Baseline Staging of Newly Diagnosed Breast Cancer – Kuwait Cancer Control Center Experience

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Key Words

Breast cancer • Metastases • Staging procedures

Abstract

Objective: To determine the value of staging investigations in detecting metastases in newly diagnosed asymptomatic patients with breast cancer. **Materials and Methods:** A retrospective review of patients' files with newly diagnosed breast cancer in the period from 1993 to 1998 was performed. Due to inadequate information, thirty-eight files were excluded leaving 785 files for analysis. **Results:** Of the total 785 patients, we found distant metastases at the time of primary diagnosis in 36 (4.6%) patients, bone metastases in 29 (3.7%) patients, pulmonary metastases in 6 (0.8%) patients and liver metastases in 5 (0.6%) patients. Overall, 0.7% of patients with clinical stage I and II disease had metastases compared with 16.2% of patients with clinical stage III disease (statistically significant $p = 0.0001$). **Conclusion:** The results confirm the low yield of routine bone scans, liver ultrasound and chest X-ray among patients with asymptomatic early-stage breast cancer. These tests are therefore not recommended for such patients, although intensive investigations are appropriate for more advanced tumors.

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Introduction

Many patients have extensive staging investigations to complete their metastatic workup following a diagnosis of breast cancer [1, 2]. The goal of these tests is to identify those patients with incurable disease so that a more realistic prognosis can be given and their treatment tailored accordingly. Bone scan (BS), liver ultrasound (LUS) and chest X-ray (CXR) are still commonly used to detect subclinical metastatic disease [3]. The usefulness of these tests is questionable [4–6], especially when one considers both their sensitivities and specificities.

The aim of this study was to determine the frequency and distribution pattern of metastases at the time of primary surgery, and to identify a group of breast cancer patients in whom imaging studies for staging can be omitted.

Materials and Methods

From January 1993 to 1998, 823 consecutive patients with primary breast cancer had surgery and subsequent therapy at Kuwait Cancer Control Center. Thirty-eight files were excluded from the analysis because of inadequate information, leaving 785 files for further analysis. All patients were clinically staged by physical

Table 1. Distribution pattern of metastases to sites at risk based on TNM staging

Stage	Bone	Lung	Liver	Bone/ liver	Lung/ liver	Bone/ lung	Total
IIA(T1N1)	–	–	1	–	–	–	1
IIB(T2N1)	2	–	–	–	–	–	2
IIB(T3N0)	1	–	–	–	–	–	1
IIIA(T3N1)	5	1	–	1	–	–	7
IIIA(T2N2)	1	–	–	–	–	–	1
IIIA(T3N2)	1	–	–	–	–	–	1
IIIB(T4N0)	1	–	–	–	–	–	1
IIIB(T4N1)	4	–	1	–	–	–	5
IIIB(T4N2)	11	3	–	1	1	1	17
Total	26	4	2	2	1	1	36

examination to determine their T and N stages. Routine investigations with CXR, LUS and BS were then carried out to detect subclinical metastases. The detection rate of metastases was correlated with clinical staging. Staging was modified according to the American Joint Committee on Cancer classification system 2002 [7]. A χ^2 test was used to determine whether metastases were significantly different between early and advanced stages.

Results

In general, 52% of the patients were Kuwaiti compared to 48% Non-Kuwaiti. The median age of the patients was 45 years. Premenopausal patients constituted 63% of the total cases. Metastases were found with routine imaging studies in 36/785 (4.6%) patients at the time of primary surgery. About 28% of the cases were premenopausal. Metastases were more frequent in bone (26/785 patients, 3.3%), followed by lung (0.5%) and liver (0.3%). Synchronous metastases were found in bone and liver in 2 cases, lung and liver in 1 case and bone and lung metastases in 1 case (table 1). The detection rate of subclinical metastases was low (0.7%) in early-stage breast cancer compared to locally advanced (16.2%) stages. This was statistically significant ($p = 0.0001$). Bone metastasis rates were 0% for patients with stage I and IIA disease, 1.4% for patients with stage IIB, 9.2% for patients with stage IIIA and 16.2% for patients with stage IIIB. Liver metastasis rates were 0, 0.4, 0, 1.2, and 2.7% for stage I, IIA, IIB, IIIA and IIIB disease, respectively. As for lung metastasis, it was found in only 3% of patients with stage III disease and none in stage I and II disease (table 2).

Table 2. Frequency and distribution pattern of metastases according to clinical staging

Stage	Metastasis			Total number of	
	bone	liver	lung	metastases	patients
I	0	0	0	0	134
IIA	0	1	0	1	234
IIB	3	0	0	3	219
IIIA	8	1	1	9	87
IIIB	18	3	5	23	111

Discussion

It has been shown that the prevalence of detectable metastatic disease in newly diagnosed breast cancer patients is exceedingly low and increases from stage I to stage III [8–9]. Ravaioli et al. [8] reviewed data about staging procedures on 1,218 breast cancer patients. An overall prevalence of 1.46% was reported when results of BS, LUS and CXR were analyzed together in patients with low-risk tumor characteristics (pT1–T3 and a number of positive nodes ≤ 3). On the other hand, in patients belonging to the high-risk group (pT4 or a number of positive nodes >3 or pN2), the prevalence was 10.68%.

This study reports a relatively low detection rate (0.7%) of subclinical metastases in early stages (stage I and II) of breast cancer as only 4 patients were found to have metastases with no clinical or biochemical abnormalities. The significance of such low value may be lowered further since there is no clinical evidence of improved prognosis with early treatment of asymptomatic metastases compared to treatment after the onset of symptoms.

In a systematic review, Myers et al. [9] reported positive BS at baseline from 0.9 to 40% with the lowest prevalence observed in stage I and the highest in stage III patients. In our study, no patient with stage I or IIA disease was found to have distant bone metastases compared to 13.1% with stage III disease.

Studies evaluating the role of LUS in detecting liver metastases showed an even lower prevalence than that observed in the studies of BS: 0% for stage I, 0.4% for stage II and 2% for stage III [9]. In this study, liver metastasis was found in 5 patients (0.6%). There was no liver metastasis in patients with stage I breast cancer. In stage II and III disease, we detected liver involvement in 0.2 and 2%, respectively.

In a large study ($n = 1,493$) designed to identify patients with early breast cancer who were upstaged to stage

IV by CXR, Chen et al. [10] found pulmonary metastases in less than 0.1% of asymptomatic patients. In this study, pulmonary metastases were present in only 6 of 785 patients (0.8%). All of them had stage III disease. Although many anesthetists traditionally require CXR before general anesthesia, there is no strong medical indication for routine preoperative CXR in asymptomatic, otherwise healthy breast cancer patients [11]. Furthermore, CXR has never been shown to improve outcome in the care of patients with clinical stage I or II breast cancer [10]. Our data support the view that CXR may be eliminated in the routine staging for asymptomatic patients with stage I or II breast cancer.

Conclusion

Our results confirm the low yield of metastases at initial presentation of operable early breast cancer (clinical stage I and II) and the relatively low yield of routine BS, LUS and CXR in asymptomatic patients. Therefore, such investigations should not be routinely done unless the results of initial clinical assessment or blood work reveal abnormalities. However, in locally advanced (clinical stage III) breast cancer, the incidence of metastases is much higher (16.2%), and more extensive investigations with BS, LUS and CXR are warranted.

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