



BREAST ULTRASOUND IN PREGNANT AND LACTATING FOR ASSESSMENT OF PHYSIOLOGICAL CHANGES AND PATHOLOGICAL LESIONS- A PICTORIAL REVIEW.

Radio-Diagnosis

Dr. Chetankumar Dhandhalya* MD 3rd Year Resident Doctor MD, Shri M.P. Shah Medical College, Jamnagar
*Corresponding Author

Dr. Shilpa Chudasama MD Associate Professor, Shri M.P. Shah Medical College, Jamnagar

Dr. Rutvik Patel MD 1st Year Resident Doctor, Shri M.P. Shah Medical College, Jamnagar

KEYWORDS

INTRODUCTION

1 Demography

The breast undergoes distinct changes during pregnancy and breastfeeding, which emerge as a variety of clinical and imaging findings. Recognizing the optimum imaging modalities for a given clinical situation by understanding the expected physiologic changes as well as common pathological lesions of the breast are of imminent importance.

2 Problem Statement

Multiple pathologic breast lesions can arise during pregnancy and lactation. Under the influence of hormones resultant physiological changes often mimic other breast diseases and create technical difficulties in accessing pre-existing breast disease. Imaging evaluation and radiological diagnosis requires insight into physiological variations and pathological lesions of pregnant and lactating breast.

OBJECTIVES

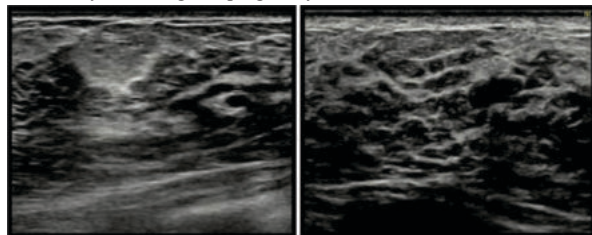
The purpose of this study is to discuss the role of USG in assessment of physiological changes that occur in the breasts throughout pregnancy and lactation along with common pathological lesions in these strata. Imaging protocols, normal imaging appearances and the imaging challenges encountered are also to be assessed.

METHODS AND MATERIALS

Pregnant and lactating asymptomatic females as well as with breast related symptoms were subjected to ultrasound examination on the ground of clinical examination. Gray scale as well as color Doppler ultrasound examination was performed as and when required using linear high frequency transducer and changes were recorded.

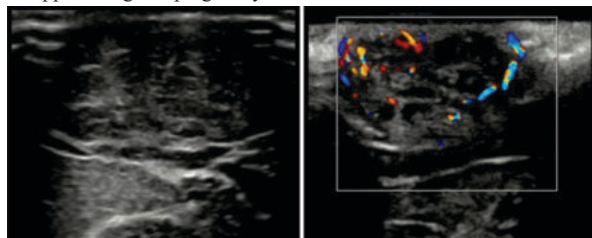
Imaging Findings In Physiological Changes:

1 Parenchymal changes in pregnancy:



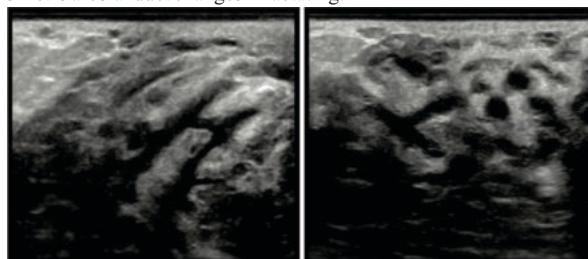
Diffuse enlargement of the non-fatty glandular component with hypo echogenicity and prominent ductal system.

2 Nipple changes in pregnancy:



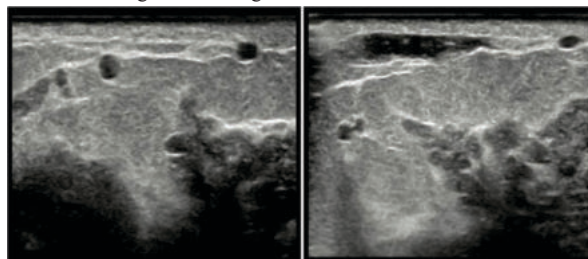
Enlarged hypoechoic nipple with multiple prominent lactiferous ducts and increased vascularity.

3 Retro areolar duct changes in lactating:



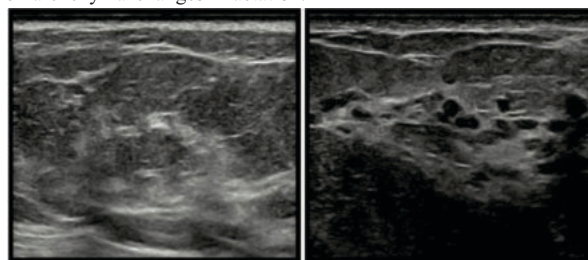
Prominent retro areolar lactiferous ducts along short and long axis with diffuse enlargement of non-fatty glandular component.

4 Vascular changes in lactating:



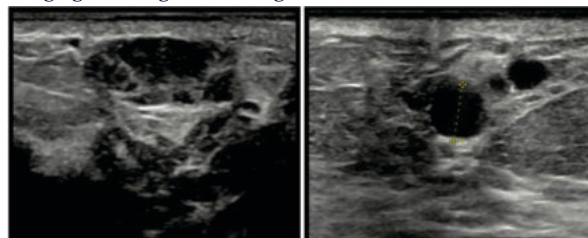
Increased number and calibre of breast vasculatures.

5 Parenchymal changes in lactation:



Diffuse enlargement of glandular component, multiple hyperechoic dots with prominent ductal system and ductal dilatation.

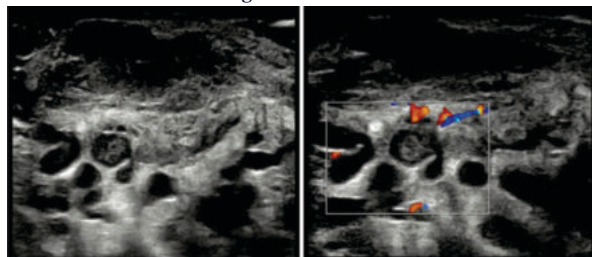
Imaging Findings In Pathological Lesions:



Left fig. : Lactation adenoma: There is oval, circumscribed, heterogeneously hypoechoic mass with mild posterior acoustic enhancement.

Right fig. : Few galactoceles: Few well defined, circumscribed, cystic lesions with low level internal echoes and posterior acoustic enhancement.

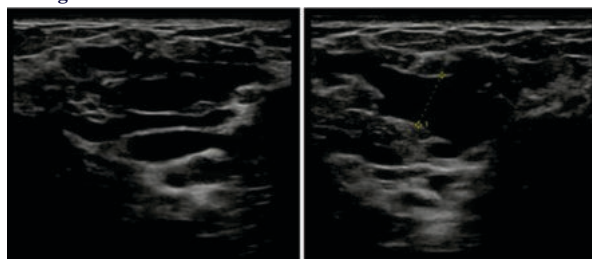
Breast Abscess With Changes Of Mastitis:



Left Fig. : Multiple dilated ducts with internal echogenic content within diffusely hyperechoic and edematous surrounding breast parenchyma. A poorly defined collection with internal echogenic debris suggests abscess formation.

Right Fig. : Color Doppler ultrasound in same patient reveals increased parenchymal vascularity, suggests ongoing inflammation.

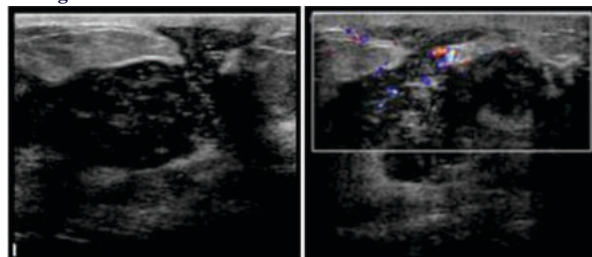
Changes Of Mastitis:



Left Fig. : Multiple dilated branching ducts within echogenic and edematous surrounding breast parenchyma.

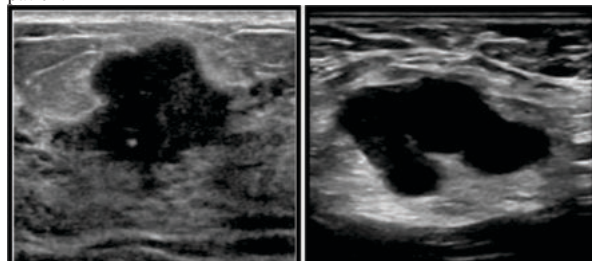
Right Fig. : Marked branching ductal ectasia with echogenic ductal walls and surrounding breast parenchyma in same patient.

Changes Of Granulomatous Mastitis:



Left Fig. : Irregular hypoechoic lesion with tubular extension to subcutaneous tissue and skin associated changes such as skin thickening and echogenicity of surrounding fat tissue.

Right Fig. : Increased intra and perilesional vascularity in same patient



Left Fig. : Pregnancy associated breast cancer: Hypoechoic mass lesion with macro lobulated margin and internal calcification. Internal vascularity was evident on color Doppler ultrasound.

Right Fig. : Metastatic lymph node An enlarged hypoechoic axillary lymph node with abnormal prominent cortex.

DISCUSSION

Ultrasound examination of breast during pregnancy and lactation is useful yet challenging because of physiological and structural changes in breast as to be discussed in table below along with imaging findings in common pathological lesions.

Conditions	Ultrasound findings
Physiological changes in pregnancy	Diffuse hypo echogenicity. Fibro glandular enlargement. Increased vascularity
Physiological changes in lactation	Diffuse hyper echogenicity. Prominent ductal system. Increased vascularity.
Lactating adenoma	Oval or round circumscribed homogeneously hypoechoic lesion with variable posterior acoustic enhancement
Galactocoele	Variable usually oval, rounded, posterior acoustic enhancement.
Mastitis	Dilated ducts, ductal ectasia with internal debris and surrounding inflamed and edematous parenchyma.
Granulomatous mastitis	Variable, usually irregular non circumscribed mass with tubular extension With or without axillary lymphadenopathy With or without hyperemia
Pregnancy associated breast carcinoma	Irregular, non-circumscribed Hypoechoic Posterior shadowing or enhancement With or without antiparallel orientation With or without cystic changes and calcification.

Advantage of ultrasound over other imaging modalities in pregnant and lactating

- Feasible and easy availability.
- No undue radiation exposure to developing fetus.
- Rapid, real time, repeatable without obvious adverse effects.

Limitation of ultrasound over other imaging modalities in pregnant and lactating

- Normal physiological changes during pregnancy and lactation under hormonal influence make it difficult to evaluate, differentiate and characterize pathological lesions.

Concluding Remarks

- Ultrasound is the primary and prominent modality of choice to reach a preliminary diagnosis in breast lesions among pregnant and lactating yet challenging due to various physiological changes.
- Not much variation is there in imaging finding associated with breast lesion among pregnant and lactating and non-pregnant women

REFERENCES

1. Holanda, A. A. R. de, Gonçalves, A. K. da S., Medeiros, R. D. de, Oliveira, A. M. G. de, ... Maranhão, T. M. de O. (2016). Ultrasound findings of the physiological changes and most common breast diseases during pregnancy and lactation. *Radiologia Brasileira*, 49(6), 389–396. doi:10.1590/0100-3984.2015.0076
2. Kieturakis, A. J., Wahab, R. A., Vijapura, C., & Mahoney, M. C. (2020). Current Recommendations for Breast Imaging in the Pregnant and Lactating Patient. *American Journal of Roentgenology*. doi:10.2214/ajr.20.23905
3. Joshi, S., Dialani, V., Marotti, J., Mehta, T. S., & Slanetz, P. J. (2013). Breast disease in the pregnant and lactating patient: radiological-pathological correlation. *Insights into Imaging*, 4(5), 527–538. doi:10.1007/s13244-012-0211-y
4. Geddes, D. T. (2009). Ultrasound imaging of the lactating breast: methodology and application. *International Breastfeeding Journal*, 4(1), 4. doi:10.1186/1746-4358-4-4