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The incidence and outcome of incidental breast lesions detected by computed tomography

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ABSTRACT

INTRODUCTION In the UK, the majority of breast cancers are diagnosed through symptomatic breast clinics and the breast screening programmes. With increased use of computed tomography (CT) to assess various pathologies, breast lesions are picked up incidentally. The aim of this study was to investigate the incidence and outcomes of breast lesions detected incidentally on CT scans.

PATIENTS AND METHODS A retrospective study was conducted to assess the incidence and outcome of incidentally found breast lesions, which were detected on chest CT scans that were conducted for other pathologies during the period from February 2007 to October 2008.

RESULTS A total of 432 chest CT scans were performed over 18 months. Thirty-three (7.63%) patients were found to have an incidental breast lesion. The mean age was 73 years (range, 50–86 years). Of these, 17 (52%) were benign, eight (24%) were primary breast cancer and the remaining eight (24%) had no definite pathology. The detection rate of breast cancer was 1.85%.

CONCLUSIONS CT is emerging as an important contributor to the detection of occult breast lesions. Radiological awareness of incidental breast lesions is important so that appropriate referral to a specialised breast unit is made.

KEYWORDS

Breast cancer – Breast lesion – Chest computed tomography – Ultrasound scan – Magnetic resonance imaging

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Breast cancer is the commonest malignancy affecting women in the UK and the Western world. In the majority of women, the diagnosis is through symptomatic clinics, breast screening programmes, private screening or by general examination while patients are seen for other pathologies. New breast lesions are also picked up incidentally while patients are having cross-sectional imaging for pathologies other than the breast. In the last few years, there has been an increase in cross-sectional imaging especially in emergency settings. A recent study reported a dramatic 226% increase in chest CT use in the emergency setting.[1] Most cross-sectional imaging (including CT, MRI, CT-PET), while being done to investigate a certain organ, is sensitive enough to pick up small lesions in other organs including the breast.

CT has become a common imaging modality for various clinical conditions. It is of great value in the staging of breast cancer; however, it is not the recommended imaging for diagnosis of this disease. Nevertheless, it is only logical to expect that occult lesions in the breast may be revealed when a CT scan is performed for pathologies other than breast. CT is especially helpful in detection of breast lesions in women with dense breasts[2–4] and the features may suggest the benign or malignant nature of breast pathology.[5]

The aim of this study was to investigate the incidence and outcomes of breast lesions detected incidentally on CT scans done for pathologies other than breast.

Patients and Methods

Experimental design

This was a retrospective observational study of chest CT scans, performed for indications other than breast disease, during a period from February 2007 to October 2008 at Princess Royal University Hospital, Kent.

Selection criteria

All consecutive chest CT scans performed for reasons other than breast symptoms over an 18-month period were selected.

Table 1 Indications of CT scans which detect incidental breast lesions

Diagnosis	Benign	Malignant	Unknown
Staging of other cancers	5	1	4
Check for recurrence	0	1	1
CT pulmonary angiogram	2	0	0
Other pathologies	9	5	3
Unknown reason	10	1	–
Total	17	8	8

Of these, the patients who were diagnosed with incidental breast lesions were further analysed and the data recorded.

Methods

We used the Bromley Hospitals NHS Trust PACs database to identify CT scans with reported positive findings of breast lesions over the past 18 months and the E-Oasis database for patient details to check documented imaging, histology and relevant history of presenting complaint. The other data included the size of the breast lesion, ultrasonography, mammography, cytology, core biopsy, the outcome and follow-up.

Results

Thirty-three (7.63%) out of 432 CT scans reported incidental breast lesions (Table 1). All CT scans were for non-mammary indications. The mean age was 73 years (range, 50–86 years). Of these, 17 (52%) were benign, eight (24%) were primary breast cancer while no breast pathology was found in eight (24%) patients (Table 2). Three patients had grade 1 cancer, three patients had grade 2 and two patients had B and T lymphomas. The detection rate of breast cancer was 1.85%. The size of the breast lesions ranged from 0.6–5.0 cm. Of the eight patients with no definite breast pathology, five patients died soon after their CT scan because of their primary disease (other than breast pathology), two patients had lymphoma and no pathology was confirmed for one patient on careful review. All the other incidental breast lesions were further assessed by mammography, ultrasonography and cytology/core biopsy (Table 2).

Table 2 Follow-up investigations

Diagnosis	Follow-up investigation	Patients (*n*)
Breast cancer	Mammogram	5
	USS	4
	Core biopsy	5
Benign breast pathology	Mammogram	10
	USS	11
	Core biopsy	3
No pathology	Mammogram	6
	USS	4
	Core biopsy	1

USS, ultrasonography.

The eight patients with malignant lesions underwent further triple assessment by mammogram, ultrasonography and core biopsy/cytology and an appropriate management plan was discussed in the multidisciplinary meeting. Four patients underwent neo-adjuvant hormonal therapy, two patients had neo-adjuvant chemotherapy and two patients underwent surgical excision followed by adjuvant therapy. One of these patients had bilateral breast cancer and underwent bilateral mastectomy (Table 3).

Of the 17 patients with benign lesions, 14 patients were assessed by further triple assessment; two had satisfactory benign appearance on CT. One patient had previous breast surgery.

Only 25 of the 33 patients with incidental breast lesions were referred to our breast unit. The other eight patients who had not been referred to the breast unit were called for further assessment. Two had died of other causes before breast investigations; breast cancer was confirmed in one patient, benign breast lesions in three and no definite pathology was reported for two patients.

Table 3 Management and outcome

Diagnosis	Patients (*n*)
Breast cancer	
Adjuvant hormonal therapy	2
Surgical excision	2
Neo-adjuvant hormonal therapy	4
Benign breast lesions	
Surgical excision	4
Cyst aspiration	2
No surgery	11
No pathology	
Chemotherapy	2
No surgery	1
Died	5

Discussion

With the increase in cross-sectional imaging for other pathologies, it is not uncommon to find incidental lesions in

other organs. Similarly, CT scans, which are conducted for the assessment of clinical problems other than breast, detect incidental breast abnormalities.[6] Often, these CT scans are reported by radiologists who do not specialise in breast pathology. Therefore, these lesions may be missed or not reported by the radiologist and, hence, not referred to the specialist for assessment and management.

In our series, only 25 (76%) patients were referred to our breast unit for further breast assessment. Interestingly, eight breast cancers were diagnosed including one breast cancer diagnosis in one of the eight patients who had not been referred. The size of the breast lesions ranged between 0.6–5.0 cm according to ultrasonography. In this study, we have selected only patients who have been reported with incidental breast lesions. Therefore, there is the possibility that there may be a few patients in whom breast lesions have not picked up or not reported.

Radiologists using cross-sectional imaging should be familiar with the CT signs of benign and malignant breast lesions. Several CT techniques have been used in the assessment of breast lesion including contrast-enhanced CT scan, multidetector techniques MD-CT, and dual time PET/CT.[7–9] The CT predictive features of breast malignancy include irregular margin spiculation, irregular shape and rim enhancement.[10] While the CT features of invasive ductal carcinoma include dense, spiculated mass with marked early and/or peripheral enhancement, lobular carcinoma may show non-specific features or asymmetric soft tissue density or mass with or without skin thickening.[11] The indeterminate breast lesion would need additional assessment. Similar to other breast assessment tests, CT impression could be classified as CT1–CT5 based on the shape, margin, spiculation, Hounsfield density and enhancement. This may simplify interpretation of the results and provide universal applicable criteria.

As the changes on CT scan may be subtle, it is imperative that all CT-detected breast lesions are referred to a breast unit for further assessment.

Conclusions

Computed tomography is a significant contributor to the detection of asymptomatic breast cancers. Reporting radiologists in cross-sectional imaging need to be aware of the CT signs of breast lesions.

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