A Pigmented Pedunculated Nodule on the Scalp

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A 46-year-old woman with skin phototype IV, presented with a pedunculated nodule on the vertex of her scalp that had been present for 5 years. The growth initially started as a small, skin-colored papule, and gradually increased in size over the past 5 years. It frequently led to difficulties in combing her hair, with occasional bleeding. Scalp examination revealed a solitary, well-defined, pigmented, pedunculated nodule measuring 3 × 4 cm in size, with a firm and fibrotic base. The surface of the nodule was mostly smooth but had some slightly lobulated areas with non-uniform violaceous pigmentation and small erosions [Figure 1]. The nodule was firm on palpation without any regional lymphadenopathy. Dermoscopic examination of the surface revealed a network-like pattern with anastomosing white bands with intervening multiple, variable-sized, round-to-oval, orange-red to bluish-grey nests and globules, along with leaf-like, serpentine, and hair pin-like vessels while the base of the lesion showed white homogeneous strands with greyish black background [Figure 2]. A therapeutic excision was done and the specimen was sent for histopathology. Histopathological examination, at scanning view, revealed broad anastomosing bands extending from the epidermis into the dermis along with ductal lumina and cystic spaces without any formal lining [Figure 3a]. There was abundant fibrovascular stroma with dilated congested capillaries and edema in the intervening stroma [Figure 3b]. There were many melanophages and heavy melanin deposition within the tumor islands as well as the intervening stroma The bands were composed of small, monomorphic, cuboidal cells with round basophilic nuclei, inconspicuous nucleoli, and compact eosinophilic cytoplasm which were connected by intercellular bridges along with ductal lumina lined by cuboidal cells [Figure 3c].

Question

What is your diagnosis?

Answer

Pigmented eccrine poroma.

Discussion

Eccrine poroma (EP) is a rare benign adnexal tumor originating from the intraepidermal portion of eccrine sweat ducts.[1] It commonly presents as a firm, flesh-colored to reddish papule, nodule, or plaque at acral sites where the concentration of eccrine sweat glands is higher.[2] The etiology is unknown. Nevertheless, it has been reported to occur over sites of trauma, previous radiation exposure or scar tissue. While non-pigmented EP is more common, pigmented variants have been reported, especially in individuals of African descent and on non-acral sites.[3] Few reports have described scalp involvement by EP, particularly the pigmented variant.[4]

The diagnosis of pigmented EP can be challenging, especially when it presents over the scalp, often being mistaken for other pigmented tumors such as giant pedunculated seborrheic keratosis, pigmented nodular basal cell carcinoma, pigmented epithelioid melanocytoma, pigmented squamous cell carcinoma, nodular melanoma, or Bednar tumor (pigmented dermatofibrosarcoma protuberans).[5,6] Accurate diagnosis is crucial as it allows dermatologists to reassure patients about the benign nature of the condition and plan appropriate interventions. Dermoscopy can aid in differentiating EP from these conditions, though there have been reports of overlapping features with basal cell carcinoma.[3] The anastomosing white

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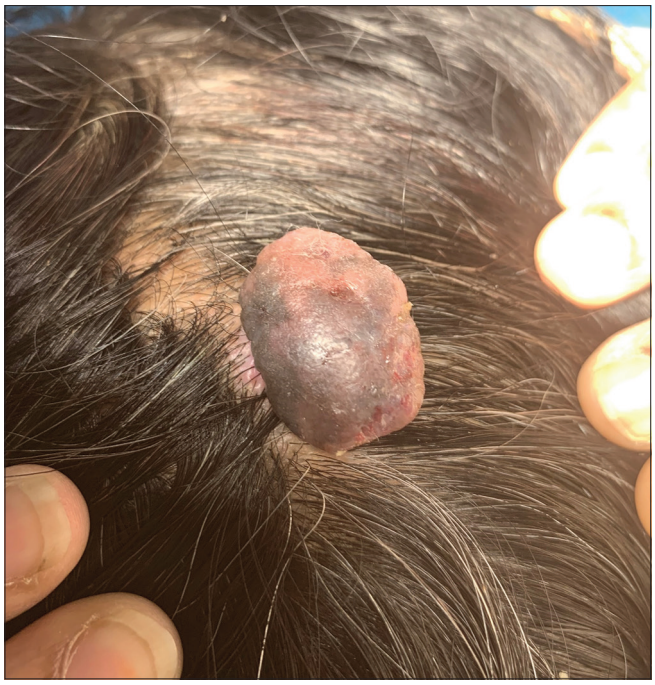

Figure 1: A solitary, well-defined, violaceous, pigmented pedunculated nodule measuring 3 × 4 cm with a firm and fibrotic base and smooth to slightly lobulated surface

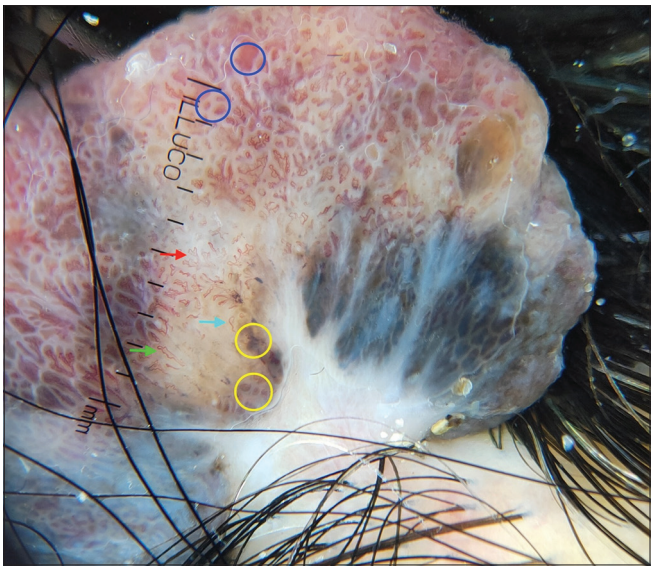

Figure 2: Dermoscopic examination revealed a network-like pattern with anastomosing white bands with intervening multiple, variable-sized, round-to-oval, orange-red (indigo-navy blue circles) to bluish-grey (yellow circles) nests and globules, along with leaf-like (red arrow), serpentine (sky blue arrow), and hair pin-like (green arrow) vessels while the base of the lesion showed white homogeneous strands with greyish black background (ILLUCO, IDS-1100, polarized; 10×)

bands on dermoscopy correlate with broad anastomosing bands of tumor cells on histology. The polymorphic vessels seen on dermoscopy correlate with the congested and dilated vessels in the stroma indicating that the stroma of EP is highly vascular, and may resemble the patterns seen in malignant tumors like melanoma and basal cell carcinoma. The intervening round-to-oval bluish-grey nests correlated with pigmented tumor islands while the orange-red nests and globules correlated with non-pigmented tumor islands. Histopathological analysis plays a critical role in confirming the diagnosis and excluding malignancy. Pleomorphic vessels along with globule-like structures and comedo-like openings, grey ovoid nests, blue-grey dots, and arborizing telangiectasias resembling pigmented basal cell carcinoma have been reported on dermoscopy of pigmented poromas.[3] However, the absence of spoke wheel areas, maple leaf-like areas, and chrysalis-like structures as well as less well-defined irregular vessels with less branching in this case helped differentiate pigmented EP from pigmented basal cell carcinoma.[3]

Histologically poromas are characterized by the presence of basaloid cells in nests and solid nodules exhibiting poroid differentiation, characterized by small ductal lumina bordered by an eosinophilic cuticle. Traditionally, the absence of melanocytes and melanin granules has been recognized as a characteristic histopathological feature in poromas. However, melanin granules and multiple melanocytes within a poroma have also been documented histologically. Within pigmented poromas, melanin is observed in the cytoplasm of neoplastic cells and, over time, within the tubules and stromal melanophages. Poromas feature a stroma that is both highly vascularized and myxoid.[1-8] Notably, pigmented EP with melanin granules has also been reported in patients of Caucasian descent implicating that racial disparities do not appear to be exclusively associated with pigmentation in EPs.[1-6] Ohata U, *et al*., hypothesized that melanocytes from the surrounding epidermis may migrate to the tumor nests under the influence of tumor-derived growth factors such as basic fibroblast growth factor (bFGF), potentially triggering colonization by melanocytes and their subsequent multiplication.[4] Eccrine porocarcinoma, potentially pigmented, represents the primary histopathological differential diagnosis. Porocarcinoma histologically presents with tumors demonstrating numerous connections to the epidermis, sometimes alongside benign EP. The tumor infiltrates the dermis and subcutaneous tissue, forming nests and lobules composed of small cells lacking basaloid features. Peripheral palisading is absent, while ductal differentiation is crucial for diagnosis, often confirmed through immunohistochemical stains like carcinoembryonic antigen (CEA) and epithelial membrane antigen (EMA). Comedo necrosis is common, and differentiation into clear-cell and squamous types may complicate differentiation from squamous cell carcinoma. Sarcomatoid changes are rare. Poor prognostic factors encompass high mitotic figures, lymphovascular invasion, depth exceeding 7 mm, and infiltrating borders. The presence of intratumoral cellular atypia, architectural distortion, atypical mitotic figures, necrosis, and

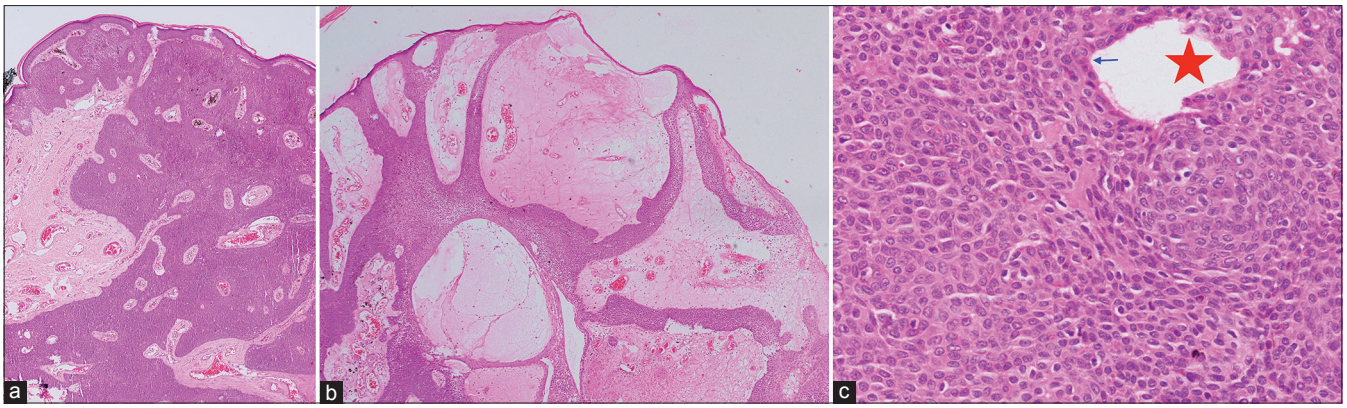

Figure 3: Histopathological examination showing (a) broad anastomosing bands extending from the epidermis into the dermis, dilated congested vessels in a fibrotic stroma, and heavy melanin deposition with melanophages within the tumor islands as well as the intervening stroma (H and E; 40×); (b) abundant loose fibrovascular stroma with dilated congested capillaries and edema (H and E; 40×); and (c) tumor composed of small, monomorphic, cuboidal cells with round basophilic nuclei, inconspicuous nucleoli, and compact eosinophilic cytoplasm, which are connected by intercellular bridges along with ductal lumina (red star) lined by cuboidal cells (blue arrow) (H and E; 400×)

pleomorphism may suggest a malignant transformation of EP. Immunohistochemical staining with polyclonal CEA assists in differentiation from other epithelial neoplasms; however, negative staining can occur in up to 23% of porocarcinomas, particularly with monoclonal antibodies.[7] Surgical excision remains the mainstay of treatment.[4]

In conclusion, a solitary, slow-growing nodule or tumor, with or without pigmentation, even outside the palms and soles, should raise suspicion of EP. Dermoscopic features can aid in diagnosis, although histopathology remains the preferred diagnostic modality. As far as our current understanding goes, the occurrence of pigmentation in EPs is uncommon, accounting for 17% of cases.[8] Subsequent investigations dedicated to comprehending melanocyte symbiosis within the tumor are imperative to elucidate the underlying mechanism governing melanocyte colonization in poromas.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initial will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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