

## Apocrine Carcinoma of the Axilla with Predominant Signet Ring Cell Features – A Case Report –

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Apocrine carcinoma arising from the apocrine sweat glands is a rare cutaneous malignant tumor which occurs predominantly in the axilla of elderly individuals. The typical histologic features of apocrine carcinoma is within a well developed glandular lumina with abundant eosinophilic cytoplasm and evidence of decapitation secretion. In rare instances, predominant signet ring cell features in apocrine carcinoma has been reported. We experienced a case that occurred in the right axilla of a 59-year-old. Histopathologic examination showed a solid tumor that extended from the upper dermis into the subcutis, with a delicate infiltrate of epithelial cells. The cells had granular amphophilic cytoplasm, predominantly showed distinct signet ring cell morphology, and were strongly positive for epithelial mucin. Both lysozyme and gross cystic disease fluid protein-15 were identified in the tumor cells. We diagnosed this to be a case of primary signet ring cell apocrine carcinoma of the axilla after several immunohistochemical and clinical evaluations.

**Key Words:** Apocrine glands; Carcinoma, signet ring cell; Axilla

Apocrine carcinomas comprise a group of very rare primary cutaneous adenocarcinomas;<sup>1,2</sup> these lesions occur predominantly in the axilla of elderly individuals, but do occasionally occur in other areas where apocrine glands are normally present, such as nipples, vulva, and eyelids.<sup>3</sup> Apocrine carcinoma with predominant signet ring cells of the axilla have been reported in 5 cases.<sup>4</sup> We experienced a case of signet ring cell apocrine carcinoma of the axilla. This seems to be the first reported case in the Korean literature.

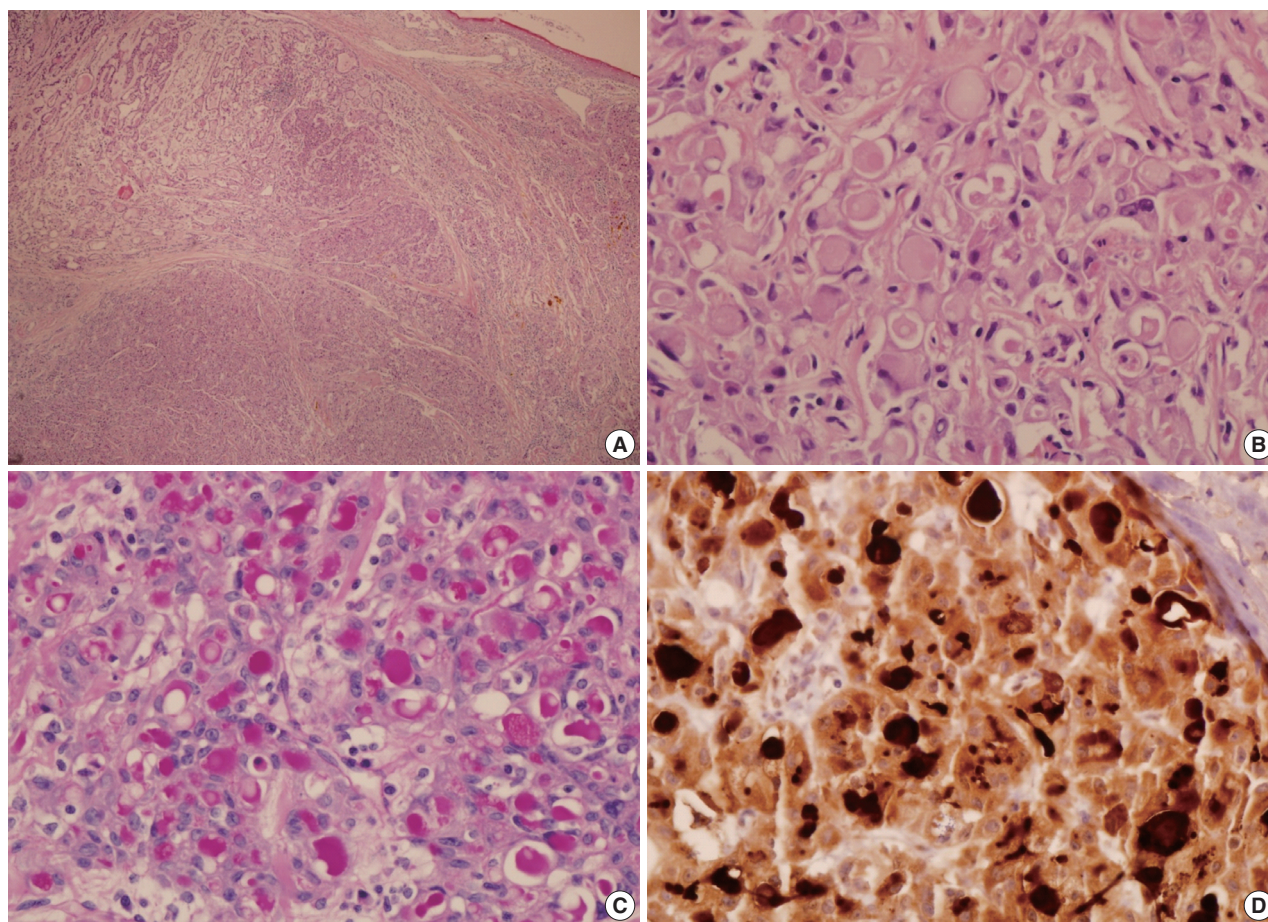
### CASE REPORT

A 59-year-old male noticed an asymptomatic firm nodule in his right axilla 7 months before presentation. The nodule gradually increased in size with bright-reddish swelling on the skin. During his first visit, a firm, bright-reddish, asymptomatic, edematous nodule measuring 1.5 cm in diameter was observed in the right axilla. A sono-guided biopsy was performed, and the histopathologic examination showed a poorly differentiated adenocarcinoma with signet ring cell features, suggestive of

metastatic carcinoma from the ectopic breast. A chest computed tomography (CT) scan, breast ultrasonography, magnetic resonance imaging (MRI), and careful examination of the breast did not reveal any abnormalities. To exclude signet ring cell adenocarcinoma of the gastrointestinal tract, an endoscopic examination and an abdominal CT, MRI, and positron emission tomography CT were performed; the results were negative for all lesions. This was thought to be the primary tumor and as such, a wide radical excision was performed.

Grossly, the skin covered specimen measured 5.0×1.8×1.6 cm. Cut sections showed an infiltrating gray white tumor involving the dermis and subcutaneous tissue (Fig. 1A).

Microscopic examination revealed a dermal based poorly circumscribed neoplasm composed of tumor cells arranged in solid nests (Fig. 1B). The neoplastic cells were round with hyperchromatic, moderately pleomorphic eccentrically placed nuclei with small prominent nucleoli. The cytoplasm showed a signet ring appearance with intracellular lumina and contained a central blob composed of mucin (Fig. 1C). The signet ring cell component comprised over 50% of the entire tumor area. Periodic acid Schiff (PAS) and PAS with diastase stains confirmed the



**Fig. 1.** Light microscopic appearance of the tumor. (A) Low power view showing a solid tumor extending from the upper dermis into the subcutaneous tissue. (B) High power view mimicking invasive ductal carcinoma of the breast. Some tumor cells show signet ring cell morphology. (C) Periodic acid Schiff with diastase stain vividly highlighting epithelial mucin within the cytoplasmic vacuoles of the signet ring cells. (D) Tumor cells expressing gross cystic disease fluid protein-15.

presence of mucin. The tumor cells were positive for gross cystic disease fluid protein-15 (GCDFP-15; Novocastra, Brulingham, CA, USA) (Fig. 1D), S-100 and lysozyme (Dako, Glostrup, Denmark) and negative for estrogen receptor (Ventana, Tucson, AZ, USA), progesteron receptor (Ventana), and carcinoembryonic antigen (Dako).

The carcinoma was initially considered to be metastatic from the breast, but extensive work up of the breast was negative, and no metastasis was disclosed. No recurrence was observed 1 year after surgery.

## DISCUSSION

A signet ring cell is an unusual morphological pattern rarely observed in primary cutaneous apocrine carcinomas with only

occasional case reports. It has been reported in the literature that only 28 cases of primary apocrine carcinoma of the skin have the signet ring cell feature,<sup>1</sup> and 5 of these evolved in the axilla.<sup>4</sup> Apocrine carcinomas showing signet ring cell features are seen in elderly males and commonly affect the eyelid and the axilla. All tumors show similarities with those variants of lobular carcinoma of the breast,<sup>5</sup> and also have been described in ductal carcinoma of the breast.<sup>6</sup> Some evidence of a primary breast lesion can be detected after careful clinical investigation in most patients. Hence, an occult primary axilla lesion is extremely rare. Tumors from ectopic breast or from an axillary extension are associated with normal mammary structures or foci of typical breast carcinoma.

Histologically, primary apocrine carcinoma with signet ring cell features is characterized by a delicate to diffuse infiltrate of epithelial cells arranged singly or in small groups scattered throu-

ghout the dermis, subcutaneous tissue, and adjacent soft tissues. Interstitial lumen formation by several cells is often present. The tumor cells are composed of polygonal cells with round nuclei and relatively abundant granular amphophilic cytoplasm; signet ring cells that contain a dominant intracytoplasmic vacuole and an eccentrically deformed nucleus are also seen.

The cytoplasmic vacuole contains epithelial mucin and is highlighted by a variety of special stains including PAS, alcian blue at pH 2.5, and mucicarmine stains. Immunohistochemically, the tumor cells are positive for the apocrine markers including the lysozyme and GCDFP-15.<sup>7</sup>

Signet ring cell adenocarcinoma metastatic to skin is the major concern of the differential diagnoses. An extensive search for an occult signet ring cell carcinoma in other organs must be undertaken before a definite diagnosis of an apocrine carcinoma with predominant signet ring cell feature of the axilla is established.

Upon histologic examination of the sono-guided biopsy tissue, we thought this was a case of metastatic signet ring cell adenocarcinoma from another organ such as the breast or the gastrointestinal tract. Thorough clinical examinations including chest and abdominal CT scan, careful examination of the breast by ultrasonography, abdominal MRI, and endoscopic examination were unremarkable. Thus, we diagnosed our case as apocrine carcinoma of the skin with predominant signet ring cell features.

In summary, this report documents the sixth case worldwide of primary apocrine carcinoma of the axilla having predominant signet ring cell features. There are three cases of the primary apocrine carcinoma of the axilla reported in Korean literature,

but none of them had signet cell features. This case seems to be the first reported case in the Korean literature.

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