Primary Cutaneous Adenoid Cystic Carcinoma: A Case Report and Review of the Literature

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Primary cutaneous adenoid cystic carcinoma is a rare cancer, with only 61 cases reported in the literature. We report an additional case and review the latest recommendations for workup and treatment.

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Case Report

A 62-year-old woman presented to her dermatologist with several months' history of a painless nodule on the scalp. The patient had a prior medical history of hypertension and osteoporosis. Results of a physical examination revealed a hard, 20×11-mm, pink and flesh-colored lesion in the midline parietal region of the scalp with alopecia over the nodule (Figure 1). Results of a shave biopsy stained with hematoxylin and eosin was diagnostic of primary cutaneous adenoid cystic carcinoma (Figure 2). Mitotic figures were not readily identified. The lesion demonstrated perineural invasion and did not invade the epidermis. The tumor cells were strongly and diffusely reactive with CD117 (*c-kit*) in a cytoplasmic pattern with membranous accentuation.

Age-appropriate cancer screening tests were performed. Results of a breast examination; mammogram; otorhinolaryngological examination; and computed tomographic (CT) scans of the head and neck, as well as the chest and abdomen, did not reveal internal malignancy. Findings from a chest x-ray were normal. Serum carcinoembryonic antigen levels were within reference range. The lesion was treated with Mohs micrographic surgery and tumor-free margins were achieved in 2 stages. The defect was repaired with a rotation flap. The patient was recurrence free at 6-month follow-up.

Comment

Adenoid cystic carcinoma can arise from a variety of primary sites, including the salivary glands, respiratory tract, cervix, vulva, breast, thymus, prostate, external auditory canal, esophagus, and skin.[1,2] Adenoid cystic carcinoma most commonly presents in the major and minor salivary glands, so primary adenoid cystic carcinoma of the major and minor salivary glands must be ruled out. In general, adenoid cystic carcinoma can have late-occurring metastasis, involving regional nodes, lungs, bone, and brain, but cutaneous metastasis from a primary head and neck adenoid cystic carcinoma is exceedingly rare, with only 3 recorded cases.[3-5] Primary cutaneous adenoid cystic carcinoma has been reported to metastasize most commonly to the lungs and pleura and also has metastasized to lymph nodes.[6]

Clinically, primary cutaneous adenoid cystic carcinoma usually is a chronic and asymptomatic flesh-colored nodule. It also has been described as a furuncle and as a lobulated, purple and red nodule that may ulcerate. The average diameter of the clinical lesion is 3.8 cm. Primary cutaneous adenoid cystic carcinoma presents most commonly in elderly and middle-aged patients, and the average age at diagnosis is 56 years. Males and females are equally affected, though there is a slight predilection for females (54%).[7,8] The scalp is the most common location, followed by the chest, but primary cutaneous adenoid cystic carcinoma has been described on many locations, including the scrotum and eyelid.[9,10]

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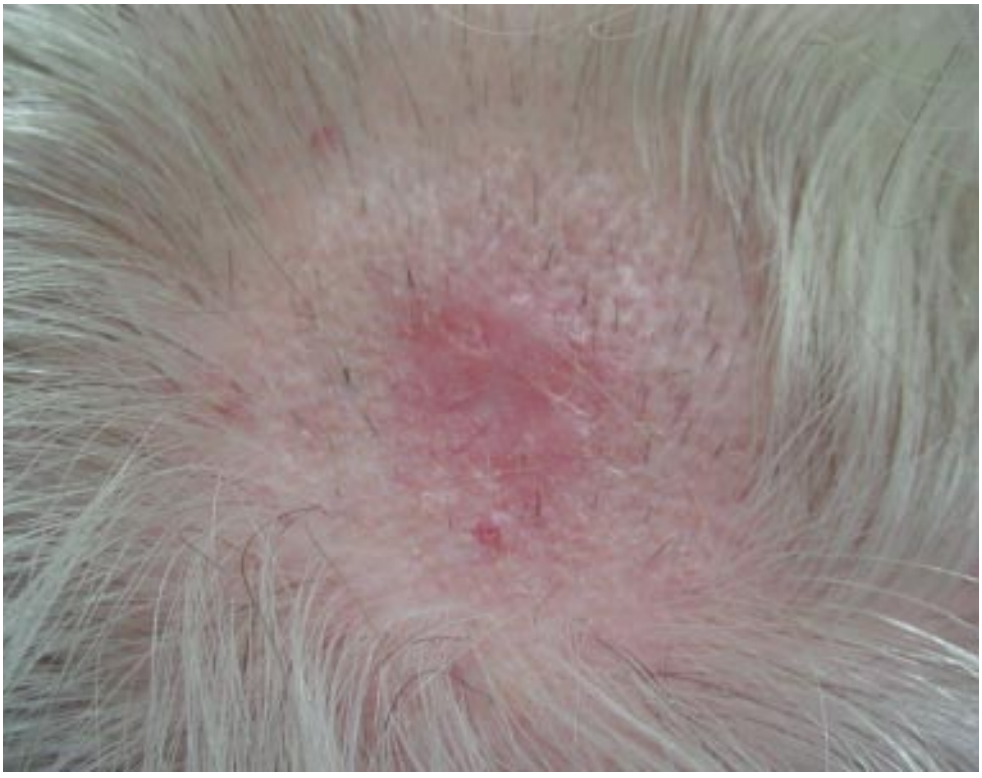

Figure 1. Pink and flesh-colored lesion (20×11 mm) in the midline parietal region of the scalp with alopecia over the nodule.

The clinical course is commonly complicated by local recurrence.

Histologically, infiltrative growth extending deep into the dermis and subcutaneous tissue and prominent perineural invasion are the characteristic features of the tumor. Tumor cells are classically arranged in tubular and cribriform patterns of the reticular dermis with a basaloid appearance, never extending to the epidermis. Adenoid cystic carcinoma follows a sequential transition of its architectural pattern from tubular to cribriform to solid. A tubular pattern has the best prognosis and represents the best differentiation. However, the solid pattern is the least differentiated with the worst prognosis. The cribriform pattern appears to lie between the tubular and solid patterns, both histologically and clinically.[11] Staining reveals eosinophilic hyaline material that is hyaluronidase sensitive and positive for periodic acid-Schiff and Alcian blue stains at pH 2.5. These findings are consistent with the presence of hyaluronic acid.[12] Perineural invasion is a histologic characteristic as well as a predictor of aggressive clinical behavior.

The cell of origin of adenoid cystic carcinoma has been hypothesized to be eccrine gland, myoepithelial cell, and undifferentiated duct cell,[2,13] but the exact origin of primary cutaneous adenoid cystic carcinoma has not been agreed upon in the literature. Lack of continuity with epidermis, immunohistochemical staining, and histologic appearance of tubular and cribriform structures favor an eccrine origin.[13] However, the tumor cells contain cytoplasmic microfilaments in parallel bundles, making myoepithelial origin possible.[2]

The differential diagnosis of primary cutaneous adenoid cystic carcinoma includes adenoid basal cell carcinoma and mucinous carcinoma. Basal cell carcinoma may show a cribriform growth pattern with lumina formation, cystic degeneration, scant cytoplasm, and hyaluronic acid mucin, mimicking primary cutaneous adenoid cystic carcinoma, but primary cutaneous adenoid cystic carcinoma lacks the peripheral palisading nests of tumor cells and the elongated basaloid cell shape of basal cell carcinomas. Also, basal cell carcinoma tumor cells connect with the epidermis and lack perineural invasion, which is a characteristic finding in primary cutaneous adenoid cystic carcinoma.[12,14] Differentiating primary cutaneous adenoid cystic carcinoma from mucinous carcinoma is easily resolved using histochemistry; primary cutaneous adenoid cystic carcinoma stains hyaluronic acid palely, while mucinous carcinoma stains densely because of sialomucins.[12]

Prior literature of primary cutaneous adenoid cystic carcinoma failed to discuss a thorough

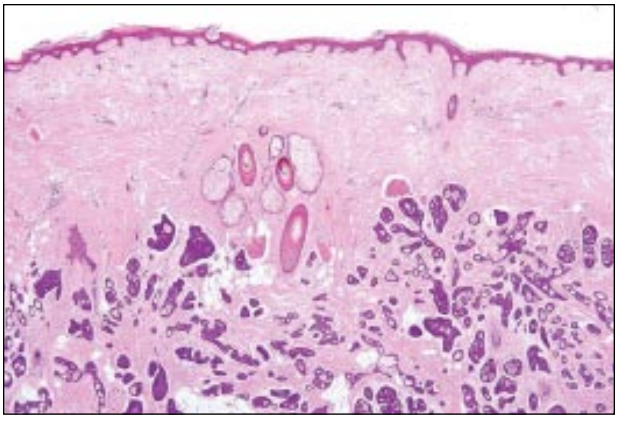

Figure 2. Multiple ductal structures embedded in a focally dense sclerotic stroma. The ducts are lined by fairly monomorphous cuboidal cells with moderate amounts of eosinophilic cytoplasm and round to ovoid nuclei with fine chromatin and small inconspicuous nucleoli. Some of the ducts show cribriform architecture and contain luminal mucin (H&E, original magnification ×4).

diagnostic workup for a patient with the disease, resulting in confusion of primary origin and missed metastatic lesions. The workup for a patient diagnosed with primary cutaneous adenoid cystic carcinoma includes a breast examination; otorhinolaryngological examination; CT scans of the head and neck, as well as the chest and abdomen; and chest x-ray. Although metastasis of adenoid cystic carcinoma to the skin is rare, an otorhinolaryngologist would best be able to eliminate primary salivary gland adenoid cystic carcinoma as a diagnosis. Primary salivary gland adenoid cystic carcinoma should be strongly considered if the patient has a history of head and neck adenoid cystic carcinoma.[3] Although rare, salivary gland adenoid cystic carcinoma can involve skin by direct extension or metastasis.[3,4] An x-ray and CT scan of the chest will rule out pulmonary metastasis because it is the most common site for primary cutaneous adenoid cystic carcinoma to metastasize.

The best treatment for primary cutaneous adenoid cystic carcinoma is surgical excision. Mohs micrographic surgery has a high sensitivity for perineural invasion and lower recurrence rates compared with other surgical techniques,[15] though evidence is weak and consists mostly of isolated case reports. Analysis of case reports of primary cutaneous adenoid cystic carcinoma treated with excision and followed up revealed 75% recurrence, though the average follow-up was longer than in the case reports using Mohs micrographic surgery. Of the 5 cases treated with Mohs micrographic surgery as reported in the literature, none of the lesions recurred, but the recorded tumor-free intervals ranging from 6 to 28 months do not allow sufficient time for recurrence.[15,16] The average size of tumors treated with Mohs micrographic surgery is 2.1 cm, smaller than the average recorded lesion. Primary cutaneous adenoid cystic carcinoma contains large amounts of hyaluronic acid, so toluidine blue stain is useful in revealing the tumor during treatment.[16]

Although rare, lymph nodes may be involved by direct extension. There have been 3 reported cases of lymph node metastasis[17-19] and some authors have suggested regional lymph node dissection as a reasonable option for larger primary lesions.[17,18] Irradiation may be used in conjunction with surgery, especially if there is doubt of complete excision or if the lesion is extensive.[20,21] Chemotherapy was implemented in cases with distant metastases.[18,22] Follow-up for primary cutaneous adenoid cystic carcinoma necessitates regular chest x-rays, as 8% of patients develop pulmonary metastases as late as 18 years after the excision of the primary lesion.[6] Because of its indolent nature and long tumor-free intervals, long-term close clinical follow-up for patients with primary cutaneous adenoid cystic carcinoma is necessary.

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