

Pelvic Recurrence of Breast Cancer Presenting as Ovarian Carcinoma: Case Report

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Abstract

Breast cancer is the most frequent cancer in women from western countries. The risk to develop recurrence of the tumor is about 30%. Intra-abdominal and pelvic metastases count <5% of clinical findings and they represent 30-40% and 20-40% of autopsy findings, respectively. Conventional imaging workup to follow-up of patients with breast cancer includes CT, MRI and bone scintigraphy for distant metastases. We present a rare case of a caucasian 59-years-old woman, with history of breast cancer in her anamnesis. She occurred to our attention for the onset of a single adnexal mass, ascites and increasing in waist circumference. Until then, the standard imaging techniques were negative for relapse. Patient was affected by recurrent lobular breast cancer. Positron Emission Tomography (PET-CT) has a high sensitivity and specificity for peritoneal carcinosis and 0.5 cm is considered as a size threshold for the detection of tumor nodules. We think PET-CT could be useful in the evaluation of women suspected of distant recurrence of breast cancer. The next step should be to design prospective studies in which PET-CT will be used as first-line imaging procedure in these patients. Impact of management and survival of patient could be significant.

Introduction

Breast cancer is the most frequent cancer in women from western countries. Its incidence has progressively increased for the past 30 years, USA count 207,090 new cases in 2010 [1]; whereas the specific mortality rate is relatively stable. The risk to develop recurrence of breast cancer is about 30% [2], it is highest in the first 2-3 years and then decreases continuously. A minority of cases (10%-20%) of all recurrences are isolated loco regional, while 60 to 70% are distant metastasis. The most commonly involved sites are bone (20-60%), lung (15-20%), loco regional (20-40%), liver (5-10%), brain (5-10%). Intra-abdominal and pelvic metastases are very rare (<5%) [3], however up to 40% of cases, they were detected in autopsy findings. Infiltrating ductal carcinoma is the most common histological subtype accounting for about 80% of all invasive breast cancer, as compared to lobular carcinoma which ranges from 7 to 20%. Both types of tumors metastasize to the common sites, but the lobular carcinoma also metastasize to the gastrointestinal tract, pelvic organs, peritoneum/retroperitoneum and urinary tract [4]. We present a rare case of recurrent lobular breast cancer presenting as a single adnexal mass, peritoneal carcinomatosis and ascites with a clinical suspicion of ovarian cancer.

Breast Cancer Follow-Up

Imaging techniques play an important role in the detection and staging of breast cancer, because early detection improves patients' prognosis, and accurate staging has a substantial influence on therapy management (surgery, chemotherapy or radiation therapy) [5-7]. However, despite all of the improvements in diagnosis and treatment, the disease-free survival time remains relatively stable. Follow-up examinations are made up to four times per year for the first 3 years, twice a year for the following 2 years and then annually in patients with adenomamectomy according to the European Society for Medical Oncology (ESMO) [8]. However, so far, worldwide agreement concerning the follow-up and therapy of breast cancer patients has not yet been achieved [9,10]. Currently, depending on the patients' symptoms, follow-up of patients with breast cancer may involve a physical examination, the assessment of tumour markers, breast and axillary lymph node ultrasound, conventional mammography and magnetic resonance mammography (MRM) for local recurrence, computerized tomography (CT) and Magnetic Resonance Imaging

(MRI) for distant metastases and bone scintigraphy for osseous metastases.

Of these, based on their availability, CT and MRI are frequently used for cancer imaging when looking for organ or lymph node metastases [7,9].

Case Presentation

We report a case of a caucasian 59-years-old woman, who was affected by infiltrating, lobular mammary adenocarcinoma. In 2001 she found a nodule of 2 cm on the right breast during self-examination, confirmed as carcinoma at biopsy. Therefore, she was submitted first to upper-outer quadrantectomy on the right breast and then to radical right mastectomy with ipsilateral axillary lymphadenectomy. Among 16 lymphonodes that were removed, 9 were positive for carcinoma. The immuno-histochemical examination revealed positivity for estrogen receptors (100%) and for progesterin receptors (80%). The patient was then treated with adjuvant chemotherapy and hormonal therapy. Follow-up consisted in clinical examination, laboratory blood test including tests for specific neoplastic markers, such as Cancer Antigen 125 (Ca125), Carcinoembryonic antigen (CEA) and Cancer Antigen 15.3 (Ca15.3) and abdominal ultrasound every 6 months, total body CT and total body scintigraphy every year. All examinations were not remarkable and investigations were negative for disease relapse until February 2010, when Ca15.3 was 105 U/ml. Consequently a CT scan was done, which did not detect any lesion suspicious for tumor relapse. In December 2010, the patient occurred to our attention referring abdominal pain and increasing in waist circumference,

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clinical examination showed left annex fixed to surrounding plans and abdominal nodularities referable to peritoneal carcinomatosis. Abdominal ultrasound detected bilateral ovarian enlargement with mixed echogenicity and ascites. Risk of Malignancy Index (RMI) score was suspected for malignancy (RMI score = 243). Only one neoplastic marker (Ca15.3: 1301 U/ml) was increased, while Ca125 serum level was within normal range (27.8 U/ml). Evacuative paracentesis was performed, leaking 500 ml of serous liquid and cytologic examination identified tumoral cells that were compatible to adenocarcinoma. The patient was submitted to total body CT with the evidence of ascites, peritoneal carcinomatosis and a para-uterine mass from adnexal origin. In January 2011, the woman underwent to surgical exploration that confirmed widespread peritoneal carcinomatosis with involvement of omentum, liver, diaphragmatic peritoneum, ileum, colon, uterus and ovaries (Figure 1). Left ovary appeared with a cyst of 4 cm, while small nodules appeared on the uterus surface. The findings were comparable to ovarian carcinoma. It was performed a biopsy on the parietal peritoneum and on uterine nodule. Therefore, considering the extension of the tumor, it was decided to program chemotherapy prior a consequent debulking surgery. The post-operative course was normal and the patient was discharged on postoperative day 3. The hystological examination revealed carcinoma of breast origin (Figure 2).

Discussion

Breast cancer represents the most common non-genital solid tumor metastasizing to the pelvis [2]. In the follow-up of breast carcinoma, evaluation of tumor recurrence or distant metastases presents a diagnostic challenge to the clinician [11]. The most common anatomical sites of recurrence are bone (35%), lung (23%), local skin (22%) and regional nodes (16%). In patients with stage I disease, breast cancer relapse occurs at loco-regional sites, while bone, lung and pleura metastases are most common in patients with stage II disease [12]. Gerber et al. reported that intrabdominal and ovarian locations count <5% of clinical findings, representing 30-40% and 20-40% of autopsy findings, respectively [3]. So, there is probably a misdiagnosis of recurrence during follow up for breast cancer. Pelvic recurrence from breast cancer is not an unusual finding, but there is not a careful investigation for abdominal region in these patients. An accurate imaging technique should achieve a high sensitivity rate. Concerning peritoneal carcinosis, PET/CT has a sensitivity and a specificity of 94%, for nodules of 5-80 mm [13] and 0.5 cm is considered as a size threshold for the detection of tumor nodules. PET/CT imaging showed high performance indexes in the detection of recurrence with a sensitivity of 93.6%, specificity of 85.4%, versus 33%, 100% for



Figure 1: Intra-abdominal carcinomatosis at surgery exploration.

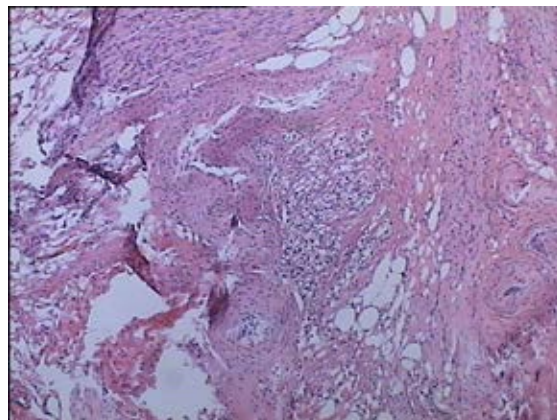


Figure 2: Cancer metastatic to the ovary with stromal involvement. The tumor cells occupy almost the entire ovary, and no residual ovarian tissue is present in this area (hematoxylin and eosin, 10×).

conventional workup, without significant difference between lobular and ductal adenocarcinoma ($p>0.05$) [2]. The role of PET-CT could be helpful in allowing early diagnosis and improving survival. The prognosis of patients with breast cancer symptomatically metastatic to the ovary is almost uniformly poor, with actuarial 5-year survival rates of 0–27% [14–17]. The median survival of patients with metastatic breast cancer is currently given as 20 to 28 months; the main treatment goal is palliation. Recurrence characteristics (such as localization and size) are critical for patient management because they have an impact on the selection of the most adequate treatment [2]. Surgery has a key role in the management of primary ovarian cancer; however, this has not been clearly established in cancers metastatic to the ovaries. There are discordant results regarding the role of surgical resection or tumoral debulking in patients with malignancies metastatic to the ovaries. The 5-year survival rates after resection of metastatic tumors in the ovaries from gynecologic and non-gynecologic organs were significantly different (47% vs. 19%) [18]. In the first report evaluating the role of debulking surgery in patients with breast cancer metastatic to the abdomen and pelvis, Abu-Rustum et al. reported that the median survival in patients with no gross residual disease after operation was longer than that of patients with visible residual disease, although this did not reach statistical significance [19]. In addition, Eitan et al. found that survival was better in optimally debulked patients (<2 cm of residual disease) than suboptimally debulked patients with breast cancer metastatic to the pelvis [20]. Early diagnosis of recurrence should allow a timely start of therapy and accordingly improve overall survival [3]. Therefore, early detection of this disease can reduce mortality significantly and will promote women's quality of life. In clinical practice, PET-CT is not included in the follow up of breast cancer, as standard procedure. Currently, conventional workup to follow-up of patients with breast cancer may involve a physical examination, the assessment of tumour markers, breast and axillary lymph node ultrasound, abdominal and pelvic ultrasound, chest x-ray, conventional mammography and magnetic resonance mammography (MRM) for local recurrence, CT and MRI for distant metastases and bone scintigraphy for osseous metastases. However, there is no evidence from randomised trials supporting any particular follow-up sequence or protocol. Our patient performed total body CT every year but she did never performed PET-CT. The exams didn't detected any lesions suspected for malignancy, however the preoperative CT revealed ascites and peritoneal carcinomatosis. Probably ulterior

evaluation, such as PET/ CT, should have been made in reason of its high sensitivity in detecting very small nodules. Major limitation of CT is its reduced sensitivity in the detection of deposits less than 1 cm in diameter, sensitivity is reported to be of 25-50% [21]. PET, instead, is limited in its ability to provide information on the exact location of lesion with abnormal FDG uptake because of the absence of precise anatomic landmarks. Integrated PET/CT is superior to CT for diagnosis of tumor recurrence and for definition of extent of disease [22]. Role of biological markers, in breast cancer, is still controversial. Some studies of CEA or CA15-3 in metastatic disease have showed positivity rates of around 40-70% and 40-80% respectively. Our patient performed consistently tumor markers and, after 9 years from surgery, only Ca 15.3 was elevated. Our patient is one of the few cases, reported in the literature, of pelvic recurrence from breast cancer. Chen in 2006 and Sheen-Chen in 2008 published, respectively, a case of primary breast cancer with metastasis to ovary and omentum and a case of metastatic ovarian cancer similar to the original breast carcinoma [23,24]. Diagnosis of pelvic metastatic tumor from breast origin is not simple. The oncologist is not generally used to focus on pelvic region during follow-up, moreover the finding of a pelvic mass in a patient with previous breast cancer, is compatible often with primitive ovarian tumor. The genital tract organs of patients with breast cancer should be carefully and routinely checked, not only for the possibility of endometrial lesions secondary to tamoxifen citrate treatment, but also for either primary or metastatic ovarian cancers. Prompt and intensive treatment may prolong survival and improve the quality of life [23]. We underline the usefulness of PET-CT in the evaluation of women suspected of distant recurrence of breast cancer. Because of its elevated sensitivity in detecting small lesions, the next step should be to design prospective studies in which PET-CT will be used as first-line imaging procedure in patients with suspicion of breast cancer recurrence.

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