

Letter to Editor

Pigmented porocarcinoma: a case report with review of the literature

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Various benign and malignant non-melanocytic tumors, including skin appendage tumors, sometimes accompany non-neoplastic melanocytes, and this phenomenon has been described as “melanocytic colonization” [1-7]. Porocarcinoma is a rare skin appendage carcinoma related to the sweat gland duct, originally described by Pinkus and Mehregan in 1963 [8]. Its incidence is reported to be 0.004% of skin biopsy specimens [9]. Poroma and porocarcinoma usually lack melanocytes and melanin pigment within the lesion [10, 11]. However, albeit extremely rare, pigmented porocarcinoma has been reported in the English literature [11-17]. Herein, we describe an additional case of pigmented porocarcinoma and review the literature.

A 55-year-old Japanese male presented with a left lower leg tumor, which had been first detected approximately 6 years earlier, and had recently gradually enlarged. Physical examination revealed a relatively well-circumscribed reddish to focally black-colored tumor with erosion, measuring 3 x 2 cm in diameter, in his left lower leg. Malignant skin tumor was suspected clinically, and subsequently, total resection of the tumor was performed.

Histopathological study of the resected specimen revealed proliferation of atypical squamoid cells accompanied by surface erosion involving the entire dermis and superficial subcutis (**Figure 1A**). These atypical squamoid cells had a high nuclear/cytoplasmic ratio and large nuclei containing conspicuous nucleoli at the periphery of the nests (**Figure 1A, 1B**), and had clear cytoplasm and a low nuclear/cyto-

plasmic ratio in the center of the nests (**Figure 1A**). Large and small ductal formations were noted within some of the nests (**Figure 1A, 1B** arrows). Moreover, multinucleated atypical squamous cells were also present (**Figure 1B**). Mitotic figures were frequently observed (8/10 high-power fields). The peculiar findings of the present tumor were the presence of dendritic melanocytes without atypia within the tumor nests (**Figure 1C, 1D**) and melanin pigment within the cytoplasm of the atypical squamoid cells (**Figure 1D**). No mitotic figures were noted in these dendritic melanocytes. In addition, at the periphery of the tumor, a benign poroma component was also present adjacent to the above-mentioned pigmented porocarcinoma (**Figure 1E**). The poroma component was composed of proliferation of basaloid cells with bland round to oval nuclei containing inconspicuous nucleoli (**Figure 1F**). Ductal differentiation with cuticular cells was noted (**Figure 1E, 1F**). Apical snout was not observed. No mitotic figures were observed in the poroma component. Moreover, neither dendritic melanocytes nor melanin pigment were present in the poroma component.

Accordingly, an ultimate diagnosis of pigmented porocarcinoma arising in poroma was made.

It is well known that porocarcinoma sometimes arises in a pre-existing poroma [10, 11]. Robson *et al.* reported that 18% of porocarcinoma cases (12/69 cases) arose in a pre-existing poroma [11]. Moreover, porocarcinoma can also arise in pre-existing hidroacanthoma simplex (HAS), an intraepidermal variant of poroma [10]. Albeit extremely rare, poroma and porocar-

Pigmented porocarcinoma

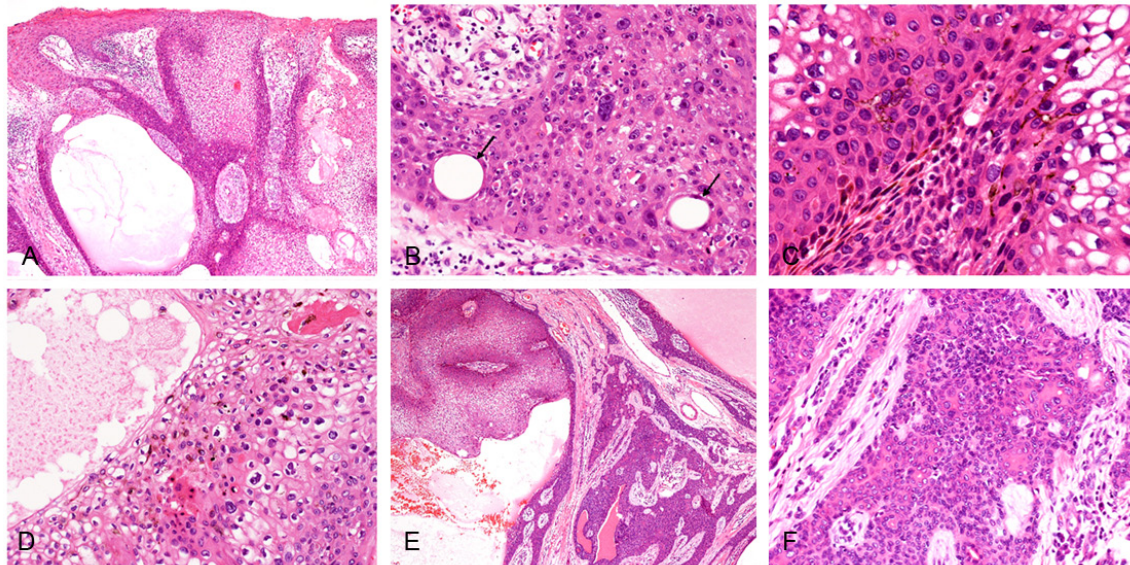


Figure 1. Histopathological features of the lower thigh tumor. A: Proliferation of atypical squamoid cells accompanied by surface erosion. At the periphery of the nests, basaloid cells are present, and atypical squamoid cells with clear cytoplasm are observed in the center of the nests. Large duct formations are noted. HE, x 40. B: Atypical squamoid cells have large nuclei containing conspicuous nucleoli. Ductal formations are observed (arrows). HE, x 200. C, D: Dendritic melanocytes without atypia are present within the tumor nests, and melanin pigments are also present within the cytoplasm of the tumor cells. HE, x 200. E: A benign poroma component (right) is present adjacent to a porocarcinoma (left). HE, x 40. F: The poroma is composed of basaloid cells without atypia, and ductal formation with cuticular cells is noted. HE, x 100.

Table 1. Clinicopathological features of pigmented porocarcinoma

Case No.	Age	Gender	Location	Pre-existing lesion	Pigmentation	Reference
1	77	Female	Back	Hidroacanthoma simplex	Porocarcinoma	[12]
2	54	Male	Shoulder	No	Porocarcinoma	[13]
3	74	Male	Leg	No	Porocarcinoma	[14]
4	77	Female	Breast	Poroma	Porocarcinoma	[15]
5	58	Male	Waist	No	Porocarcinoma	[16]
Present Case	55	Male	Lower leg	Poroma	Porocarcinoma	

cinoma may be accompanied by non-neoplastic melanocytes and/or melanin pigment within the tumor [10, 11]. Robson *et al.* reported that 3% of porocarcinoma had melanocytes within the tumor [11]. **Table 1** summarizes the clinicopathological characteristics of the previously reported cases of pigmented porocarcinoma as well as the present one (two cases reported by Robson *et al.* were not included because the clinicopathological features of these cases were not available [11]). The average age of the patients was 65.8 years, and males were more commonly affected (male/female 4/2). Extremities were predominantly affected, however, this lesion can occur in the trunk as well. Three of 6 cases had pre-existing lesions (2 cases of poroma and 1 case of HAS). Pigmentation was

observed only in porocarcinoma in all cases. Hara and Kamiya, and Maeda *et al.* reported cases of pigmented porocarcinoma, and both cases were histopathologically diagnosed as malignant melanoma initially [12, 16]. Moreover, Roaf *et al.* reported a case of pigmented porocarcinoma clinically diagnosed as malignant melanoma [13]. These results suggest that pigmented porocarcinoma can be misdiagnosed as malignant melanoma both clinically and histopathologically.

Further, we previously reported a case of porocarcinoma arising in pre-existing pigmented HAS and summarized the clinicopathological features of four cases of this type of tumor [10]. In three of these 4 cases, melanocytes were

present only in the HAS component. Pigmentation can be observed in both poroma/HAS and porocarcinoma [17], therefore, pigmented poroma and porocarcinoma must be included in the differential diagnostic consideration of black lesions.

Disclosure of conflict of interest

None.

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