# Desmoplastic/Spindle Cell Squamous Cell Carcinoma of the Skin. A Diagnostically Challenging Tumor Mimicking a Scar: Clinicopathologic and Immunohistochemical Study of 6 Cases

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**Abstract:** Desmoplastic cutaneous squamous cell carcinomas (SCCs) are rare neoplasms with an increased risk of local recurrence and metastasis usually affecting sun-exposed skin of the elderly. Microscopically, they are characterized by elongated cords of atypical epithelial cells associated with a prominent (usually reactive) desmoplastic stroma. To expand this clinicopathologic spectrum, we report 6 cases of an unusual variant of desmoplastic SCC in which the "desmoplastic" areas are predominantly composed of cytologically bland malignant spindle cells mimicking a reactive/benign scarring process. Five patients were males and a patient was a female. The median age at presentation was 72 years. Three patients had history of several years of immunosuppressive therapy for solid organ transplant. All tumors affected sun-damaged skin of the head and commonly infiltrated into the subcutaneous fat and deeper structures. Histopathologically, they were predominantly composed of relatively bland spindle cells in a fascicular pattern. Mitoses ranged from 2 to 4 per 10 high power fields. Pleomorphism was focally seen in all cases. Squamous differentiation in the invasive component was focally seen in 4 cases. SCC in situ was seen in all cases. All cases showed reactivity for keratin immunostains. Median follow-up was 19 months. Two of 6 patients died of metastatic SCC; 1 patient died of unrelated causes; and 3 patients were alive without evidence of disease. Accurate recognition of this entity is essential because of potential misdiagnosis as a benign process including scar and dermatofibroma. Careful search for atypical features and squamous differentiation, immunohistochemical studies, and, in some cases, deeper sections are required to establish the diagnosis.

**Key Words:** desmoplastic, scar, spindle cell, squamous cell carcinoma

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## INTRODUCTION

The designation desmoplastic cutaneous squamous cell carcinomas (SCCs) is usually used in reference to tumors with an unusually prominent stromal reaction.[1–6] They are rare malignant neoplasms with an increased risk of local recurrence and metastasis that usually affect sun-exposed skin of older patients.[2,3,6]

Histopathologically, they are characterized by variably atypical epithelial cells arranged as single units and elongated cords and trabeculae associated with a prominent (usually reactive) desmoplastic stroma.[1–6] We describe an unusual spindle cell variant of desmoplastic SCC in which a component of the "desmoplastic" areas are characterized by cytologically bland neoplastic cells indistinguishable from a reactive scarring process.

## MATERIALS AND METHODS

Six cases of spindle cell SCC with a predominant (greater than 90%) spindle cell/desmoplastic pattern, largely devoid of significant cytologic atypia, were retrieved from the files of the Brigham and Women's Hospital. The study was approved by our Institutional Review Board. Data analyzed included patient's sex and age, tumor location, tumor size, depth of invasion, mitotic rate, presence of perineural and lymphovascular invasion, squamous differentiation, and associated SCC in situ (SCCIS). In addition to 4-micron hematoxylin and eosin–stained sections generated from formalin-fixed paraffin-embedded tissue, 4-micron sections from representative blocks of each of these cases were cut for immunohistochemical analysis. Immunohistochemistry for AE1/AE3, CAM5.2, 34BetaE12, pan-keratin, and p63 were performed in all cases. Immunohistochemistry for S100 and MART-1 were performed in all cases. The antibodies, clones, dilutions, pretreatment conditions, and sources are listed in Table 1. We used the Envision Plus detection system (Dako, Carpinteria, CA) for all antibodies. Appropriate positive and negative controls were included throughout. We graded immunoreactivity semiquantitatively as 0, no staining; 1+, $<$5% tumor cells reactive; 2+, 5%–25% of tumor cells reactive; 3+, 26%–50% tumor cells reactive; and 4+, $>$50% tumor cells reactive. Four cases (cases 1, 3, 4, and 5) were analyzed by polymerase chain reaction (PCR) for human papillomavirus (HPV) detection. After DNA extraction, each sample underwent PCR analysis using primers designed to amplify a broad spectrum of HPV types (manufactured by Access Genetics; Eden Prairie, MN). Amplifed DNA products were initially screened (as present or absent), then typed by

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