

## ORIGINAL ARTICLE

# Incidental Breast Cancers Identified in the One-Stop Symptomatic Breast Clinic

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**Purpose:** Breast cancers can be asymptomatic at an early stage and hence screening programmes play an important role in detecting breast cancers early. Even in those patients who present with breast symptoms, breast cancers may be present at a site remote to the site of symptoms. In this study, we aimed to assess the frequency, site and imaging modality used to identify these incidental cancers in the symptomatic one-stop breast clinic. **Methods:** All patients who were seen in our breast clinic with breast symptoms over a two-year period were included in the study. We correlated the presenting symptoms of patients diagnosed with breast cancer with imaging (mammogram and ultrasound) findings. Incidental cancers were defined as “histologically confirmed breast cancers which were impalpable, re-

mote to the site of symptoms and only identified on imaging.” **Results:** In the study period, 281 women were diagnosed with breast cancer out of 4,400 patients seen at the one-stop breast clinic. Thirty six patients (12.8%) diagnosed with breast cancer had an incidental cancer which was only identified by imaging. The majority of contralateral, incidental cancers were identified by both mammography and ultrasound (US) and patients were all above 35 years. **Conclusion:** We suggest mammography of both breasts and US of the symptomatic breast in order to identify incidental cancers.

**Key Words:** Breast, Mammography, Ultrasonography

## INTRODUCTION

The symptomatic one-stop breast clinic has had a valuable impact in the assessment of women with suspected breast cancer. At the clinic, patients undergo triple assessment which includes ultrasound (US), mammogram and tissue sampling as required [1]. Patients get the results of their radiological investigations the same day and receive the results of tissue sampling shortly after. Since the one-stop breast clinic was established in our unit, we subjectively noticed that many breast cancers were identified on imaging at sites that did not correspond to the patients' symptoms. An overall increase in the use of US and computed tomography (CT) in diagnostic radiology has lead to an increase in the findings of other incidental malignancies including renal and thyroid malignancy [2,3]. It has been reported that breast cancers are detected as an incidental finding on thoracic CT with an incidence of 0.30-1.85% [4,5].

It is known that unsuspected breast cancers are detected by mammography and by ultrasound [6,7]. In the breast screening population, 7.2 cancers were detected by mammography per 1,000 (0.72%) women screened in England in 2007-2008 [6]. The incidence of mammographic and clinically occult malignancies which were detected only by screening US is reported as 1.69% [7]. In addition, in a different group of women with dense breasts the incidence of mammographically and clinically occult breast cancers identified only by ultrasound was 0.23-0.32% [8-10]. In this study, we aimed to assess the frequency of incidental breast cancers in our one-stop breast clinic. To our knowledge, this has not previously been studied in the setting of the one-stop clinic.

## METHODS

All patients who were diagnosed with breast cancer in the one-stop breast clinic in our unit over a two-year period (April 2003 to April 2005) were evaluated. The patients' presenting symptoms were correlated with imaging (mammogram and US) findings. In our symptomatic breast clinic, all patients over the age of 35 years undergo bilateral mammography. In addition, whole breast US is performed on the symptomatic breast;

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however, if the patients' clinical symptoms, examination or mammography are suggestive of malignancy, then bilateral, whole breast US is performed [11].

We defined symptomatic cancers as "histologically confirmed breast cancers which entirely correlated to the patient's symptoms." We defined incidental cancers as "histologically confirmed breast cancers which were detected only by imaging in a completely separate location to the site of presenting symptom and were not palpable by the clinician." These incidental cancers were always of a different histological type to a symptomatic cancer, if present, causing the pathologist to interpret these as separate malignancies.

The incidental cancers were initially identified by examining the one-stop breast data sheet, which is completed during the one-stop breast clinic by the breast surgeon and breast radiologist and contains details of presenting symptoms and clinical, radiological and histological outcomes. We subsequently also examined these patients' hospital case notes.

### RESULTS

During the two-year study period, 4,400 patients were assessed in the one-stop breast clinic and 281 (6.4%) of these patients were diagnosed with breast cancer. Among them, 245

patients (5.6%) had symptomatic breast cancers which correlated with the radiological findings and 36 patients (0.8%) had incidental breast cancers which were identified only on imaging and were remote to the symptoms. Of all patients diagnosed with cancer in the one-stop breast clinic, 87.2% were symptomatic cancers and 12.8% had an incidental cancer identified (with or without an additional symptomatic cancer).

Of the 36 patients diagnosed with incidental cancers, 23 (63.9%) were identified in the ipsilateral breast to the patient's presenting symptom and 13 (36.1%) in the contralateral breast (Table 1, Figure 1). Of the 23 ipsilateral incidental cancers, 18 were in the patients who also had a symptomatic cancer and five were in the patients who presented with normal or benign change (Table 2). Of the 13 contralateral incidental cancers, nine were in the patients who also had a symptomatic cancer and four were in the patients who presented with normal or benign change (Table 2, Figure 1). Overall, of the 36 incidental cancers, 27 (75%) were second cancers which were clearly separate on both imaging and histology to the symptomatic cancer and nine (25%) were solitary incidental cancers. Therefore, the overall incidence of solitary incidental breast cancers in the one-stop clinic was 0.2% (9/4,400 patients).

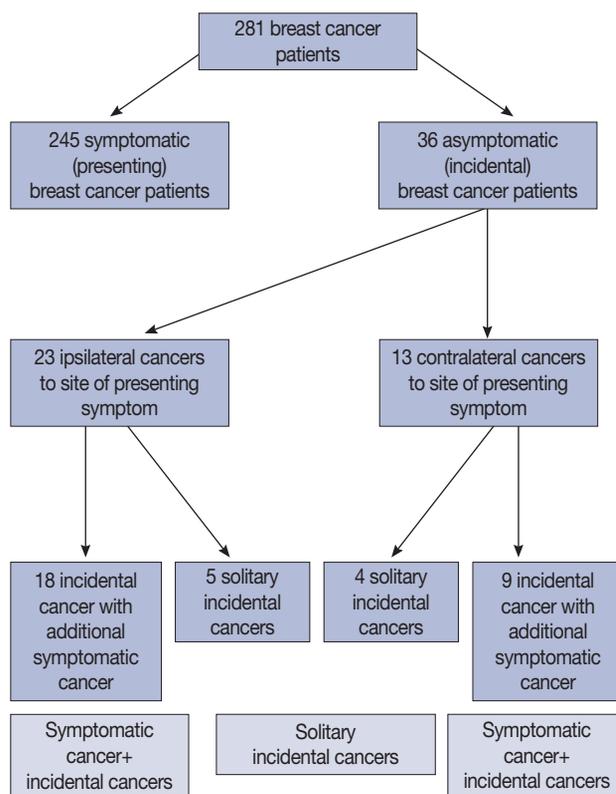
The mean age (range) of patients with symptomatic cancers

**Table 1.** Site of incidental breast cancers compared to the site of the patients presenting symptom

Site of incidental cancers compared to presenting symptoms	No. (%)
Ipsilateral, different quadrant	15 (41.7)
Ipsilateral, same quadrant	6 (16.7)
Ipsilateral, axillary lymph node presentation	2 (5.6)
Contralateral breast	13 (36.1)
Total	36 (100)

**Table 2.** Presenting symptom and histological outcome of presenting symptom of patients diagnosed with incidental cancers

	Lump	Nipple inversion	Nipple discharge	Pain	Nipple eczema
Ipsilateral (n=23)					
Presenting symptoms	21	1	1		
Histological outcome					
Malignant	18				
Benign	1				
Normal	2	1	1		
Contralateral (n=13)					
Presenting symptoms	11			1	1
Histological outcome					
Malignant	9				
Benign	2				
Normal				1	1



**Figure 1.** Diagrammatic representation of breast cancers diagnosed in the one-stop clinic.

was 64 years (24-100 years) compared to 63 years (36-90 years) for incidental cancers. The age range for patients with incidental cancers in the ipsilateral breast to their presenting symptom was 38-79 years compared to an age range of 36-90 years for patients with contralateral incidental breast cancers. Seven patients with incidental cancers were below and 15 patients were above the age range for the national breast screening programme (50-70 years). The Nottingham Prognostic Index (NPI) of patients diagnosed with symptomatic breast cancers was 4.4 compared to an NPI of 4.5 of patients diagnosed with an incidental breast cancer.

Some of the incidental cancers were identified in an atypical manner (Table 2). Two patients presented with axillary node metastases and on imaging were identified to have incidental breast cancers. One patient presented with a simple breast abscess and on imaging was found to have an incidental breast cancer on her contralateral breast. Other patients with incidental cancers included a patient with chronic nipple inversion and another patient with non-blood stained green nipple discharge, these were not considered clinically suspicious for malignancy.

Table 3 demonstrates the imaging modality by which incidental cancers were identified. The majority of incidental cancers were identified by both modalities. Twenty seven incidental breast cancers were detected by mammography (some of these were also detected by US), therefore, the incidence of mammographically-detected incidental breast cancers was 0.61% in the one-stop clinic. Similarly, 32 incidental breast cancers were detected by US (some of these were also detected by mammography), therefore, the incidence of US-detected incidental breast cancers was 0.73% in the one-stop clinic. Two incidental breast cancers were detected only by mammography (ultrasonographically occult) and seven incidental breast cancers were detected only by US (mammographically occult). Therefore, in the one-stop breast clinic the incidence of incidental breast cancers detected only by mammography was 0.05% and the incidence of mammographically occult breast cancers detected only by US was 0.16%.

**Table 3.** Imaging modality by which incidental cancers were identified the site of the incidental breast cancer is indicated in relation to the site of the presenting symptom

Imaging modality	Ipsilateral No. (%)	Contralateral No. (%)
Both mammogram and US	15 (65.2)	10 (76.9)
Mammogram only		2 (15.4)
US only	7 (30.4)	
Mammogram not performed	1 (4.3)	
US not performed		1 (7.7)
Total	23 (100)	13 (100)

US=ultrasonography.

One patient with a chest wall recurrence following a previous mastectomy on the same side as her presenting symptom did not undergo a mammogram as she had a recent normal surveillance mammogram of her remaining breast. Another patient, who was identified to have an obvious breast cancer on the same breast as her presenting symptom along with an incidental cancer on the contralateral breast, did not undergo an US examination because of pain.

## DISCUSSION

A significant proportion of patients (12.8%) diagnosed with breast cancer in this study had an incidental breast cancer (with or without a symptomatic cancer) and were only identified by imaging. This was higher than we expected prior to undertaking this study. To our knowledge, incidental cancers have not been previously investigated in the one-stop breast clinic.

Approximately a third of patients diagnosed with incidental cancers were on the contralateral breast to the site of the presenting symptom. The majority of contralateral incidental cancers were identified by both mammography and US, however, two cancers were identified solely by mammography (ultrasonographically occult). One of these two patients had microcalcification on her mammogram which was ultrasonographically occult. The youngest patient with a contralateral breast cancer identified only by imaging was 36 years. These findings would be supportive of a thorough evaluation of both breasts with mammography in patients over the age of 35 years in order to identify incidental cancers. In the majority of patients with contralateral incidental cancer, the cause of the presenting symptom was a separate malignancy. It is known that patients with a unilateral breast cancer have a 5-15% increased risk of a second malignancy in the contralateral breast [12,13]. Therefore, radiological assessment of the contralateral breast is particularly important if a suspected malignancy has already been identified in the symptomatic breast. This is in accordance with previous studies, which demonstrate that mammography is the follow-up imaging modality of choice to detect contralateral breast cancers in patients with a unilateral breast cancer [14,15].

The majority of incidental cancers identified in the ipsilateral breast to the patient's presenting symptom were identified by both imaging modalities, however, a third of cases were only identified by US examination. This reinforces the fact that both imaging modalities should be performed in the symptomatic breast. In the majority of cases with an incidental cancer on the same side as the presenting symptom, the presenting symptom was subsequently diagnosed as a separate malignancy. Therefore, US examination of the symptomatic breast is particularly

important whenever a suspected malignancy has been identified. Previous studies also demonstrate that US is superior to mammography in identifying the extent of tumour spread and should particularly be used whenever breast conserving surgery is contemplated [16,17].

In this study, all types of presenting symptom were associated with incidental cancer, although the patients' presenting symptom was most commonly a lump which was subsequently confirmed to be a separate malignancy. In the patients with symptoms which were not considered suspicious of breast cancer such as non-blood stained nipple discharge and breast pain, the cause of the presenting symptom itself was always related to normal breast tissue. It is possible that in the two patients who presented with long-standing nipple inversion and green nipple discharge, the incidental cancer may have spread microscopically down the ductal system resulting in these symptoms. It is therefore important to fully evaluate the entire breast with both imaging modalities even if the clinical history is non-suspicious and even if benign pathology or normal breast tissue has been identified which corresponds to the patients' symptoms as many patients have dual pathologies. This has also been highlighted in previous studies which demonstrate that bilateral mammography in patients with a non-suspicious clinical history reveals incidental malignancies in a small but significant number of cases [18-20].

The overall detection rate of breast cancers by mammography in our one-stop clinic was 0.61% which is similar to the detection rate in the Breast Screening Programme (0.72%) [6]. The detection rate of breast cancer by US in our one-stop clinic was 0.73%, this is lower than that reported by Simpson et al. [7], but higher compared to studies in which asymptomatic patients with dense breasts underwent US screening [8-10].

Although we are effectively screening patients attending the one-stop clinic, the identification of an incidental cancer may have an important impact on patient management. Patients with a single symptomatic cancer may undergo breast conserving surgery. On the other hand, patients with both an incidental cancer and a separate symptomatic cancer in the same breast will subsequently undergo mastectomy. In addition, patients with an incidental cancer in the opposite breast to a symptomatic cancer will undergo bilateral breast surgery, whether wide local excision or mastectomy. Furthermore, the identification of two separate malignancies may necessitate an alteration in the chemotherapy regime.

Incidental breast cancers, which are only identified through imaging, constitute a significant proportion of breast cancers identified in the one-stop symptomatic breast clinic. We suggest mammography of both breasts and whole breast US of the symptomatic breast in order to identify incidental breast

cancers. Although we are effectively screening patients in the one-stop clinic with mammography and US, the identification of incidental breast cancers has significant implications for patient management.

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