Carcinosarcoma of the breast: report of two cases

J. Gogas, *Prof.*; **E. Kouskos,** *Senior Registrar*; **C. Markopoulos,** *Assoc. Prof.*; **D. Mantas,** *Registrar*; **Z. Antonopoulou,** *Registrar*; **K. Kontzoglou,** *Lecturer*; **J. Stamoulis,** *Registrar*; **V. Kyriakou,** *Senior Pathologist*

2nd Department of Propedeutic Surgery - Athens University Medical School - "Laiko" General Hospital - Athens (Greece)

Summary

Carcinosarcoma is a rare, malignant tumor of the breast, consisting of intraductal or infiltrating carcinoma contiguous or subtly merged with a highly cellular, mitotically active pleomorphic spindle cell stroma (sarcoma). It is a form of the metaplastic mammary carcinomas and it is probably derived of myoepithelial cells.

We report two cases of breast carcinosarcoma in two white women. The patients, following a frozen section positive for malignancy, had had a modified radical mastectomy. Paraffin sections and positive immunohistochemical cell staining (in our first case) confirmed the diagnosis of carcinosarcoma. This tumor should be distinguished from other forms of metaplastic carcinomas because it is very aggressive and has an ominous prognosis.

Key words: Carcinosarcoma; Metaplastic Carcinoma; Mammary Gland.

Introduction

Carcinosarcomas (CS) of the breast are very rare, biphasic neoplasms composed of a malignant spindle cell stromal component (at least 50% of the tumor) and an in situ or infiltrating carcinoma, which is contiguous or admixed with the sarcomatous component [1].

They are a distinct form of metaplastic carcinomas [2], which also include spindle cell carcinomas [3], matrix-producing carcinomas [4], those with giant osteoclasts [5] and squamous cell carcinomas of ductal origin [6].

In view of the rarity and the difficulties in the diagnosis we report two cases of breast CS at our Breast Unit in the last 20 years and we discuss the differential diagnostic problems from other forms of metaplastic cancers, the pathological-immunohistochemical characteristics, the metastatic behavior and the causes of the poor prognosis.

Case reports

Case 1

A 67-year-old woman presented with a mass in the left breast which she had noticed three months previously. Her obstetric history was normal. Physical examination confirmed the presence of the mass (5 cm in maximum diameter approximately) and palpable lymph nodes in the left axilla. Mammography of the left breast revealed a nodular mass with irregular borders (Figure 1). The clinical and mammographic findings were indicative of breast malignancy. The patient, after preoperative examinations (with normal results), had a modified radical mastectomy.

Pathology showed a large mass (6.5 x 5 x 2.5 cm) with a complex microscopic pattern: infiltrating ductal carcinoma was present, poorly differentiated (grade 3), hormonally sensitive with DNA aneuploidy. The sarcomatous component cells were polymorphic with increased mitotic activity (grade 3) (Figure 2). Immunohistochemical staining revealed positive reaction in the epithelial component for epithelial membrane antigen

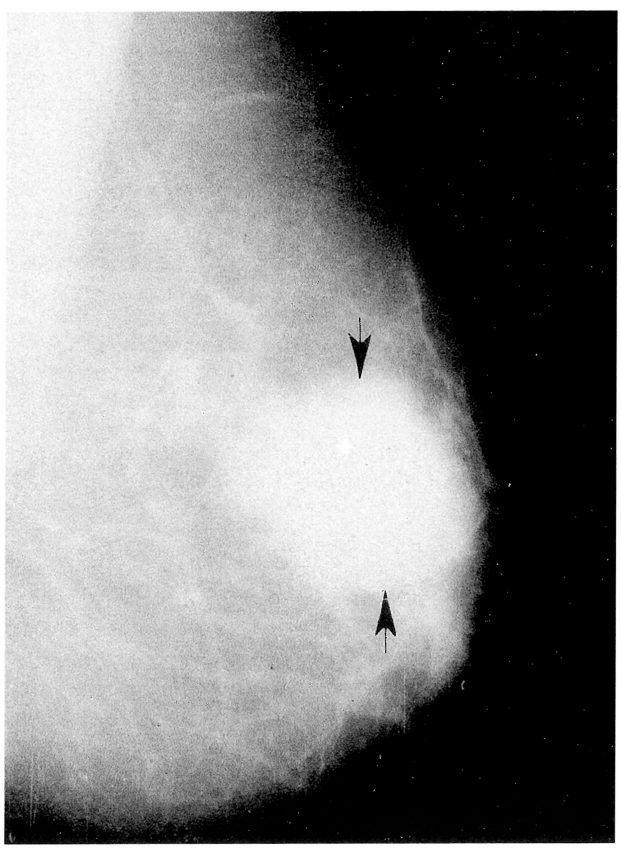

Figure 1. — Mammogram of the first patient showing a nodular mass (maximum diameter: 5 cm) with irregular borders.

Revised manuscript accepted for publication August 29, 2002

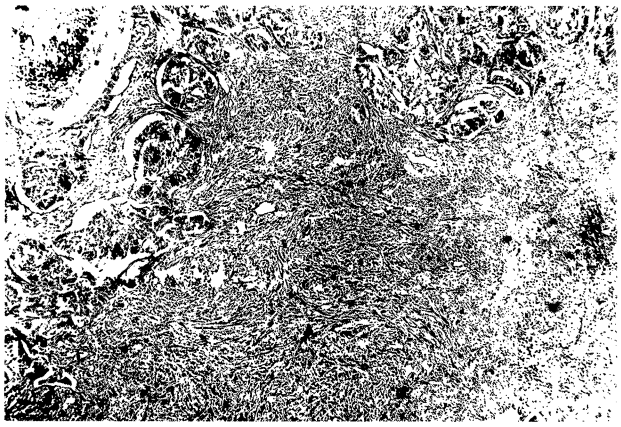

Figure 2. — Epithelial malignant tissue (left), sarcomatous component (center) and tissue necrosis (right). (H&E, 1:120)

(EMA) and keratin, while in the stromal cells positivity was found for S-100 protein, SMA, desmin and vimentin. Four of the 31 excised axillary lymph nodes were invaded: three were invaded by cancer and one by both cancer and sarcoma.

The patient, even though receiving adjuvant chemotherapy, presented lung and bone metastases within a three-month period and died four months later.

Case 2

A 30-year-old woman complained of having a lump in her left breast for four months. Breast examination showed a large mass (4 cm in maximum diameter approximately) located in the upper outer quadrant of the left breast and a palpable lymph node in the left axilla. The patient had a fine needle aspiration cytology (FNAC) of the lump, positive for malignancy, and underwent a modified radical mastectomy.

Pathology showed a large mass (5 x 3 x 3 cm) merely encapsulated and its cut surface had firm grayish-white areas and haemorrhagic areas with cyst formation. Microscopically the tumor consisted of intermingled carcinomatous and sarcomatous areas. It was found to be a CS, with an infiltrating ductal carcinoma, hormonally sensitive and moderately differentiated (grade 2) and a fibrosarcomatous stromal component with grade 3. One of the 21 lymph nodes removed from the left axilla was positive. Immunohistochemical staining was not performed.

The patient received adjuvant chemotherapy and was disease free for six years, but finally she presented with brain and liver metastases and died a few months later.

Discussion

Possible mechanisms for CS development are the proliferation of myoepithelial cells which exhibit biphasic differentiation, the transformation of the cancerous epithelial elements into mesenchymal ones or the proliferation of benign stromal tissue [1, 7, 8].

CS makes up 0.1% of breast malignancies [7]. Most of the patients with CS are postmenopausal (70%) and white (80%). The usual clinical manifestation is a large mass, sometimes fixed to the skin or chest wall. Both our cases had similar clinical findings. Mammographic appearance of CS is that of a mass with irregular borders (our first patient had similar mammographic findings). The presence of calcifications is common but not indicative of CS, while the bone formation is [1]. Fine needle aspiration cytology in CS cases could be useful in detecting malignancy (mainly cancer), as it was for our second patient, but it is difficult to identify the presence of both carcinomatous and mesenchymal components [9].

The principles of surgical treatment are similar to those for breast cancer. Treatment of choice is modified radical mastectomy with postoperative radiotherapy (locoregional control) and chemotherapy (metastatic spread control) [7].

The pathology of CS reveals large tumors (median diameter: 6.5 cm) with infiltrating or in situ malignant epithelial components (or both) and polymorphic or fibrosarcomatous stroma, presenting metaplastic (unspecified, chondroid or osseoid) changes [7]. Immunohistochemical stainings in CS present the same findings to those referred in our first case [10, 11].

The prognosis of CS is poor and it is related to the large tumor size, the advanced TNM stage, the lack of inflammatory reaction, the infiltrating margins and the high proportion of a metaplastic mesenchymal element. Axillary lymph node invasion (present in about 25% of CS cases) is not strongly associated with survival or CS recurrence. The epithelial component of CS is hormone sensitive in 10-15% of cases (both our cases were positive), therefore hormone treatment is not usually effective [1]. The 5-year overall survival for CS is 45-50%. The respective rates for TNM Stages I, II, III and IV are 80-95%, 65-70%, 20-30% and 0% [1, 8].

Tumor recurrence is either locoregional (if tumor recurred in the remaining breast tissue, chest wall or axilla) or as distal disease: distal lymph nodes, lung, bones, liver and brain. The presence of metaplastic mesenchymal cells in blood-borne metastases and their absence in the lymph nodes probably outweighs the impact of the malignant epithelial tissue on survival [7, 11].

CS should be distinguished from other forms of metaplastic cancers, fibrosarcoma, osteosarcoma, malignant fibrous histiocytoma and cancer arising on cystosarcoma phylloides because they are less aggressive and the prognosis is better [1, 3-6, 12].

In conclusion, carcinosarcoma has a different biologic behaviour from breast cancer, being very aggressive in keeping with its high-grade mesenchymal stroma.

References

[1] Wargotz E. S., Norris H. J.: "Metaplastic carcinomas of the breast. Carcinosarcoma". *Cancer*, 1989, *64*, 1490.

[2] Oberman H. A.: "Metaplastic carcinoma of the breast. A clinicopathologic study of 29 patients". *Am. J. Surg. Pathol.*, 1987, *11*, 918.

[3] Wargotz E. S., Deos P. H., Norris H. J.: "Metaplastic carcinomas of the breast. Spindle cell carcinoma". *Hum. Pathol.*, 1989, *20*, 732.

[4] Wargotz E. S., Norris H. J.: "Metaplastic carcinomas of the breast. Matrix producing carcinoma". *Hum. Pathol.*,1989, *20*, 628.

[5] Wargotz E. S., Norris H. J.: "Metaplastic carcinomas of the breast. Metaplastic carcinoma with osteoclastic giant cells". *Hum. Pathol.*, 1990, *21*, 1142.

[6] Wargotz E. S., Norris H. J.: "Metaplastic carcinomas of the breast. Squamous cell carcinoma of ductal origin". *Cancer*, 1990, *65*, 272.
[7] Gutman H., Pollock R. E., Janjan N. A., Johnston D. A.: "Biologic distinctions and therapeutic implications of sarcomatoid metaplasia of epithelial carcinoma of the breast". *J. Am. Coll. Surg.*, 1995, *180*, 193.
[8] Kaufman M. W., Marti J. R., Gallager H. S., Hoehn J. L.: "Carcinoma of the breast with pseudosarcomatous metaplasia". *Cancer*, 1984, *53*, 1908.
[9] Nogueira M., Andre S., Mendonca E.: "Metaplastic carcinomas of the breast-fine needle aspiration (FNA) cytology findings". *Cytopathology*, 1998, *9*, 291.
[10] Kuo S. H., Chen C. L., Huang C. S., Cheng A. L.: "Metaplastic carcinoma of the breast: analysis of eight Asian patients with special emphasis on two unusual cases presenting with inflammatory-type breast cancer". *Anticancer. Res.*, 2000, *20*, 2219.
[11] Paterson D. A.: "Carcinosarcoma and metaplastic carcinomas". *The Breast*, 1992, *1*, 136.
[12] Harris M., Persaud V.: "Carcinosarcoma of the breast". *J. Pathol.*, 1974, *112*, 99.

Address reprint requests to:
KOUSKOS EFSTRATIOS, M.D.,
Senior Registrar in Surgery
Ourania Douka Str. 10-12
New Smirni 171 22, Athens, Greece