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Pigmented Breast Carcinoma

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= 국문초록 =

환자는 52세 여자로 1년 전 우측 유방에 발생하여 점차 커지면서 궤양을 형성하는 색소성 결절을 주소로 내원하여 조직생검을 시행하였다. 병리조직소견상 진피종양은 표피 전층을 침범하였으며 표피와 진피 경계부위의 종양세포 사이에 다수의 멜라닌세포가 관찰되었다.

저자는 파제트양 악성 흑생종과 감별이 어렵고 비교적 드문 색소성 유방암을 보고한다.

Breast carcinoma rarely involves the epidermis and very few cases are pigmented. Only few cases of breast carcinoma with pigmentation were reported by Azzopardi[1], Jacoy[2] and Sau[3]. Sau named this rare tumor as pigmented breast carcinoma. This tumor is characterized by the breast carcinoma with the pigmentation. The pigmentation is caused by the proliferation of melanocytes and melanophages without atypia. Although no melanocytic atypia is present, this carcinoma resembles malignant melanoma clinically and histologically.

Report of a Case

A 52-year-old woman had an ulcerated, and pigmented lesion on the right breast for one year. Ten years ago, a bean sized non-tender subcutaneous nodule developed on the right breast. It didn't change in size and shape for 9 years, but since 1 year ago it has gradually increased in size, and became ulcerated and pigmented. Also several small satellite lesions developed recently(Fig. 1). A walnut sized mass was palpated beneath the pigmented skin lesion. There was no axillary and supraclavicular lymphadenopathy. The physical examination revealed no other abnormalities. Biopsy from the pigmented area of the right breast was performed. The diagnosis of the breast carcinoma without evidence of distal metastasis was made. The patient refused the surgical treatment and radiation therapy.

Histopathologic Findings

The biopsy of the right breast revealed thinning of the epidermis and elongation and wide separation of the rete ridges caused by a band-like infiltration of neoplastic cells that filled the papillary dermis, obscuring the dermoepidermal junction, and

extended into the deep dermis and subcutaneous fat.

The neoplastic cells also extended into the epidermis involving its full thickness both as single cells and small clusters of cells in a so-called pagetoid manner(Fig. 2). The neoplastic cells demonstrated large, eccentric, abundant pale cosinophilic, sometimes vacuolated, cytoplasm. Mitoses were frequent. Many melanocytes with finely granular melanin pigment and long dendritic processes were interspersed between the neoplastic cells in the dermis in close proximity to the epidermis. Atypia of the melanocytes was not observed.

The tumor cells in the sclerotic middle and deep dermis infiltrated in the arrangement of 'Indians in a file' form between the collagen bundles(Eig.

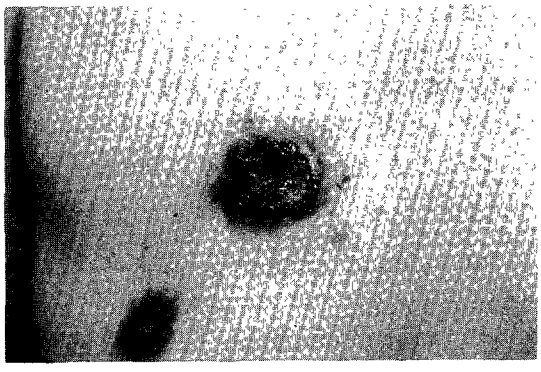

Fig. 1. Walnut sized well-marginated black colored ulceration with rolling border and small satellite lesions on the right breast.

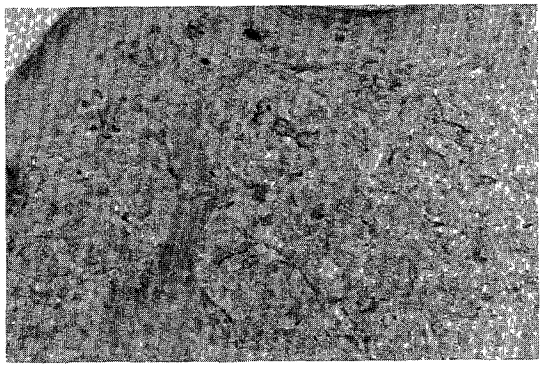

Fig. 2. The tumor cells in upper dermis obscuring the dermoepidermal junction and extension of these cells into the epidermis(H & E, ×400).

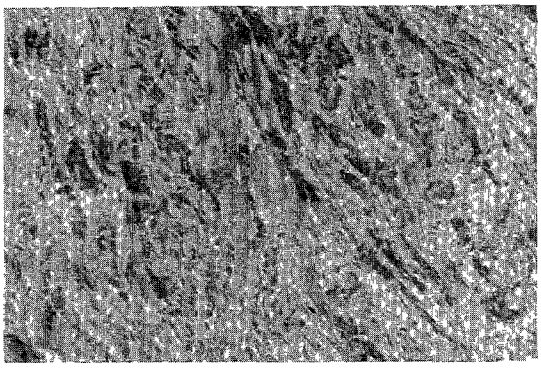

Fig. 3. The neoplastic cells in the sclerotic middle and deep dermis infiltrated in the arrangement of 'Indians in a file' form between the collagen bundles(H & E, ×400).

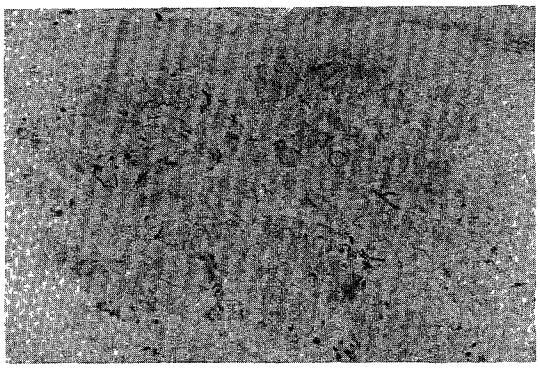

Fig. 4. Carcinoembryonic antigen stain. Tumor cells in dermis show positive reaction. Also noted are melanocytes with dark brown pigment(CEA, × 400).

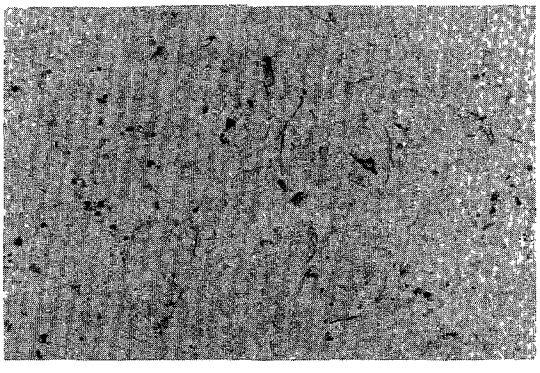

Fig. 5. Epithelial membrane antigen stain. The tumor cells are stained pink. Melanocytes with brown pigment surround tumor cells in papillary dermis and are scattered between tumor cells(EMA, ×400).

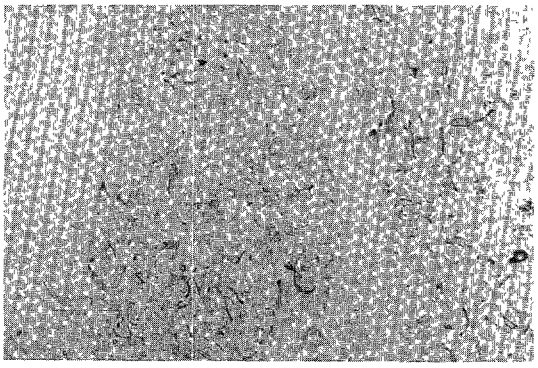

Fig. 6. S100 stain. Tumor cells show negative reaction. Normal melanocytes are interspersed among the tumor cells(S100, ×400).

3).

Mucin could not be demonstrated within the tumor cells by the PAS stain after diastase digestion. Immunohistochemical stains for S100 protein, carcinoembryonic antigen(CEA), epithelial membrane antigen(EMA) were performed.

The neoplastic cells were positive for CEA(Fig. 4), EMA(Fig. 5), but staining for S100 protein was negative. However, the dendritic pigmented cells interspersed among the tumor cells did stain with S100 protein(Fig. 6).

Discussion

Breast carcinoma involving the overlying skin is uncommon. In a series of 946 cases reported by Fisher et al[4], cutaneous involvement was encountered in only 42(4.4%) cases. Mammary Paget's disease is an intraepidermal carcinoma of the nipple and areola, and its origin from an underlying intraductal carcinoma with intraepithelial extension is generally accepted[4-6]. Epidermal involvement in mammary Paget's disease occurs by direct extension of tumor cells contained within the underlying dermis[4)5]. Our patient had epidermotropic breast carcinoma and not Paget's disease. In this case, the pigmentation was found to be primarily due to interspersed melanocytes and melanophages within the tumor. The histologic criteria and the differential immunohistochemical staining characteristics of melanoma and breast carcinoma are presented.

The presence of dendritic pigmented cells within the tumor infiltrate in close proximity to the epidermis made this case intriguing. Paget's cells[7)8)] and metastatic carcinoma cells[9)] may contain melanin pigment.

The breast carcinoma with pigmentation was an unexpected finding. Melanocytes normally inhibit the epidermis and certain special sites in the pilar structures. They are usually sparse or absent in the sweat gland apparatus including the intraepidermal part. Admittedly the breast originates as a modified apocrine gland embryologically, but it is so vastly altered structurally and functionally that it is generally considered to be a quite distinct organ. Melanocytic infiltration in the breast carcinoma is all the more remarkable when one considers that such infiltration has not, to our knowledge, been described in sweat gland tumor, benign or malignant. Why it should take place in the apparently alien environment of a breast carcinoma is not easily understood. The colonization of breast carcinoma is sometimes accompanied by depletion of melanocytes in the overlying epidermis. This could indicate that melanocytes migrate into the carcinoma at the expense of the epidermis, altering their habitat without necessarily undergoing concomitant hyperplasia. This would imply a selective preference for residence in the carcinomatous environment.

However, we did not observe depigmentation of the epidermis in this case and it is therefore possible that melanocytes may actually proliferate to some extent during the process of colonization of the tumor. An alternative explanation is that, during the process of colonization of the carcinoma by melanocytes, the epidermis becomes patchily denuded of melanocytes and that, at a later stage, the epidermis may become repopulated by melanocytes. A prospective study is necessary to investigate this problem further[1)].

A case of metastatic breast carcinoma simulating melignant melanoma was reported by Jacoby et al[2]. They described a firm uniformly black tumor mass adjacent to a mastectomy scar that microscopically showed a dense cellular infiltrate containning melanophages. A similar case has been reported by Poiares-Baptista and Abreu de Vasconcelos [10].

When pigmented cells were found within carcinoma involving the skin, it may be difficult to differentiate them from the cells of malignant melanoma. Carcinoma can be differentiated from the melanoma by the morphologic appearance of the tumor cells, their mucin or melanin content by the presence or abscence of dermal sclerosis[2)3)7)]. In difficult cases when the tumor cells contain melanin and lack mucin, immunohistochemical stains are useful confirming the diagnosis. EMA has been shown to react with normal and malignant mammary epithelium and a wide variety of human tissues[11)]. Strongly positive reactions of EMA are present in mammary Paget's disease and malignant melanoma. CEA has been demonstrated in many tumors, including breast carcinoma and mammary and extramammary Paget's disease[2)]. S100 protein is an acidic protein originally isolated from bovine that is present in melanoma cells[13)].

We report a pigmented invasive breast carcinoma that simulated a malignat melanoma. The morphologic findings of the tumor cells, the architectural pattern of infiltrating tumor cells in a sclerotic dermis, and the negative immunohistochemical staining for S100 protein confirmed the diagnosis of breast carcinoma.

References

1) Azzopardi JG, Eusebi V : *Melanocyte colonization and pigmentation of breast carcinoma. Histopathology 1977 : 3 : 21-30*
2) Jacoby R, Roses DF, Valensi Q : *Carcinoma of the breast metastatic to the skin and simulating malignant melanoma. In Ackerman AB, Pathology of Malignant Melanoma, Chicago, Year Book Medical Publishers Inc., 1981 : 263-267*
3) Sau P, Solis J, Lupton GP, James WD : *Pigmented breast carcinoma. Arch Dermatol 1989 : 125 : 536-539*
4) Fisher ER, Gregori RM, Fisher B, et al : *The pathology of invasive breast cancer : a syllabus derived from findings of the Nation Surgical Adjuvant Breast Project(protocal No 4). Cancer 1975 : 36 : 1-84*
5) Nance FC, DeLoach DH, Welsh RA, Becker WF : *Paget's disease of the breast. Ann Surg 1970 : 7 : 864-874*
6) Sitakalin C, Ackerman AB : *Mammary and extramammary Paget's diseases. Am J Dermatol 1985 : 7 : 335-340*
7) Cuberson JD, Horn RC : *Paget' disease of the nipple : review of 25 cases with special reference to melanin pigmentation of Paget cells. Arch Surg 1956 : 72 : 224-231*
8) Neubecker RD, Bradshaw RP : *Mucin melanin and glycogen in Paget's disease of the breast. Am J Clin Pathol 1961 : 36 : 49-53*
9) Masson P : *Pigment cells in man : biology of melanomas. Ann NY Acad Sci 1984 : 4 : 15-51*
10) Poiares-Baptista A, Abreu de Vasconcelos A : *Cutaneous pigmented metastasis from breast carcinoma simulating malignant melanoma. Int J Dermatol 1988 : 27 : 124-125*
11) Sloance JP, Armerod MG : *Distribution of epithelial membrane antigen in normal and neoplastic tissue and its value in diagnostic tumor pathology. Cancer 1981 : 47 : 1786-1795*
12) Kariniemi AL, Forsman L, Wahlstrom T, Vesterinem E, Anderson L : *Expression of differentiation antigens in mammary and extramammry Paget's disease. Br J Dermatol 1984 : 110 : 203-210*
13) Nakajima T, Watanabe S, Sato Y, Kameya T, Shimosata Y, Ishinora K : *Immunohistochemical demonstration of S100 protein in malignant melanoma and pigmented nevus and its diagnostic implication. Cancer 1982 : 50 : 912-918*