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Abstract

We describe 11 poroid neoplasms with sebaceous differentiation, including a metaplastic (sarcomatoid) carcinoma arising in association with an apocrine poroma. Six lesions had the silhouette of a classical poroma, 3 of poroid hidradenoma and 1 of dermal duct tumor. In all cases, sebaceous differentiation was identified as clustered or solitary, mature sebocytes occurring mainly at the periphery of intradermal cellular aggregations, accompanied by sebaceous ducts. In one poroma, clusters of sebocytes were seen within intradermal aggregates and intraepidermally. In 1 of the 3 poroid hidradenomas, the eosinophilic cuticle lining the cyst was crenulated in foci associated with sebocytes. In none of the cases were there signs of follicular differentiation. One poroma, in addition to sebaceous differentiation, showed decapitation secretion in some ductular structures. The single carcinoma was an ulcerated oval to spindle cell neoplasm surrounded laterally by the residuum of a poroma containing groups of sebocytes. The epithelial islands of the poroma were prominently keratinized and blended gradually with the pleomorphic cells of the metaplastic carcinoma that immunohistochemically stained focally for cytokeratins and simultaneously showed strong vimentin expression. Our study supports previous findings that sebaceous differentiation can be identified not only in classical poroma but also in the related lesions known as dermal duct tumor and poroid hidradenoma. Occurrence of metaplastic carcinoma in association with apocrine poroma is a rare event which indicates the existence of a malignant counterpart of the latter entity, which can be descriptively referred to as "sarcomatoid apocrine porocarcinoma."
Sebaceous Differentiation in Poroid Neoplasms: Report of 11 Cases, Including a Case of Metaplastic Carcinoma Associated With Apocrine Poroma (Sarcomatoid Apocrine Porocarcinoma)

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Abstract: We describe 11 poroid neoplasms with sebaceous differentiation, including a metaplastic (sarcomatoid) carcinoma arising in association with an apocrine poroma. Six lesions had the silhouette of a classical poroma, 3 of poroid hidradenoma and 1 of dermal duct tumor. In all cases, sebaceous differentiation was identified as clustered or solitary, mature sebocytes occurring mainly at the periphery of intradermal cellular aggregations, accompanied by sebaceous ducts. In one poroma, clusters of sebocytes were seen within intradermal aggregates and intraepidermally. In 1 of the 3 poroid hidradenomas, the cosinophilic cuticle lining the cyst was crenulated in foci associated with sebocytes. In none of the cases were there signs of follicular differentiation. One poroma, in addition to sebaceous differentiation, showed decapitation secretion in some ductular structures. The single carcinoma was an ulcerated oval to spindle cell neoplasm surrounded laterally by the residuum of a poroma containing groups of sebocytes. The epithelial islands of the poroma were prominently keratinized and blended gradually with the pleomorphic cells of the metaplastic carcinoma that immunohistochemically stained focally for cytokeratins and simultaneously showed strong vimentin expression. Our study supports previous findings that sebaceous differentiation can be identified not only in classical poroma but also in the related lesions known as dermal duct tumor and poroid hidradenoma. Occurrence of metaplastic carcinoma in association with apocrine poroma is a rare event which indicates the existence of a malignant counterpart of the latter entity, which can be descriptively referred to as “sarcomatoid apocrine porocarcinoma.”

Key Words: apocrine poroma, carcinosarcoma, cutaneous adnexal tumors, metaplastic carcinoma, porocarcinoma, sarcomatoid apocrine porocarcinoma, sebaceous differentiation

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MATERIALS AND METHODS

The 11 cases were found in the consultation or routine files of the authors. Sebaceous differentiation represented a minor but significant component of the 11 cases. They were identified among approximately 300 poroid lesions...
collectively seen by the authors, but this frequency of sebaceous differentiation is likely an overestimate of this occurrence owing to consultation case bias. The possibility that sebaceous areas represented preexisting sebaceous lobules entrapped by poroma was ruled out. Cases included in the study showed multiple foci of sebaceous differentiation, which were not associated with identifiable preexisting adnexa. These foci were extensive enough to ensure that definite distinction between de novo sebaceous differentiation and residual sebaceous elements from preexisting normal structures could be made confidently. Cases where entrapment could not be ruled out were excluded from the study.

The essential clinical information was obtained from pathology and clinical records. Follow-up was not sought, except for the SAP. This study was based on light microscopy; only in SAP were immunohistochemical studies performed utilizing the following antibodies against cytokeratins (clone AE1:AE3, 1:50, DakoCytomation, Glostrup) and desmin (D33, 1:50, DakoCytomation, Glostrup).

RESULTS
Clinical Data
The main clinical information is summarized in Table 1. All tumors were surgically removed. The patient with the SAP (case 11) was without evidence of recurrence or metastatic disease 18 months after surgery.

Histopathological Features
Six of the benign lesions had the silhouette of a classical poroma, 3 of poroid hidradenoma and 1 of dermal duct tumor. In all cases, sebaceous differentiation was identified as clustered or solitary, mature sebocytes occurring mainly at the periphery of intradermal cellular aggregations, accompanied by sebaceous

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BCC, basal cell carcinoma.
ducts (Figs. 1–3). In one poroma, clusters of sebocytes were seen within intradermal aggregates and intraepidermally (Fig. 2). In 1 of the 3 poroid hidradenomas, the eosinophilic cuticle lining the cyst was crenulated in foci associated with sebocytes (Fig. 3).

The SAP was an ulcerated oval to spindle cell neoplasm surrounded laterally by the residuum of a poroma containing

FIGURE 2. Poroma with sebaceous differentiation. A, B, C, clusters of sebaceous cells are evident within epidermis and within the dermal islands of neoplastic cells.

FIGURE 3. Poroid hidradenoma with sebaceous differentiation. A, solid-cystic lesion with no connection to the epidermis. B, poroid cells, cuticular cells, and small ductal structures. C, sebocytes in the vicinity of the cuticle which is somewhat crenulated and eosinophilic, similar to that seen in steatocystoma or isthmus of the hair follicle.
groups of sebocytes. The epithelial islands of the poroma were prominently keratinized and blended gradually with the pleomorphic cells of the metaplastic carcinoma that immunohistochemically stained focally for cytokeratins and simultaneously showed strong vimentin expression (Fig. 4).

In none of the cases were there signs of follicular differentiation. One poroma, in addition to sebaceous differentiation, showed decapitation secretion in some ductular structures.

**DISCUSSION**

Besides sebaceous carcinoma, sebaceoma, sebaceous adenoma, and sebaceous cystic tumors, the 4 entities included
in the category of sebaceous tumors in the updated World Health Organization classification,15 foci of sebaceous differentiation can be encountered in a range of benign and malignant adnexal tumors of the skin, including apocrine mixed tumor, cylindroma, spiradenoma, tubular adenoma, pilar tumor, microcystic adnexal carcinoma, and others.7,16–24 Conversely, rare sebaceous carcinomas and sebaceomas may show signs of apocrine differentiation.25,26 Some neoplasms may show “divergent” differentiation reflecting all three lineages of the folliculosebaceous apocrine unit, consistent with the close embryological relationship of these elements.24,27–31 Such dual or tripartite differentiation is often taken to support the apocrine nature of a neoplasm with ductal differentiation and was used to support the concept of apocrine poroma.3,32

Our study adds 11 further examples of poroid lesions with sebaceous differentiation to those previously reported. The classical poroma pattern dominated in our small series, similar to other reports in the literature with the exception of occasional descriptions of sebaceous differentiation in poroid hidradenoma. Similar to the series of Harvell et al.,5 none of our patients presented with a tumor on planar or palmar surfaces, the sites of predilection for poroma. Interestingly, in case 2 sebaceous clusters were found within the epidermis similar to the tumors reported by Hanau et al.4 and Lee et al.10 This raises the possibility that cases of hidroacanthoma simplex showing sebaceous differentiation may also exist.

The occurrence of a metaplastic (sarcomatoid) carcinoma associated with apocrine poroma (case 11) has not been previously described to our knowledge. The malignant counterpart of poroma, the porocarcinoma, has emerged as a distinct neoplasm.33–35 There are few reports of metaplastic carcinomas associated with poroma, but sebaceous differentiation was not documented in those articles.16–30 With few exceptions, those neoplasms have been largely described as “carcinosarcomas.” We and others,39 however, posit that practically all lesions reported as such actually represent metaplastic (sarcomatoid) carcinomas, the latter defined as carcinomas which, in addition to the conventional epithelioid phenotype, exhibit a sarcomatoid spindle cell component with a mesenchymal phenotype derived from the epithelial component and which may be associated with various types of mesenchymal differentiation. Authentic primary carcinosarcomas of the skin seem to be exceptionally rare, and perhaps, at this time only the so-called trichoblastic carcinosarcoma meets the strict definitional criteria for a carcinosarcoma.39,40

In summary, our study supports the previous findings that sebaceous differentiation can be identified not only in classical poroma but also in the related dermal duct tumor and poroid hidradenoma. Occurrence of metaplastic carcinoma in association with apocrine poroma is a rare event that indicates the existence of a malignant counterpart of the latter entity, which can be descriptively referred to as “sarcomatoid apocrine porocarcinoma.”

REFERENCES


