Primary Cutaneous Mucinous Carcinoma: Case Report and Review of the Literature

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Primary cutaneous mucinous carcinoma is a rare malignant neoplasm of sweat duct origin, with the eyelid being the most common location. Secondary cutaneous mucinous carcinoma represents metastases, and it is thus imperative to differentiate primary mucinous carcinoma of the skin from metastatic lesions to the skin. Distant metastases of primary cutaneous mucinous carcinoma are rare. Surgical excision, including Mohs micrographic surgery, is recommended for treatment.

Primary cutaneous mucinous carcinoma (PCMC) is a rare malignant neoplasm of sweat duct origin. Approximately 150 cases have been reported since it was first described in 1952 by Lennox et al.[1] The most common location is the eyelid, but other sites, such as the scalp, face, neck, extremity, trunk, perianal region, and vulva, have been reported.[2-11] Bilateral involvement of the eyelids has also been reported.[2,3] Secondary cutaneous mucinous carcinoma represents metastases from the gastrointestinal tract, breast, salivary gland, lacrimal gland, nose and paranasal sinus, lung, ovary, kidney, or gall bladder.[7-19] It is imperative to differentiate primary mucinous carcinoma of the skin from metastatic lesions to the skin. We present a patient with a primary mucinous carcinoma of the scalp.

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CASE REPORT

A 46-year-old man presented to our office with a 1-cm firm, pink, smooth nodule, with overlying telangiectasias and a translucent quality, located on the right frontal scalp. The lesion had been present for approximately 3 months and was progressively increasing in size. He denied any recent weight loss, night sweats, fevers, or chills. The lymph nodes in the head and neck region and the axillae were nonpalpable. The lesion was clinically thought to be either a basal cell carcinoma or an adnexal neoplasm and was biopsied by saucerization technique.

The biopsy revealed aggregates of an epithelial neoplasm within large pools and collections of mucin. The neoplasm comprised irregular lobules, numerous small ducts and tubular structures, solid aggregates, single units, and cribiform formations. The cells revealed enlarged vesicular nuclei with pale eosinophilic to focally vacuolated cytoplasm. The mucinous stroma was compartmentalized and separated by fibrous septa. There was no connection to the overlying epidermis, and no lymphatic invasion was noted.

A panel of immunohistochemical markers revealed strong positivity for keratins AE1/AE3, cytokeratin (CK) 7, and epithelial membrane antigen; focal positivity for carcinoembryonic antigen; and minimal positivity for S-100 protein. The tumor cells were negative for CK20.

Prominent and strong nuclear positivity for the estrogen receptor and the progesterone receptor was also noted. The biopsy and immunohistochemical findings were consistent with a diagnosis of PCMC.

Oncologic and surgical consultations were arranged. A thorough search for an internal primary neoplasm, including magnetic resonant imaging of the brain, computed tomography scans of the chest, abdomen, and pelvis, and laboratory studies, was negative. The patient was referred to an oncologic surgeon for excision of the lesion.

COMMENT

PCMC is a rare neoplasm of sweat glands initially described with eccrine differentiation. However, recent reports have indicated an apocrine differentiation.[6,7] Wako et al[7] showed evidence of apocrine-type differentiation, such as distinctive decapitation secretion in a case of mucinous carcinoma of the skin arising on the right temple of a 70-year-old man. Similar findings have been reported in the literature.[13,20] In addition to decapitation secretion, similar features are noted in mucinous carcinoma and colloidal carcinoma of the mammary gland, an apocrine gland tumor.[7,14] Eccrine differentiation in PCMC is noted because of the presence of mitochondrial oxidative enzymes such as lactic dehydrogenase, succinic dehydrogenase, and isocitric dehydrogenase.[12] Also, neoplastic cells in PCMC are similar to the dark cells of eccrine glands.[7,12]

Clinical Features

PCMC has a male predominance of approximately 2:1 and is typically seen in patients 50 to 70 years of age. The reported age range varies from 8 to 95 years.[5,9] The most common area of involvement is periorbital, with the eyelid being the most common site. The PCMC clinical lesion typically presents as a solitary nodule or a cystlike neoplasm ranging from 0.5 to 8 cm in size.[2,4,5] The color of the lesion can be tan, gray, red, or blue.[4] The lesion is typically slow growing, asymptomatic, and translucent with overlying telangiectasias, thus simulating basal cell carcinoma, at least in some cases.

Dermoscopy

Examination of the lesion under dermoscopy reveals a whitish network that represents fibrous septum and light brown globules that represent mucinous deposition.[21]

Histology

Histologically, mucinous carcinoma has been classically defined as nests of epithelial cells floating in lakes of extracellular mucin separated by fibrous and collagenous septa. Mucinous materials are usually positive with periodic acid–Schiff, mucicarmine, and Alcian blue stains at pH 2.5 and are digested with sialidase but not diastase and hyaluronidase.[10,21]

Within the tumor are 3 populations of cells, including dark cells that secrete sialomucin, light cells or stem cells, and intermediate cells with both characteristics, resembling the secretory portion of the eccrine coil.[4,12,15,22,23] Some mucinous carcinomas can have a mucocelelike configuration. Lymphatic invasion has been reported and can be confirmed by immunohistochemical markers CD31 and Ulex europaeus.[4,15] Mucin seen in PCMC is nonsulfated sialomucin in contrast to sulfated mucin seen in other sweat gland tumors.[9]

Immunohistochemistry

PCMC has been shown to be positive for various immunohistochemical markers such as carcinoembryonic antigen, S-100 protein, gross cystic disease fluid protein-15, low-molecular-weight cytokeratin 35βH11, epithelial membrane antigen, α-lactalbumin, and estrogen and progesterone receptors.[2-5,8,9,12-14,16,19,20] Primary mucinous carcinoma of the skin is negative for vimentin.[16] Immunohistochemical markers can be useful in differentiating primary cutaneous origin from secondary lesions. Mucinous carcinoma arising in the colon is usually positive for CK20, whereas ovarian mucinous carcinoma is negative for gross cystic disease fluid protein-15 and S-100 protein.[8,16,17]

Differentiation of Origin

Mucinous carcinoma arising primarily in the breast is similar to PCMC, and thus the 2 sources may be indistinguishable histologically.[9] Qureshi et al[24] suggested the presence of a peripheral myoepithelial cell layer as a clue to cutaneous origin, which can be used to differentiate primary cutaneous from metastatic mucinous carcinoma, especially of breast origin. The myoepithelial cell differentiation, if present, can be confirmed using immunohistochemical stains for p63, CK5/6, smooth muscle actin, calponin, HHF35, and CD10.

Biologic Behavior

PCMC has a propensity for local recurrence as well as regional spread, but distant metastases are rare. Local recurrence rates as high as 30% to 45% and lymph node spread of 10% to 12% have been reported.[9,15,22] Recurrence rates of 40% have been reported for tumors involving the eyelids.[12] Invasion of the tumor into muscle, periosteum, parietal bone, dura, and transverse sinus has been observed but is rare.[22]

Management

PCMC can be treated with excision or Mohs micrographic surgery. Excision margins ranging from 0.2 to 1 cm have

been reported.[23] Mohs micrographic surgery remains a viable treatment option since the tumor has a high rate of local recurrence, low rate of distant metastases, and absence of skip areas.[11,19,25] Immunoperoxidase-guided micrographic surgery using low-molecular-weight CK was successfully demonstrated by Marra et al.[26] Antiestrogen therapy such as tamoxifen can be of benefit since the tumor shows nuclear positivity to the estrogen receptor; however, more studies are needed.[19] Recurrent or metastatic PCMC is both resistant to radiation and unresponsive to chemotherapy.[27]

SUMMARY

PCMC is a rare cutaneous malignancy that may simulate basal cell carcinoma clinically. Histologic features are distinctive; however, it may be difficult to differentiate primary cutaneous lesions from metastatic tumors originating at other sites, such as the gastrointestinal tract. PCMC may be locally aggressive and may occasionally spread to regional lymph nodes. Distant metastases are, however, uncommon. Surgical excision, including Mohs micrographic surgery, is recommended for treatment. PCMC is resistant to both radiation and chemotherapy.

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