Solid variant of a pure intracystic papillary carcinoma of the breast: case report

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Summary

Intracystic papillary carcinoma (IPC) of the breast is an uncommon malignant breast neoplasm and usually occurs in advanced age. It is characterized by a more benign behavior and a subsequent higher survival rate. We describe such a case of a 58-year-old female, who displayed a gradually growing tumor of the right breast. The lesion was well circumscribed and had a hard consistency with a cystic appearance. Mammography, breast ultrasonography and fine needle aspiration cytology failed to obtain a definite diagnosis. Based on the preoperative clinical identification of right axillary lymphadenopathy, the patient eventually underwent segmental resection of the right breast and right axillary nodal dissection. As regards the histological findings, the neoplasm corresponded to a pure intracystic papillary carcinoma of the solid variant. IPC represents a breast tumor with papillary differentiation growing inside a cyst, and excisional biopsy is often necessary to confirm the disease. Careful pathological examination is essential, to exclude the presence of coexistent ductal carcinoma in situ or invasive carcinoma.

Key words: Intracystic papillary carcinoma, Breast cancer, Neoplasm.

Introduction

Intracystic papillary carcinoma (IPC) is an uncommon malignant breast neoplasm generally characterized by slow growth and a better prognosis than ductal carcinomas not otherwise specified. IPC can occur in a pure form, or it may be associated with ductal carcinoma in situ or invasive carcinoma. To our knowledge, this is the second reported case of pure IPC of the solid cellular variant [1].

This paper describes in detail the case history and discusses thoroughly the diagnostic and therapeutic implications of this unusual entity.

Case Report

A 58-year-old woman became aware of a large lump, located in the right lower medial quadrant. She had first noticed this mass three months before, and since then it slowly grew and hindered her daily activity. Her family history was unremarkable, as well as her medical history. She had never undergone any radiation and there was no reported history of breast trauma.

On physical examination, the patient had a hard "cystlike" mass. It was well-circumscribed, non-tender, approximately 8 cm in diameter, and was detected in the right lower medial quadrant at 4 o'clock. The lesion seemed to have clear borders and a flat surface, mimicking a large phyllodes tumor (Figure 1). There was evidence of clinical right axillary lymphadenopathy, but there were no abnormal findings in the left breast or in either axilla.

A mammogram, first performed to investigate this lump, revealed a dense, well-defined mass, 8 cm at the longest dimension in the lower medial quadrant, which corresponded to the palpable mass (Figure 2), while breast ultrasonography (US) confirmed the presence of a large complex lesion, with solid and cystic components, occupying the lower medial quadrant of the right breast (Figure 3a). Doppler US interrogation demonstrated flow within the septa of the mass (Figure 3b). US of the right axilla showed enlarged axillary nodes that were homogeneously hypoechoic. A puncture aspiration provided 60 ml of bloody fluid content. Fine-needle aspiration (FNA) cytology from the breast cystic lesion raised the suspicion of a papillary carcinoma, but yielded no definite diagnosis.

Considering the patient's age, clinical examination, the bloody feature of the fluid and the presence of residual mass after inspiration, we decided to perform excisional biopsy, under general anesthesia. Excisional biopsy and frozen section analysis confirmed the malignant nature of the lump. The patient eventually underwent a segmental resection of the right breast, including axillary lymph-node dissection.

The macroscopic examination showed a pink, friable, cystic mass of 7 cm in diameter, containing 25 ml of hemorrhagic fluid (Figure 4). The histological essay revealed a cystic lesion with solid structures lined by layers of epithelial malignant cells and surrounded by a thick fibrous wall. Large atypical cells, with irregular nuclei and low mitotic index were observed within the cyst wall and were arranged in a solid pattern. No epithelial neoplastic tissue was present in the adjacent mammary tissue, outside the fibrous wall. Cut sections documented the presence of nine axillary lymph nodes, with no metastatic deposits noted within the nodes. On immunostaining, the neoplastic cells expressed progesterone and estrogen receptors, but they did not express HER 2/neu and p53 protein. The confirmed final diagnosis was pure intracystic papillary carcinoma of the solid variant (Figure 5). Currently, the patient is being treated with 2.5 mg/day of letrozole at the outpatient clinic, and no signs of recurrence have been recognized.

Discussion

IPC encompasses a small distinctive subgroup of non-invasive breast cancer, which accounts for less than 0.5% of breast malignancies. The mean patient age at diagnosis is 63-67 years. Approximately half of IPCs arise in the retroareolar region of the breast and the usual clinical manifestation is a palpable mass or nipple discharge [2].

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Fig. 1

Fig. 2

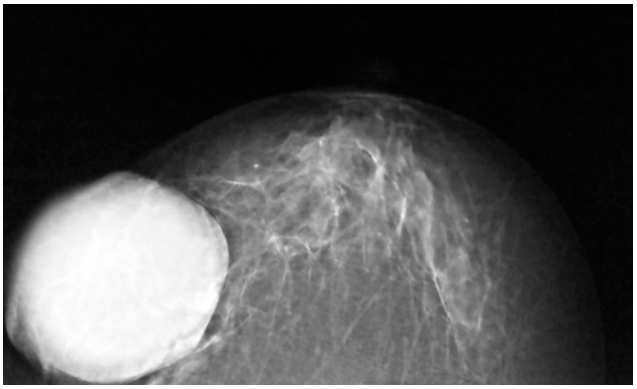

Fig. 3a)

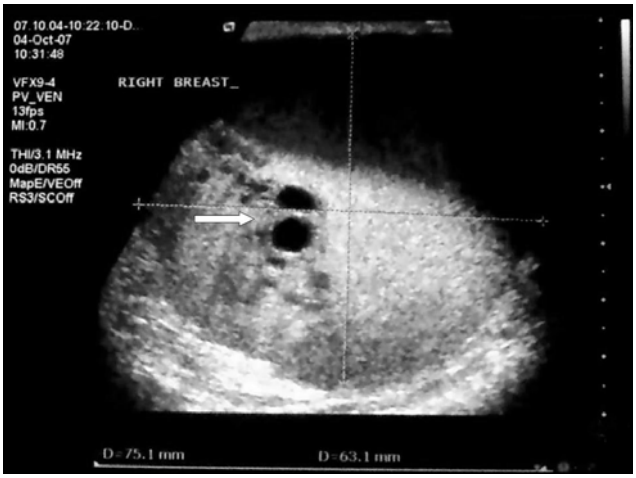

Fig. 3b)

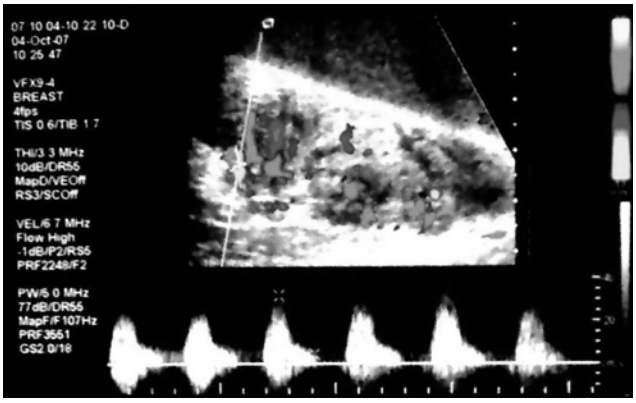

Fig. 4

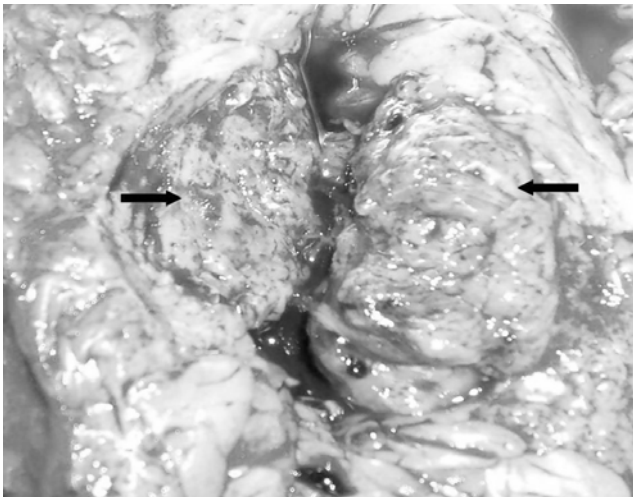

Fig. 5

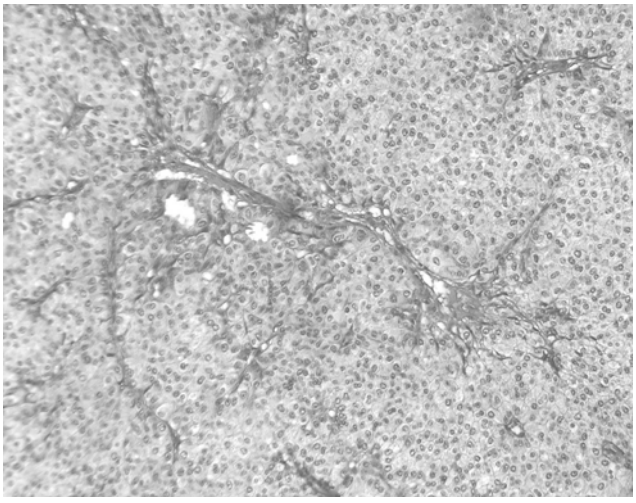

Figure 1. — Clinical appearance of the large "cystlike" mass in the right lower medial quadrant.

Figure 2. — Craniocaudal mammography showing a large mass with well-defined margins and high density.

Figure 3. — a) Targeted breast ultrasonography revealing complex cystic masses in the lower medial right breast. b) Doppler sonography showing intratumoral blood flow.

Figure 4. — Photograph of gross specimen showing the pinkish appearance of spherical tumor *(arrows)* within the hemorrhagic cystic space.

Figure 5. — Papillary proliferation composed of solid neoplastic cells with low mitotic index (hematoxylin & eosin staining x 200).

According to Carter *et al.*, IPC is divided in three subtypes: i) pure IPC, ii) IPC with associated DCIS, and iii) IPC with associated invasive cancer. In most series, the frequency of each subtype is 33%, respectively. The majority of patients with IPC will have associated DCIS or invasive cancer, or both, and should be treated on the basis of this associated pathology [3]. The nature of the associated lesions to IPC is essential for prognostic reasons and for assessment of the margins. Moreover, it has been reported that IPC accompanied by DCIS is an important precursor to invasive carcinoma and in this occasion further treatment is always indicated [4].

Pathologically, IPCs may show four different cellular patterns: i) cribriform, ii) solid columnar epithelial, iii) stratified spindle cell, or iv) a transitional cell form resembling urothelium, or a combination of two or more of these patterns may be seen [5]. IPCs usually contain fibrous and vascular elements, but the existence of necrosis is often associated with the presence of an invasive component. Most tumors are pink to tan, have a soft or friable consistency, and have a spherical, well-defined contour. Hemorrhagic areas within the solid components of the tumor and bloody content within the cystic spaces are often identified [6]. As regards our patient, the macroscopic appearance and clinicopathologic findings were in accordance with the features of a pure IPC of the solid cellular pattern.

The mammographic findings of IPC are usually well circumscribed high-density masses, because of the hemosiderin hemorrhage deposits. Sometimes, satellite nodules or microcalcifications or both are present. Targeted breast ultrasonography confirms the presence of solid or complex cystic masses with posterior acoustic enhancement, while Doppler sonogram often demonstrates vascularity of the solid portion or large feeding vessels [7]. Although it is a rare manifestation, some investigators have reported an uncommon sonographic appearance of IPCs, without any solid component, thus mimicking a breast cyst [8]. On the other hand, contrast-enhanced breast magnetic resonance imaging (MRI) may detect marked enhancement of cyst walls, septations and mural nodules, but the imaging findings cannot establish a definitive diagnosis [6, 7].

It is noteworthy that recent studies were undertaken to evaluate the diagnostic value of FNA and core needle biopsy (CNB), in order to approach an accurate preoperative diagnosis, if possible. FNA cannot always differentiate between benign and malignant papillary breast tumors. It is strongly postulated that the difficulty in obtaining a definite diagnosis of malignancy by FNA can be attributed to the cystic and hemorrhagic nature of these lesions, sparse cellularity and necrotic debris [7]. In our case, a FNA cytologic study revealed cells with minimal atypia and papillary morphology, but the result was interpreted as a borderline lesion. Matsuo *et al.* have suggested measuring the CEA value of aspirated fluid, using anti-CEA monoclonal antibody, as this is an easy, safe and valuable procedure for the accurate diagnosis of IPC [9]. Some studies have proposed that CNB has been proven to be more effective in distinguishing papillary neoplasms from other diseases and benign papillomas from papillary carcinoma [10, 11]. Although CNB is a useful diagnostic modality for IPCs, it may be unable to distinguish between in situ and invasive lesions, because it cannot obtain adequate tissue by the periphery of the mass [7].

Today, there is still no clear consensus regarding the optimal treatment of IPC. The treatment of choice for pure IPC is ample local excision without axillary lymphadenectomy, while long-term follow-up is necessary after surgical treatment [11, 12]. Local excision is therapeutic and no adjuvant therapy is needed following appropriate surgery. "Appropriate surgery" means that clear margins should be achieved, in order to reduce the possibility of tumor recurrence. Although recurrence seems to be extremely rare following complete tumor resection, there are no collected data regarding recurrence rates because of the limited number of reported cases in the medical literature and the short follow-up of these patients.

As regards our patient, the diagnosis of IPC required an excisional biopsy. The patient eventually underwent segmental excision of the right breast with axillary lymph node dissection because of the prominent clinical regional lymphadenopathy.

References

[1] Poultsidis A.A., Kalra S., Bobrow L., Purushotham A.D.: "Intracystic papillary carcinoma; solid variant in a male breast - case report and review of the literature". *J. BUON.,* 2002, *7,* 157.

[2] Lieberman L., Feng T.L., Susnik B.: "Case 35: Intracystic papillary carcinoma with invasion". *Radiology,* 2001, *219,* 781.

[3] Leal C., Costa I., Fonseca D., Lopes P., Bento M.J., Lopes C.: "Intracystic (encysted) papillary carcinoma of the breast: a clinical, pathological, and immunohistochemical study". *Hum. Pathol.*, 1998, *29,* 1097.

[4] Carter D., Orr S.L., Merino M.J.: "Intracystic papillary carcinoma of the breast. After mastectomy, radiotherapy or excisional biopsy alone". *Cancer,* 1983*, 52,* 14.

[5] Lefkowitz M., Lefkowitz W., Wargotz E.S.: "Intraductal (intracystic) papillary carcinoma of the breast and its variants: a clinicopathological study of 77 cases". *Hum. Pathol.,* 1994, *25*, 802.

[6] Wagner A.E., Middleton L.P., Whitman G.J.: "Intracystic papillary carcinoma of the breast with invasion". *Am. J. Roentol.,* 2004, *183,* 1516.

[7] Ko K.H., Kim E.K., Park B.W.: "Invasive papillary carcinoma of the breast presenting as post-traumatic recurrent hemorrhagic cysts". *Yonsei Med J.*, 2006, *47,* 575.

[8] Liston J.C.: "Case report: an unusual interval breast cancer masquerading as a simple cyst". *Clin. Radiol.*, 1997, *52,* 876.

[9] Matsuo S., Eto T., Soejima H., Ohara O., Hidaka O., Miyazaki J. *et al.*: "A case of intracystic carcinoma of the breast: the importance of measuring carcinoembryonic antigen in aspirated cystic fluid". *Breast Cancer Res. Treat.,* 1993, *28,* 41.

[10] Kinoshita T., Fukutomi T., Iwamoto E., Takasugi M., Akashi-Tanaka S., Hasegawa T.: "Intracystic papillary carcinoma of the breast in a male patient diagnosed by core needle biopsy: a case report". *Breast.,* 2005, *14,* 322.

[11] Solorzano C.C., Middleton L.P., Hunt K.K., Mirza N., Meric F., Kuerer H.M. *et al.*: "Treatment and outcome of patients with intracystic papillary carcinoma of the breast". *Am. J. Surg.,* 2002, *184,* 364.

[12] Andrés B., Aguilar J., Torroba A., Martínez-Gálvez M., Aguayo J.L.: "Intracystic papillary carcinoma in the male breast". *Breast J.,* 2003, *3*, 249.

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