

## Case Report

# Squamoid eccrine ductal carcinoma: an extremely rare variant of sweat duct carcinoma

## 鱗狀小汗腺導管癌：汗管癌的一種極罕見變異

H Şahin, FE Kombak, ZD Akdeniz Doğan, L Cinel

Squamoid eccrine ductal carcinoma (SEDC) is an extremely rare variant of sweat duct carcinoma. Herein, we report a case of an 80-year-old female who presented with an ulcerated plaque on her forehead. An initial punch biopsy revealed an invasive tumour with squamous features. Subsequently, excisional biopsy revealed squamous and ductal areas, with frequent mitosis and extensive perineural invasion. The patient has been disease-free for four years. SEDCs have a better prognosis than other sweat duct carcinomas. Differential diagnoses for SEDCs include squamous cell carcinoma, microcystic adnexal carcinoma, porocarcinoma and metastatic tumours. There is a high possibility of misdiagnosing SEDC as squamous cell carcinoma, particularly in small punch and shave biopsies.

鱗狀小汗腺導管癌是汗管癌的一種極罕見變異。在此，我們報告了一例 80 歲女性的額頭上有潰瘍斑塊，最初的鑽取活檢顯示為具有鱗狀特徵的侵襲性腫瘤；隨後的切除活檢則顯示分別有鱗狀和導管區域，可見頻繁的有絲分裂和廣泛的神經旁侵犯。該患者診斷後已無病四年，正印證了鱗狀小汗腺導管癌的預後比其他汗管癌好。鱗狀小汗腺導管癌的鑑別診斷包括鱗狀細胞癌、微囊腫性附件癌、汗孔癌和轉移性腫瘤。鱗狀小汗腺導管癌誤診為鱗狀細胞癌的可能性很高，尤其是在細小樣本的鑽取和刮取活檢。

**Keywords:** Microcystic adnexal carcinoma, squamoid eccrine ductal carcinoma, sweat duct carcinoma

關鍵詞：微囊腫性附件癌、鱗狀小汗腺導管癌、汗管癌

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## Introduction

Adnexal carcinomas are rare and diverse cutaneous neoplasms of skin. Among these carcinomas, malignant sweat gland tumours comprise a heterogeneous group of uncommon neoplasms with varied biological behaviour; the best known types include porocarcinoma, microcystic adnexal carcinoma (MAC), hidradenocarcinoma and eccrine ductal carcinoma (syringomatous carcinoma).

Squamoid eccrine ductal carcinoma (SEDC) is an extremely rare variant of sweat duct carcinoma. SEDC generally occurs as a solitary plaque or nodule on the head and neck in elderly male patients<sup>1,2</sup> and exhibits a dual pattern comprising squamous differentiation on the surface and ductal differentiation in the deeper parts.<sup>2,3</sup> There is a high possibility of misdiagnosing SEDC as squamous cell carcinoma (SCC), particularly in superficial punch and shave biopsies.<sup>4-6</sup>

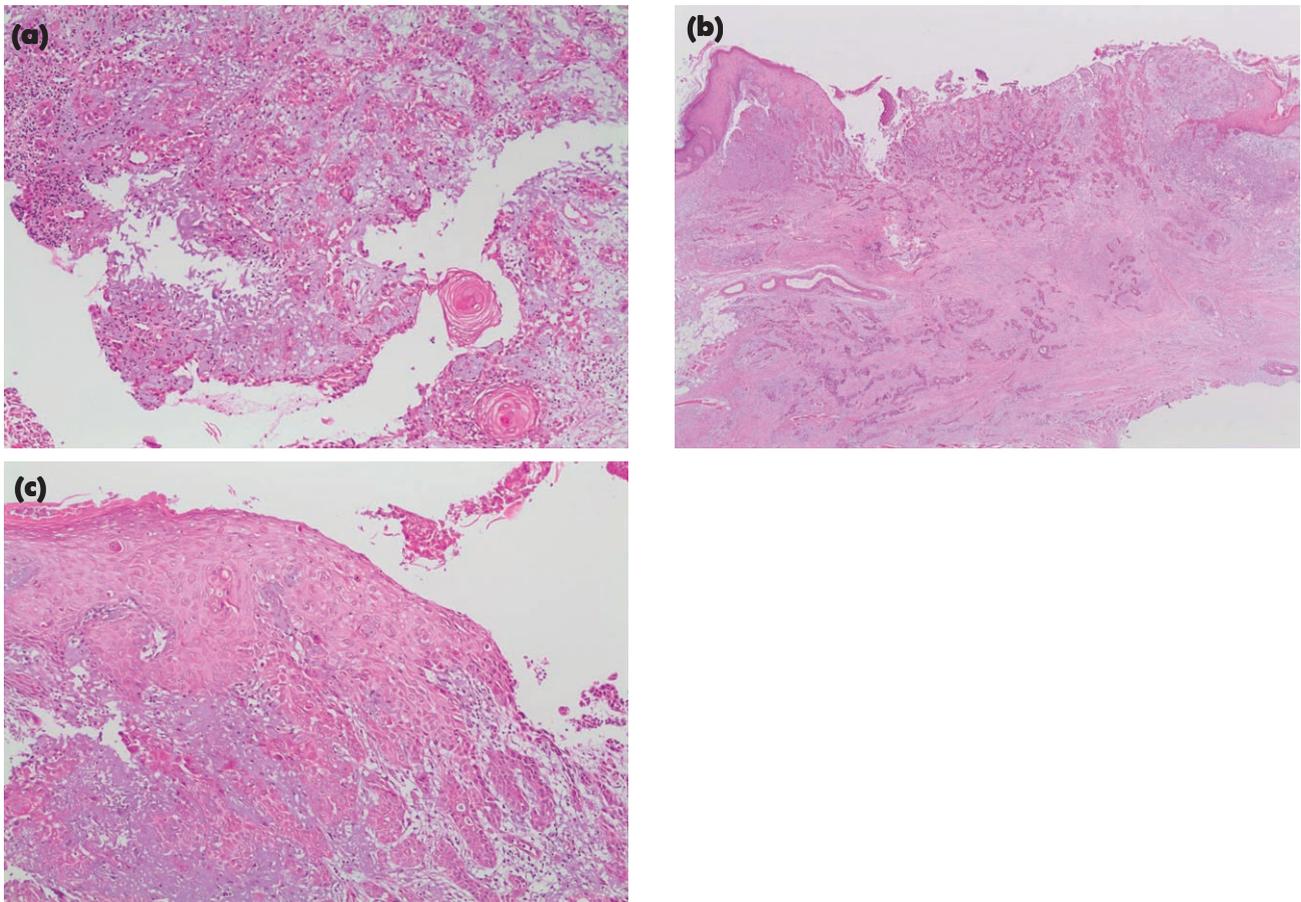
## Case

An 80-year-old female with a lesion on her forehead for two years was admitted to the department of plastic and reconstructive surgery. Physical examination revealed a 1.3-cm-diameter ulcerated plaque with ill-defined border (Figure 1). Based on an initial clinical diagnosis of SCC, an incisional biopsy was performed, which revealed an 'invasive tumour showing squamous features with ulceration'. Subsequently, an excisional biopsy was performed. The tumour was poorly marginated with its infiltrating growth

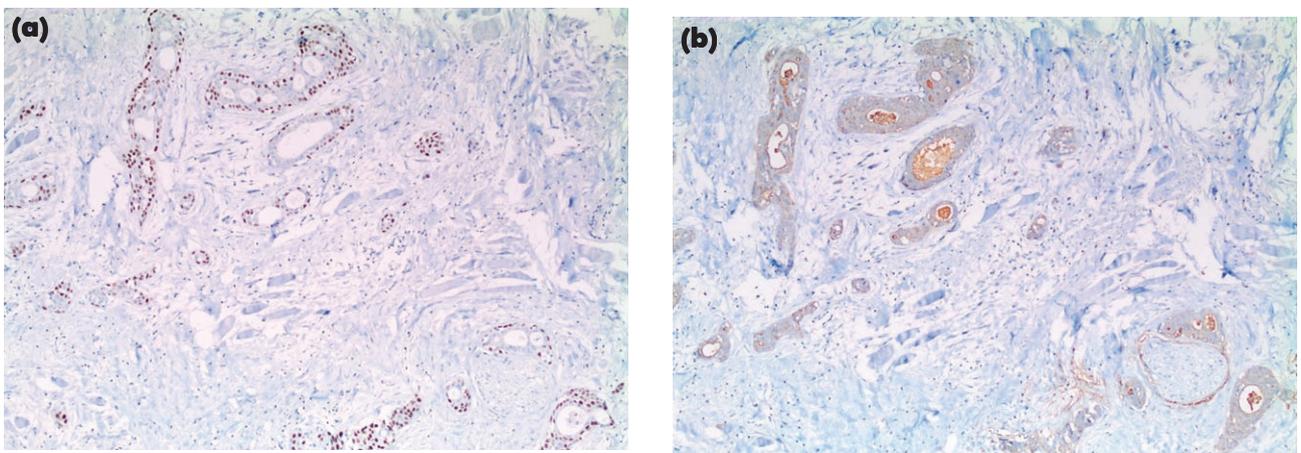
pattern. Squamous differentiation was primarily found in the superficial parts of the tumour, and ductal areas were located in the middle and deeper parts. Invasion to the subcutaneous fat tissue was observed. Squamous components, including keratin cysts and eddies, and a ductal component with lumen formation were identified (Figures 2 a & b). Neoplastic cells were focally connected with surface epidermis (Figure 2c). Neoplastic cells with squamous differentiation had a wider eosinophilic cytoplasm. However, neoplastic ductal cells were more irregular and angulated and had a diminished cytoplasm, with a higher nucleo-cytoplasmic ratio. There were frequent mitoses and extensive perineural invasion; no necrosis was observed. The deep surgical margin was tumour positive. Positive staining with P63 and P40 (Figure 3a) immunohistochemical markers was observed in both the superficial and deeper parts of the tumour. Neoplastic cells were positive for epithelial membrane antigen (EMA) (Figure 3b) and carcinoembryonic antigen (CEA) in only the ductal component. Neoplastic cells showed no immunoreactivity to cytokeratin (CK) 20, CK7,



**Figure 1.** Ulcerated lesion on forehead.



**Figure 2.** (a) Incisional biopsy showing malignant squamous cells and few squamous pearl formations. H&E,  $\times 100$ . (b) Superficial squamoid and deeper ductal components are seen. Note the infiltrating borders of the tumour. H&E,  $\times 200$ . (c) Connection between the neoplastic cells and epidermis, H&E,  $\times 100$ .



**Figure 3.** (a) Positive staining with P40 immunohistochemistry,  $\times 100$ . (b) Positive staining with EMA immunohistochemistry,  $\times 100$ . Perineural invasion is also seen in the bottom right corner.

S100, SOX10, Ber-EP4, GATA3 and gross cystic disease fluid protein 15. The proliferation index was about 20% with Ki67 staining. The patient did not accept re-excision; surprisingly, she has been disease-free for four years.

## Discussion

SEDC is an exceedingly rare variant of sweat duct carcinomas and is a slow-growing lesion primarily observed on the head and neck and rarely on the extremities and trunk.<sup>2,4,6,7</sup> Grossly, SEDC generally has an infiltrating, hard, poorly circumscribed appearance.<sup>4,5</sup> Ulceration may be present in 47% of cases.<sup>2</sup>

Microscopically, tumours are composed of squamous (superficially located) and ductal (deeply located) features, including squamous eddies, horn cysts, keratinisation and ductal lumen formation.<sup>2,4,7</sup> Connection with surface epithelium is common and deep invasion and subcutaneous infiltration are also frequent.<sup>2</sup> The deeper part of the tumour comprises pleomorphic epithelioid cells showing ductal differentiation. There is increased mitotic activity with occasional atypical mitotic figures.<sup>1</sup> A study involving 30 cases reported perineural invasion in 8 cases and lymphovascular invasion in two cases.

SCC is the major differential diagnosis of SEDC. The presence of ductal features is the most important difference between SEDC and SCC. Positive staining for CEA and EMA, which confirms ductal differentiation, is highly supportive of the diagnosis of SEDC.<sup>3</sup> The squamous component of SEDC is located superficially and connected with the epidermis; therefore, there is a high possibility of misdiagnosing SEDC as SCC in superficial incisional or shave biopsies, as in our case.<sup>3,4,5,7,8</sup>

Differential diagnoses also include MAC, porocarcinoma, malignant mixed tumour and metastatic carcinomas.<sup>7,8</sup> MAC, one of the most common subtypes of adnexal carcinoma, is a

neoplasm of the folliculosebaceous-apocrine unit. MAC exhibits a biphasic pattern within a dense fibrous stroma, including the areas of follicular, sebaceous and occasionally ductal differentiation, rather than squamous differentiation,<sup>5</sup> but lacks the significant atypia unlike SEDC. Conversely, the cystic structures of MAC are not expected in SEDC.<sup>7</sup> Negativity to GATA3 antibody helps in distinguishing SEDC from adnexal carcinomas with apocrine differentiation.<sup>9</sup> Porocarcinoma, an uncommon subtype of sweat gland tumours, is generally found on the extremities. Necrosis, comedo-like microcalcification and atypical cells in a cribriform pattern are important signs of porocarcinoma, whereas they are not expected in SEDC. Malignant mixed tumours may exhibit squamous differentiation, but they can be distinguished from SEDC based on their biphasic nature and chondromyxoid features. Metastatic carcinomas with glandular differentiation might be confusing during the differential diagnosis. Positivity to CK 5/6, CK15, P40 and P63 staining would be useful in distinguishing primary cutaneous tumours from metastatic tumours with glandular differentiation.<sup>6,8,10</sup> Conversely, connection with the overlying epidermis is highly supportive of a primary tumour rather than a metastatic tumour with squamous features.

SEDC has been accepted as an aggressive tumour with multiple local recurrences, lymph node metastasis (up to 13%) and perineural invasion.<sup>2</sup> However, SEDC is more likely to have a better prognosis than non-squamoid ductal eccrine carcinomas and other ductal carcinoma types, which have a higher risk for local recurrence, perineural invasion, atypia and metastasis.<sup>8,9</sup> As SCC has a more favourable prognosis than SEDC, it is important to distinguish between SEDC and SCC for patient management.

The biological characteristics and origin of SEDC are still debatable. To our knowledge, over 40 case reports of SEDC have been documented in the English literature because it is very rare and

under-reported.<sup>1</sup> It is most likely to be a low-grade tumour that originates from the eccrine glands and exhibits prominent squamous differentiation.<sup>1,2,5</sup> Some authors consider that SEDC might be a non-folliculocystic variant of MAC.<sup>5</sup>

Total excision of the tumour with or without Mohs technique and close follow-up are suggested in the literature.<sup>4</sup> Although we observed perineural invasion, a relatively high proliferation index and positivity of surgical margin, the patient has been disease-free for four years.

The proper naming of SEDC has been debatable. McCalmont argues that 'eccrine' is not a synonym for 'ductal'; therefore, these tumours should be termed as 'adnexal carcinoma with ductal differentiation.'<sup>11</sup> Although we use the term SEDC in this case report, due to its widespread use in the literature, we primarily agree with McCalmont, given that there is no certain method to identify the eccrine nature of ducts. Therefore, the tumours we report here can also be termed as adnexal carcinoma with ductal and squamous differentiation.

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## References

1. van der Horst MPJ, Brenn T. Update on Malignant Sweat Gland Tumors. *Surg Pathol Clin* 2017;10:383-97.
2. van der Horst MP, Garcia-Herrera A, Markiewicz D, Martin B, Calonje E, Brenn T. Squamoid Eccrine Ductal Carcinoma: A Clinicopathologic Study of 30 Cases. *Am J Surg Pathol* 2016;755-60.
3. Chhibber V, Lyle S, Mahalingam M. Ductal eccrine carcinoma with squamous differentiation: apropos a case. *J Cutan Pathol* 2007;34:503-7.
4. Clark S, Young A, Piatigorsky E, Ravitskiy L. Mohs micrographic surgery in the setting of squamoid eccrine ductal carcinoma: addressing a diagnostic and therapeutic challenge. *J Clin Aesthet Dermatol* 2013; 6:33-6.
5. Kavand S, Cassarino DS. "Squamoid eccrine ductal carcinoma": an unusual low-grade case with follicular differentiation. Are these tumors squamoid variants of microcystic adnexal carcinoma? *Am J Dermatopathol* 2009;31:849-52.
6. Chan H, Howard V, Moir D, Dyll-Smith D. Squamoid eccrine ductal carcinoma of the scalp. *Australas J Dermatol* 2016;57:e117-9.
7. Terushkin E, Leffell DJ, Futoryan T, Cowper S, Lazova R. Squamoid eccrine ductal carcinoma: a case report and review of the literature. *Am J Dermatopathol* 2010;32: 287-92.
8. Saraiva MI, Vieira MA, Portocarrero LK, Fraga RC, Kakizaki P, Valente NY. Squamoid eccrine ductal carcinoma. *An Bras Dermatol* 2016;91:799-802.
9. Pardal J, Sundram U, Selim MA, Hoang MP. GATA3 and MYB Expression in Cutaneous Adnexal Neoplasms. *Am J Dermatopathol* 2017;39:279-86.
10. Qureshi HS, Ormsby AH, Lee MW, Zarbo RJ, Ma CK. The diagnostic utility of p63, CK5/6, CK 7, and CK 20 in distinguishing primary cutaneous adnexal neoplasms from metastatic carcinomas. *J Cutan Pathol* 2004;31: 145-52.
11. McCalmont TH. It's more than you know. *J Cutan Pathol* 2013;40:699-700.