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Diagnostic Pitfalls of Eccrine Porocarcinoma with Extensive Squamous Differentiation

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Lee CH, Jung SJ, Kim KB, Lee SJ, Kim AR, Choi KU. All the authors are contributed equally to this article.

Abbreviations:

EMA: Epithelial Membrane Antigen; BCL2: B-cell Lymphoma 2; CEA: Carcinoembryonic Antigen; CD117: CLuster of Differentiation 117; HMB45: Human Melanoma Black 45; PAS: Periodic Acid-Schiff; PET-CT: Positron Emission Tomography-Computed Tomography; CK19: Cytokeratin 19

1. Abstract

1.1. Background: Eccrine porocarcinoma is an extremely rare malignant skin tumor. Furthermore, because it has clinicopathologic characteristics similar to other skin adnexal tumors, it is often difficult for clinicians and pathologists to diagnose.

1.2. Case presentation: A 54-year-old man presented with a solitary erythematous plaque on his right thigh and initially was diagnosed with Bowen's disease by clinician. But the histologic finding was malignant tumor with intracytoplasmic lumina and ducts in background of extensive squamous differentiation. The ductal component was confirmed by CEA immunohistochemistry. Metastatic carcinoma was revealed in the inguinal lymph node. The final diagnosis was eccrine porocarcinoma.

1.3. Conclusion: Accurate diagnosis can have an impact on improving a patient's prognosis. Eccrine porocarcinoma needs more intensive treatment because its prognosis is worse than that of squamous cell carcinoma. We need to know the difference between other tumors and make a more accurate diagnosis.

2. Background

Eccrine porocarcinoma is a rare malignant tumor originating from the sweat glands, but most common sweat gland carcinoma. Since its first introduction in the 1960s, it has represented around 0.01% of all malignant cutaneous neoplasms [1-3].

The etiology of eccrine porocarcinoma is unknown. However, it can develop from the malignant transformation of pre-existing eccrine poroma [3]. Typically, eccrine porocarcinoma appears on the head and neck (40%) or lower extremities (34%) in the form of a mass or nodule [4]. It may be asymptomatic, but it can also show the common clinical manifestations of malignancy such as spontaneous bleeding, ulceration, itching, pain, and sudden growth [5]. Treatment for eccrine porocarcinoma includes surgery, chemotherapy, and radiation therapy. The initial treatment is the complete surgical excision and evaluation of nodal and distant metastasis [6-8]. Eccrine porocarcinoma has high recurrence and metastatic rates of 20%. Metastasis occurs mainly in the regional lymph nodes and the mortality rate for patients with node metastasis is 67%. Patients with distant metastasis have been reported to have a survival

period of five to 24 months [4,7,9,10]. As such, since eccrine porocarcinoma has an aggressive behavior, differential diagnosis is important for proper treatment. Because squamous metaplasia is a common feature of eccrine porocarcinoma, squamous cell carcinoma needs to be differentiated from other malignancies, as well as benign poroma tumors. We report a case of eccrine porocarcinoma with extensive squamous differentiation arising in the right thigh skin of a 54-year-old man.

3. Case presentation

A 54-year-old man visited the hospital because of a solitary erythematous plaque on his right thigh noticed three years earlier. The lesion grew in size despite medication and ointment application. His clinical diagnosis was Bowen's disease.

A piece of skin on the right thigh and soft tissue labeled "right inguinal lymph node" were submitted for evaluation. An ill-defined brownish and elevated lesion 6.5 x 5.5 x 0.4 cm was present. Histologically, the tumor was characterized by invasive squamous cell carcinoma showing intercellular bridges**,** keratinization, and keratin pearls. A pagetoid extension was identified. A small portion of the tumor revealed nests of partially eosinophilic and clear cells with intracytoplasmic lumina and ducts.

Immunohistochemistry for epithelial membrane antigen (EMA), p63, BCL2(B-cell lymphoma 2), carcinoembryonic antigen (CEA), cluster of differentiation 117(CD117), and human melanoma black (HMB45), and Periodic acid-Schiff (PAS) special staining were performed and different parts of the tissue showed different expressions. The squamous component was positive for p63, whereas the ductal component was positive for CEA, CD117, and PAS. EMA was diffusely positive in both of the components.

A separate lymph node revealed metastatic carcinoma. Unlike the skin lesion, it only showed porocarcinoma with extensive comedo-necrosis without squamous differentiation.

Further assessments were conducted after the diagnosis. Positron emission tomography-computed tomography (PET-CT) and additional lymph node dissection were performed to detect metastasis to other organs. No metastasis was found in other organs or the 11 inguinal lymph nodes dissected. Six months have passed since the resection and there are no signs of recurrence.

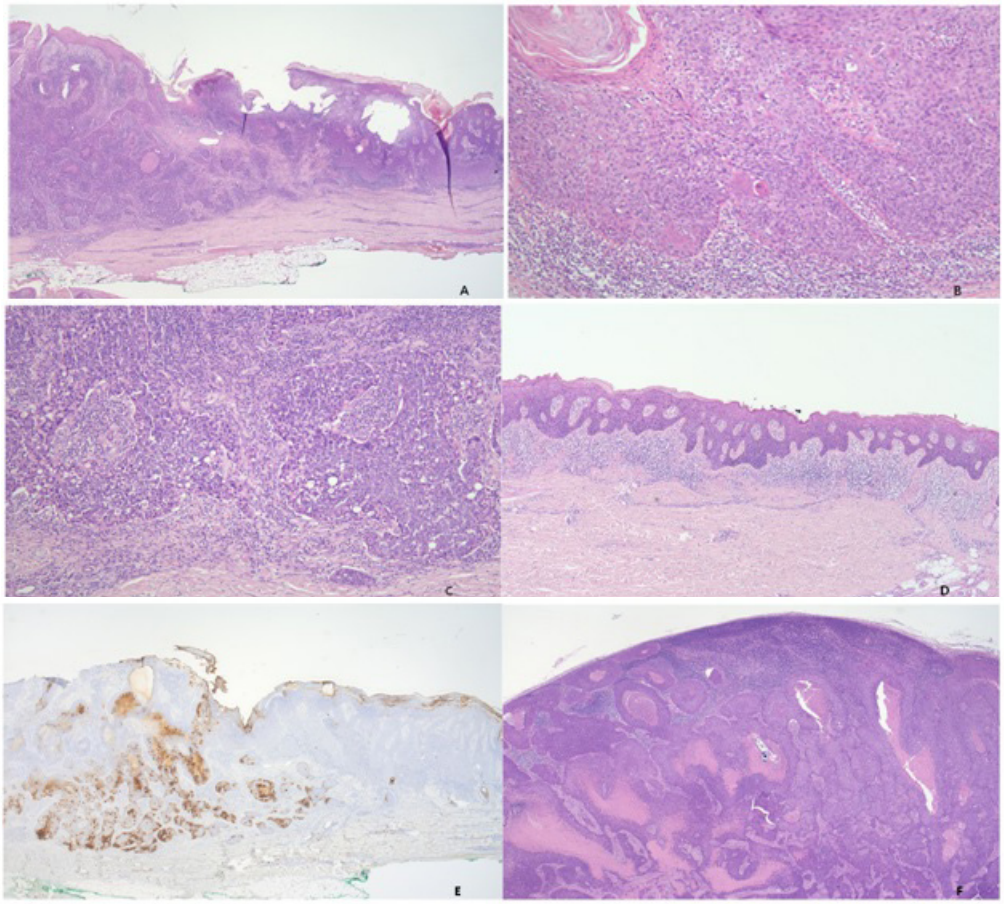

Figure 1: Various histological features of eccrine porocarcinoma. (A) Two distinct areas were observed at low magnification. At high magnification, (B) extensive squamous cell differentiation, (c) atypical nests of eosinophilic epithelioid cells with necrosis and focal duct formation, and (D) pagetoid spread are seen. (E) The ductal component was revealed by CEA immunohistochemistry. (F) It metastasized to lymph node is observed.

4. Discussion

Eccrine porocarcinoma is a rare malignancy of the skin but has variable clinical signs similar to other cutaneous tumors, so can be misdiagnosed as other benign or malignant tumors. In fact, clinicians most often mistake it for squamous cell carcinoma [11-13]. Also histologically, eccrine porocarcinoma resembles cutaneous squamous cell carcinoma, one of the differential diagnosis of eccrine porocarcinoma, because squamous metaplasia is a common finding in it, which is sometimes extensive [3,14,15]. Eccrine porocarcinoma tends to present aggressive behavior with a high risk of local recurrence and nodal and distant metastasis. It has a poorer prognosis compared to that of cutaneous squamous cell carcinoma. Most patients with squamous cell carcinoma have a favorable outcome after surgical resection. However, some have a high risk of local recurrence, distant metastasis, and mortality [16]. Therefore, an accurate diagnosis is required for proper treatment. Eccrine porocarcinoma shows histologic findings of irregularly shaped strands and nests of eosinophilic, epithelioid cells with varying degrees of cytologic atypia and nuclear pleomorphism. Duct formation is a prerequisite for the diagnosis and an important feature differentiating it from squamous cell carcinoma [3, 11]. It also shows extensive necrosis (comedo type or with cystic cavities) and increased mitotic activity in addition to an infiltrative border and cytological atypia. These malignant findings must be distinguished from benign eccrine poroma. Abundant clear cytoplasm and distinct cell borders, pagetoid extension resembling Paget's disease, and pigmentation can be observed [3,8,13]. Diseases to be discriminated due to these findings include sebaceous carcinoma, metastatic renal cell or other clear cell tumors, Paget's disease, and balloon cell melanoma.

Immunohistochemical and special stains may help in the differential diagnosis. Specifically, the identification of ductal differentiation by EMA, CEA, and PAS analysis is very useful. S-100 and Cytokeratin 19(CK19) may also be helpful markers distinguishing eccrine porocarcinoma from other tumors [8,10,13,14]. A study reported that CD117 (C-KIT) was useful for differentiating eccrine porocarcinoma from squamous cell carcinoma [17].

Proper treatment is related to good patient prognosis, which must be preceded by an accurate diagnosis. Pathologic diagnosis is difficult because eccrine porocarcinoma may show several histologic findings that can be observed in other tumors. If the tumor shows extensive squamous differentiation like this case, eccrine porocarcinoma can be difficult to distinguish from squamous cell carcinoma. It has an even worse prognosis than squamous cell carcinoma, so an accurate diagnosis considering the clinical features, histological findings, and auxiliary test results is necessary.

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