

molecule 1 expression in varicella zoster virus-infected keratinocytes during herpes zoster: another immune evasion strategy? *Am J Dermatopathol.* 2004;26:27-32.

10. Schottelius AJ, Moldawer LL, Dinarello CA, Asadullah K, Sterry W, Edwards CK 3rd. Biology of tumor necrosis factor-alpha-implications for psoriasis. *Exp Dermatol.* 2004;13:193-222.

11. Wallis RS, Ehlers S. Tumor necrosis factor and granuloma biology: Explaining the differential infection risk of etanercept and infliximab. *Semin Arthritis Rheum.* 2005;34 Suppl 1: 34-8.

Malignant Degeneration of Linear Hidroacanthoma Simplex

I Rodríguez-Blanco, D Sánchez-Aguilar, C Peteiro, and J Toribio

Servicio de Dermatología, Complejo Hospitalario Universitario, Facultad de Medicina, Universidad de Santiago de Compostela, La Coruña, Spain

To the Editor:

We describe an 88-year-old woman with various lesions in the right submammary region that had remained stable for more than 40 years. She reported rapid growth and ulceration of one of the lesions in the past year. The examination showed a firm tumor of diameter 7 cm below the right breast. The surface of the tumor was keratotic at the periphery and ulcerated in the middle with foul-smelling serous exudate. Adjacent to the lesion, there were various smaller erythematous

brownish tumors with a velvety surface, and with a linear distribution (Figure 1). No enlarged local or regional lymph nodes were palpated. Laboratory workup, chest x-ray, electrocardiogram, bilateral mammography, and right axillary ultrasound were all normal. An incisional biopsy of the larger tumor and another biopsy of one of the adjacent lesions were taken. In the first case, the hematoxylin-eosin stain showed irregular, anastomosed islets composed of intraepidermal tumor cells, some of them pigmented, with a clearer

cytoplasm than the surrounding keratinocytes. Abundant atypical cells with large, irregular, hyperchromatic nuclei were observed inside the tumor masses. In some sections, cystic spaces within these nests of basaloid cells could be seen. The epidermis presented hyperkeratosis, foci of parakeratosis, and irregular acanthosis (Figure 2 A and B). A biopsy of the smaller lesion showed well-defined nests of uniform cuboidal cells with rounded, basophilic nuclei showing no atypia, and with cystic structures in the interior (Figure



Figure 1. Ulcerated, exudative tumor with pigmented, keratotic surface at the periphery and ulceration in the middle, and various smaller tumor lesions with a linear distribution pattern.

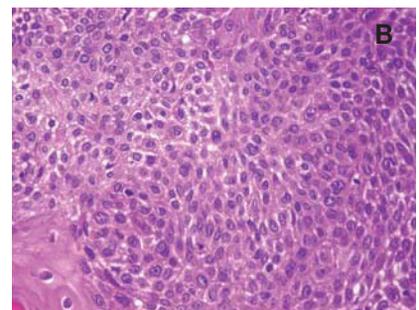
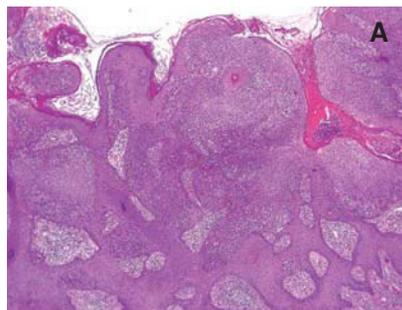


Figure 2 (A y B). Acanthotic epidermis containing tumor-cell nests that show atypias and mitotic figures. (A, Hematoxylin-eosin, $\times 20$; B, hematoxylin-eosin, $\times 100$.)

3). The tumor cell cytoplasm contained positive *p*-aminosalicylic acid (PAS) granules in both cases. Immunohistochemical staining showed tumor islets stained with monoclonal anti-cytokeratin antibodies AE1/AE3 and 34betaE12, and antibodies against epithelial membrane antigen (EMA), but no immunoreactivity for cytokeratins 7 or 20, or with the CAM5.2 anti-cytokeratin antibody; there was also no immunoreactivity for carcinoembryonic antigen (CEA), or gross cystic disease fluid protein-15. Malignant hidroacanthoma simplex (MHS) from hidroacanthoma simplex (HS) of linear distribution was diagnosed; the ulcerated malignant tumor was removed surgically. A year and a half after diagnosis, the patient remained asymptomatic with no evidence of distant metastasis in the follow-ups, which included physical examination every 3 months as well as blood tests, chest x-ray, and abdominal ultrasound every 6 months.

In 1956 Smith and Coburn¹ were the first to refer to HS, using the term to designate a benign intraepidermal tumor of sweat gland origin and described its malignant counterpart, MHS, suggesting that any Borst-Jadassohn intraepidermal epitheliomas could be included in this new entity. In 1969 Holubar and Wolff² considered HS to be a variant of eccrine poroma and proposed the name "intraepidermal eccrine poroma." Since that time, several cases of HS and MHS have been

published, and HS continues to be considered an intraepidermal variant of eccrine poroma,³ whereas MHS has been given several names, including in situ porocarcinoma,⁴ eccrine porocarcinoma,⁵ and hidroacanthoma simplex with invasive growth.⁶

The clinical presentation of HS is not characteristic, but is usually located on the lower limbs of elderly patients, with a slight predominance among women. A literature review revealed 2 descriptions of nonintraepidermal eccrine tumors with a linear distribution—1 eccrine porocarcinoma located on the buttock⁷ and an eccrine poroma along 1 leg.⁸ Thus, our case appears to be the first description of MHS on a linear HS.

Histologically, the HS is characterized by islets of small, uniform, basophilic or poorly stained cells that are clustered within an acanthotic epidermis and that contain PAS-positive cytoplasmic granules. Ductal differentiation (recognizable ducts, intracytoplasmic lumens, or cystic structures) is observed; the ducts can be seen with PAS stain and show positivity for EMA or CEA, although there are several cases published in the literature in which CEA was negative.⁹⁻¹¹ An MHS lesion is composed of the cells described above, but shows cytological pleomorphism, frequent mitoses, and an invasive structure.

Several cases of malignant transformation of HS have been published,^{1,4,11,12} and its potential for degeneration has been discussed extensively. In our case, the HS lesions adjacent to the MHS had been present for more than 40 years and, therefore, we believe there is evidence of malignant degeneration.

The prognosis of MHS is not accurately known due to the limited number of case reports that describe the patient's progress and the lack of long-term follow-up. The suggested treatments are extensive local excision or Mohs micrographic surgery in the case of HS, due to its potential risk for degeneration.¹² Other alternatives are electrodesiccation or radiation.

In conclusion, although several tumors of eccrine origin with a linear distribution have been described, we did not find any case of linear HS with degeneration to MHS.

References

1. Smith JL, Coburn JG. Hidroacanthoma simplex; an assessment of a selected group of intraepidermal basal cell epitheliomata and of their malignant homologues. *Br J Dermatol*. 1956;68:400-18.
2. Holubar K, Wolff K. Intraepidermal eccrine poroma: a histochemical and enzyme-histochemical study. *Cancer*. 1969;23:626-35.
3. Fariña MC, Requena L. Poromas. In: Requena L, editor. *Neoplasias anexas cutáneas*. Madrid: Grupo Aula Médica S.L.; 2004. p. 89-95.
4. Bardach H. Hidroacanthoma simplex with in situ porocarcinoma. A case suggesting malignant transformation. *J Cutan Pathol*. 1978;5:236-48.
5. Mehregan AH, Hashimoto K, Rahbari H. Eccrine adenocarcinoma. A clinicopathologic study of 35 cases. *Arch Dermatol*. 1983;119:104-14.
6. Kitamura K, Kinehara M, Tamura N, Nakamura K. Hidroacanthoma simplex with invasive growth. *Cutis*. 1983;32:83-4, 86-8.
7. Akiyoshi E, Nogita T, Yamaguchi R, Toyoda H, Kawashima M, Hidano A. Eccrine porocarcinoma. *Dermatologica*. 1991;182:239-42.
8. Ogino A. Linear eccrine poroma. *Arch Dermatol*. 1976;112:841-4.
9. Moreno A, Salvatella N, Guix M, Llistosella E, de Moragas JM. Malignant hidroacanthoma simplex. A light microscopic, ultrastructural, and immunohistochemical study of 2 cases. *Dermatologica*. 1984;169:161-6.
10. Perniciaro C, Muller SA, Zelickson BD, Snow JL. Hidroacanthoma simplex: an ultrastructural and immunohistochemical study. *J Cutan Pathol*. 1994;21:274-9.
11. Ansai S, Koseki S, Hozumi Y, Tsunoda T, Yuda F. Malignant transformation of benign hidroacanthoma simplex. *Dermatology*. 1994;188:57-61.
12. Lee JB, Oh CK, Jang HS, Kim MB, Jang BS, Kwon KS. A case of porocarcinoma from pre-existing hidroacanthoma simplex: need of early excision for hidroacanthoma simplex? *Dermatol Surg*. 2003;29:772-4.

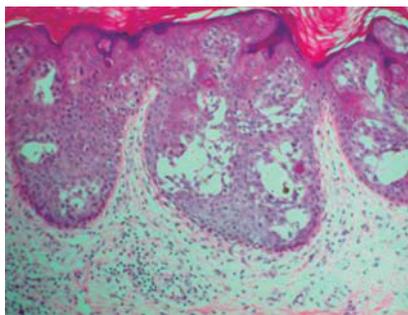


Figure 3. Well-defined islets of tumor cells without atypias forming cystic structures (hematoxylin-eosin, $\times 40$).