

IMPORTANCE OF ULTRASOUND IN SCREENING DENSE BREASTS – CASE REPORT

ZNAČAJ ULTRAZVUČNOG PREGLEDA U SKRININGU DOJKI GUSTOG TKIVA – PRIKAZ SLUČAJA

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Case report

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Abstract

Introduction. Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer-related mortality in women. While mammography remains the only screening method proven to reduce breast cancer mortality, its sensitivity is significantly lower in women with dense breast tissue, ranging from 30% to 48%. Supplementary ultrasound screening is effective in detecting mammographically occult cancers in these women. **Case Report.** A 40-year-old female presented for a baseline mammogram, which revealed very dense breast tissue but no pathological changes. However, a cluster of altered lymph nodes was detected in the right axilla. Subsequent ultrasound examination identified speculated soft tissue changes in the retroareolar region of the right breast, as along with pathologically altered lymph nodes in the right axilla. The findings were classified as Breast Imaging-Reporting and Data System 5 I.dex, prompting a CORE biopsy. Pathohistological analysis confirmed breast cancer (Estrogen Receptor 0, Progesterone Receptor 0, Human Epidermal growth factor Receptor 2 3+, Ki-67 Antigen 31%) with axillary metastasis (Estrogen Receptor 0, Progesterone Receptor 0, Human Epidermal growth factor Receptor 2 3+, Ki-67 Antigen 15%). **Conclusion.** Mammography remains the gold standard for breast cancer screening tool but has reduced sensitivity in women with dense breast tissue compared to women with fatty replaced tissue. This case underscores the importance of supplemental ultrasound in detecting mammographically occult breast cancer.

Key words: Fibrocystic Breast Disease; Ultrasonography; Mammography; Breast Neoplasms

Sažetak

Uvod. Karcinom dojke je najčešće dijagnostikovani malignitet i vodeći uzrok smrti od karcinoma kod žena. Mamografija je jedini metod za skrining koji je dokazano povezan sa smanjenjem smrtnosti od karcinoma dojke. Osetljivost mamografije varira i kreće se od 30% do 48% kod žena sa gustim tkivom dojki. Ultrazvuk za skrining je efikasan u otkrivanju mamografski skrivenog karcinoma kod žena sa gustim tkivom. **Prikaz slučaja.** Pacijentkinja starosti 40 godina, dolazi na prvu mamografiju. Na baznom mamogramu vrlo gustih dojki nisu uočene patološke promene u obe dojke. Međutim, u desnoj aksili je uočen konglomerat izmenjenih limfonodusa. Na ultrazvučnom pregledu desne dojke retroareolarno uočene je spikulirana mekotkivna promena, kao i patološki izmenjeni limfni čvorovi u desnoj aksili. Ultrazvučni nalaz desne dojke klasifikovan je kao *Breast Imaging-Reporting and Data System* 5, što ukazuje na visok stepen sumnje na malignitet. Pacijentkinja je podvrgnuta CORE biopsiji, a patohistološki nalaz je pokazao karcinom dojke, sa receptorom estrogena 0, receptorom progesterona 0, receptorom humanog epidermalnog faktora rasta 2 3+, Ki-67 antigen (protein povezan sa proliferacijom ćelija) 31%. Biopsija aksilarnog limfnog čvora takođe je pokazala slične nalaze sa receptorom estrogena 0, receptorom progesterona 0, receptorom humanog epidermalnog faktora rasta 2 3+, Ki-67 antigen (protein povezan sa proliferacijom ćelija) 15%. **Zaključak.** Mamografija je trenutno jedini alat za skrining karcinoma dojke koji je dokazano povezan sa smanjenjem smrtnosti od karcinoma. Međutim, mamografija je manje efikasna u otkrivanju karcinoma kod žena sa gustim tkivom dojki u poređenju sa ženama sa masnim tkivom dojke. Ovaj prikaz slučaja pokazuje značaj dodatnog ultrazvučnog pregleda kod pacijentkinja sa gustim tkivom dojki.

Ključne reči: dojke gustog tkiva; ultrasonografija; mamografija; tumori dojke

Introduction

Breast cancer is the most frequently diagnosed cancer and is the leading cause of cancer related death in women. The global burden of breast cancer continues to rise, with an estimated 2.3 million new cases diagnosed annually [1]. Early detection through screening is crucial for improving survival outcomes,

with studies showing that annual screening beginning at age 40 can reduce breast cancer mortality by up to 40% [2]. Mammography has long been the gold standard for breast cancer screening, and its association with reduced breast cancer mortality has been well established [3]. However, the sensitivity of mammography is variable, ranging from 80% to 98% in women with fatty breast tissue to as low as 30% to

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Abbreviations

BI-RADS– Breast Imaging-Reporting and Data System
 ER – Estrogen Receptor
 PR – Progesterone Receptor
 HER2 – Human Epidermal growth factor Receptor 2
 Ki67 – Ki-67 Antigen (protein related to cell proliferation)

48% in women with dense breast tissue [4]. Dense breast tissue can obscure tumors on mammograms, which increases the likelihood of false negatives and delayed diagnoses [5].

In response to these challenges, ultrasound has emerged as a valuable adjunct to mammography in women with dense breast tissue. Recent studies have shown that screening ultrasound can detect cancers that may be missed on mammograms, particularly in women with high breast density [6]. A study by Glechner et al. [7] demonstrated that adding ultrasound to mammography significantly improved the detection rate of breast cancers in dense-breast women, with a reduction in the number of false negatives. Despite the added benefits, ultrasound screening is not without limitations, breast US has been criticized for increasing the number of false-positive findings [8]. Nonetheless, recent evidence supports the use of supplemental ultrasound screening as an effective means of improving breast cancer detection in women with dense breasts [9]. This case report explores



Figure 2. Ultrasound of the right axilla

the challenges of breast cancer detection in women with dense breast tissue and emphasizes the role of ultrasound in enhancing early diagnosis [10].

Case report

A 40-year-old woman presented for her first baseline mammogram. A previous ultrasound examination had been classified as Breast Imaging-Reporting and Data 2 (BI-RADS 2), indicating no pathological findings. The patient had no significant family history of breast cancer, suggesting a low-risk profile.

The baseline mammogram revealed extremely dense breast tissue (BI-RADS 2), with no visible pathological changes (**Figure 1**). However, a clustered of altered lymph nodes was detected in the right axilla, prompting further evaluation.

A supplementary ultrasound was performed, revealing spiculated soft tissue changes in the retroareolar region of the right breast, measuring approximately 23 x 22 mm (**Figure 2**), and pathologically altered axillary lymph nodes (**Figure 3**). Based on these findings, the classification was upgraded to BI-RADS 5 l.dex, indicating a high suspicion of malignancy.

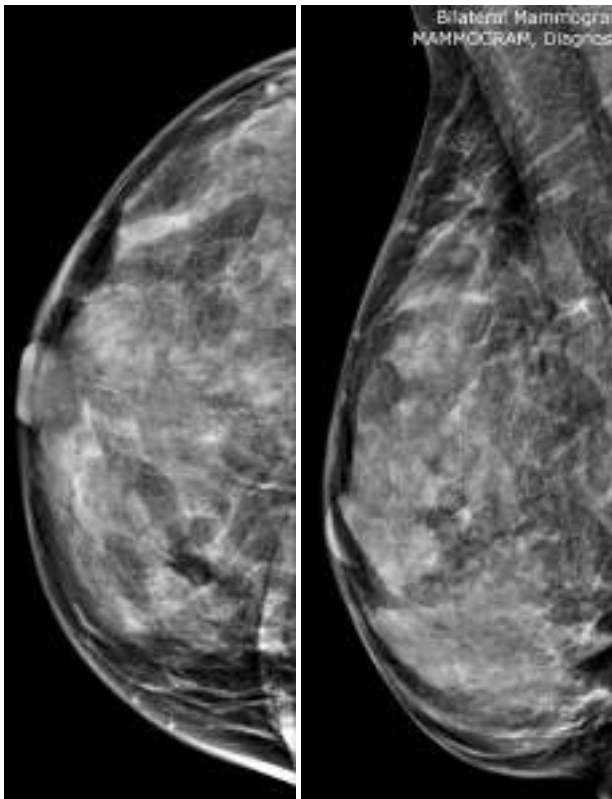


Figure 1. Mammography of the right breast in CC and MLO projection – BI RADS 2



Figure 3. Ultrasound of the right breast – BI RADS 5

The CORE needle biopsy HER2-positive invasive breast cancer with the following markers: Estrogen Receptor (ER)-negative (0), Progesterone Receptor (PR)-negative (0), Human Epidermal growth factor Receptor 2 (HER2)-positive (3+), and Ki-67 Antigen (protein related to cell proliferation) (Ki67) index of 31%. Furthermore, the pathological evaluation of the axillary lymph nodes revealed a similar profile: ER-negative (0), PR-negative (0), HER2-positive (3+), with a Ki67 index of 15%.

The patient is currently undergoing neoadjuvant chemotherapy with the Adriamycin-Cyclophosphamide protocol, with follow-up and additional treatment plans based on the therapeutic response.

Conclusion

Mammography remains the primary screening tool for breast cancer, but its effectiveness is significantly reduced in women with dense breast tissue, increasing the risk of missed diagnoses. This case report highlights the importance of supplemental ultrasound, demonstrating its ability to detect mammographically occult breast cancer. Integrating ultrasound into routine screening for women with dense breasts could enhance cancer detection, improve diagnostic accuracy, and facilitate early intervention - ultimately leading to better patient outcomes.

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