

## Epidermotropic Metastases with Trans-epidermal Elimination from Breast Carcinoma

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Sir,

Epidermotropic metastasis is an uncommon histopathological feature characterized by pagetoid spread of neoplastic cells in the epidermis. This special type of metastasis has been reported in several types of metastatic neoplasms, including malignant melanoma (1), eccrine porocarcinoma (2), squamous cell carcinoma (3), colon adenocarcinoma (4) and breast carcinoma (4, 5). On the other hand, trans-epidermal elimination, first described by Mehregan (6) in elastosis perforans serpiginosa, is a specific mechanism whereby foreign constituents can be eliminated through the epidermis. This phenomenon has been observed in various benign or malignant cutaneous tumours, such as melanocytic nevus (7), eccrine poroma (8), malignant melanoma (9) and metastatic carcinoma (4, 5).

We describe here a rare case of epidermotropic metastases with trans-epidermal elimination from breast carcinoma mimicking mammary Paget's disease and discuss the mechanism of this phenomenon. In addition, we report a specific clinical appearance of the areas where the trans-epidermal elimination of the tumour cells occurred. To our knowledge, such clinical and histopathological features in cutaneous metastasis from breast carcinoma are exceptionally rare (5).

### CASE REPORT

A 57-year-old Japanese woman had undergone left mastectomy because of mammary carcinoma (clinical stage I) in 1996. In April 2002 she developed left axillary lymph node metastasis and received systemic

chemotherapy with doxifluridine and hormonal treatment. However, she noticed some red flares on her left lateral chest. In August 2004, a skin biopsy of the lesion revealed skin metastasis from breast carcinoma and she was referred to our hospital for excision of the metastatic lesions in March 2005. Physical examination revealed an erythematous indurated plaque, 10–20 cm in diameter, on the left chest and abdomen (Fig. 1A). Several small satellite, red-coloured nodules, with crusts were observed in and around the plaque. Yellowish-white spine-like keratotic dots on an erythematous plaque were also observed (Fig. 1B). She underwent wide local excision of the lesions. Histopathologically, the tumour cell nests were seen entirely in the dermis. Round-shaped, atypical carcinoma cells with eosinophilic cytoplasm proliferated in a sheet. In addition, some tumour cells presented as single-file arrangement between collagen bundles in the dermis. Pagetoid spread of the tumour cells (epidermotropic tumour cells) was also observed in the epidermis. However, tumour cell nests were found only in one eccrine sweat duct in the serial section. The area of yellowish-white keratinized dots showed histologically a hollow or invagination that was filled with eosinophilic keratinous material and degenerated tumour cells accumulating in a spine-like fashion above the epidermotropic nests of the tumour cells in the epidermis (Fig. 2A). In addition, the degenerating tumour cells in the papillary dermis appeared to penetrate through the epidermis, suggesting trans-epidermal elimination (Fig. 2B). Immunohistochemically, the tumour cells were negative for S-100 and HMB-45 (not shown).

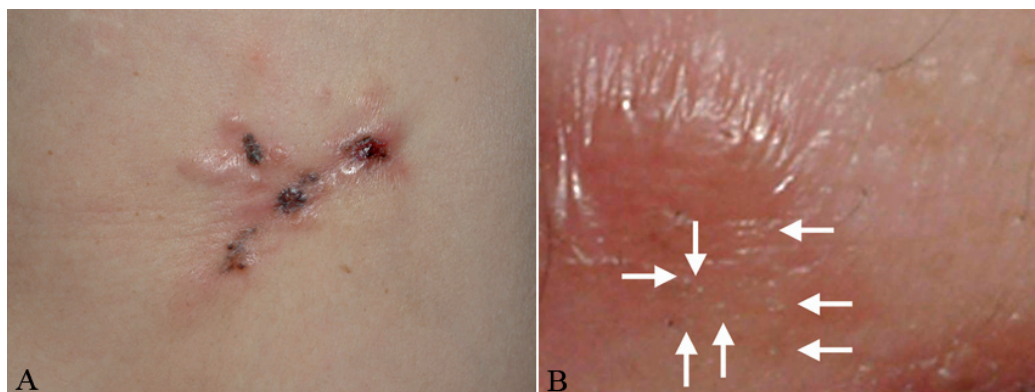


Fig. 1. (A) Several metastatic nodules with crusts scattered on an indurated erythematous plaque in the left side of the chest. (B) Yellowish-white keratotic dots on an erythematous plaque (arrows).

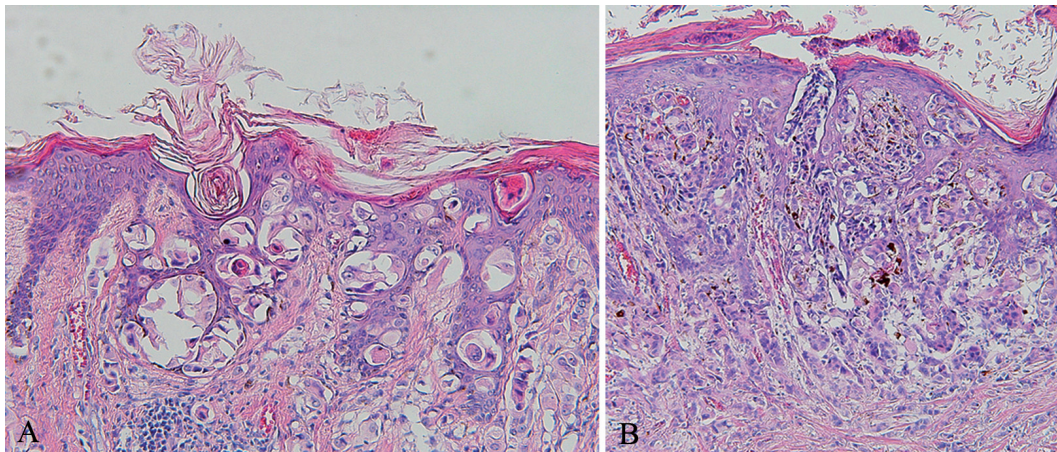


Fig. 2. (A) Hyperkeratotic lesion was seen above the nests of round-shaped clear cells in the epidermis. (B) Trans-epidermal elimination of degenerated carcinoma cells was observed (H&E  $\times 200$ ).

## DISCUSSION

Although metastatic skin tumours can have several histopathological patterns, epidermotropic metastasis with pagetoid pattern is uncommon (1–5). This specific metastasis is rarely seen in skin metastasis from adenocarcinomas (2, 5). Some authors considered that epidermotropism of tumour cells is a form of field neoplasia (10), whereas the other suggested that it is caused by a homing phenomenon (11). In our case, metastatic carcinoma cells were seen not only in the epidermis, but also in the dermis as single-file arrangement. Such pagetoid spread of tumour cells in the epidermis may be caused by the partial invasion from the intradermal carcinoma cells. In addition, trans-epidermal elimination of the neoplastic cells was observed in some areas. Mehregan (12) classified trans-epidermal elimination into three types. According to Mehregan's classification, trans-epidermal elimination from the dermal tumour cell nests in the present case corresponds to type 3. In this type, tumour cells are eliminated through the trans-epidermal canal from the dermis (13). In our case, there were many hollows or invaginations filled with eosinophilic keratinous material containing degenerated tumour cells above the epidermotropic tumour cell nests, suggesting their elimination from the epidermis. We speculate that the degenerated tumour cells in the epidermis may induce the early keratinization of keratinocytes surrounding the nests to form an epidermal canal, resulting in the elimination from the epidermis. The foci of the latter elimination corresponded clinically to yellowish-white hyperkeratotic spine-like dots that are very similar to lichen spinulosus, and this is the most interesting feature of the present case. To our knowledge, this unusual clinical appearance in relation to eliminated tumour cells has not been reported previously. We emphasize

that yellowish-white keratotic dots on a skin metastatic plaque of adenocarcinoma could indicate the existence of tumour nests in the epidermis.

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