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ORIGINAL PAPER

Pigmented Papillary Carcinoma: A Rare Tumor of the Male Breast

Andrea Farkas · Roland Istók · Eszter Székely · Tibor Glasz · Janina Kulka

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Abstract Primary melanin pigment containing tumors of the breast are rare. We report a pigmented papillary carcinoma of a 60-year-old male patient who presented a firm mass 1.7 cm in diameter with an ill defined border on ultrasonography behind the mamilla. To the best of our knowledge this is the third case report of this type of tumor in male breast.

Keywords Breast carcinoma · Male breast · Melanin pigment · Papillary carcinoma · Pigmented papillary carcinoma

Introduction

Melanin pigment containing tumors in the breast are rare. Primary malignant melanomas of the breast and primary breast carcinomas which infiltrate the epidermis and possess large amounts of pigment-rich melanocytes are well known examples.

In the presented case, apart from the melanin-laden tumor cells of the primary papillary carcinoma, melanocytes in the tumor stroma were also detected, indicating the possible uptake of melanin pigment by the tumor cells.

A. Farkas (✉)
Department of Pathology, St Imre Hospital,
12–16 Tétényi út,
Budapest 1115, Hungary
e-mail: drfarkasandrea@gmail.com

R. Istók · E. Székely · T. Glasz · J. Kulka
2nd Department of Pathology, Semmelweis University,
Budapest, Hungary

Case History

A 60-year-old male patient presented with a swollen, livid left mamilla. Clinical examination of the left breast showed a palpable, firm mass 1.7 cm in diameter with an ill defined border on ultrasonography.

Fine needle aspiration biopsy was performed. On the smear, large amounts of closely packed or dissociated epithelial tumor cells were detected. These cells had wide, bright eosinophilic cytoplasm, their vacuolated, hyperchomatic nuclei showed irregularity. In some larger cell groups, the malignant cells seemed to form papillary structures. In the background numerous histiocytes were present with dark brown pigment in their cytoplasm. Invasive malignant tumor was unequivocally diagnosed. Based on the cytological report, breast conserving surgery and axillary block dissection were performed.

The 29 g excised specimen measured 9×4×2.5 cm. The 8×3 cm skin ellipse contained a swollen, livid mamilla. On the cut surface there was a 2.2 cm, greyish-white, well-circumscribed, compact mass behind the mamilla. In some areas the tumor had livid appearance. Macrosopically, the resection margins were tumor-free.

Dissection of the 10×4×4.5 cm axillary fat tissue revealed 11 brownish lymph nodes.

Microscopy

The microscopic examination of the breast specimen, corresponding to the result of the former fine needle aspiration biopsy, showed a well circumscribed intracystic papillary neoplasm composed of small, monomorph tumor cells with moderately eosinophilic, not well circumscribed cytoplasm, and hyperchromatic nuclei. Mitotic figures were

rare (Fig. 1). At some microscopic foci invasion of the surrounding parenchyma was detected, proved also by collagen 4 (dilution 1:300, Dako, Glostrup, Denmark) and laminin (dilution 1:500, Dako, Glostrup, Denmark) immunohistochemistry. Between the tumor cells and in the fibrovascular core of the papillary projections numerous cells with large and small granules containing brownish pigment in their cytoplasm were seen. This pigment proved argentaffin by Grimelius staining, whereas it could not be stained with Prussian Blue and PAS reaction. These pigment-containing cells proved to be non-melanocytic cells by immunohistochemistry as they were negative with both HMB45 (dilution 1:200, Dako, Glostrup, Denmark) and Melan-A (dilution 1:100, Dako, Glostrup, Denmark) antibodies but positive with cytokeratin (clone: MNF116, dilution 1:300, Dako, Glostrup, Denmark). Interestingly, Melan-A positive but pigment free melanocytic cells appeared next to this cell population. Large macrophages containing excessive amounts of melanin were also present. The skin above the lesion showed normal pigment content.

Myoepithelial cells, using smooth muscle actin (dilution 1:150, Dako, Glostrup, Denmark) and p63 (dilution 1:200, Dako, Glostrup, Denmark) immunohistochemistry, could not be demonstrated within the tumor. One hundred percent of the cells of the intracystic papillary tumor showed intensive nuclear estrogene- (dilution 1:200, Novocastra, Newcastle upon Tyne, UK) and progesterone- (dilution 1:200, Novocastra, Newcastle upon Tyne, UK) receptor positivity, whereas 30% were positive with the Ki67 (dilution 1:150, Dako, Glostrup, Denmark) proliferation marker, and around 10% of the tumor cells were positive for p53 (dilution 1:200, Dako, Glostrup, Denmark). No Her2/neu oncoprotein overexpression with the CB11 (dilution 1:100, Novocastra, Newcastle upon Tyne, UK) antibody or Her2/neu gene amplification (inform Her2/Neu FISH kit, Ventana Illkirch Cedex, France) could be detected in the invasive component of the tumor.

In one of the 11 axillary lymph nodes examined a 19 mm intraparenchymal metastasis partly built up of the pigmented tumor cell population was detected.

Discussion

Pigmented carcinoma of the breast is rare and should be differentiated from metastatic melanoma of the skin which constitutes 15% of the metastatic tumors of the female breast. So far, only one primary pigmented papillary tumor of the male breast showing resemblance to our case was reported in 1985 by Romanelli and Toncini [1]. These authors concluded that the pigmented tumor which composed melanin-laden tumor cells and non-neoplastic melanocytes occurred under the highly pigmented areola. Saitoh et al. [2] reported a pigmented carcinoma of a 68 years old male which occurred as a black papule of the right nipple.

In our report the pigmented tumor presented in the subareolar region of the breast similarly to these other two published cases, it therefore seems highly probable that the

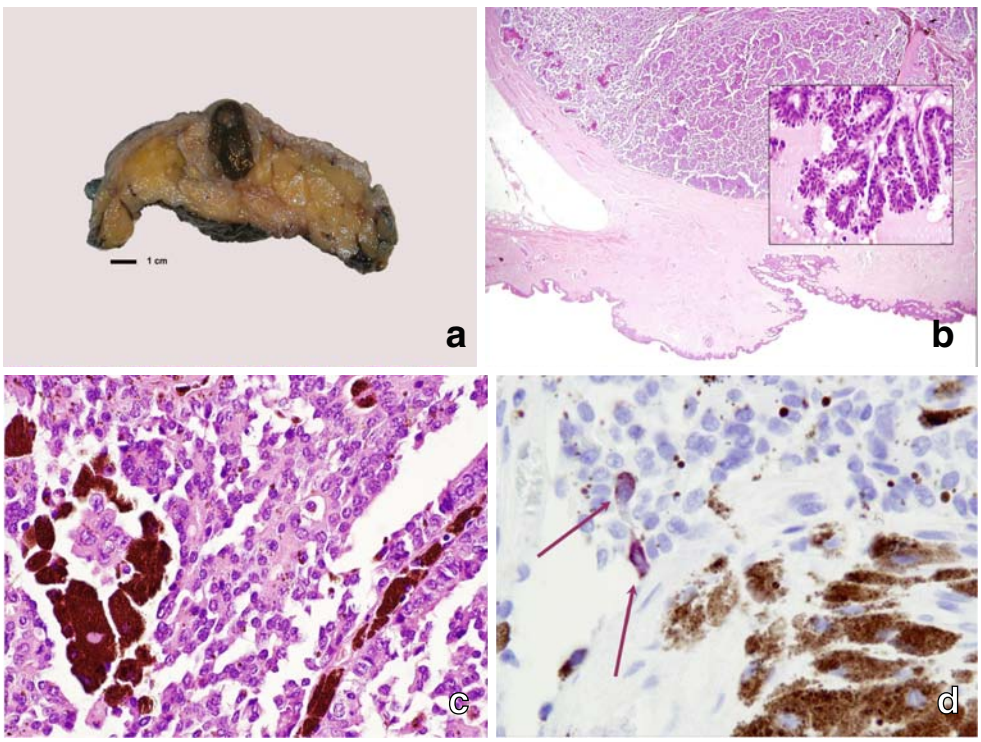

Fig. 1 **a** Macroscopic appearance of the lesion. **b** Low-power magnification showing a well-circumscribed lesion behind the mamilla composed of papillary structures (*insert*). **c** A group of pigment-containing cells within the tumor. **d** Large macrophages filled with melanin and pigment-free Melan-A positive melanocytic cells (*arrow*) next to tumor-cells, Melan-A immunohistochemistry

melanin pigment taken up by the tumor cells originates mainly from the highly pigmented skin of the nipple. The migration of the melanocytes from the epidermis into the stroma of the superficially located tumor is most likely to be an additional source of melanin pigment within the tumor.

Reference

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