Case report

Sarcoidosis of the breasts – when should it be considered?
A case report

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DOI: 10.15557/JoU.2022.0022

Abstract
Sarcoidosis is a systemic inflammatory disease of unknown aetiology. Given its complex clinical presentation, the disorder frequently causes diagnostic challenges. In most cases, the primary manifestation is in the lungs and mediastinum. Breast involvement as the primary manifestation of sarcoidosis is rare, accounting for less than 1% of cases. The authors present the case of a 44-year-old woman whose disease first manifested as multiple non-specific BIRADS 4 lesions in both breasts, accompanied by axillary lymphadenopathy, detected by ultrasound examination. The lesions were not visible on mammography. The course of the disease was clinically silent, with intermittent remissions, until the complete resolution of focal breast lesions on ultrasound after two years of follow-up. The paper presents an algorithm for the management of multifocal breast pathology with associated lymphadenopathy, which led to the prompt verification of sarcoidosis.

Introduction
Given the heterogeneity of presentations, the diagnosis of sarcoidosis is a challenge to both clinicians and diagnosticians. Multiorgan involvement, varied imaging findings and diverse clinical features frequently contribute to prolonging the time to diagnosis. Serious complications of untreated sarcoidosis include pulmonary fibrosis, cardiac arrhythmias, and damage to the central nervous system. Therefore, prompt diagnosis is crucial for the further clinical course of the disease. The reported case shows that individualised approach is required of medical teams to achieve satisfactory treatment outcomes.

Case report
A 44-year-old woman, who had annual prophylactic breast ultrasound scans, without any complaints or palpable breast lesions, presented for a breast ultrasound during lactation. The examination revealed a few small focal lesions with uneven margins, up to 7 mm in size, arranged in a non-parallel configuration, with small blood vessels along their periphery. The foci were characterised by reduced echogenicity, with no enhancement or acoustic shadow visible behind the lesions. The foci were located primarily in the outer quadrants...
of both breasts. No calcifications were seen within the lesions, and on ultrasound elastographic images they all appeared soft ($E_{\text{max}} < 20$ kPa) (Fig. 1A–C). In addition, enlarged hypoechoic lymph nodes, up to 21 mm in length, with thickened, hypoechoic cortical layers, up to 4 mm thick, with preserved rich hilar vascularisation and no visible sinuses, were identified in both axillary fossae (Fig. 1D). On mammography, glandular structures were predominant, without abnormal thickening or microcalcifications.

In view of the presence of numerous solid lesions in both breasts, the first step involved performing a core-needle biopsy (CNB) of the dominant lesion. Using a 14G needle, three core specimens were taken. The presence of malignant tumour cells was ruled out. Multiple granulomas with multinucleated giant cells, without signs of serous necrosis, were identified. The suspicion of granulomatous lobular mastitis (GLM) was raised, to be differentiated with another disease characterised by granulomas. To this end, a test for bacteria of the genus *Corynebacterium* in the breast material was carried out. The bacteria were not detected. To extend the diagnostic work-up for granulomatous lesions, tissue material was obtained from lymph nodes for histopathological analysis. A CNB procedure was performed using a 14G needle. Three core specimens were taken. Clusters of epithelioid cells with sparse multinucleated giant cells, without features of necrosis, were found. Analysis of the lymph node lesions and the focal lesion in the breast led to the suspicion of sarcoidosis (Fig. 2, Fig. 3). In the next step, the patient was referred for pulmonary consultation. High-resolution computed tomography (HRCT) showed lesions characteristic of sarcoidosis, presenting as small nodules in the middle fields and at the fissures of both lungs (Fig. 4). Histopathological analysis of material taken during bronchoscopy showed fragments of bronchial mucosa with granulomas composed of epithelial and giant cells, without signs of necrosis. Based on these findings, the diagnosis of sarcoidosis was estab-

Fig. 1. Ultrasound findings in a 44-year-old female patient with breast sarcoidosis. A–D. Pre-biopsy examination, E–H. Examination performed a year later. B-mode ultrasound revealed a hypoechoic nodule with an irregular margin. Colour Doppler ultrasound showed small blood vessels surrounding the lesion. On shear wave elastography, the lesion appeared soft

![Image](image1.png)

Fig. 2. Microscopic examination of lymph node tissue showed an aggregation of epithelial cells with multinucleated giant cells, without signs of necrosis. Hematoxylin and eosin staining (10x magnification)

lished. The dynamics of the lesions in the breasts was followed up at intervals of several months, for a total of two years. Over that period, the focal lesions in the breasts shrank and grew again until they resolved completely (Fig. 1E–H). The patient remains under the care of the Outpatient Clinic of Pulmonary Diseases and the Outpatient Clinic of Breast Diseases. At the time of diagnosis, she did not require pharmacological treatment.

**Discussion**

Sarcoidosis is an idiopathic systemic inflammatory disorder which typically occurs in individuals between 20 and 40 years of age\(^1\),\(^2\). In 90% of cases, the disease begins in the lungs or mediastinal lymph nodes, but it can manifest in any organ, including the breasts\(^3\),\(^4\). The diagnosis of sarcoidosis relies on three criteria: compatible clinical or
Idiopathic granulomatous mastitis (IGM) is more common in the postpartum period. Even though the patient gave birth two years before the appearance of the breast lesions, she was still lactating at the time of diagnosis. The characteristic manifestations of IGM include lobular mastitis with microabscesses, and inflammatory changes and damage to the mammary ducts. The histopathological material did not show any changes specific to this disease entity. The results of HRCT of the chest and histopathological examination of the mucosal sample obtained during bronchoscopy confirmed the presence of changes pathognomonic of sarcoidosis. Moreover, by excluding other possible causes of the lesions, all three criteria for the diagnosis of pulmonary sarcoidosis with breast involvement were met. The diagnosis was additionally confirmed by the clinical course, which was characterised initially by partial and eventually complete remission of the inflammatory lesions. The results of HRCT of the chest and histopathological examination of the mucosal sample obtained during bronchoscopy confirmed the presence of changes pathognomonic of sarcoidosis. Moreover, by excluding other possible causes of the lesions, all three criteria for the diagnosis of pulmonary sarcoidosis with breast involvement were met. The diagnosis was additionally confirmed by the clinical course, which was characterised initially by partial and eventually complete remission of the inflammatory lesions. The literature reports show that – depending on the stage – pulmonary lesions may resolve spontaneously in up to 90% of patients. The case reported here, though isolated, is consistent with previous literature findings. Over the two-year follow-up, the patient experienced several remissions of the lesions, followed by their recurrence. Ultimately, the abnormalities resolved completely both in the breasts and axillary lymph nodes.

**Fig. 3. Typical features of breast sarcoidosis (5x magnification)**

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**Fig. 4. Axial CT scan showed small perivascular nodules in the middle and lower lobes of the right lung, consistent with sarcoid granulomas**

**Conclusions**

The reported case provides evidence for the clinical polymorphism of sarcoidosis. The authors highlight the...
importance of an individualised approach in diagnosing this systemic disease which, if left untreated, results in a significantly reduced quality of life for the patient. Moreover, the development of breast lesions as a primary symptom of the disease emphasises the role of preventive breast ultrasound in women. Good collaboration between diagnosticians, pathologists and clinicians is essential for a successful treatment outcome.

Conflict of interest

Authors do not report any financial or personal connections with other persons or organizations, which might negatively affect the contents of this publication and/or claim authorship rights to this publication.

Acknowledgements

We would like to thank the Patient (IM) for her consent to the publication of her case report.

Author contributions

Original concept of study: DJ, RKM, KD-S. Writing of manuscript: DJ, IY, KD-S. Analysis and interpretation of data: DJ. Final acceptance of manuscript: DJ, IY. Collection, recording and/or compilation of data: DJ, LJ, KR-P, KD-S. Critical review of manuscript: RKM, KD-S.

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