmth, tenderness, and/or induration of the breast. Systemic symptoms are uncommon. The microbiological diagnosis is an important step in the clinical approach, with *Staphylococcus aureus* being the most identified causative organism. Treatment recommendations include antibiotic therapy followed by either surgical incision or needle aspiration if medical therapy fails.

A previously healthy, 38-day-old girl presented with a 2-week history of breast asymmetry, initially discrete and then followed by a gradual increase in size and inflammatory signs of the left breast. On physical examination, she had unilateral swelling, erythema, warmth and induration of the left breast, fluctuation and nipple involution. No purulent discharge was observed. She underwent an ultrasound that revealed a breast abscess. She was started on oral antibiotics, with a posterior switch to the parenteral route, but no clinical improvement was found. Therefore, the patient was referred to surgical drainage, with a good clinical evolution afterward.

In conclusion, the diagnosis of neonatal breast abscess was made due to exuberant clinical inflammatory local signs and poor response to oral antibiotic therapy. It was successfully treated with combined surgical and medical management. This case shows that a good outcome may be achieved with timely diagnosis and adequate treatment.

Keywords

Hypertrophy of the breast, neonatal mastitis, breast abscess, newborn.

Corresponding author

Inês Pedrosa, Department of Pediatrics, Centro Hospitalar de Leiria, Rua das Olhalvas, 2410-197 Leiria, Portugal; tel.: 00351244817000; email: inesverissimop@gmail.com.

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Case report

A 38-day-old girl was admitted to our Pediatric Emergency Department (ED). She was born by vaginal delivery at 38 weeks of gestation, with an Apgar score of 9/10 and a birth weight of 2,830 g. No pregnancy complications were reported. She was exclusively breastfed, with a good weight gain. Her mother stated that the child had been previously healthy, until 2 weeks before, when she noticed a unilateral swelling of the breast, followed by a gradual increase in size and inflammatory signs. She denied compressing the nipple on previous days or any other symptoms such as fever, vomiting, diarrhea or poor feeding.

A week prior to admission, the patient was presented to a routine appointment with her physician, and the breast asymmetry was attributed to physiologic breast hypertrophy in female infants. She was sent home and, followed up 5 days later, an ultrasound (US) of the breast was ordered, and she was started on oral antibiotics (amoxicillin-clavulanic acid 50 mg/kg every 8 hours). She was then referred to the ED when improvement was not found after 36 hours of oral therapy.

On admission, she was well-appearing, with unilateral swelling, erythema, warmth, tenderness, and induration of the left breast. The mass was fluctuant, and there was nipple involution (**Fig. 1**). No purulent discharge from the nipple was observed. Laboratory analysis showed leukocytosis (white blood cell counts 20,500/μL, neutrophil counts 8,500/μL), C-reactive protein was 12.1 mg/L and platelets were 649,000/μL. Blood cultures were not drawn. US examination showed a heterogeneous hypoechoic area in the left nipple region, with 29 x 16 mm, suggesting a breast abscess. At this point, she was admitted to the Neonatal Special Care Unit with the diagnosis of neonatal mastitis complicated with breast abscess, and parenteral antibiotic therapy (oxacillin 150 mg/kg every 8 hours) was started.

There was a lack of clinical improvement 2 days after admission, including persistent painful swelling, erythema and fluctuation of the breast, so a surgery consultation in a tertiary center was requested.

The girl underwent incision and drainage of the abscess, and progressive improvement of inflammatory signs and breast engorgement was noted. The surgical drain was removed 3 days after the procedure. Parenteral antibiotic therapy was changed to amoxicillin-clavulanic acid 150 mg/kg every 8 hours until the results of the cultures became available and, subsequently, completed a course of oral antibiotics (amoxicillin-clavulanic acid 50 mg/kg every 8 hours). The cultures were positive for *Staphylococcus aureus* susceptible to amoxicillin-clavulanic acid. She was transferred back to our hospital 5 days after surgical drainage, with good general condition and good oral intake. There was still discreet swelling of the left breast (**Fig. 2**);

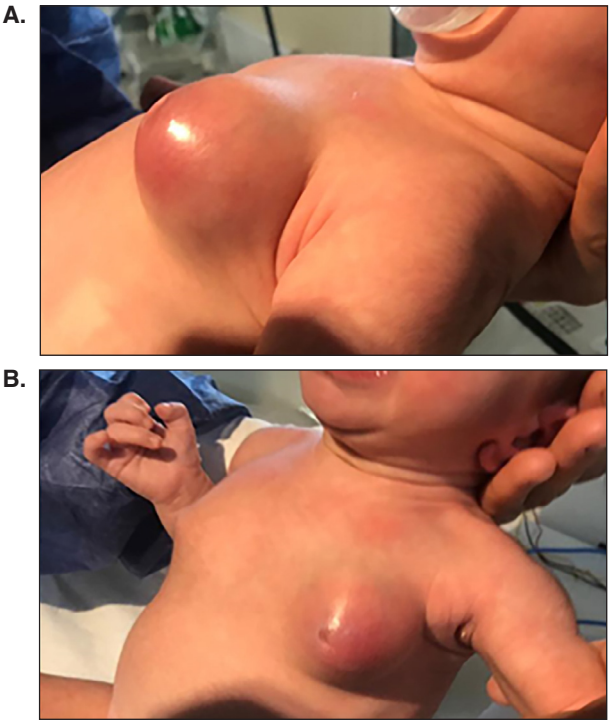

Figure 1. The patient upon presentation to the Emergency Department (ED).

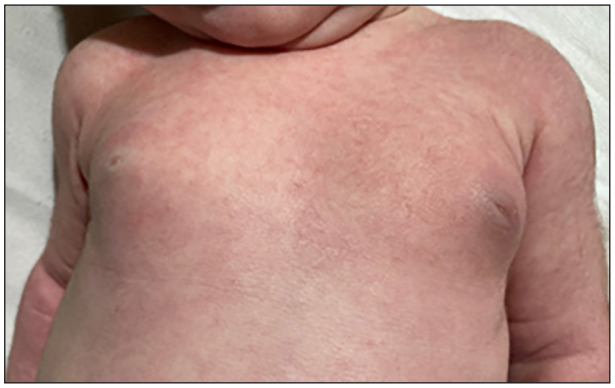

Figure 2. The patient after abscess drainage and 1-week antibiotic therapy.

however, she was discharged and completed outpatient antibiotic therapy (a total of 14 days). A routine visit was scheduled for clinical assessment 1 week after discharge; she was doing well with complete resolution of the condition.

Discussion

Mastitis is defined as an inflammatory process of the breast, which may or may not be accompanied by infection. Mastitis with or without breast abscess in the neonatal period usually occurs in term infants. There is a peak incidence around the third week of life, with mastitis appearing earlier at 2 weeks of life and mastitis with abscess at 4 weeks [1-4]. This is in line with what happened to our patient. During the first 2 weeks, neonatal mastitis appears with equal frequency in both genders. Thereafter, it becomes more common in females, with a ratio of about 2:1 [1, 2].

The pathophysiology of neonatal mastitis is related to the physiological hypertrophy of the breast of the newborn, induced by *in-utero* exposure to maternal estrogens [2, 5]. Infection is usually triggered by the presence of potentially pathogenic bacteria on the skin and/or mucous membranes that, using the nipple as a gateway, reach the breast parenchyma. *Staphylococcus aureus* is the most common causative organism (> 75-80%), with only occasional Gram-negative bacteria and a few reports of anaerobic bacteria [4, 5].

Neonatal mastitis usually presents with erythema, edema, warmth, hypersensitivity and local hardening and is usually unilateral [2, 5]. Systemic symptoms are rare [4]. Purulent exudate exiting through the nipple or formation of an abscess may also occur. Although infant mastitis is usually uncomplicated, cases of extensive cellulitis, necrotizing fasciitis, and osteomyelitis have been reported [5].

A US exam should be performed if a developing abscess is suspected, there is a delayed response to antibiotics, or a diagnosis of mastitis is in question [6].

In our case, the diagnosis of neonatal mastitis with abscess was suspected when the patient was not improving despite oral antibiotic therapy, and further corroborated by the US results. She underwent incision and drainage of the breast abscess. Later, *Staphylococcus aureus*, sensitive to amoxicillin-clavulanic acid, was identified in the abscess drainage culture.

Regarding treatment, current recommendations are to initiate antibiotic therapy followed by either surgical incision or needle aspiration if medical therapy fails (when spontaneous drainage does not occur) [2, 4, 6]. Some authors defend initial treatment with parenteral antibiotics, given the risk of developing breast abscess in infants treated with oral antibiotics [2-4]. The treatment failure may be due to poor antibiotic compliance, poor oral antibiotic absorption with inadequate levels to penetrate the abscess site, and the need for adequate drainage [7, 8]. The choice of empirical antibiotic therapy should be guided by knowledge of the germs usually involved and by local patterns of susceptibility [2, 8]. Afterward, breast pus culture should be performed in order to tailor therapy. The necessity of blood culture is uncertain and arguably of low utility in afebrile and well-appearing infants [9].

In most cases, the prognosis is excellent, and recurrences are rare [1, 3, 5]. Published data regarding the long-term impact of neonatal mastitis (with or without abscess) on the developing breast is limited [10]. However, cases of breast asymmetry (hypoplasia or formation of scar tissue) after incision and abscess drainage have been reported [4, 5, 10]; therefore, the procedure should be performed by appropriately trained personnel [5].

Overall, neonatal mastitis is a rare condition, with a good prognosis when properly treated. This case highlights the importance of a timely diagnosis and prompt surgical drainage for a good clinical outcome. A 6-month follow-up revealed no recurrence or complications after this episode, with a good weight and developmental status.

Informed consent

Written informed consent was obtained from the parents of the child.

Declaration of interest

The Authors have no conflicts of interest to declare. Funding: the Authors received no financial support.

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