

# Clinical Observations

## How breast cancer presents

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A study of 501 new breast cancers in patients seen in a consulting surgical practice revealed that 87% were in patients 45 years of age or older. The patients had found 83% of the cancers. The distributions of size and stage were the same for the tumours found by the patients and those found by the referring physicians. Two thirds of the cancers had an associated visible clinical sign, demonstrating the importance of inspection in the examination of the breast. Dimpling, sometimes apparent only on manipulation of the tumour, was present with 264 of the cancers and was often associated with "minimal" lesions. Mammography was done for 63 of the breast cancers but it missed 27. Of the physician-found cancers 15 were in patients who had already had breast cancer, 4 were in patients presenting with symptomatic metastases and 14 were in women presenting with other disorders. Of the 52 cancers found by periodic examination 3 were locally advanced and 21 had axillary metastases, while among the 28 "early" cancers 12 were in women who were senile, mentally defective or psychotic. Only four of the cancers found by the physicians were in women under age 45; two were rapidly fatal, one had

an axillary metastasis, and the fourth was in a woman who had had cancer of the opposite breast. The remaining 284 lesions found by periodic or routine examination in women under age 45 were benign. Thus, periodic or routine examination for unsuspected breast cancer in women under age 45 seems unjustified except in those who have already had breast cancer.

Une étude de 501 nouveaux cas de cancer du sein chez des patientes vues en consultation de chirurgie au cours d'une période de 10 ans a révélé que 87% des patientes étaient âgées de 45 ans ou plus. Les patientes avaient découvert elles-mêmes leur cancer dans 83% des cas. La distribution de la taille et du stade d'évolution des tumeurs découvertes par les patientes était la même que pour les tumeurs trouvées par les médecins traitants. Deux-tiers des cancers étaient associés à des signes cliniques visibles, démontrant l'importance de l'inspection dans l'examen du sein. Un capiton cutané, parfois visible seulement lors de la manipulation de la tumeur, était présent dans 264 cancers et était souvent associé à des lésions dites "minimales". Une mammographie fut pratiquée pour 63 cancers du sein, mais 27 échappèrent à l'examen. Parmi les cancers découverts par les médecins 15 le furent chez des patientes qui avaient déjà eu un cancer du sein, 4 chez des patientes qui avaient des symptômes de métastases et 14 chez des femmes qui présentaient d'autres affections. Des 52 cancers découverts lors d'examen périodiques 3 étaient des

tumeurs locales à un stade avancé et 21 présentaient des métastases axillaires, alors que parmi les 28 cancers "précoces" 12 étaient retrouvés chez des femmes qui étaient séniles, mentalement déficientes ou psychotiques. Seulement quatre des cancers découverts par les médecins l'ont été chez des femmes de moins de 45 ans; deux s'avèrent rapidement fatals, un avait une métastase axillaire, et le quatrième fut trouvé chez une femme qui avait eu un cancer de l'autre sein. Les 284 autres lésions découvertes lors d'examen périodiques ou de routine chez des femmes de moins de 45 ans étaient bénignes. En conséquence, l'examen périodique ou de routine chez la femme de moins de 45 ans pour découvrir un cancer du sein insoupçonné ne semble pas justifié, sauf chez celles qui ont déjà été atteintes de cancer du sein.

The purpose of this paper is to review the way breast cancer presents in a consulting surgical practice in Canada. It is hoped that a detailed understanding of how this disease presents will help improve the efficiency of the diagnostic process.

### Study population and method

I reviewed the charts of the 3549 patients seen in my referral practice from 1973 to 1982 inclusive. All the patients were referred because they or their physician perceived a breast problem. Automatic routine follow-up was maintained only for those patients with breast cancer. A total of 501 new breast cancers were dealt

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with. Four patients presented with bilateral breast cancer, and each of the cancers was counted separately. Five of the cancers (two in patients with Paget's disease) were intraductal and apparently noninfiltrating. One was a lobular in-situ cancer. There were three malignant cystosarcomas.

The patients with breast cancer were classified according to the reason for presenting for medical attention. Either the patient had found a breast lump or deformity or experienced nipple discharge or pain, or a physician had found a lump or deformity and initiated intervention. Patients who presented with a lump and another complaint were considered to have presented with a lump.

Patients in the physician-found category consisted of two kinds. Most had visited their physicians for a routine, periodic physical examination for unsuspected disease when the breast carcinoma was found. A few had presented with a separate health problem, and during the associated physical examination the breast cancer was found. In four of these instances the problem was a manifestation of metastatic cancer.

If the radiologist's report suggested any possibility of cancer, then mammography was considered to have recognized it. Almost all the mammography was ordered by the first-contact physician, and almost all was done by radiologists in eastern Ontario.

The visible clinical signs were classified as dimpling, dimpling on manipulation or other deformity. Dimpling referred to any dimple, wrinkle or dent seen in either the skin of the breast or the areola. Sometimes this sign was only elicited by manipulating the lesion (Fig. 1) or the breast tissue over it (Fig. 2). The other visible abnormalities included nipple retraction, skin nodules, peau d'orange, inflammation, and distortion of the axis of pointing of the nipple. Patients with no visible signs were listed separately.

The stages of cancer assigned were based on the pathological measurement of the tumour and the report on the microscopic examination of the axillary lymph nodes when available. Stage I included tumours less than 5 cm in diameter without "grave" signs<sup>1</sup> or axillary

lymph node metastases. Stage II included primary lesions of a similar size with axillary node metastases. Stage III lesions were greater than 5 cm in diameter or had "grave" signs. Stage IV lesions had distant metastases. Minimal cancers included invasive lesions 1 cm or less in diameter without axillary metastases and the six noninvasive lesions.

### Observations

Some 87% of the women with breast cancer were 45 years of age or older (Table I). As expected cancers in postmenopausal women predominated: 71% were in women who were not having periods, 25% in women who were and 4% in women who had undergone an ovary-preserving hysterectomy.

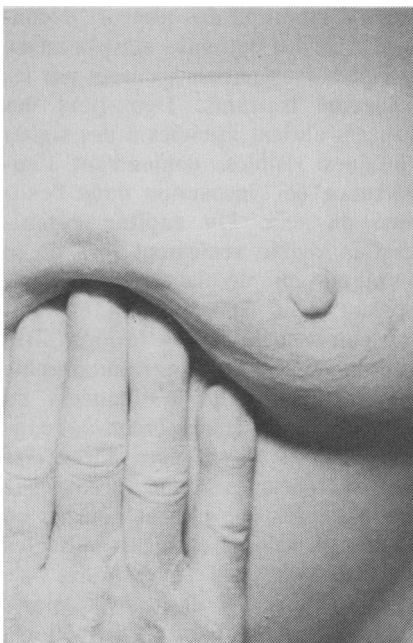
The patients found 83% of the breast cancers; of these, 88% appeared as a lump either alone or in addition to some other abnormality (Table II). The distribution of the stages of the cancers did not differ between the patient-found and physician-found groups (Table I). The mean diameter of the stage I and II tumours was 2.5 cm in the patient-found group and 2.6 cm in the physician-found group. Patients found 44 of the 50 minimal breast cancers. Of the six physician-found minimal lesions four were in women who had previously had breast can-

cer. Of the 33 cancers in patients who had had an earlier breast cancer 18 were found by the patient and 15 were found by physicians during routine or periodic examination.

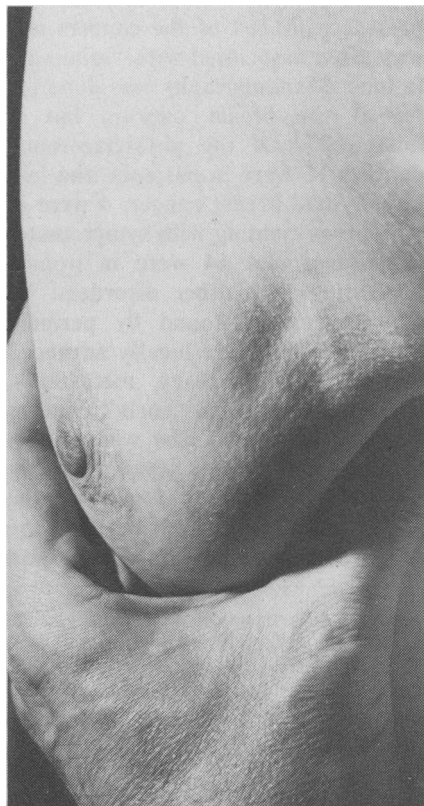
Two thirds of the tumours had an associated visible clinical sign (Table III). In 195 tumours there was dimpling with or without another sign, but too often its significance was not appreciated by the first-contact physician. In 68 tumours the dimpling appeared only on manipulation. The mean diameter of the stage I cancers associated with visi-

**Table I—Age distribution of patients with 501 breast cancers**

Age (yr)	No. of patients
20-24	1
25-29	2
30-34	16
35-39	22
40-44	24
45-49	60
50-54	74
55-59	67
60-64	59
65-69	66
70-74	46
75-79	28
≥ 80	36



**FIG. 1—Dimpling appearing on manipulation of breast lump.**



**FIG. 2—Dimpling appearing on manipulation of skin and breast tissue over lump.**

ble clinical signs was 2.4 cm, whereas the mean was 2.0 cm for those without such signs. However, when dimpling was evident only on manipulation of the lesion the mean diameter was 2.0 cm. Of the 50 minimal cancers 19 were associated with dimpling, although with 5 the dimpling appeared only on manipulation, and an additional 5 cancers were associated with another visible clinical sign, usually Paget's disease. The stage II breast cancers associated with visible signs had a mean diameter of 3.1 cm, compared with 2.6 cm for those without such signs. Naturally, there was a disproportionate number of locally advanced tumours associated with visible signs.

Mammography had been performed on only 63 of the breasts in which cancer was ultimately found. In 15 of the 28 cases of stage I cancer the mammographer was at least suspicious of a neoplasm. The results of mammography were reported as suspicious or positive in 16 of the 23 cases of stage II breast cancer and 5 of the 11 of stage III cancer but not in the 1 case in which distant metastases were clinically recognizable. Thus, mammography missed 27 of the 63 cancers for which it was ordered. However, for 4 of the 501 tumours it did expedite the diagnosis. On the other hand, aspiration cytology hastened the recognition of breast cancer on 26 occasions.

Of the 85 physician-found cancers 15 were discovered in women with previous breast cancer (of these 11 were found during a follow-up examination at a cancer clinic). Another four breast cancers that had

not been recognized by the patient were the source of metastases that had been responsible for the patient's seeking health care. A further 14 cancers were found during physical examination for unsuspected breast disease in patients who had presented with entirely different diseases. Many of these patients were aware of the breast problem prior to its "discovery" by the physician, but as the patient had not attended the physician because of the breast problem these were not counted as patient-found. Of these 14 cancers 5 were locally advanced and 1 had distant metastases. The mean diameter of the remaining eight tumours, none of which had axillary metastases, was 2.6 cm.

The remaining 52 physician-found cancers were detected as the result of periodic or routine examination for unsuspected disease. Of these, 3 tumours were locally advanced, 21 were associated with axillary metastases, and only 28 did not have axillary metastases; the mean diameters of the last two groups of primary tumours were 3.0 and 2.4 cm respectively. Furthermore, of the 28 lesions confined to the breast, 12 were in women who were senile, mentally defective or psychotic (9 were living in institutions). Three cancers were second cancers of patients with bilateral simultaneous breast cancer.

All the physician-found unsuspected breast cancers were first detected by physical examination.

Only 4 of the 65 breast cancers in women under the age of 45 years were found by periodic or routine examination. One of these patients, who had peau d'orange and bone

metastases, died within 1 year of recognition of the disease. A second woman, who had axillary metastases, died of metastatic breast cancer within 2 years of its first recognition. A third patient had already had a cancer of the other breast; her lesion was found during a follow-up examination at a cancer clinic. The fourth patient had a lesion only 1.5 cm in diameter, but it was associated with an axillary lymph node metastasis. Thus, the number, stage and outcome of the cancers found by periodic or routine examination in women under 45 were disappointing.

Of the nine women aged 45 to 49 years whose cancers were found by periodic or routine examination three had previously had cancer of the breast and were undergoing routine follow-up at cancer clinics, two had axillary lymph node metastases and in one the cancer was locally advanced when diagnosed.

In each age group the lesion was roughly twice as likely to prove to be a cancer if it was found by the patient rather than a physician (Table IV). Cancer was rare and benign lesions were common in women under the age of 45 years.

## Discussion

This study revealed several obser-

**Table III—Visible clinical signs associated with 501 breast cancers**

Sign	No. (and %) of cancers
Dimpling	196 (39)
Dimpling on manipulation	68 (14)
Other deformity*	78 (16)
None	159 (32)

\*Nipple retraction, skin nodules, peau d'orange, inflammation, or distortion of axis of pointing of nipples.

**Table IV—Age distribution of patients with 501 breast cancers according to who found the lesion in 3549 consultations**

Age (yr)	No. (and %) of lesions	
	Patient-found	Physician-found
≤ 44	61/1781 (3)	4/288 (1)
45-49	51/346 (15)	9/83 (11)
50-54	62/244 (28)	12/80 (15)
≥ 55	242/505 (48)	60/242 (25)

**Table II—Presentation and stage of 501 breast cancers**

Variable	No. (and %) of cancers	
	Patient-found	Physician-found
<b>Presentation</b>		
Lump alone or lump and deformity, pain or discharge	364 (73)	82 (16)
Deformity alone	31 (6)	3 (1)
Pain alone	14 (3)	-
Discharge alone	7 (1)	-
<b>Stage</b>		
I	241 (48)	47 (9)
II	109 (22)	22 (4)
III	60 (12)	11 (2)
IV	6 (1)	5 (1)
<b>Total</b>	<b>416 (83)</b>	<b>85 (17)</b>

vations that may be of help to physicians in recognizing breast cancer in Canadian women. However, because of the long preclinical course and the chronic and systemic nature of most breast cancers,<sup>2,6</sup> these observations will not likely cause many cancers to be found when the ultimate outcome can be substantially changed. These observations should provide reassurance to physicians that they are not missing breast cancers, so that unnecessary breast biopsies can be avoided.<sup>7</sup>

In this study there was a smaller proportion of locally advanced and metastatic disease than Burns and associates<sup>8</sup> reported for patients from northern Alberta. Her series had a slightly greater proportion of young and a slightly smaller proportion of older women. On the other hand, Mahoney and Csima<sup>9</sup> reported a series from a Toronto clinic (with substantial screening activity) that had a greater proportion of young patients but only a tiny proportion with locally advanced disease. However, in spite of the few patients with locally advanced disease the average tumour size was identical to that in the patients reported here. The series reported by Dionne and colleagues<sup>10</sup> had a similar proportion of patients with advanced disease but fewer small tumours without axillary metastases and a slightly greater proportion of young women. Thus, while the series reported here may have included a somewhat greater proportion of older patients and a slightly greater proportion of small cancers, the differences are not substantial; therefore, this series seems to be representative of the women with breast cancer likely to be encountered in Canada. This assumption is further supported by the similar incidence of simultaneous bilateral breast cancers in this series and in that reported by Mueller and Ames.<sup>11</sup>

This study emphasizes the fact that breast cancer is a disease of women over the age of 45 years. In this series only 13% of the breast cancers occurred in women under the age of 45 years, 8% in those under 40 and 4% in those under 35. Yet it is women under the age of 45 in whom the breasts are at their lumpiest and that the lumpy, painful, nipple-discharging breast disorders

(associated with active ovarian cycles) are to be expected. On the other hand, three quarters of breast cancers occur in postmenopausal women, the group for which physician anxiety about the nature of breast problems should be highest.

Since 83% of the breast cancers were found by the patients, women should be reassured that they can and do find most of the important breast disorders. Most of them recognized their problem by finding a breast lump. It is disappointing to see how often patients who had noted a deformity had the diagnosis delayed because the first-contact physician was unable to definitely identify a lump associated with the deformity and therefore ignored the sign. Finally, of the few women (5%) who presented to their physician because of pain or nipple discharge all but one had an obvious lump. The patient who did not have a lump (having presented with nipple discharge) had had a cancer of the other breast and had distortion of the nipple. Thus, the patient complaining of pain or nipple discharge without a lump or deformity is unlikely to have breast cancer.

The most important observation of this review has been that two thirds of the patients with breast cancer had some visible clinical sign. While visible signs can sometimes be elicited by elaborate maneuvers that have been described in standard textbooks,<sup>1,12</sup> none were used during these examinations. The patient was first examined sitting on the side of the table for discrepancies in the contour of the breasts and in the position of lie and the shape of the nipples. That this was rarely practised by the referring physician was indicated by the fact that most of the patients attempted to lie down when the examination of the breast commenced. Not only is inspection best begun with the patient sitting, but the axilla is most readily palpated in this position. Also, useful information often comes from palpating the breast in this position. Palpation is then continued with the patient reclining. Nearly 40% of the patients had a visible dimple or contour change that was recognizable by inspection alone. In another 14% this dimpling was evident only on manipulation of the lesion. That

16% of the patients had some other visible signs such as nipple retraction, skin nodules, peau d'orange, bulging, or change of axis of pointing of the nipples further emphasizes the value of inspection of the breast.

Dimpling is not a sign of late breast cancer; it is also present with small lesions. In this study the distribution of tumour size and staging was not substantially different for those with dimpling and those without. Other deformities (e.g., peau d'orange and skin nodules) are associated with a much more advanced kind of tumour.

While new techniques may become available that will allow the earlier diagnosis of breast cancer, perhaps permitting the alteration of its systemic nature, at present we have no choice but to use our current tools. These include noting relevant features of the patient's history<sup>13</sup> and taking advantage of the valuable information often available by inspecting the breast before and during palpation. In this study, like others,<sup>14</sup> assistance from mammography has been disappointing. In other smaller Canadian series with more frequent use it has missed breast cancers in 24%<sup>15</sup> and 27% (41% for women under the age of 50)<sup>16</sup> of subjects. Negative results from mammography should only be accepted when an experienced examiner has also judged the breast to be negative for cancer by physical examination.<sup>16,17</sup> Surgeons may derive some reassurance if they have a conservative formal biopsy policy, using aspiration biopsy when indicated,<sup>18</sup> though this too is capable of missing breast cancers.

In this series the results of periodic or routine examination for unsuspected disease, albeit practised in an uncoordinated fashion and to a varying degree, were disappointing.

Since 15 of the physician-found cancers were in women who had already had breast cancer it is not fair to credit these to the examination of well women for unsuspected disease. The finding of a further four breast cancers in patients who already had symptomatic metastatic disease was scarcely a benefit of examination for unsuspected disease. Thus, only 66 (13%) of all the breast cancers in the decade re-

viewed could be attributed to periodic or routine examination for unsuspected disease, and in each case it was physical examination that located the lesion. However, 6 of these lesions were locally advanced or had demonstrable distant metastases, another 21 had axillary lymph node metastases, 12 were in patients with incapacitating mental illness and 3 were in patients with bilateral disease. It is clear that in only 5% of the cases of recognized breast cancer can we consider "early" disease to have been successfully identified, with the prospect of possible avoidance of untimely death of the patient.

While these discouraging results are not a reason for abandoning all efforts to identify unsuspected breast cancer, they do suggest that efforts should be confined to circumstances in which they are most likely to be rewarding. Breast cancer is relatively uncommon before the age of 45, and benign disorders are common before this age (only 4 of the 288 lesions found during a routine physical examination in this age group proved to be breast cancer). In addition, the disease in young women may be less amenable to successful treatment.<sup>19,21</sup> Finally, a great deal of anxiety is generated by the finding of any breast problem in this age group. For these reasons it appears that searching for unsuspected breast cancer in women under the age of 45 is not justified except in those who have already suffered the disease.

The low yield of cancers in the screening of young women has been observed by others. George and co-workers<sup>22</sup> found only one breast cancer in 1077 examinations of women aged 40 to 49 years. These examinations generated 92 referrals to surgeons and 32 biopsies. Though women aged 35 to 39 years made up 14.6% of the screenees in the National Cancer Institute-American Cancer Society Breast Cancer Detection Demonstration Projects, only 3.2% of the cancers found were in this group, and one third of these were noninvasive.<sup>23</sup> On the other hand, 25% of the lesions found during a routine examination in women over 55 years of age proved to be breast cancer. Further, the age-specific incidence of breast cancer is

much greater in these older women, and with the waning of ovarian cycles the benign lumpiness of the breast tends to disappear, so that malignant disorders are more easily identified.

Women between 45 and 55 years of age are an intermediate group. Only 10% to 15% of the lesions found will be cancers, so that much emotional and some physical morbidity will be induced by the finding of benign changes. Probably the morbidity:benefit ratio justifies persistence in screening this age group by physical examination, although this recommendation should be investigated by studies that involve more patients than is possible in the experience of one consultant. The Canadian Task Force on the Periodic Health Examination<sup>24</sup> recommended that breast examinations commence at age 50.

Possibly, coordinated special screening programs such as that of the Canadian National Breast Cancer Screening Study<sup>25</sup> will find "earlier" breast cancers and will answer whether intervening "earlier" in this chronic disease will alter its ultimate course.

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