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Aspiration Cytology of Pilomatrixoma
- Report of 2 Cases Misdiagnosed as Metastatic Carcinoma -

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= Abstract =

We describe cytologic findings of two cases of pilomatrixoma which had been cytologically misdiagnosed as suspicious malignant and malignant lesions in 35 year-old and 22 year-old females who presented a palpable neck mass. The cytologic smears showed many basaloid cells with a high nuclear-cytoplasmic ratio, nuclear hyperchromatism and prominent nucleoli, keratinized squamous cells with pyknotic nuclei, foreign body giant cells, and chronic inflammatory cells in necrotic background. Retrospective view of this aspiration smear revealed that these findings were characteristic features of pilomatrixoma, and the evenly distributed chromatin pattern as well as the lack of nuclear pleomorphism were considered to be the differential points from malignant neoplasm. Pilomatrixoma is a benign neoplasm which should be included in differential diagnosis if the fine needle aspiration cytologic smear of a neck mass or subcutaneous mass of any site showed these features.

Key words : Fine needle aspiration cytology, pilomatrixoma.

Introduction

Pilomatrixoma is a benign skin tumor with differentiation toward hair cortical cells. It usually occurs as a solitary, firm, dermal or subcutaneous nodule in the head and neck region and upper extremities of young people. Its histological feature is clear-cut, but the aspiration cytology is sometimes erroneously interpreted as malignant. We experienced two cases of pilomatrixoma aspiration cytology interpreted as suspicious malignancy and metastatic carcinoma.

Case presentation

Case 1; A 35 year-old female patient visited Korea Cancer Center Hospital complaining of a right neck mass. Physical examination revealed a subcutaneous nodule, 1cm in diameter, covered by normal skin without discoloration. Fine needle aspiration (FNA) of the mass was performed, and the cytologic diagnosis was 'suspicious malignancy'. We recommended biopsy of the mass.

Case 2; A 22 year-old female presented with a right mid-neck mass, which had been noted for 7

months. There was no pain or other symptoms. Physical examination revealed a 2cm sized movable hard subcutaneous nodule, and the clinical impression was metastatic enlarged lymph node. FNA was done, and the cytologic diagnosis was 'metastatic carcinoma'. After the cytologic report, the clinician made many efforts to find the primary site, and performed excisional biopsy.

Cytologic features

The aspirates of each case were stained by the Papainicolaou method. Cytologic examination showed abundant cellularity at low power view. The predominant cells were deeply basophilic basaloid cells with scanty cytoplasm or naked nuclei lying singly or in large sheets or clusters (Fig. 1). A few cells of them showed a single, well defined and prominent nucleolus (Fig. 2). The nuclei were hyperchromatic, but vesicular or finely granular with evenly distributed chromatin. These cytologic appearance was common in both cases. There also were many nucleated squamous cells. The cytoplasm was abundant and orangeophilic, and the nucleus was pyknotic and round or angular (Fig. 3). This finding was more prominent in case 1. In both cases, no typical anucleated ghost cells were observed, but irregularly clustered keratin-like material was abundant (Fig. 4). Chronic inflammatory cells were seen in the background of both cases, admixed with necrotic debris and foreign body giant cells.

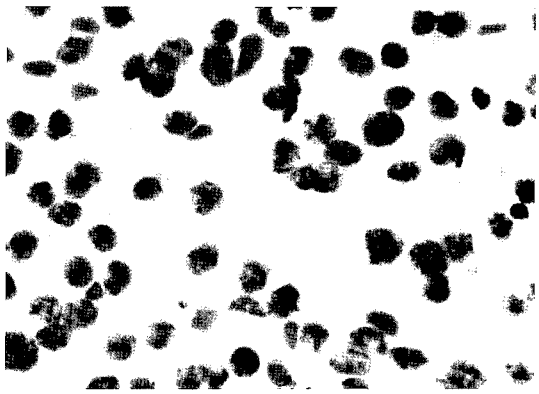

Fig. 2. Individually scattered basaloid cells with prominent nucleoli, regular chromatin distribution and scanty cytoplasm (Papanicolaou, ×200, Case 2).

Fig. 1. Basaloid epithelial cells, arranged in clusters or isolated, with hyperchromatic nuclei (Papanicolaou, × 100, Case 2).

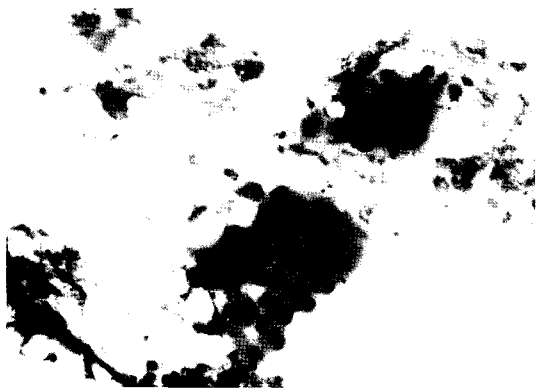

Fig. 3. Squamous cells with pyknotic nuclei and abundant cytoplasm are smeared in necrotic background (Papanicolaou, ×200, Case 1).

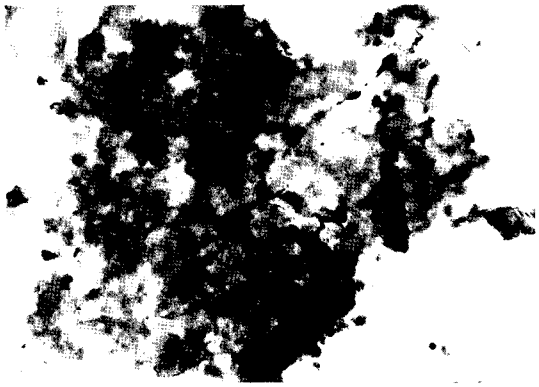

Fig. 4. Largely clustered keratin debris showing irregularly arranged pyknotic nuclei (Papanicolaou, ×100, Case 2).

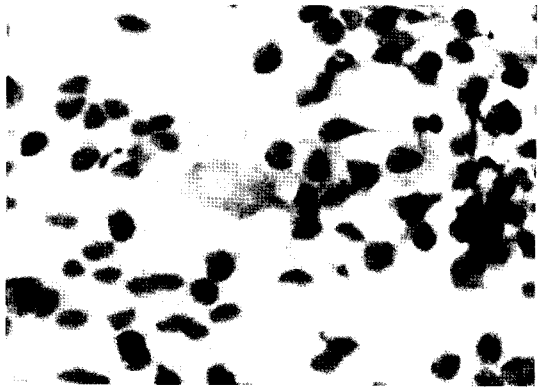

Fig. 5. An isolated ghost cell (Papanicolaou, ×200, Case 2).

Histologic features

In both cases the excisional biopsy revealed typical histology of pilomatrixoma consisting of basaloid cells merging with ghost cells (Fig. 5). Foreign body giant cells and chronic inflammatory cells were also present.

Discussion

FNA cytology has been a good diagnostic tool for unspecified cervical lesions, such as the lymph node, thyroid, salivary gland, and subcutaneous skin lesions. Pilomatrixoma, however, was frequently a pitfall in aspiration cytology. Accurate cytologic diagnosis was made in only 7 cases among the previous documented 19 cases. Ten cases were initially reported as malignant lesions or suggestive malignancy, and two cases were inadequate for cytologic diagnosis[1~7]. The cytologic feature that easily induces a misdiagnosis as a malignant tumor is high cellularity composed of hyperchromatic epithelial cells which are immature squamous cells in fact. The diagnostic cytologic features of pilomatrixoma include basaloid cells with scanty cytoplasm, vesicular nuclei and a distinct nucleolus, single naked nucleus, intermediate type cells, anucleated ghost cells and foreign body giant cells in an inflammatory background with occasional calcified material[2]. Review of the FNA materials in the present cases suggested that we would not have been missed the appearance of the smears if strict cytologic criteria had been applied. Metastatic squamous cell carcinoma was an important diagnostic consideration in our cases. However, a carcinoma would have irregular borders to the epithelial cluster, malignant nuclear feature such as coarse chromatin, prominent nucleoli and chromatin clearing, and lack of uniformly arranged basaloid cells. Nasopharyngeal undifferentiated carcinoma and poorly differentiated carcinoma were also considered as differential diagnosis. This kind of tumors would cytologically show irregular syncytial sheets of highly pleomorphic cells often intimately mixed with many lympohoid cells. Other items of differential diagnosis include basal cell carcinoma

and epidermal inclusion cyst. In basal cell carcinoma, cells are arranged in palisading pattern, nucleoli are not prominent, and there is no squamous differnentiation. The old stage pilomatrixoma can mimic epidermal inclusion cyst.

In our cases, the main causes of misdiagnoses were 1) the low index of suspicion for benign lesion which would have high nuclear-cytoplasmic ratio, hyperchromatism, and a prominent nucleolus, 2) the ignorance of keratin cluster and foreign body giant cells, although they could be shown in benign or malignant lesions, 3) the paucity of ghost cell and calcium deposits which are very important diagnostic clues in pilomatrixoma, and 4) the lack of clinical information. After histologic diagnosis, review of the cytologic smear revealed that there were a few ghost cells in case 2 (Fig. 6). The ghost cells are not stained well by the Papanicolaou method, but stained well by the Giemsa method[3]. In conclusion, one should think and rule out the possibility of pilomatrixoma when the cytologic smear shows the feature mimicking squamous cell carcinoma or other malignant epithelial lesions.

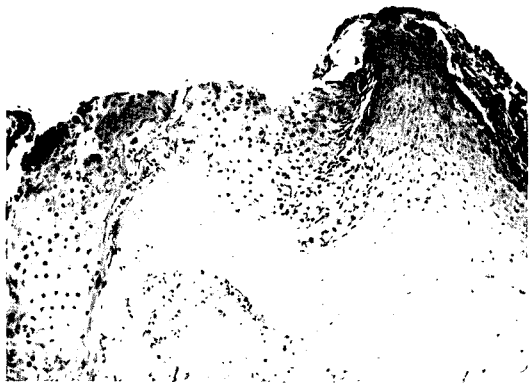

Fig. 6. Histologic section of pilomatrixoma showing sheet of closely packed epithelial cells merging with keratinized cells and ghost cell (H & E, ×40, Case 1).

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= 국문 초록 =

모기질 세포종의 흡인 세포학
- 전이성 암종으로 오진된 2 예 보고 -

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고 재 수 · 하 창 원 · 조 경 자 · 장 자 준

35 세 및 22 세 여자의 경부에 생긴 종괴의 세침흡인 세포학적 검사에서 악성이 의심되는 병변 및 악성 병변으로 오진되었던 모기질 세포종 2 예의 세포학적 소견을 기술한다. 핵 세포질의 비율이 높고 뚜렷한 핵소체를 보이는 기저양 세포, 농염성 핵을 가진 각화된 편평상피세포, 이물형 거대세포 및 괴사성 배경을 보였고, 후속하여 보았을 때 이러한 소견은 모기질 세포종의 특이적인 소견으로서 악성 종양으로 보기에는 염색질의 분포가 균질하고 핵들의 다형성이 없는 점이 악성 종양과는 구별되는 소견이었고, 모기질 세포종은 경부 종괴 및 여하한 부위의 피하 종괴의 세침흡인에서 상기의 소견을 보일 때 감별 진단의 하나로서 고려해야할 양성 병변이다.