

Sonographic Features of Physiologic Neonatal Breast Enlargement

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ABSTRACT

The varying presentations of neonatal breast enlargement on imaging have been underreported in the literature. Our case report profiles a 3-week-old female patient who presented with a history of left breast enlargement with redness and tenderness for 2 days, who was clinically diagnosed and managed for neonatal mastitis, which was actually a neonatal breast enlargement with adjacent cellulitis. Awareness that physiologic neonatal breast enlargement can be associated with adjacent cellulitis without mastitis can prevent unnecessary hospitalization and treatment with parenteral antibiotics.

Key words:

Cellulitis, neonatal breast enlargement, neonatal mastitis

INTRODUCTION

Breast enlargement is a common condition that occurs in both male and female neonates, due to the influence of maternal hormones during the fetal life. However, neonatal breast enlargement rarely present with sonographic features that can be misinterpreted as neonatal mastitis which mandates hospitalization and parenteral antibiotic treatment.

We present a female neonate with tender unilateral breast enlargement associated with overlying skin discoloration and sonographic appearance of breast tissue similar to that of the contralateral asymptomatic breast tissue.

CASE REPORT

A full term, previously healthy 3-week-old female patient who was brought to the out-patient clinic with left breast enlargement, redness and tenderness for 2 days and history of some clear, non-bloody, milk-like discharge from the left nipple. The prenatal history included normal pregnancy with normal vaginal delivery and no maternal infections during the pregnancy. The neonate was afebrile but showed slightly decreased activity. Her vital signs were stable. Left breast examination showed a 3 × 4.5 cm erythematous region overlying a firm, tender, palpable subareolar breast mass with no nipple discharge and no evidence of enlarged axillary lymph nodes. Right breast examination showed a palpable, non-tender right subareolar mass without overlying skin discoloration. Laboratory results for cell count showed no evidence of sepsis. Blood sample was sent for culture and sensitivity. Since, there was no nipple discharge at examination, culture of the discharge was not performed.

However, nasal swab was tested for methicillin-resistant *Staphylococcus aureus* (MRSA) by polymerase chain reaction technique which was negative. Based on the clinical findings of tender left breast swelling with overlying skin redness and nasal swab negative for MRSA, the neonate was admitted for management of neonatal mastitis and started on parenteral clindamycin therapy. Ultrasonography of the left breast 1 day after hospitalization demonstrated a retroareolar heterogeneously hypoechoic mass measuring 3.6 × 1.4 × 3.0 cm with tiny cysts, internal vascularity and adjacent soft-tissue hyperechogenicity [Figures 1 and 2]. Sonography of the right breast showed a retroareolar mass measuring 2.0 × 0.9 × 2.0 cm with sonographic features similar to the left breast mass. No loculated fluid collections were seen in either breast mass. Since, the clinical reassessment after breast sonogram showed improvement in skin discoloration and breast tenderness, the patient was transitioned to oral clindamycin and discharged on the 3rd day of hospitalization to complete a total 10 day course of antibiotics. The blood culture showed no growth of bacteria

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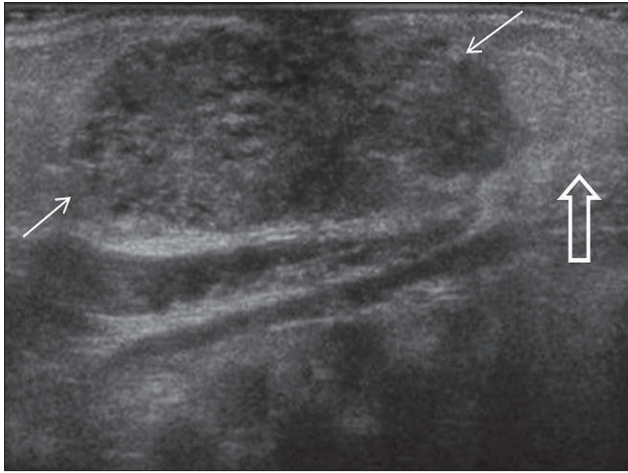


Figure 1: Ultrasound of left breast mass in radial plane shows a well-defined, oval, heterogeneously hypoechoic retroareolar mass (short arrows) with tiny cysts and hyperechogenicity of surrounding subcutaneous soft-tissues (open arrow)

or yeast after 5 days. Follow-up ultrasonography performed 26 days later showed complete resolution of left breast mass and decreased size of the right breast mass.

DISCUSSION

The embryology of breast development involves the precursor of breast originating as early as 6 weeks of intrauterine life.^[1] Neonatal breast enlargement is defined as the benign proliferation of glandular tissue. It is believed to be due to crossing of estrogens across the placenta into the fetal circulation or a normal response to dropping estrogen levels in the maternal circulation toward the end of pregnancy, which may trigger the secretion of prolactin from the neonate's pituitary gland.^[2-4] Neonatal breast enlargement is asymptomatic or physiological in 60-90% of neonates and can be unilateral or bilateral, more frequently bilateral.^[4,5] It usually presents in the 1st week of life and usually resolves spontaneously within 6 months of age, but may take longer in some babies.^[2] Less often, there can be some liquid secretion from an enlarged breast which may disappear with time without treatment.^[2,3] This nipple discharge can be even bloody at times and may be due to mammary duct ectasia. Management of neonatal breast enlargement should mainly involve reassurance to the parents.^[4,6] When the breast bud begins to form, it appears as a retroareolar or subareolar hypoechoic tissue relative to the fat on ultrasound (US).^[1,4] The usual sonographic appearances of neonatal breast enlargement are that of a hypoechoic retroareolar tissue or hyperechoic retroareolar nodule with central star-shaped or linear hypoechoic areas representing simple branched ducts.^[6]

Neonatal mastitis is an infection of the breast tissue, commonly occurring in full term infants since premature

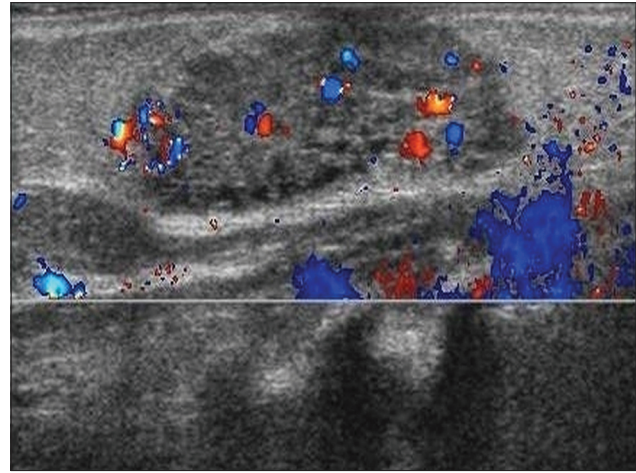


Figure 2: Color Doppler ultrasound of the left breast mass in radial plane shows internal vascularity

infants have underdeveloped breasts that are unlikely to get infected.^[7] It usually occurs under 5 weeks of age with peak incidence at 3 weeks of age.^[4,8-10] It is mostly unilateral with no predilection for right or left breast. In the first 2 weeks of life, it is found in equal frequency in males and females but after 2 weeks of life it is twice more likely in female infants. *Staphylococcus aureus* is the most common causative organism (83-88%).^[4,10] The pathogenesis is unclear. One of the postulates is that the pathogens colonizing in the skin of the breast, nipple and mucous membranes enter through the nipple and mammary ducts to reach the breast, which is engorged under the influence of maternal hormones. However, when the causative organism is a gram negative bacteria, hematogenous spread is a possible explanation.^[8,10] Typical presentation of neonatal mastitis can include unilateral swelling, erythema, warmth, tenderness and induration in the absence of systemic signs of infection. Occasionally, surrounding skin changes and axillary lymph node involvement can occur.^[7,10] When neonatal mastitis is suspected, a full sepsis work-up is recommended which includes blood and nipple discharge culture and sensitivity as well as breast sonography. Current recommendation for neonatal mastitis advocates initial parenteral antibiotic use with good coverage for *Staphylococcus aureus*.^[7] If left untreated, neonatal mastitis can progress to breast abscess formation and rarely lead on to cellulitis, fasciitis, osteomyelitis, brain abscess and generalized sepsis.^[4,8]

The sonographic appearance of neonatal mastitis in four patients has been described by Borders *et al.* as either poorly marginated hyperechoic breast tissue with hypervascularity or as masses with mixed echotexture and internal vascularity. Surrounding hypervascular, hyperechoic subcutaneous fat was seen in all their four patients. One of their patients developed a breast abscess which had a prior appearance of a mass with mixed echogenicity and

now appeared hyperechoic and avascular. Based on the sonographic findings of another patient with breast abscess, they suggest that neonatal mastitis can be differentiated from neonatal breast abscess by the presence of increased peripheral vascularity that they saw surrounding a cystic breast mass.^[8]

In our case, sonography showed heterogeneously hypoechoic retroareolar mass with tiny cysts, internal vascularity and hyperechogenicity of the adjacent subcutaneous fat tissue. Follow-up US on the 26th day showed complete resolution of the symptomatic left breast mass and reduction of size with resolution of cystic changes in the asymptomatic right breast mass. The left breast symptoms of tenderness and skin discoloration in our patient were therefore believed to be due to adjacent cellulitis and not neonatal mastitis for which this neonate was inadvertently hospitalized and treated with parenteral clindamycin.

We believe that heterogeneously hypoechoic retroareolar masses with tiny cysts and internal vascularity should be regarded as an uncommon appearance of asymptomatic neonatal breast enlargement, not to be confused with neonatal mastitis. Sonography in symptomatic neonatal breast enlargement can help to differentiate between this uncommon sonographic appearance of breast tissue accompanied by adjacent cellulitis from neonatal mastitis, thus preventing aggressive management with parenteral antibiotics and hospitalization.

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