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CASE REPORT

Eccrine porocarcinoma of the thumb in a patient with chronic exposure to benzene glue

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Introduction

Eccrine porocarcinoma (EPC) is an uncommon and aggressive type of skin cancer that originates from the intraepidermal component of the sweat gland apparatus, also known as acrosyringium [1]. The first case was reported in 1963 by Pinkus and Mehregan. The authors referred to this tumour as "epidermotropic eccrine carcinoma" [2], whereas Mishma and Moriok in 1969, were the first ones to coin the term "eccrine porocarcinoma" [3] and focused on the common histopathologic transformation of the benign form of eccrine poroma to its subsequent malignant counterpart.

This type of skin cancer is extremely rare and corresponds to 0.005 to 0.01 % of all the cutaneous tumors [4]. According to data from the Rare Care-Surveillance of Rare Cancers in Europe, the incidence rate is 0.28/100.000 for the skin adnexal carcinoma of the skin [5].

EPC occurs in both sexes and has been described to have a female predominance and it is often seen during the 6th to 8th decades of life [6],[7]. It can occur de-novo or on a pre-existing eccrine poroma lesion. It arises mainly in the lower limbs, head, trunk and hands [6]. No standard treatment has yet been established. Wide excision and Mohs surgery have been described as treatment options with chemotherapy to be the only management modality for lymph node spread of the tumor. Even by wide local excision with tumour-free margins, about 20 % of EPC will recur and 20 % will present regional nodal metastases [8]. Distant metastases are rare, although have been reported by Robson et al. [6].

Eccrine porocarcinoma should be differentiated from aggressive digital papillary adenocarcinoma, an extremely rare type of sweat gland carcinoma that is essentially limited to the digits [9] but has a much more aggressive behaviour, with a high rate of local recurrences and distant metastases [10].

Case report

A 52-year-old right handed male upholster, presented to our outpatient clinic with a solitary, solid, nodular and painless lesion of 7 mm in diameter on the pulp of his left thumb, which was growing rapidly over the last 6 months, with no other signs or symptoms related to this. The patient's history did not initially unveil any pre-existing skin lesion. He did not have any significant medical history, was not on any medication and did not, at first, give any history of traumatic incidence. However, on closer questioning, he reported of a very small nodule being present for years and that this had started recently growing. More significantly, he then admitted being frequently exposed to benzene glue because of his occupation, which he has been practicing since the age of 12. Specifically, ever since that age, whenever he accidentally cut himself with chisels or any other sharp object or raw wooden surfaces, he used this substance on a regular basis for haemostatic purposes, which incidentally, he found extremely efficient,

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As a clinical diagnosis was difficult to reach, we decided to perform an excision biopsy with 3–4 mm safety margins. The clinical examination and the small size of the tumour did not raise suspicions for malignancy and this is the reason that no pre-operative photographic record of the lesion was taken. Histology revealed a well circumscribed, rather undifferentiated tumor, comprised of poroid and squamoid cells, many of which were atypical and had pleomorphic nuclei. Cystic spaces filled with eosinophilic secretion were also present. Ductal differentiation was confirmed by EMA immunostain. The tumor cells also expressed AE1/AE3. Stain with MIB 1/Ki 67 detected a high mitotic rate of the neoplastic cells. There was no lymphovascular space involvement (LVSI) or perineural invasion (PNI). Ductal differentiation, intracytoplasmic lumina and the small size of the tumor cells differentiated this lesion from invasive squamous cell carcinoma (Figs. 1a–c, 2). There was real duct differentiation and not misinterpretation of normal sweat ducts being entrapped.

After the diagnosis of eccrine porocarcinoma was established, we performed a CT scan of the abdomen, head and neck and an axillary nodes ultrasound all which did not demonstrate any metastases.

The patient was informed of the available therapeutic choices. Due to the localization of the tumour on the last segment of the thumb, we considered that an accepted wide excision margin could not be established without an amputation of the distal phalanx (Fig. 3). The patient consented to the proposed surgical plan and the thumb was amputated at the level of the IP joint. The patient was then followed up every three months for a period of one year and a half without any signs of recurrence so far.

Discussion

Eccrine porocarcinoma is a very rare cutaneous malignancy arising from eccrine sweat glands. Approximately 250 cases have been reported[1] since this lesion was first described by Pinkus and Mehregan in 1963. According to Robson[3] who published the largest series of 69 cases, it is more commonly found in the lower limbs (44 %) with the trunk (24 %) and head (11 %) being the second and third most common site respectively. It is less commonly found in the upper limbs and it has reported only twice in the fingers so far. Requena [11] descripted the first case in that location and Bhat et al. [12] the second one. It also seems to be more commonly seen in females, although it might be difficult to give a genetic explanation at this stage.

It can arise de novo or from a pre-existing poroma. Although etiology remains unknown, some authors have linked EPC to diabetes mellitus, radiation and arsenic exposure. In this case we observe EPC developing in a patient with chronic exposure to benzene glue essentially through skin contact and inhalation secondarily. Although benzene exposure has been widely related to leukemia [13], its implication in the etiopathogenesis of skin cancer in humans has not been proved. Baudouin in 2002 demostrated that benzene is one of the pollutants that reacts most specifically with the skin and explained that chemicals can alter the barrier function of the skin either by degrading the keratin or by excessive drying causing the skin to crack. Also showed that the most frequent routes are the pores and hair follicles.[14] Michielsen et al. showed that ingestion of hexachlorobenzene leads to the formation of lesions in lungs and skin in rats [15]. Maltoni showed that neonatal and early life exposure to benzene via inhalation singnifically increased incidences of multiple types of cancers in liver, lung, skin, and other tissues in mice and rats.[16].

The histologic characteristics of EPC vary a lot so more than one consultation is often needed in order to establish the diagnosis. Belin et al. reported that 37 % of the cases in his series were initially misdiagnosed most commonly as cSCC [7].

EPC was earlier believed to be an extremely aggressive tumor but in some cases no recurrence or metastases were observed after a significant number of years, even in cases of late excisions [17] [18]. Robson et al. divided the tumor into the “pushing” and “infiltrative” histological subtypes and showed that the latter have much worst prognosis. They also

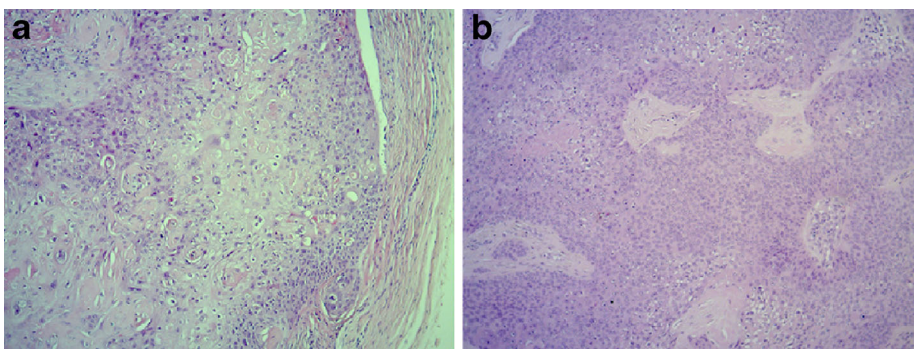

Fig. 1 **a** ductal differentiation and many mitotic figures (× 40 H&E), **b** small size of the tumor cells (× 40 H&E)

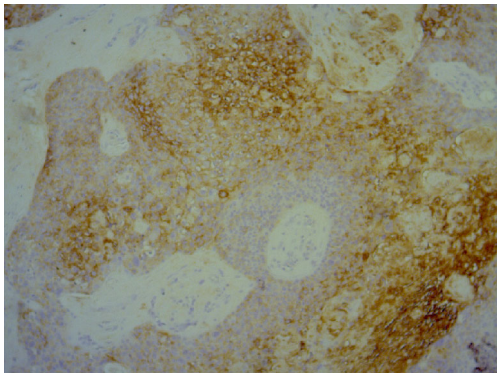

Fig. 2 neoplastic cells positive for EMA (× 40)

showed that mitoses, tumor depth and lymphovascular invasion suggest a more aggressive tumor.

Because of the rarity of this specific skin cancer, no standard therapeutic protocols exist. In our case the high rate of mitoses demonstrated an aggressive carcinoma and even though the severity of the functional deficit of an amputated distal phalanx in the thumb was thoroughly considered and with the patient's full consent, we decided that amputation of the affected phalanx would be the safest surgical approach oncologically. Post-operatively the patient consulted the Oncological team of our Hospital for the indication of adjuvant therapy. In spite of the aggressive histopathologic findings of the tumour, the wide surgical excision was considered adequate for his stage (lack of local or distant nodal or other metastases) and a thorough patient's follow-up every 3 months was proposed.

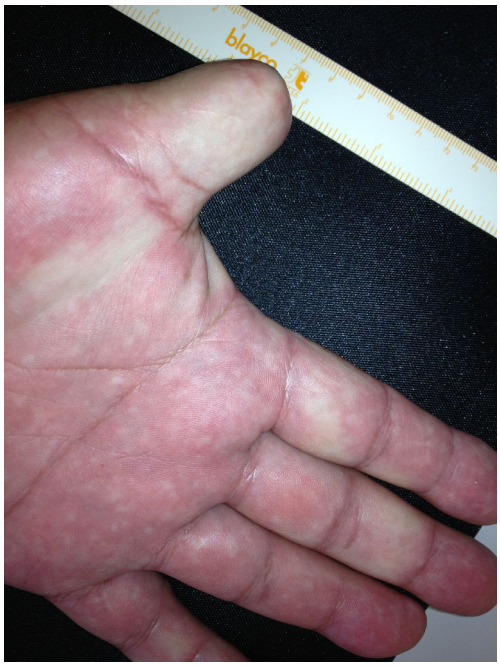

Fig. 3 patient's thumb 12 months after amputation

Conclusion

EPC is an extremely rare tumor of the skin. So far, it has been reported only twice in the literature to affect the hand. The clinical diagnosis is difficult and its histologic findings can be misleading. Due to its aggressive behavior and potential for metastatic disease, we consider that the mainstay treatment should be that of a wide local resection.

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