The Breast 42 (2018) 94–101

Contents lists available at ScienceDirect

The Breast

journal homepage: www.elsevier.com/brst

Frequency and characteristics of additionally detected ipsilateral breast lesions following recall at screening mammography

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ARTICLE INFO

Article history:
Received 18 May 2018
Received in revised form
22 August 2018
Accepted 28 August 2018
Available online 28 August 2018

Keywords:
Epidemiology
Breast cancer
Screening
Malignancy
Ipsilateral lesion

ABSTRACT

Purpose: To determine the frequency and outcome of additionally detected ipsilateral breast abnormalities following recall at screening mammography.
Methods and materials: We included a consecutive series of 130,338 screening mammograms obtained between January 1, 2014 and January 1, 2016. During 2-year follow-up, clinical data were collected of all recalls. Women with a bilateral recall (115) and women recalled for multiple lesions in one breast (165) were excluded from the analyses. Screening outcome parameters were determined for recalled women with or without evaluation of additional ipsilateral breast abnormalities following recall.
Results: A total of 3995 women were recalled (recall rate, 3.1%). In 258 (6.4%) of these women, another lesion was detected in the ipsilateral breast than the one for which she had been recalled. Biopsy was more frequently performed of additionally detected ipsilateral lesions than of recalled lesions (55.8% (144/258)) versus 39.7% (1375/3457), ($p < 0.001$)). The proportion of malignancy in recalled lesions and additionally detected lesions was comparable (21.5% (743/3457) versus 19.0% (49/258), $p = 0.34$). Of all 144 biopsies of additionally detected ipsilateral lesions, 9 revealed a synchronous tumour in addition to a malignant recalled lesion, and 33 biopsies revealed multicentric or multifocal tumours. In 5 women, the recalled lesion turned out to be benign, whereas the additional lesion in a different quadrant was malignant at biopsy. A total of 97 biopsies showed benign findings.
Conclusion: A substantial proportion of women are analyzed for additional ipsilateral breast lesions following recall. These lesions are more frequently biopsied than recalled lesions, but have a comparable probability of being malignant. The majority of additionally detected cancerous lesions are part of multifocal or multicentric malignancies.

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1. Introduction

Screening mammography programmes have successfully been implemented in western countries over the past decades. Several studies have observed a reduction in breast cancer mortality, following the introduction of breast cancer screening, which is explained by detection of breast malignancy in an earlier stage and improved treatment [1–3].

Over the years, improvements in breast imaging have increased the accuracy and detection rates at screening mammography. There

Abbreviations: BI-RADS, Breast Imaging Reporting and Data System; CCMO, Dutch Central Committee on Research involving Human Subjects; CNB, Core needle biopsy; DBT, Digital breast tomosynthesis; FFDM, Full field digital mammography; FNAB, Fine-needle aspiration biopsy; SCNB, Stereotactic core needle biopsy.

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https://doi.org/10.1016/j.breast.2018.08.104
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is ongoing research to increase the detection of malignant breast lesions and to reduce false positive recalls of screening mammography programmes, for example by implementation of breast tomosynthesis [2–11].

In the diagnostic setting, additional imaging is usually performed to characterize a recalled lesion and additional ipsilateral or contralateral breast abnormalities may be detected. These additionally detected lesions are most frequently benign, but they also comprise malignant satellite lesions associated with the primary cancer and synchronous primary malignancies [12–16]. Few results have been published on the detection of additional ipsilateral lesions by breast ultrasonography or mammography [15]. It also remains unclear whether whole breast sonography, rather than targeted ultrasonography, should be used in the diagnostic work-up after recall. Frequently, additional ipsilateral lesions are diagnosed by pre-operative magnetic resonance imaging (MRI) in women with breast cancer [16].

To our knowledge, data on additionally detected breast lesions following recall of a different mammographic abnormality are lacking. Therefore, the purpose of the current study was to assess the frequency, characteristics and outcome of additionally detected ipsilateral breast lesions after recall in women who attended a biennial screening mammography programme in the South of the Netherlands.

2. Material and methods

2.1. Study population

This is a prospective observational follow-up study of women aged 50–75 years who attended a biennial breast cancer screening programme conducted in the south of the Netherlands. Details of the design of our breast cancer screening programme have been described previously [17,18]. Women are personally invited by letter to attend the screening programme and the attendance rate is more than 80%. Women being treated for breast cancer or those attending clinical follow-up after treatment of breast cancer do not attend the screening programme. Also, women with breast implants masking most of the fibroglandular tissue at mammography are advised to refrain from the programme. Otherwise, there are no exclusion criteria for screening. A consecutive series of 130,338 full-field digital mammography screens (13,762 initial screens and 116,576 subsequent screens) were included between January 1, 2014 and January 1, 2016. The screening mammograms were obtained at four specialized screening units (three mobile units and one fixed unit at Screening Program South).

Prior to participation, women are routinely asked for their permission for using their data for the evaluation of the screening programme and scientific purposes and all recalled women gave this permission. To minimize diagnostic bias, we excluded women who were recalled because of bilateral or multiple ipsilateral lesions, as additional diagnostic imaging procedures are more likely to be performed in these women than in women recalled for a unilateral lesion.

Ethical approval by our local Institutional Review Board was not required for this observational follow-up study, according to the Dutch Central Committee on Research involving Human Subjects (CCMO).

The flow chart of screened women and subsequent inclusion is depicted in Fig. 1.

2.2. Screening procedure and recall

All digital mammograms were obtained with a Lord Selenia FFDM system (HologicInc, Danbury, CT), with a 70 μm pixel size and a 232 × 286 mm field of view. The examinations were obtained by specialized screening mammography radiographers and all screening mammograms were double read in a blinded fashion by a team of 12 certified screening radiologists. All but one of the screening radiologists read more than 10000 screens yearly in the screening region we currently report on. The remaining radiologist reads 3000 screens in this specific region and an additional 10000

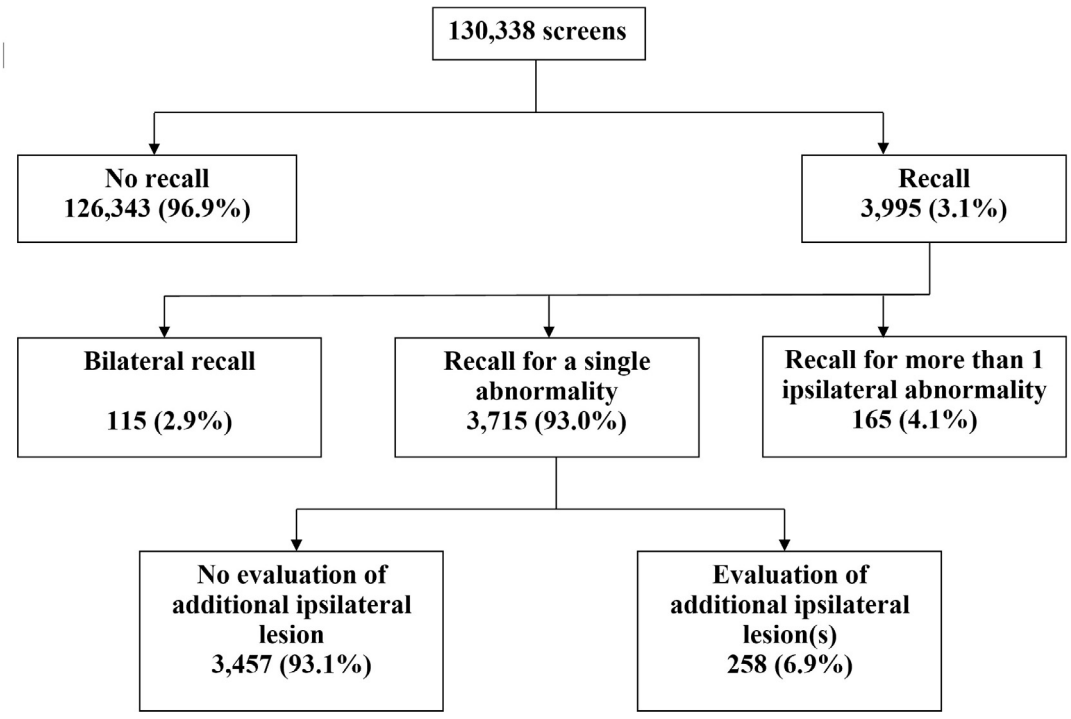

Fig. 1. Flowchart of screened women and subsequent study inclusion.

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