

Eccrine Porocarcinoma: Cytologic Diagnosis by Fine Needle Aspiration Biopsy (FNAB)

Porocarcinoma Écrino: Diagnóstico Citológico por Biopsia por Agulha Fina



Alexandra KALOGERAKI¹, Dimitrios TAMIOLAKIS¹, Thomas TSAGATAKIS², Katerina GERONATSIU¹, Vrettos HANIOTIS¹, Maria KAFOUSSI²
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ABSTRACT

Introduction: Eccrine porocarcinoma is an uncommon malignant adnexal tumor of the skin. Eccrine porocarcinoma is an adenocarcinoma of the eccrine sweat gland with a propensity to recur locally and gives metastases to regional lymph nodes. This paper presents a cytologic diagnosis by fine needle aspiration of an eccrine porocarcinoma along with histopathology and immunocyto-histochemistry.

Case Report: The cytologic findings of an eccrine porocarcinoma in a 76-year-old female and histologic features of the skin tumor are reported. Cytologically in fine needle aspiration biopsy, the tumor was characterized by atypical malignant cells with basophilic cytoplasm, hyperchromatic nuclei and prominent nucleoli. The cytologic diagnosis was confirmed by histology.

Conclusions: The accurate preoperative diagnosis of eccrine porocarcinoma is crucial to developing a curative surgical plan. Fine needle aspiration cytology provides a convenient, safe and effective approach to solving a challenging differential diagnosis.

Keywords: Biopsy, Fine-Needle; Eccrine Porocarcinoma; Sweat Gland Neoplasms.

RESUMO

Introdução: O porocarcinoma écrino (PE) é um tumor maligno pouco comum dos anexos cutâneos. Trata-se de um adenocarcinoma da glândula sudorípara écrina com propensão para recorrer localmente e para originar metástases ao longo dos gânglios linfáticos regionais. Este artigo apresenta um diagnóstico por citologia aspirativa com agulha fina (CAAF) de um PE, associado ao exame histológico e de imunocito/histoquímica.

Caso Clínico: São descritos os achados da citologia de um porocarcinoma écrino numa doente de 76 anos de idade, bem como as características histológicas do tumor cutâneo. A citologia aspirativa revelou que o tumor se caracterizava pela presença de células atípicas malignas com citoplasma basófilo, núcleos hiper cromáticos e nucléolos proeminentes. O diagnóstico citológico foi confirmado pela histologia.

Conclusões: É crucial obter um diagnóstico pré-operatório preciso de modo a desencadear um plano cirúrgico curativo. A CAAF possibilita uma abordagem pouco invasiva, segura e efectiva, de modo a esclarecer um diagnóstico diferencial exigente.

Palavras-chave: Biópsia por Agulha Fina; Porocarcinoma Écrino; Neoplasias das Glândulas Sudoríparas.

INTRODUCTION

Eccrine porocarcinoma (EP) is a rare and particular malignant sweat gland tumor, and represents only 0.005% of epithelial cutaneous neoplasms. The first reported case was attributed to Pinkus and Mchregan.¹ Since then a few subsequent studies have been presented. Mishima and Morioka introduced the term of EP later in 1969.² The tumor was described by them as an intraepidermal proliferation of tumor cells and intraepidermal ducts among the tumor cells; the latter resembled eccrine sweat ducts in the epidermis and clefts. The authors further identified the intraepidermal portion of the acrosyringium as the point of origin of the tumor, and the term of porocarcinoma (poro=duct) was thus coined.³ EP may result from malignant transformation of a benign eccrine poroma or occur *de novo*⁴ and most commonly involves lower extremities, trunk and head. There is a predilection for elderly patients in the fifth to eighth decades of life and a female predominance.⁵ About 20% of EP will recur and about 20% will metastasize to regional lymph nodes. There is mortality rate of 67% in patients with lymph node metastasis.⁶

CASE REPORT

A 76-year-old female visited our outpatient clinic with the presence of a progressively enlarging skin lesion over the right inguinal region for two years. It was a solitary lesion. The patient's history was unremarkable. No chronic immunosuppression, no previous ingestion of arsenic, no prior radiotherapy, was reported. On physical examination the skin overlying the tumor was yellowish in colour and polypoid in appearance. The patient underwent local excision but she denied a wider excision which was recommended by the pathologist who deemed the margin of excision too close.

One year later, the patient experienced local recurrence and inguinal lymph nodes metastases, treated by surgical excision. The patient denied any adjuvant therapy and she is disease-free three months after recurrence.

Imaging studies showed no evidence of bone erosion or distant metastases. A fine needle aspiration (FNA) biopsy was performed using a 25-gauge needle. The cytologic diagnosis was suggestive of an eccrine porocarcinoma (EP).

1. Departments of Pathology-Cytopathology, Medical Faculty, University of Crete, Heraklion, Crete, Greece.

2. Department of Surgery, Asklepion General Hospital, Heraklion, Crete, Greece.

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On gross examination tumor size was 8,2 x 6 x 2,5cm, with a depth measuring 5mm within the dermis. Microscopically the diagnosis was of an eccrine porocarcinoma of Bowenoid type (Bowenoid porocarcinoma).

MATERIAL AND METHODS

The material obtained was smeared on glass slides. The air dried smears were stained with Giemsa and the alcohol fixed with Papanicolaou's method (Fig.1).

Immunocytochemistry.

In air dried smears immunocytochemistry was performed using the markers EMA (Fig.2) and CK5/CK6 (Fig.3).

In histological specimens fixed in 10% formalin, after the surgical resection of the tumor, the stains H&E (Fig.4) & Alcian blue were performed.

Immunohistochemistry.

The markers HMB45, chromogranin, CD56, CEA, Vimentin, MNF116, and involucrine were used.

RESULTS

Cytology: The slides showed abundant material that comprised clusters, sheets and isolated neoplastic cells with basophilic cytoplasm, oval, hyperchromatic nuclei, and prominent nucleoli. The cells exhibited marked pleomorphism. Mitotic figures were not found and a background of necrotic debris was observed.

Histology: Massive dermal infiltration by the tumor was demonstrated. Solid cords and rosettes of neoplastic cells were observed. The majority of tumor cells were small with prominent nucleoli and nuclear pleomorphism. The cytoplasm was clear. Mitotic figures with atypia were found. There were areas with squamous differentiation. Two histopathological patterns were found with areas of eccrine porocarcinoma and Bowen disease.

Immunocytochemistry: The majority of neoplastic cells expressed strongly the EMA and CK5/CK6 markers.

Immunohistochemistry: The tumor cells did not express HMB45, chromogranin, CD56, CEA, and Vimentin but were focally positive for MNF116 and involucrine.

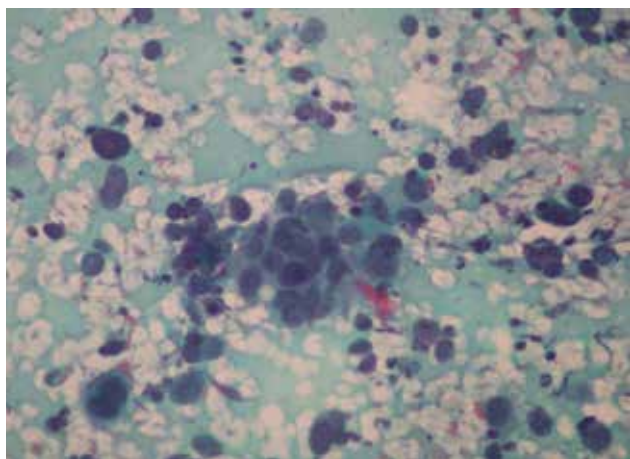


Figure 1 – Clusters, sheets and isolated neoplastic cells with basophilic cytoplasm, oval, hyperchromatic nuclei, and prominent nucleoli. FNAB, Papanicolaou stain X 400.

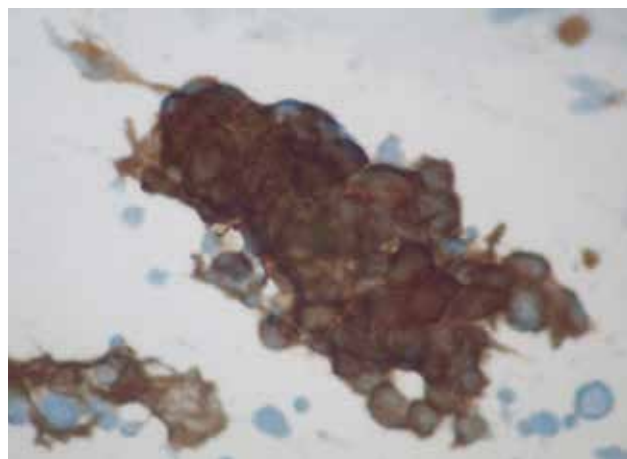


Figure 2 – Cluster of neoplastic cells positive for EMA. FNAB. EMA immunostain X 400.

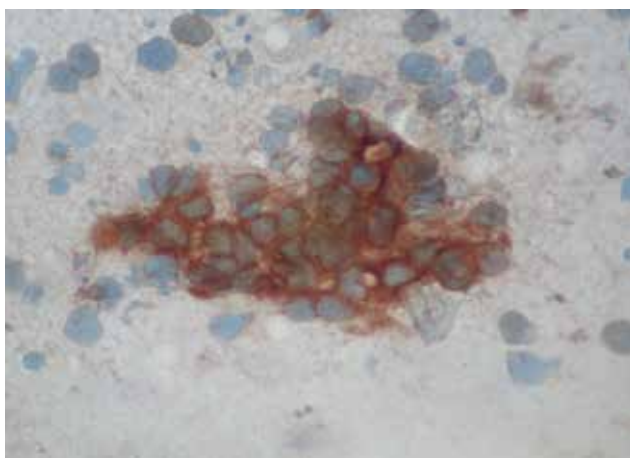


Figure 3 – Cluster of neoplastic cells positive for CK5/CK6. FNAB. CK5/CK6 immunostain X 400.

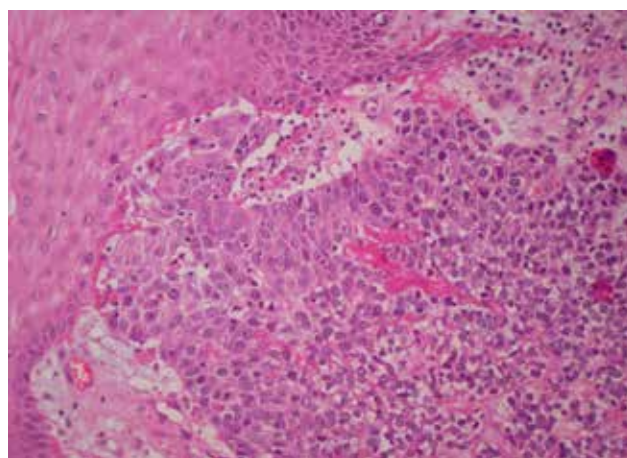


Figure 4 – Massive dermal infiltration by the tumor. The majority of tumor cells were small with prominent nucleoli and nuclear pleomorphism. Tissue section. H&E stain X 200.

DISCUSSION

Eccrine porocarcinoma (EP) is an infrequent cutaneous neoplasm of unknown etiology.

EP has a propensity to arise on the lower limbs (44%), trunk (24%), or head and neck (24%).⁷ A few cases have been reported in the upper extremity (2%) and hand (3%). However, rare cases of penile involvement have been reported.⁸ It is a primary malignant tumor arising from the intraepidermal portion of the eccrine sweat duct or acrosyringium. From the marked pagetoid extension and cytologic characteristics of the tumor cells i.e. glycogen containing, absence of tonofibrils, and their relationship to the surrounding epidermis, Pinkus and Mehregan in 1963,¹ concluded the tumor is likely to be eccrine in origin. This tumor may occur de novo or developing from a pre-existing lesion as degenerative progression and it can manifest clinically as a solitary lesion with non characteristic macroscopic appearance, as an ulcerated nodule or as a plaque, polypoid or verrucous lesion.⁹⁻¹¹ In our case the lesion was polypoid in appearance and yellowish in color, arising on the right inguinal region.

The clinical differential diagnosis is difficult, including seborrheic keratosis, pyogenic granuloma, poroma, amelanotic melanoma, squamous cell carcinoma (SCC), basal cell carcinoma (BCC), verruca vulgaris, metastatic adenocarcinoma, and Bowen's disease.

Clinical differential diagnosis from squamous cell carcinoma (SCC) is difficult. In a series by Robson et al,⁵ the clinical diagnosis was never correct where this information was supplied. The reported difficulty with accurate clinical diagnosis highlights the need for ancillary studies such as FNA. Certainly, aspiration cytology could be expected to help distinguish an epithelial from a primary skin tumor.

Histological differential diagnosis from SCC is based on more nuclear pleomorphism, intercellular bridge formation, keratinization, absence of ducts and negative staining for CEA and other markers of glandular differentiation.

The diagnosis of EP is rendered on either an invasive architectural pattern and/or significant cytologic pleomorphism in a tumor showing eccrine differentiation. Tumors are typically formed of cohesive basaloid epithelial cells. Abenoza and Ackerman contend that epithelial cell atypia alone does not constitute a diagnosis diagnosis of malignancy as this may be seen in benign eccrine poroma.⁵ Roaf et al. drew attention to histologically apparent 'benign' lesions with locally destructive behavior and subsequent metastases.⁵ Furthermore, Shaw et al described two types of EP: the "cytological variety with malignant cellular features and possibly necrosis and an 'infiltrative' form defined according to the nature of the advancing tumor margin irrespective of the degree of cytologic atypia."⁵ Robson et al⁵ agree with this latter interpretation, notwithstanding that some benign eccrine poromas may have low-grade atypia. It may be speculated that nuclear atypia in the cuticular cells may reflect the biologic behavior and show a greater tendency towards malignant transformation than poroid cells, and that there may be a pathologic continuum according to the degree of nuclear dysplasia.

In our case the histologic diagnosis was of an eccrine porocarcinoma with a 'Bowenoid' pattern. Solid cords of tumor invaded the dermis and consisted of markedly pleomorphic epithelial cells. Bizarre multinucleate tumor cells and focal keratinisation enhanced the likeness to proloferative bowenoid dysplasia, but the presence of ducts within the lesion lined by tumor cells excluded this diagnosis. We performed Alcian Blue histostain in tumor tissue sections which was positive. The diagnosis of EP was based on the finding of an invasive architectural pattern and significant cytologic atypia in a tumor showing eccrine differentiation. Tumor tissue sections contained easily recognizable ducts lined by cuboidal cells often having an eosinophilic luminal cuticle, and/or less well developed ducts, having irregular and poorly formed structures and intracytoplasmic lumina which was highlighted with Alcian Blue histostain and CEA immunohistostain.

The cytologic differential diagnosis includes: Nonkeratinizing Squamous cell carcinoma (SCC), Basal cell carcinoma (BCC), Metastatic adenocarcinoma and Malignant Melanoma (MM). In Nonkeratinizing SCC the neoplastic cells are round or oval, dispersed singly or in discohesive two-dimensional geographic sheets, the cell borders are well-defined, the cytoplasm dense and refractile, and the nucleus hyperchromatic with coarse chromatin and prominent nucleoli. In BCC the tumor cells are small, arranged in tight clusters with peripheral palisading, with cell borders ill-defined, minimal cytoplasm, high nuclear/cytoplasmic ratio, oval or spindle nuclei, and small or inconspicuous nucleoli. In metastatic adenocarcinoma the neoplastic cells are single or in tight clusters that attend to form acini, the cell borders are ill-defined, the cytoplasm is foamy or vacuolated, and the nuclei are pleomorphic, hyper- or hypochromatic, and exhibit prominent nucleoli. In case of metastatic lobular breast carcinoma, the tumor cells are small, uniform, single, with eccentric nuclei and intracytoplasmic vacuoles containing targetoid inclusions.³ Eccrine porocarcinoma cells may form and exhibit intracytoplasmic vacuoles, but in our case were not present. In malignant melanoma, the tumor cells are single or loosely associated, epithelioid or spindle-shaped, with well-defined cell borders, intracytoplasmic melanin pigment may be seen; multinucleation, large and eccentric nuclei with intranuclear inclusions are also seen. As always, correlation of the cytological features with patient's known history and the clinical presentation is crucial for making a correct diagnosis in a challenge situation.

The cytopathologic features of the present case included: 1) clusters, sheets, and isolated epithelial cells with basophilic cytoplasm, 2) round to oval, hyperchromatic nuclei and prominent nucleoli, 3) mitotic figures not found, 4) a background of necrotic debris. The neoplastic cells expressed strongly EMA and CK5/CK6 markers.

This constellation of findings was distinctive in the present case and, in the proper clinical setting, is diagnostic.

However, cytology still can play a triage role in the evaluation of such tumors since it will provide an initial clue to the possibility of a primary cutaneous malignant epithelial

neoplasm. A cytologic diagnosis of cutaneous carcinoma, regardless of subtypes, sometimes is sufficient for choosing clinical management. Histologic confirmation is always warranted for a definitive diagnosis.⁵ Rege and Shet cautioned that a percentage of skin adnexal tumors is difficult to diagnose with aspirates and thus requires a core biopsy.¹³

In conclusion, EP is an adenocarcinoma of the eccrine sweat gland with a propensity to recur locally and metastasize to regional lymph nodes.

FNA cytology potentially provides a convenient safe and

effective approach to solving a challenging differential diagnosis but must be complemented by histopathology and immunohistochemistry. Clinical correlation with the patient's history is essential.

CONFLICT OF INTERESTS

None stated.

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None stated.

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