Cerrahpaşa Med J 2024; 48(3): 212-218 ORIGINAL ARTICLE

Is Porocarcinoma a Rare Entity as Previously Reported? A Case Series Presented in a Short Span with Repeating Misdiagnosis and Comparison to Existing Literature

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Abstract

Objective: Porocarcinomas are rare malignant eccrine sweat gland-derived tumors that are less than 0.005% of all malignant epithelial cutaneous tumors and are mostly seen in the lower extremities as reported in the literature. In this study, we aimed to present a case series of porocarcinoma that are initially referred to our center with various initial diagnoses and thereby raise the awareness of porocarcinoma when making a differential diagnosis of a skin tumor, both clinically and pathologically as it may drastically change the treatment modalities.

Methods: Five cases of porocarcinoma with various initial pathologic diagnoses that were referred to our clinic between 2020 and 2022 were reviewed retrospectively. Collected data was compared to existing literature and changes to treatment modalities from the initial diagnosis were discussed.

Results: There are a total of 5 porocarcinoma cases with different initial diagnoses. (4 cases male, 1 case female). The mean follow-up time of the cases is 25 months (13-36). In one case, locoregional lymph node metastasis was observed 4 months after tumor excision. In 5 cases, 2 are located in the trunk, 1 in the head and neck, 1 in the lower extremity, and 1 in the upper extremity. Complementary lymph node dissection was performed in only one patient.

Conclusion: Eccrine porocarcinoma is presented as a very rare tumor, and both clinicians and pathologists should be more mindful of this tumor during differential diagnosis in order not to overlook this entity and miss additional treatment options needed to control porocarcinoma oncologically.

Keywords: Eccrine porocarcinoma, malignant tumor, pathological diagnosis, rare disease, skin appendage tumor

Introduction

Porocarcinomas are rare malignant eccrine sweat gland-derived tumors that are reportedly less than 0.005% of all malignant epithelial cutaneous tumors. These tumors are mostly seen in the lower extremities and are commonly seen in old age. Since its first description back in 1967, only 453 cases have been reported worldwide.[1] There is no consensus on the natural course and management of these tumors but they have a high incidence of locoregional and lymph node metastasis therefore making a differential diagnosis and separating them from more lenient tumors such as basal cell carcinoma is quite important for oncological control.

In this study, we aimed to present 5 cases of porocarcinoma with various initial pathologic diagnoses that are less aggressive in nature. All 5 patients were admitted to our clinic between 2020 and 2022. By conducting this study, we aimed to contribute to the existing literature by answering the question of whether porocarcinoma cases, which are known to be extremely rare according to the literature, are more common than the rates stated and whether the diagnosis of porocarcinoma is likely to be missed due to certain difficulties in its pathological and clinical distinction from other less aggressive skin cancer modalities. A subsequent aim of this study is to raise awareness of this supposedly very rare entity.

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Methods

For this retrospective cohort study, ethical approval was obtained from the İstanbul University-Cerrahpaşa review board (Approval no: MU7UMt7U, Date: December 14, 2023). 5 cases of porocarcinoma with various initial pathologic diagnoses (3 patients with punch biopsy (Bx), 2 patients with incisional Bx confirmed by pathologic diagnoses) that were referred to our clinic between 2020 and 2022 were reviewed retrospectively. Collected data was compared to existing literature and changes to treatment modalities from the initial diagnosis were discussed. All patients except one are followed up without locoregional metastasis or recurrence during their follow-up. Pathological samples of all patients were examined to determine points of diagnostic confusion during histopathological examinations and to examine and guide points where histopathological criteria can be guided in determining locoregional metastasis and adjuvant treatment modalities. All procedures were performed in accordance with the Helsinki Declaration of 1975 and written informed consent was obtained prior to any surgical procedure and inclusion into the study.

Results

There are a total of 5 porocarcinoma cases with different initial diagnoses. (4 cases male, 1 case female). The mean age of

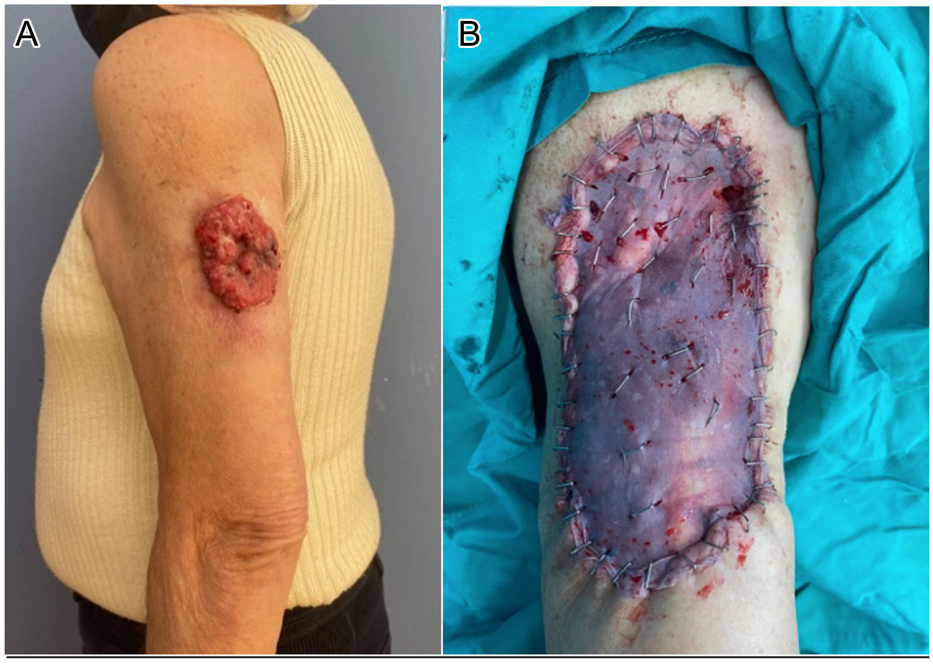

Figure 1. Preoperative (A) and intraoperative (B) images of mass in the posterior left arm of case 1 patient.

the patients is 61.8 years (45-73). In one case, locoregional lymph node metastasis was observed 3 months after tumor excision, and adjuvant radiotherapy was not given to this case before metastasis. Of the 5 cases, 2 are located in the trunk, 1 in the head and neck, 1 in the lower extremity, and 1 in the upper extremity. Complementary lymph node dissection was performed in only 1 patient. The mean follow-up time of the cases is 25 months (13-36). While 4 of 5 patients received adjuvant radiotherapy after tumor excision, 1 patient received radiotherapy after complementary lymph node dissection. The mean time between the patient's initial biopsy diagnosis and definitive surgery is 3 months (1-7 months). The initial biopsy diagnosis of only one of the patients was benign (eccrine poroma), while the initial diagnosis of the others was malignant.

Case 1

A 76-year-old woman with no known disease other than hypertension and coronary artery disease was referred to an external dermatology center after the lesion on the posterior left arm, which started as a small open wound in 2010, rapidly increased in size and caused intermittent bleeding in the last 2 years. The incisional biopsy was reported as BCC and the patient was referred to our clinic. No lymphadenopathy was observed in the initial examination of the patient, who also had an ulceronodular mass measuring 8 × 6 cm in the posterior left arm. Subsequent axillary USG reported no pathological lymph nodes and the mass was resected with wide safe surgical margins including the triceps muscle fascia on the base and the defect was reconstructed with split thickness skin graft (STSG) (Figure 1). The final pathology was CK7 positive eccrine porocarcinoma with basoloid differentiation and clear surgical margins. As a result of the change in diagnosis from BCC to porocarcinoma, the case was discussed in the tumor council and a decision was made for the patient to receive 10 cycles of radiotherapy. After completion of the radiotherapy, the patient is being followed up with PET/CT in close intervals and she has been disease-free for the last 36 months without any recurrence.

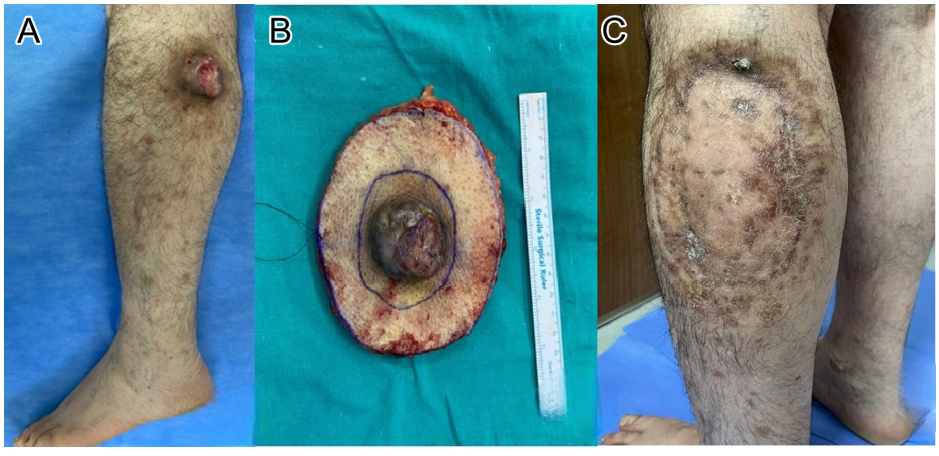

Figure 2. Preoperative (A) and intraoperative (B) images of mass in the right lateral crural region of case 2 patient. C) Postoperative sixth month view of after grafting.

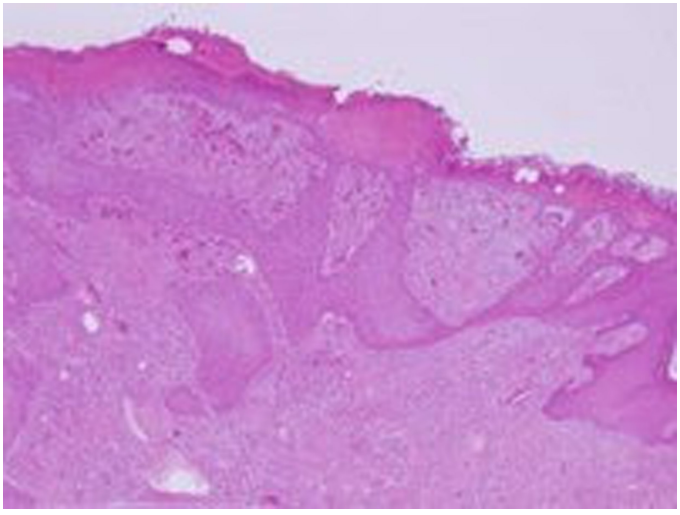

Figure 3. Porocarcinoma with an epidermal connection; HE × 40.

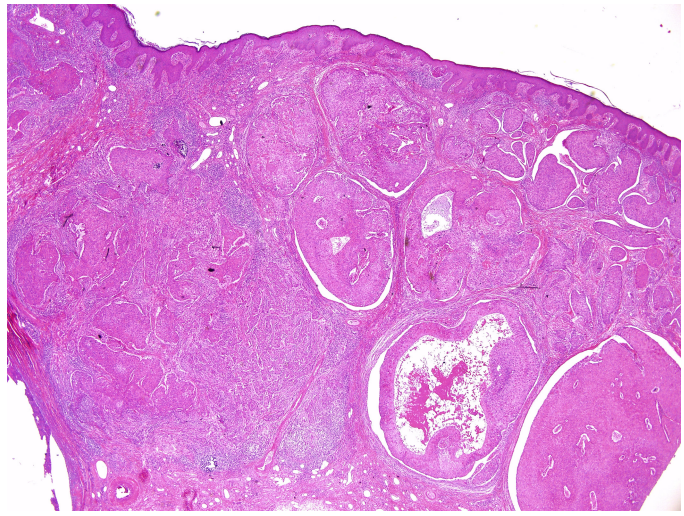

Figure 4. Nests of pleomorphic poroid cells; HE ×200.

Case 2

A 47-year-old man with no known comorbidity was referred to our university medical center because of a purple mass located in the lateral part of the proximal left cruris, which had been present for 25 years but showed rapid growth in the last 2 years. A punch Bx was performed by dermatology and the mass was reported as a benign eccrine poroma. No additional findings were detected on systemic examination. The mass was completely excised and the defect area was reconstructed with STSG (10 × 5 cm) (Figure 2).

The final pathology of the excision material was eccrine porocarcinoma and the borders of the mass were reported to be tumor-free microscopically. Microscopic examination revealed a dermal infiltrative tumor with an epidermal component (Figure 3). Tumor islands had central necrosis and desmoplastic stroma is prominent (Figure 4). Tumor cells had round–oval nuclei with prominent nucleoli and moderate eosinophilic cytoplasm. Ductus formation was observed (Figure 5). Tumor cells were positive with immunohistochemical EMA stain and ductus formation can be easily seen (Figure 6). 4 months after the excisional surgery, 3 × 3 cm mass, thought to be a pathologic lymph node, was palpated in the left inguinal region and a subsequent PET scan was revealed increased FDG uptake in the left inguinal lymph nodes. As metastatic disease was suspected, left inguinal lymph node dissection was performed. The pathology of the dissection material revealed carcinoma metastasis in 8 of 20 lymph nodes with no apparent peri-nodal invasion. The patient was discharged without any problems on the fifth postoperative day and received 20 sessions of complementary radiotherapy after being discussed on the tumor council. The patient is being followed up with PET/CT at 3-month intervals and no systemic metastasis was observed for the last 26 months.

Case 3

A 45-year-old male patient, with a known history of colon cancer, was admitted to our clinic for the excision of a nodular lesion on the anterior chest wall that had been present for 25 years. Three months after the left hemicolectomy was performed, and while being treated with tyrosine kinase inhibitors, the mass on the anterior chest wall began to grow rapidly and began to show ulceration. The patient applied to a dermatology clinic for the ulcerating lesion and a punch biopsy was done. Biopsy revealed squamous carcinoma with ductal differentiation infiltrating the dermis and the patient was referred to our clinic. The patient's preoperative CT scan showed a 47 × 54 mm ulceronodular mass extending subcutaneously on the skin in the midline at the level of the sternum.

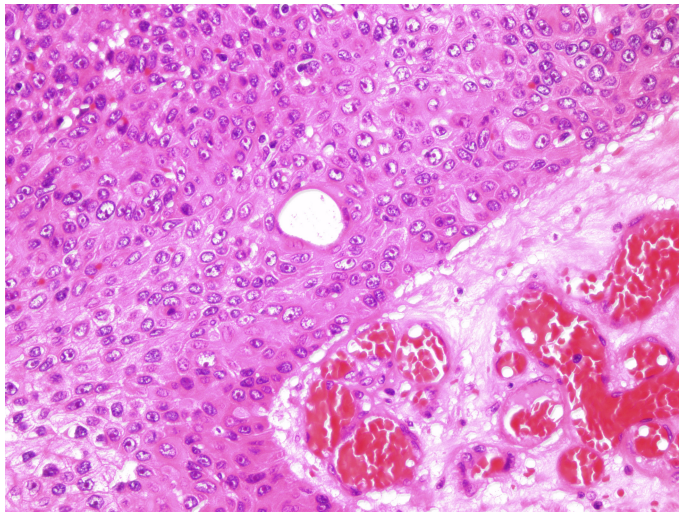

Figure 5. Ductal formation; HE ×400.

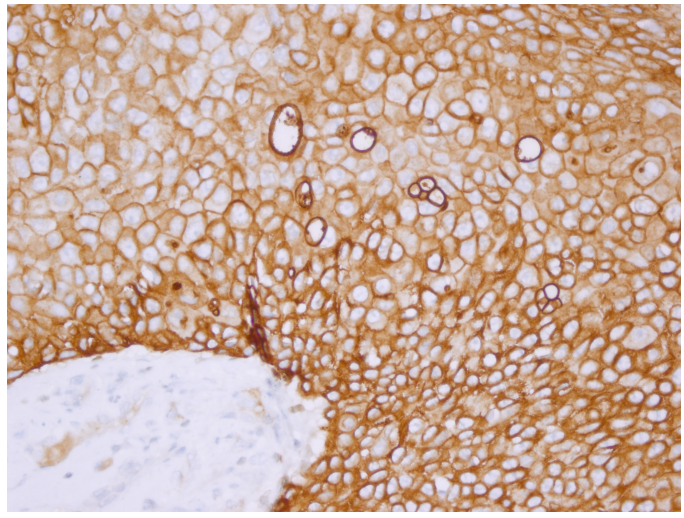

Figure 6. Immunohistochemical EMA in ductal formation.

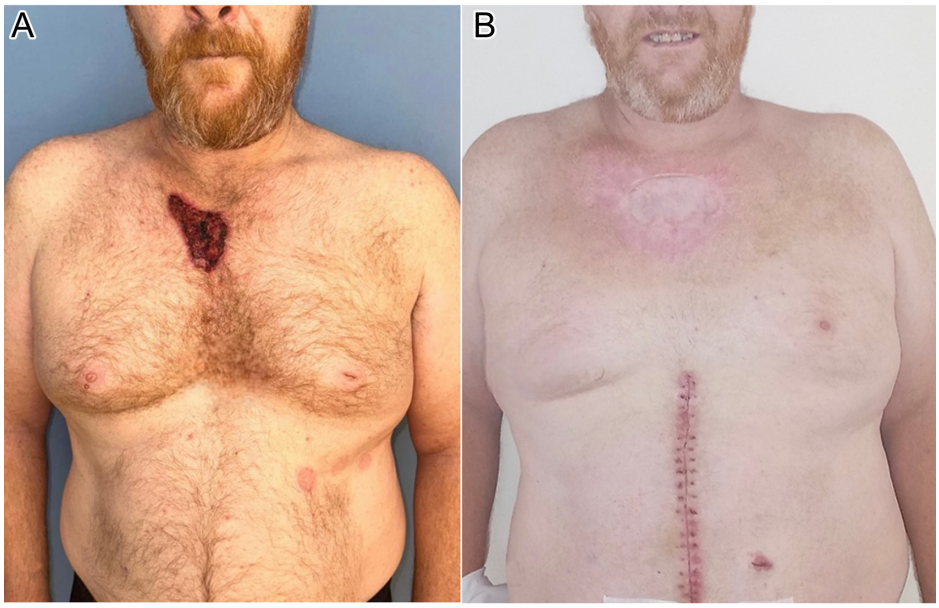

Figure 7. Preoperative (A) and postoperative first year (B) images of lesion in the anterior chest wall of case 3 patient.

The ulceronodular mass was resected with a wide surgical margin sparing the periosteum of the sternum and the remaining defect was reconstructed with STSG (Figure 7). Microscopic examination revealed an infiltrative tumor consisting of basaloid cells (Figure 8). Tumor nests in a prominent desmoplastic stroma. Central necrosis and ductal differentiation can be observed (Figure 9). The diagnosis was eccrine porocarcinoma with safe surgical margins with moderate ulceration and desmoplasia. The patient subsequently received 10 sessions of radiotherapy. No recurrence of porocarcinoma was detected during the follow-up 25 months.

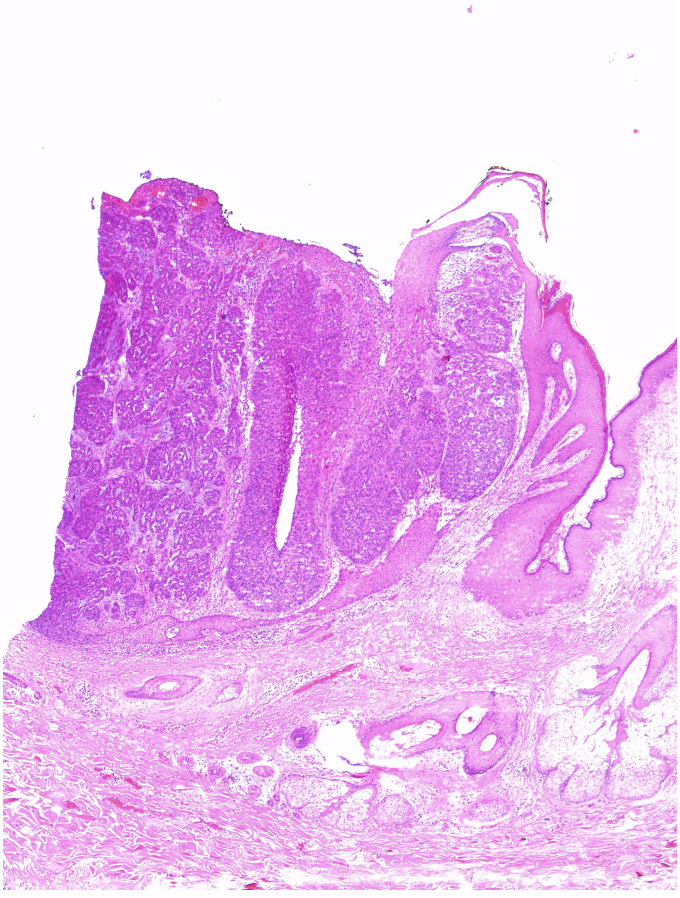

Figure 8. Malignant tumor with epidermal connection; HE ×40.

Case 4

A 73-year-old male patient with no known comorbidities other than hypertension was referred from a dermatology clinic after a punch Bx revealed moderately differentiated SCC in a rapidly enlarging lesion in the left lumbar area which was present since birth but started to change 3 months ago. The mass was resected with a 1 cm macroscopic margin and the remaining defect was reconstructed with STSG (Figure 10). The final pathology revealed eccrine porocarcinoma with clear surgical margins and accompanying moderate ulceration and lymphovascular invasion. The patient received 10 sessions of adjuvant radiotherapy subsequently and was followed up with PET/CT at 3-month intervals for the last 25 months without any local or distant recurrence.

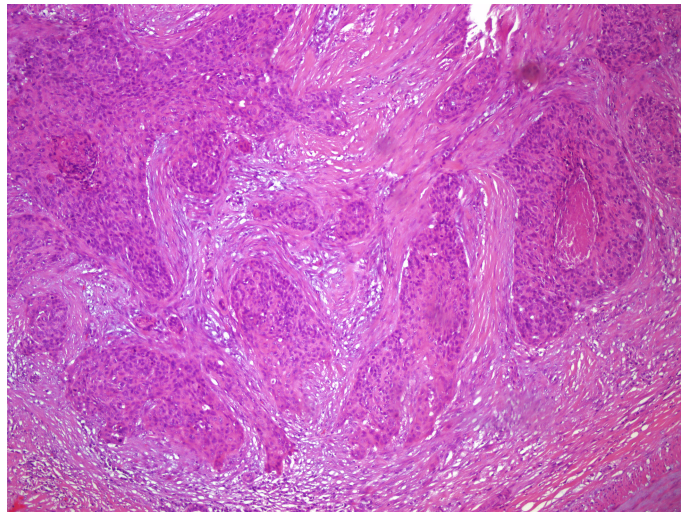

Figure 9. Infiltrative tumor with anaplastic cells within a desmoplastic stroma; HE ×100.

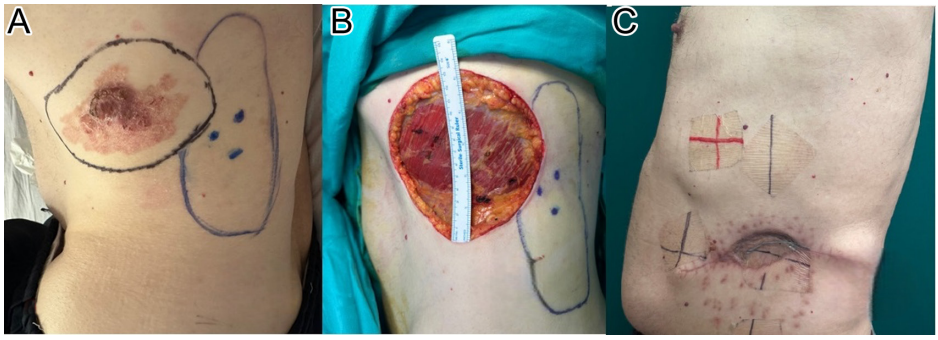

Figure 10. Preoperative (A) and intraoperative (B) images of mass in the left lumbar region of case 4 patient. (C) Image of the grafted area before radiotherapy.

Case 5

A 68-year-old male patient with no known comorbidities other than hypertension and DM was referred to the dermatology department after an incisional Bx revealed noduloinfiltrative BCC in a rapidly enlarging lesion on the right preauricular region, which had been present 10 years. The existing mass was resected with a wide surgical margin and a frozen section was sent, and upon the detection of frontal branch porocarcinoma infiltration of the facial nerve in the frozen section, the frontal branch was included and expanded to a 2 cm safe margin. Frontal branch repair was performed with a right sural nerve graft and the defect was repaired with a right occipital artery-based scalp flap (Figure 11).

Histopathologic examination showed anastomosing tumor islands in the dermis. Tumor cells had a moderate amount of eosinophilic cytoplasm. Nuclei were round and oval with coarse chromatin. Lumen formation can be appreciated (Figure 12). Tumor cells were positive for CK7, CK19 along with ductal positivity for CEA (Figures 13 and 14). The pathology of the wide excision material of the patient was found as 1.7 cm for the closest lateral surgical margin, 0.3 cm for the base surgical margin, moderate ulceration, desmoplasia, and perineural invasion. The patient was referred to medical oncology and radiation oncology and 10 cycles of adjuvant radiotherapy were performed. The patient was followed up with PET/CT at 3-month intervals and no locoregional or distant metastasis was observed for the last 13 months.

Discussion

Eccrine porocarcinoma cases are reportedly very rare. Although it is mostly seen in the lower extremities, it can also be encountered in the face, scalp, or less frequently in the upper extremities and trunk.[2]

Porocarcinoma diagnosis can be challenging for pathologists. They may show basoloid or squamous differentiation and are frequently confused with SCC and BCC.[3] Light microscopic evaluation of porocarcinoma reveals a malignant tumor formed by moderately or frankly atypical cells that display at least focal ductal differentiation. Approximately 10% of porocarcinomas are in situ lesions that are confined to the epidermis. Porocarcinoma is characterized by the downward growth of broad anastomosing bands with pushing margins or infiltrative lower borders. Tumor cells have pleomorphic vesicular nuclei with scant cytoplasm. Mitotic activity is conspicuous and necrosis is a common finding. There is no specific immunohistochemical marker for porocarcinoma. Ductal formation can be highlighted by carcinoembryogenic antigen (CEA) and epithelial membrane antigen (EMA). Cytokeratin 7 (CK7) and cytokeratin 19 (CK19) also show membranous expression in ductal epithelial cells. The tumor can be differentiated from basal cell carcinoma by ductal differentiation and the absence of peripheral palisading of tumor cells. In addition, porocarcinoma may show extensive squamous differentiation which may necessitate differentiation from squamous cell carcinoma.[1]

In a series of 69 cases, Robson et al emphasized the importance of recognition of eccrine ducts but reported that some poorly differentiated tumors may be missed if taken as the main criterion for diagnosis.[4]

There is no overall consensus on the management of porocarcinomas accepted universally. Because of its rarity, it is not possible to plan prospective studies comparing surgical techniques and/or investigating the value of adjunctive therapies. The few published series include a very small number of cases. The main treatment is wide local excision and cure can be achieved in 70-80% of cases. However, a few small series with successful results have

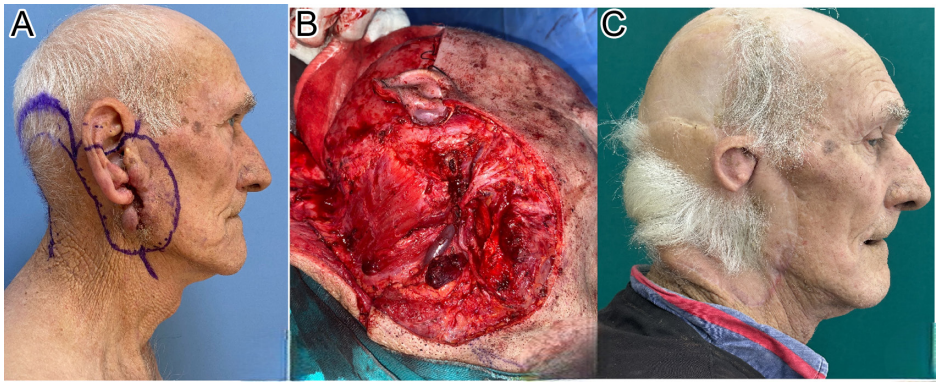

Figure 11. Preoperative (A) and intraoperative (B) images of mass in the right preauricular region of case 5 patient. (C) Postoperative image of the patient 1 year after radiotherapy treatment.

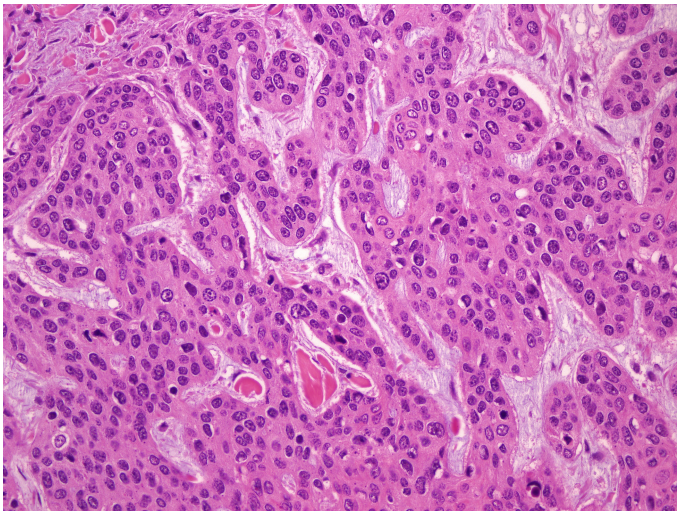

Figure 12. Atypical poroid cells with marked pleomorphism and irregular nuclear contours; HE ×400.

been reported with the Mohs microsurgical technique.[5] Regional lymph node metastasis is found in 20% of cases which is significantly higher than SCCs.[6] The role of sentinel lymph node biopsy remains controversial. Some authors have suggested the possible role of SLNB for all or some EPC patients, but more studies are needed.[7] A case series of 69 patients with porocarcinoma demonstrated a tumor depth of at least 7 mm and frequent mitoses to be predictive of lymph node metastasis, and the authors suggest that, although a positive SLNB may occur only infrequently, SLNB may be useful for porocarcinomas with such characteristics.[8] Regional lymph node dissection should be performed if there is a spread to regional lymph nodes.[9] The mortality rate in these cases has been reported as 67%. There are useful histopathology characteristics to help decide if a sentinel node biopsy should be done or not. These so-called poor prognosis histopathological signs were described by Robson et al and described as 14+ mitoses per high-power field, lymphovascular invasion, and tumoral involvement deeper than 7 mm. Among the patients observed in our series, only one patient had lymphovascular invasion, tumoral involvement deeper than 7 mm, and numerous mitoses.[10] Due to the nature of this study, survival times or prognosis factors are not established.

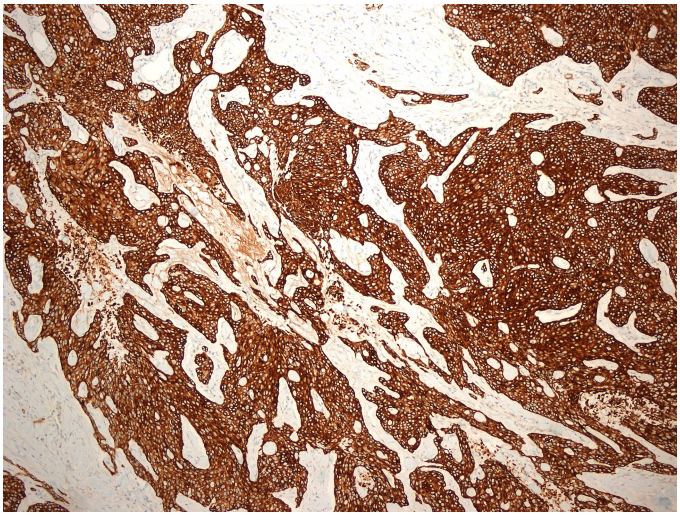

Figure 13. Immunohistochemical strong and diffuse CK7 and CK19 positivity in ductal epithelial cells.

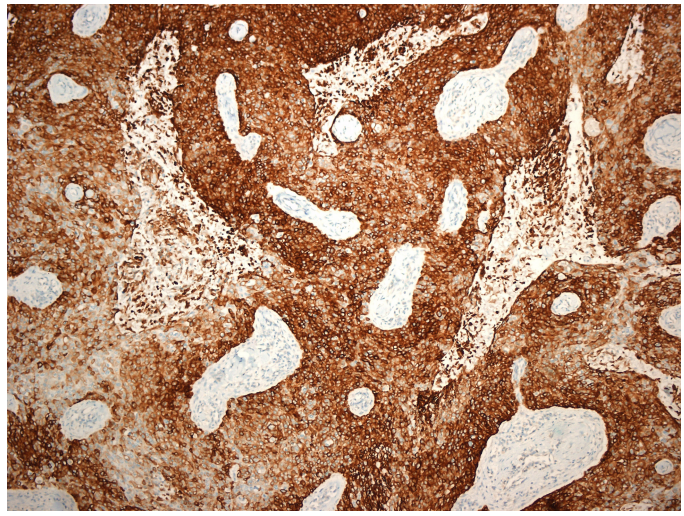

Figure 14. Immunohistochemical strong and diffuse CK7 and CK19 positivity in ductal epithelial cells.

One patient in our series underwent complementary lymph node dissection due to the presence of a palpable lymph node and increased uptake in PET/CT that was discovered 3 months after surgery. The remaining 4 patients are all being followed up as tumor-free and the mean follow-up time of the cases is 25 months (13-36). The fact that all 5 cases of eccrine porocarcinoma, which is stated to be very rare according to the literature, were admitted to our clinic (which roughly serves a population of 500 000-1 000 000) with various but much less aggressive diagnoses in a short span of 3 years, raises the question of whether eccrine porocarcinoma is more common than initially stated in the literature or whether these cases are misdiagnosed as other entities. It should be kept in mind that if the diagnosis of porocarcinoma, which has significantly high mortality and morbidity if locoregional control is not achieved, is missed and the appropriate treatment especially adjuvant radiotherapy is not performed, systemic dissemination and local recurrence may be observed much frequently. In the literature, due to the small number of porocarcinoma cases, a widely accepted treatment protocol, a proper safe surgical margin limit, or indications for complementary radiotherapy have not been determined. Among the patients mentioned in our study, the closest surgical margin was 1 cm. All of the patients in our study received adjuvant radiotherapy after being discussed in the tumor council and no recurrence was observed after the definitive surgery. The fact that the only patient who did not initially receive radiotherapy had lymph node metastasis in a short span of 4 months, may allow us to speculate that adjuvant radiotherapy is a crucial part of the treatment algorithm, especially in porocarcinoma cases with high-risk pathological features such as lymphovascular invasion and ulceration.

The fact that all of the cases we presented were referred to our center with different initial pathological diagnoses is too much of a coincidence and further multi-centered studies may need to be conducted nation-wide to validate our suspicion that porocarcinoma is an entity that is being underdiagnosed.

Conclusion

In conclusion, reported eccrine porocarcinoma cases are quite limited to evaluating treatment modalities or outcomes. However, the results of the few reported series indicate that patients with eccrine porocarcinoma are particularly at risk of local and regional recurrence. We presented the clinical and

pathologic features of 5 cases of eccrine porocarcinoma, which were referred to our clinic with different initial diagnoses and undergone extensive resection with complementary radiotherapy in our center. All the cases are disease-free for at least 1 year as of the conduction of this study. Both clinicians and pathologists should be more aware of the presence of this type of tumor in order not to miss the crucial window for locoregional control of this rare but aggressive tumor.

Availability of Data and Materials: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of İstanbul University-Cerrahpaşa (Approval no: MU7UMt7U, Date: December 14, 2023).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – E.Y., A.E.; Design – E.Y., A.E.; Supervision – E.Y., A.E.; Resource – E.Y.; Materials – E.Y., Ö.G., A.M.Ö.M., Ö.A.Ü.; Data Collection and/or Processing – E.Y., Ö.G., A.M.Ö.M., Ö.A.Ü.; Literature Search – E.Y., Ö.G., A.M.Ö.M., Ö.A.Ü.; Writing – E.Y., A.E.; Critical Review – E.Y., A.E., A.M.Ö.M.

Declaration of Interests: The authors have no conflicts of interest to declare.

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