Missed cancers on mammograms: Causes and measures of prevention

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Summary

Mammographically missed breast cancers remain a major medical and legal issue. In order to clarify causes and methods of the limitations, we present the experience of our Unit on this field. During the years 1999 and 2000, 319 breast cancer patients were admitted for surgical treatment to our Unit. Their files were reviewed in order to identify cases with mammography-related delayed diagnosis. Thirty-three cases of mammographically missed cancers were found (10.3%). The usual reasons for the delayed diagnoses were: retrospectively visible cancers, in benign looking lesions no further action was taken, and lesions with a rather malignant appearance were reported as benign. Missed cancers could be reduced by simple measures such as the full assessment of breast patients with clinical, radiologic, and cytologic-histologic evaluation, the double screening of mammograms, and improvement of the mammographic equipment and technique.

Key words: Mammography; Breast cancer; Missed cancer.

Introduction

Breast cancer, the most common malignancy in the female population, is successfully diagnosed by a triple assessment; clinical examination, mammography (± ultrasound) and fine needle aspiration cytology. However, some cases of breast cancer are missed, causing a considerable delay, usually for 12 months or even more, in the final diagnosis and consequently a poor prognosis [1, 2].

Many articles on missed cancers have been published, emphasizing the possible reasons [3-5]. In our retrospective study we present our data of mammographically missed cancers and we focus on the causes and the methods of prevention of this major medical and legal issue.

Materials and Methods

During the 2-year period, January 1999 to December 2000, we admitted and offered surgical treatment to 319 breast cancer patients in our Breast Unit. The selection of this specific period was based in two facts; first the large number of breast cancer patients that had surgical treatment in our Unit (> 150/year), and second the full files of all our patients.

All those files were reviewed with the aim of identifying cases with delayed patient diagnostic procedures due to mammographic misinterpretation.

Results

Thirty-three cases of mammographically missed cancers were identified (10.3%), while in nine cases (2.8%) the cancers were truly invisible on mammography, and the diagnosis was based on clinical abnormalities and on ultrasonographic findings. Causes of the delayed diagnosis are reported in Table 1. The most common ones were: retrospectively visible cancers (Figure 1), lesions with a malignant appearance reported as benign, and benign looking lesions where no further action was taken (Figure 2).

Table 1. — *Causes of delay in mammography-based diagnosis of breast cancer in our series.*

Causes of delay	Number of cases
Cancer present on a prior mammogram, but not reported by the radiologist	12
Benign appearance of a palpable lesion - no further action was recommended	7
Possibly malignant lesion was reported as benign - patient asked for a further opinion by a breast specialist	5
Dense breasts that interfere in tumor borders	4
Suboptimal technique	2
Lesion in deep position, next to the chest wall; not shown or part of it shown on mammogram	2
Only one view	1
Total	33

Discussion

Missed cancers remain an important problem that could be prevented, but unfortunately not totally avoided, given that some breast malignancies are invisible on mammograms and the mammography itself has its own limitations [2, 6, 7]. Besides the obvious medical responsibility, missed breast cancers appear to present an increasing legal aspect related to malpractice litigation [1, 2, 8].

Many reasons for the delayed diagnosis have been identified and reported. The majority are related to the mammographic technique and interpretation, while some

Revised manuscript accepted for publication September 3, 2003

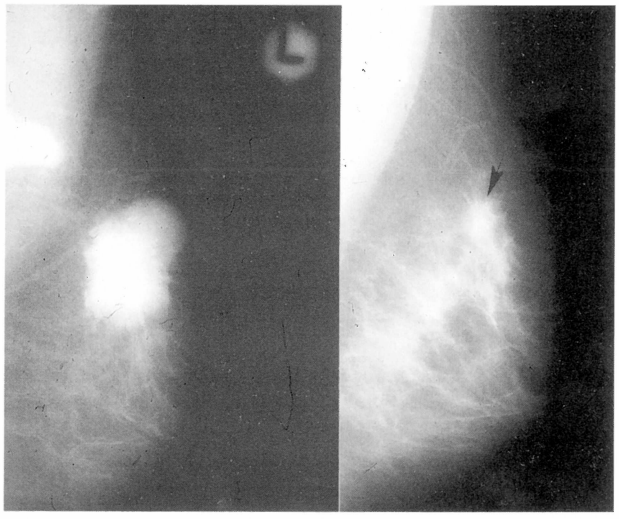

Figure 1. — Mammograms of a breast cancer patient showing the tumor at the time of surgery, and in an early stage in a prior film two years before (arrow).

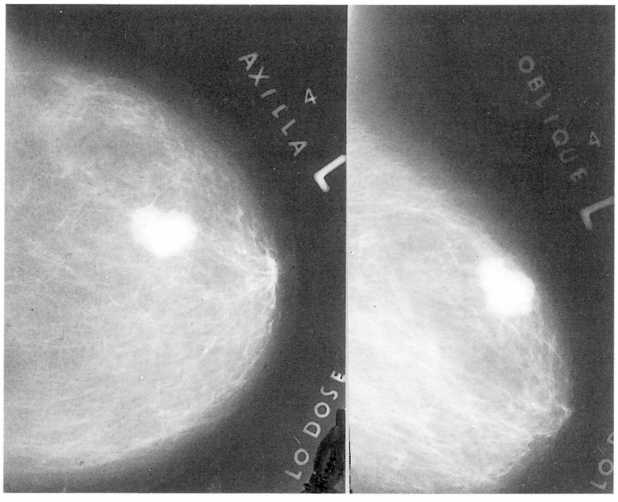

Figure 2. — Mammogram (MLO, CC) of a patient with a possibly benign looking lesion, which finally proved to be cancer.

others are related to different factors, such as: imperfect clinical examination that misses a lump [1]; inappropriate reassurance by the phycisian that a finally malignant mass is benign without tissue diagnosis; misread pathology or cytology [4]; no radiologic evaluation of a lump [1]; and the specific specialty of the breast clinician with gynecologists to be most commonly related to missed cancers [1, 2].

Among the mammography-related factors most important are the misread mammograms [4], the observerradiologist's error, the technical problems related to mammography [9, 10], the mammograms in young women and in dense breasts regardless of age [5, 11, 12], the deep retroglandular location of the breast tumor [3, 5], the small size of the lesions [3], the parenchymal distortions and developing opacities in mammographically dense breasts [5], and the retrospective view of prior films that reveals up to 30% of missed cancers to be visible [5, 11]. Our findings are in accordance with the above-mentioned factors.

The problem of the missed cancers could be reduced by establishing some rules of patient management: 1) symptomatic breast patients should not be based only on the radiologist's evaluation, but they should have full diagnostic assessment by a breast clinician. On the other hand, breast specialists should not rely solely on their own judgment, but should demand radiologic assessment [4]; 2) patients and clinicians should not rely on benign reported mammograms. Clinicians should review the films on their own [4]; 3) a double review of mammograms, by two independent radiologists, could increase the percentage of cancers detected up to 15% [10,13], while computer-aided diagnostic evaluation of mammography could be helpful in almost 80% of missed cancers [12, 14]; 4) improvement of mammographic equipment and technique (e.g., digital mammography) and proper exposure, compression and positioning of the breast on the mammographic equipment are essential [5]; 5) in cases of mammographically dense breasts or in young patients, besides clinical evaluation, further radiologic examination with ultrasound should be performed [5]; 6) the management of breast patients should be under the care of well-trained breast specialists [2].

Conclusion

Missed breast cancers remain a challenge for medicine of the 21st century. Breast specialists are responsible for reducing their incidence, restricting malpractice, and increasing the numbers of early detected cancers that have an excellent prognosis.

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