Clinical Center of Vojvodina, Novi Sad, Center for Radiology[1]
University of Novi Sad, Faculty of Medicine Novi Sad[2]

Case report
Prikaz slučaja
UDK 618.19-073:616.5-003.84
https://doi.org/10.2298/MPNS2210305L

UNUSUAL PRESENTATION OF DERMAL MICROCALCIFICATIONS ON MAMMOGRAPHY IMAGES – A CASE REPORT

NEUOBIČAJEN PRIKAZ MIKROKALCIFIKACIJA KOŽNOG POREKLA NA MAMOGRAFSKIM SNIMCIMA − PRIKAZ SLUČAJA

Sonja LUKAČ[1, 2], Maja STANKOV[1, 2], Dijana NIĆIFOROVIĆ[1, 2], Jelena PILIPOVIĆ GRUBOR[1], Daniela DONAT[1] and Tijana MRĐANIN[1]

Summary
Introduction. Calcifications and microcalcifications are mineral deposits in the breast tissue. Breast calcifications are a common mammographic finding, present on over 80% of images, and they are usually benign. Characteristics such as size, shape, number, distribution pattern, location, density, and other findings help determine the pathology. Dermal calcifications of the breast are superficial and benign calcifications that are usually found on the sebaceous glands of the skin. In some cases, calcifications can be the first marker of underlying cancer development. They may be associated with the presence of ductal carcinoma in situ or even invasive ductal carcinoma that has spread to the surrounding breast tissue. By correct identification of benign calcifications as such, unnecessary interventions and use of limited resources can be avoided. **Case Report.** A 66-year-old female patient presented for a regular mammography check-up. On the previous mammographic examination, she was categorized as bilateral breast imaging reporting and data system 1. The new mammography images showed numerous newly formed grouped microcalcifications at the junction of the lower quadrants of the right breast, and a stereotactic vacuum-assisted biopsy was indicated. During the biopsy attempt, the image guided biopsy program did not detect any calcifications in the parenchyma or in any projection and therefore it did not allow the biopsy procedure to continue after several attempts. Examination of the right breast skin revealed lesions treated by the patient for a few weeks; a repeat mammogram was performed and it was observed that the calcifications were of dermal origin. **Conclusion.** Dermal calcifications are mostly tiny, about the size of skin pores, single or clustered, and often have a calcified rim surrounding a lucent center. However, dermal calcifications deserve a special attention, because they sometimes lack a lucent center and simulate grouped intraparenchymal calcifications that require careful monitoring or biopsy.
Key words: Calcinosis; Skin; Magnetic Resonance Imaging; Biopsy; Stereotaxic Techniques

Sažetak
Uvod. Kalcifikacije i mikrokalcifikacije predstavljaju nakupine mineralnih naslaga na tkivima dojke. Kalcifikacije dojke su čest mamografski nalaz, prisutan na preko 80% slika i obično su benignih odlika. Karakteristike kao što su veličina, oblik, broj, obrazac distribucije, lokacija, gustina i drugi nalazi pomažu u određivanju patologije. Dermalne kalcifikacije dojke su površinske i benigne kalcifikacije koje se obično nalaze na lojnim žlezdama kože. U nekim slučajevima kalcifikacije mogu biti prvi marker osnovnog razvoja raka. One mogu biti povezane sa prisustvom duktalnog karcinoma in situ ili čak invazivnog duktalnog karcinoma koji se proširio na okolna tkiva dojke. Pravilnom identifikacijom benignih kalcifikacija kao takvih može se izbeći nepotrebna intervencija i korišćenje ograničenih resursa. **Prikaz slučaja.** Pacijentkinja, 66 godina, javlja se na redovnu mamografsku kontrolu. Na prethodnom mamografskom pregledu kategorizovana je *Breast Imaging Reporting and Data System* kao 1 bilateralno. Na novim mamografskim snimcima uočavaju se na spoju donjih kvadranata desne dojke novonastale mnogobrojne grupisane mikrokalcifikacije, te je indikovana stereotoksična vakum asistirana biopsija. Prilikom pokušaja biopsije, program aparata nije detektovao ni u jednoj projekciji prisustvo kalcifikacija u samom parenhimu i samim tim nije dozvoljavao da se procedura biopsije nastavi nakon više pokušaja. Posmatranjem spoljašnjosti kože desne dojke uočena je promena koju pacijentkinja tretira nekoliko nedelja unazad, te je načinjen ponovni mamografski snimak gde je uočeno da su kalcifikacije porekla kože. **Zaključak.** Kalcifikacije kože se najčešće opisuju kao sićušne, veličine kožnih pora, pojedinačne ili grupisane; često imaju kalcifikovani rub koji okružuje lucentni centar. Ipak kalcifikacije kože zaslužuju posebnu pažnju jer ponekad nemaju lucentni centar i simuliraju grupisane intraparenhimske kalcifikacije koje zahtevaju brižljivo praćenje ili biopsiju.
Ključne reči: mikrokalcifikacije; koža; magnetna rezonanca; biopsija; stereotaksične tehnike

Introduction

Breast cancer is the most common malignant disease and cause of death among women in the developed world. Despite increasing incidence, survival has improved over the past two decades with rates of up to 80% reported in Western Europe, North America, Japan and Australia, due to a combination of more effective treatments, better supportive care, and earlier detection [1].

Mammography is the most effective method for breast cancer screening. One of the main early symp-

Corresponding Author: Dr Sonja Lukač, KCV – Centar za radiologiju, Univerzitet u Novom Sadu, Medicinski fakultet, 21000 Novi Sad, Hajduk Veljkova 1-7, E-mail: sonja@lukac.rs, sonja.lukac@mf.uns.ac.rs

Abbreviations
SVAB – stereotactic vacuum-assisted biopsy

toms of cancer on a mammogram is the appearance of microcalcifications [2].

Calcifications and microcalcifications are mineral deposits in the breast tissue. Breast calcifications are a common mammographic finding, present in over 80% of images and they are usually benign [3].

Calcifications account for 31% of all breast lesions found by mammographic screening and can occur as benign or malignant breast lesions. Approximately 55% of clinically non-palpable breast cancers have been shown to be associated with calcifications [4].

Characteristics such as size, shape, number, distribution pattern, location, density, and other findings help determine the pathology. Dermal breast calcifications are superficial and benign calcifications that are usually found on the sebaceous glands of the skin. In some cases, calcifications can be the first marker of the underlying cancer development. They may be associated with the presence of ductal carcinoma in situ or even invasive ductal carcinoma that has spread to the surrounding breast tissue.

Proper identification of benign calcifications as such can help to avoid unnecessary interventions and use of limited resources such as stereotactic vacuum-assisted biopsy (SVAB) [5, 6].

Breast SVAB is a modern method that solves the need for a larger tissue sample for histological analysis. The main indications for SVAB are clustered microcalcifications and this method has been shown to be reliable [7, 8].

Case Report

A 66-year-old female patient came for a regular mammography check-up. The previous mammography examination (one year earlier) showed no suspicious clustered microcalcifications or tumor formations, and she was categorized as bilateral breast imaging reporting and data system (BI RADS) 1. New mammography images showed numerous newly formed clustered microcalcifications at the junction of the lower quadrants of the right breast **(Figures 1**

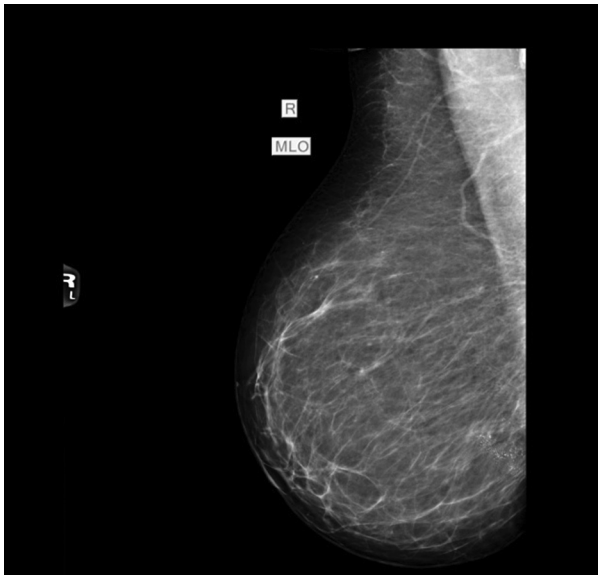

Figure 1. Mediolateral oblique mammography view of the right breast
Slika 1. *Mamografska slika u mediolateralne kose projekciji desne dojke*

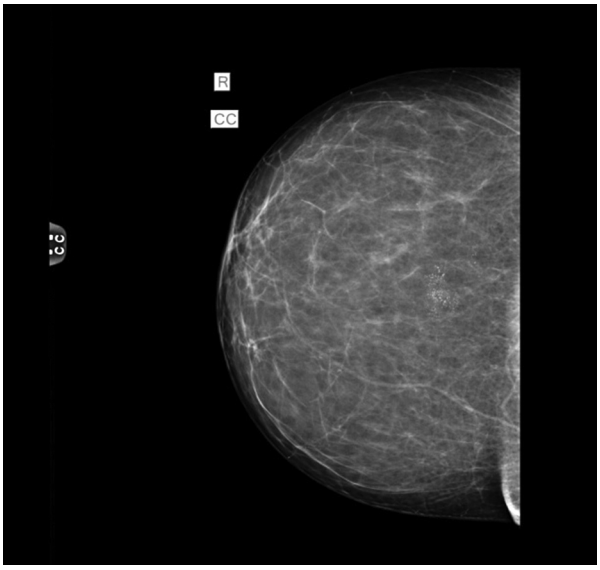

Figure 2. Craniocaudal mammography view of the left breast
Slika 2. *Mamografska slika u kraniokaudalnoj projekciji leve dojke*

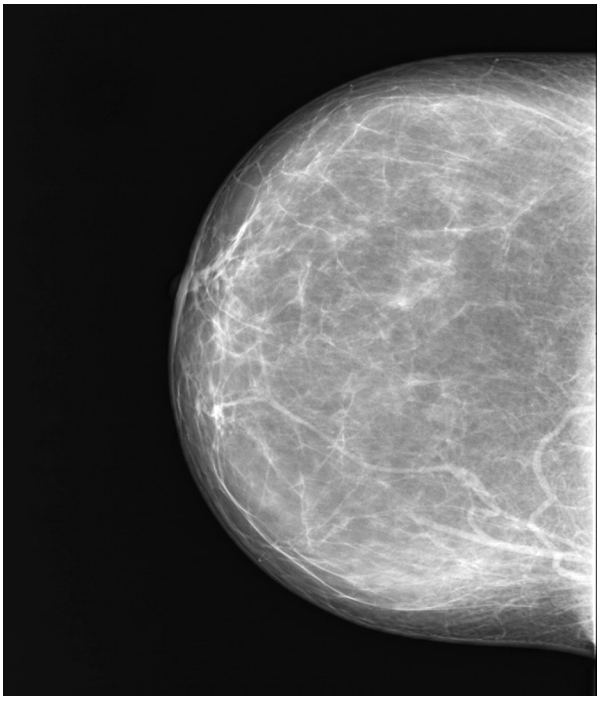

Figure 3. Craniocaudal mammography view of the right breast
Slika 3. *Mamografska slika u kraniokaudalnoj projekciji desne dojke*

and 2). A stereotactic vacuum-assisted biopsy was indicated. During the biopsy attempt, the image guided biopsy device program did not detect any calcifications in the parenchyma or in any projection and therefore it did not allow the biopsy procedure to continue after several attempts. Examination of the right breast skin revealed lesions treated by the patient for several weeks. The patient was offered a dermatology consultation and a recheck after therapy and resolution of the lesion. The patient returned for a follow-up mammogram a month later and the previously described cluster of microcalcifications was not seen, indicating that the calcifications were of dermal origin **(Figure 3)**.

Conclusion

Dermal calcifications are mostly tiny, about the size of skin pores, single or clustered, and often have a calcified rim surrounding a lucent center. However, dermal calcifications deserve a special attention, because they sometimes lack a lucent center and simulate grouped intraparenchymal calcifications that require careful monitoring or biopsy.

With the advancement of digital technology, the detectability of microcalcifications has increased as well as the reliability of their classification; however, in some cases it is still difficult for radiologists to correctly differentiate benign from malignant calcifications, especially those classified as breast imaging reporting and data system 3.

References

1. Menezes GL, Winter-Warnars GA, Koekenbier EL, Groen EJ, Verkooijen HM, Pijnappel RM. Simplifying Breast Imaging Reporting and Data System classification of mammograms with pure suspicious calcifications. J Med Screen. 2018;25(2):82-7.

2. Wang J, Yang X, Cai H, Tan W, Jin C, Li L. Discrimination of breast cancer with microcalcifications on mammography by deep learning. Sci Rep. 2016;6:27327.

3. Lei C, Wei W, Liu Z, Xiong Q, Yang C, Yang M, et al. Mammography-based radiomic analysis for predicting benign BI-RADS category 4 calcifications. Eur J Radiol. 2019;121:108711.

4. Bluekens AM, Holland R, Karssemeijer N, Broeders MJ, den Heeten GJ. Comparison of digital screening mammography and screen-film mammography in the early detection of clinically relevant cancers: a multicenter study. Radiology. 2012;265(3):707-14.

5. Houben IP, Vanwetswinkel S, Kalia V, Thywissen T, Nelemans PJ, Heuts EM, et al. Contrast-enhanced spectral mammography in the evaluation of breast suspicious calcifications: diagnostic accuracy and impact on surgical management. Acta Radiol. 2019;60(9):1110-7.

6. Nalawade YV. Evaluation of breast calcifications. Indian J Radiol Imaging. 2009;19(4):282-6.

7. Park HL, Hong J. Vacuum-assisted breast biopsy for breast cancer. Gland Surg. 2014;3(2):120-7.

8. Craft M, Bicknell AM, Hazan GJ, Flegg KM. Microcalcifications detected as an abnormality on screening mammography: outcomes and followup over a five-year period. Int J Breast Cancer. 2013;2013:458540.

Rad je primljen 29. III 2023.
Recenziran 10. IV 2023.
Prihvaćen za štampu 10. IV 2023.
BIBLID.0025-8105:(2022):LXXV:9-10:305-307.