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Sebaceous Carcinoma and Squamous Cell Carcinoma Collision Tumor on the Back: A Case Report

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ABSTRACT

A collision tumor refers to the simultaneous presence of two different tumors from distinct tissue origins at the same or adjacent anatomical sites. We report a case of a 73-year-old female with a back skin lesion, where histology and immunohistochemistry revealed the co-existence of squamous cell carcinoma and sebaceous carcinoma within the same lesion. The lesion was surgically excised with clear margins, and no recurrence or metastasis was observed during a one-and-a-half-year follow-up period.

KEYWORDS

collision tumor; squamous cell carcinoma; sebaceous carcinoma

1 Background

A collision tumor is characterized by the simultaneous presence of a tumor that originates from two different tissue types. The most common type of skin collision tumor involves a melanocytic nevus combined with basal cell carcinoma [1]. The co-occurrence of squamous cell carcinoma (SCC) and sebaceous carcinoma (SC) in the same skin lesion is extremely rare, with only one reported case occurring on the eyelid [2]. Sebaceous carcinoma is a rare malignant tumor, typically found in the head and neck region, especially around the eyes. It most commonly affects elderly patients, with a median age of 73 years, and is more frequent in females (approximately 70% of cases). Due to its histological similarities to other diseases, sebaceous carcinoma is often misdiagnosed, leading to increased morbidity and mortality. The standard treatment is wide local excision, and recent studies have shown the effectiveness of chemotherapy, radiotherapy, and immunotherapy for this condition [3]. Skin SCC is a malignant tumor originating from epidermal keratinocytes. SCC can arise de novo or from pre-existing skin lesions such as lichen planus, actinic keratosis, or lupus erythematosus. SCC is often asymptomatic, and patients typically discover the lesion only after it has progressed. Given its metastatic potential, early biopsy of non-healing skin lesions is crucial [4].

2 Case Report

A 73-year-old female presented with a raised, gray-red nodule approximately the size of a broad bean on her back, resembling a granulation tissue (Figure 1A). Pathological examination revealed a 2.5 cm × 2 cm × 1 cm tissue sample with a skin flap. The central area of the lesion was gray-red and raised 0.4 cm above the skin surface. The cut surface appeared gray-white and solid, with a medium consistency.

Microscopic examination revealed two distinct tumors within the same lesion (Figures 1B, 1C). One tumor showed basaloid cells with basophilic cytoplasm and sebaceous-like cells with clear or vacuolated cytoplasm. The tumor exhibited significant cellular atypia with frequent mitoses, and areas with sebaceous duct differentiation containing eosinophilic secretion were observed (Figure 1D). The second tumor consisted of epithelial cells with abundant eosinophilic cytoplasm, with invasive growth into the subcutaneous tissue. Cell junctions and abnormal keratinization were evident (Figure 1E). Based on these morphological features, the lesion was diagnosed as a collision tumor composed of sebaceous carcinoma and SCC.Immunohistochemistry showed strong diffuse positivity for P40, P63, and CK5/6 in both the SCC and SC areas (Figures 2A, 2B). Notably, the SCC area showed scattered cytoplasmic granular staining for adipophilin (ADFP) and focal weak positivity for CK7 (Figures 2D, 2E), while the sebaceous carcinoma area demonstrated strong membranous and vacuolar cytoplasmic positivity for ADFP and diffuse strong positivity for CK7 (Figures 2C, 2F). Ki-67 proliferation indices were approximately 70% in the SCC region and 40% in the sebaceous carcinoma region. These findings, along with the morphological and immunophenotypic results, confirmed the diagnosis of a collision tumor. The surgical margins were negative for cancer.

The tumor was excised with a 9mm margin, and during a one-and-a-half-year follow-up, no recurrence or metastasis was observed.

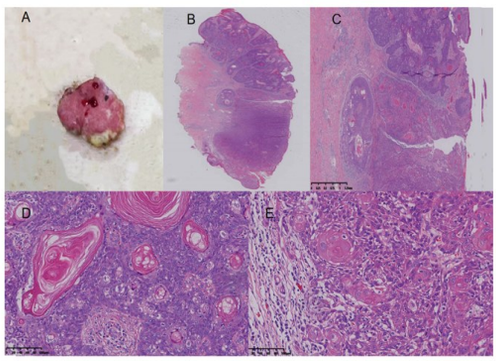

Figure 1 Clinical and Microscopic Features of the Collision Tumor

A: A red nodule is observed on the back skin, which is prone to bleeding upon palpation. B, C: Microscopic examination reveals the tumor is composed of sebaceous carcinoma (upper right) and squamous cell carcinoma (lower right). D: High magnification of sebaceous carcinoma shows basaloid cells with basophilic cytoplasm and scattered sebaceous-like cells with clear or vacuolated cytoplasm. The cellular atypia is significant, with frequent mitotic figures. Some tumor areas exhibit sebaceous duct differentiation containing eosinophilic secretion. E: In the squamous cell carcinoma region, the tumor shows invasive growth with cell junctions, accompanied by abnormal keratinization and keratin pearl formation.

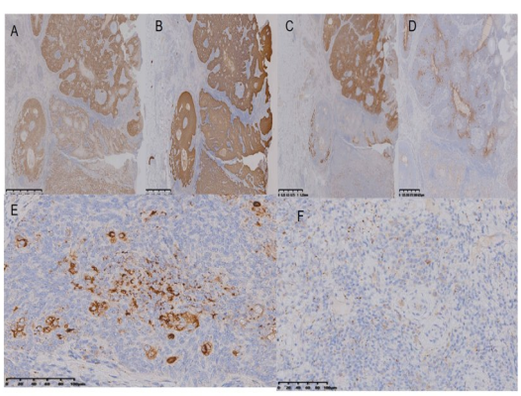

Figure 2 Immunohistochemical Features of the Collision Tumor

A: P40 shows strong positivity in both the SCC and SC regions. B: CK5/6 is strongly positive in both the SCC and SC regions. C: CK7 shows diffuse strong positivity in the SC region and focal weak positivity in the SCC region. D: ADFP (adipophilin) is focally strongly positive in the SC region, while it shows scattered weak positivity in the SCC region. E: High magnification reveals a membranous and vacuolar staining pattern of ADFP in the SC region. F: High magnification shows scattered cytoplasmic granular staining for ADFP in the SCC region.

3 Discussion

In this case, distinct sebaceous differentiation and squamous cell differentiation were present in separate areas of the same lesion. The tumor exhibited poorly defined boundaries with invasive growth into deeper tissues. Cellular atypia, mitotic figures, and pathological mitoses were also evident. Thus, the morphological findings were consistent with epithelial malignant tumors, specifically sebaceous carcinoma and SCC. Immunohistochemical analysis further confirmed this diagnosis. The simultaneous occurrence of SCC and SC within the same lesion without overlap meets the criteria for a collision tumor. The pathogenesis of collision tumors remains controversial. Several mechanisms have been proposed, including regional carcinogenesis, stem cell transformation, and paracrine interactions between the two tumors. While most collision tumors are considered to be incidental, some may share a common origin or similar pathogenic mechanisms, which might explain their co-occurrence. For example, the relationship between SCC and basal cell carcinoma has been documented [5]. Ansai and Mihara suggested that sebaceous carcinoma may arise from pre-existing SCC lesions. Additionally, advanced age and prolonged ultraviolet (UV) exposure may contribute to the occurrence of two unrelated skin tumors colliding in the same location [2].

The diagnosis of sebaceous carcinoma can be challenging. Shields et al. noted that although the clinical features of sebaceous carcinoma are well-documented, only 32% of patients were suspected of having this condition during histopathological examination, and approximately 50% were definitively diagnosed post-examination [6]. Since sebaceous carcinoma can mimic the histological features of SCC or basal cell carcinoma, specific immunohistochemical markers such as ADFP, AR, Ber-EP4, and CK7 can aid in the diagnosis, especially in cases where histopathology is inconclusive [7].

When two distinct tumors are present in the same lesion, failure to recognize both types can result in misdiagnosis, particularly when one of the tumors is malignant. Both SCC and SC have the potential for distant metastasis, which may increase the risk of recurrence and mortality. Accurate diagnosis of collision tumors provides better prognostic outcomes for patients. Clinicians and pathologists should be vigilant in considering the possibility of collision tumors in skin lesions and utilize immunohistochemistry and molecular properties to assist in diagnosis.

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