

ROLE OF ULTRASOUND IN BREAST CALCIFICATIONS DETECTION

Alaa El Din Mohamed Abd Elhamid Mostafa, Hebatallah Hassan Mamdouh Hassan, Samar Mohamed Abd Elhamid Eshiba,
Mona Abd Elbaset Abd Elwahab Elsheikh

Department of Radiodiagnosis and Intervention, Faculty of Medicine, Alexandria University

Introduction

Breast cancer is the most common cancer in women, accounting for about 1 in 8 cancer diagnoses worldwide. In 2024, there were approximately 2.3 million new cases and 685,000 deaths globally. By 2040, these numbers are estimated to rise to over 3 million cases and 1 million deaths annually.

Mammography plays a crucial role in the early detection of breast cancer, significantly improving treatment outcomes by identifying cancers before symptoms appear. Advances like 3D mammography offer improved detection rates, especially in dense breasts. Despite its benefits, there are certain limitations of mammographic studies as in case of dense breast tissue, technical errors of poor positioning, compression and poor image quality can lead to false negative results.

Ultrasound plays a significant role in breast cancer diagnosis, particularly in specific cases as in dense breast tissue. Ultrasound also plays a role in characterizing the lesion as it aids in differentiation between solid masses and fluid-filled cysts, guiding further diagnostic steps as ultrasound guided breast tissue biopsy. So, it can be a complementary tool alongside mammography to investigate suspicious areas of the breast.

Aim of the work

The aim of this study was to assess the ability of ultrasound in detection of breast calcification correlated with mammography.

Patients and Methods

PATIENTS: This study was performed on female patients, referred to the breast imaging unit department of radio diagnosis and intervention Alexandria Main University Hospital over a period of six months interval, starting from 1/6/2024 till 1/12/2024. All of them were referred for screening or diagnostic mammographic imaging.

METHODS: All patients were subjected to:

- Full history taking including personal data: Personal history included: Name, age, sex,
- Family history included: History of any breast pathology with special concern for breast carcinoma,
- operative history of: Previous operations in the breast. Medical history of: Any pathological breast condition.

•Psychological disturbance. Any other medical condition.

•Imaging investigations: Mammography and US.

Both techniques were performed separately by two different radiologists experienced in breast imaging, who were blind of the findings reported by each other.

Results

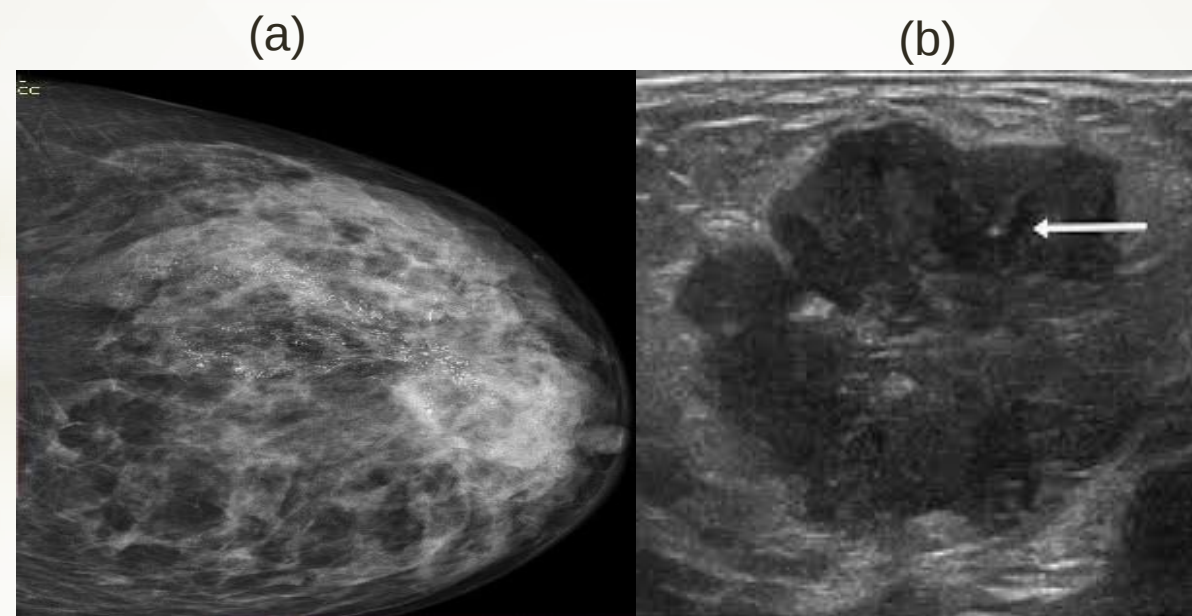


Figure (1): 57 years female patient, complaining of left breast lump and mastalgia with positive family history of breast cancer

CC view and US (a, b) of Left breast showed lower medial infra-areolar iso-dense mass lesion occupying the anterior third of the breast at 1-3 o'clock axis, in mass microcalcifications (arrow)

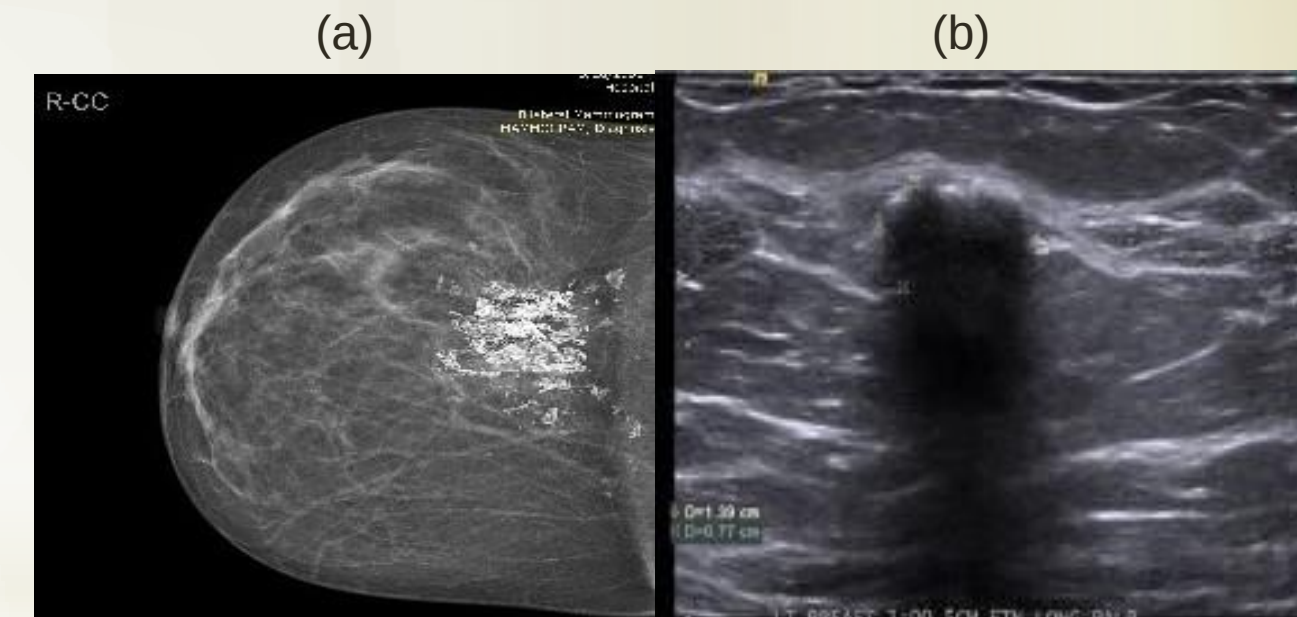


Figure (2): 43 years female patient, complaining of multiple bilateral upper limb dermal lesions, incidentally detected right breast lump, No family history of breast cancer. CC (a), of right breast showing upper outer quadrant ductal wall calcification (>2mm size) of regional distribution.

US (b): large regional coarse calcification with posterior shadowing.

Conclusion

- Mammography is considered as a gold standard for precise assessment of the calcification considering their morphology and distribution pattern
- Unlike mammogram, US can differentiate benign from malignant calcifications but to a certain limit. It fails in detection and verification of diffuse small benign calcifications, and outside mass calcifications. On the other-hand the technique is helpful in identification of calcifications inside the mass or inside the duct.