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Effusion Cytology of Metastatic Rhabdomyosarcoma
- Report of Three Cases -

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= Abstract =

Cytologic findings of pleural effusion in three cases of rhabdomyosarcoma are reported. Case 1 was a pleomorphic rhabdomyosarcoma which had devoped at the chest wall of an elderly male patient and caused pleural effusion. The cytologic features were consistent with pleomorphic rhabdomyosarcoma, that was, showing loose clusters, cellular pleomorphism, and abundant finely vesicular cytoplasm. Cases 2 and 3 were embryonal rhabdomyosarcomas in young adults. Primary site was the oral cavity in case 1, but unknown in case 2 and case 3. The effusion cytology was similar in these cases. Clustered or isolated small round cells with hyperchromatic nuclei and scanty cytoplasm were smeared. The cohesiveness of tumor cells was weak and the cells did not show linear arrangement or nuclear molding. Effusion cytology in a sarcoma patient would be diagnostic when the primary site and the type of sarcoma were already known.

Key words : Cytology, Effusion, Rhabdomyosarcoma

Rhabdomyosarcoma is classified as embryonal, botryoid type of embryonal, alveolar, and pleomorphic type, and the first three types commonly develope in children, adolescents, or young adults. Pleomorphic rhabdomyosarcoma is more common in adults[1]. Sarcomas, including rhabdomyosarcoma, rarely cause malignant effusion, therefore there were few documented cases about the cytologic feature of rhabdomyosarcoma or other sarcomas[2, 3]. We experienced three cases of effusion cytology of rhabdomyosarcoma. One is pleomorphic type and the others are embryonal type.

Case 1 : A 64 year-old male patient was admitted to this hospital through emergency room because of dyspnea. He was chronic ill-looking, and his chest X-ray revealed left pleural effusion and a multilobulated mass in the thoracic cavity. He had a past history of chest mass resection for 2 times, which was diagnosed as pleomorphic rhabdomyosarcoma. Cytologic features of the pleural fluid were as follows. The smears revealed many tumor cells, isolated or clustered, and margins of the cluster were ragged. Individual tumor cells showed hyperchromatic nuclei, coarse chromatin, and occasional prominent nucleoli. Bizarre giant cells were occasionally seen. The cytoplasm was scanty to abundant, eosinophilic, and finely bubbly(Fig. 1). Intracytoplasmic cross striation was

Fig. 1. Case 1. The Tumor cells are arranged in loose cluster with large pleomorphic and hyperchromatic nuclei the cytoplasm is abundant and finely vesicular (Papanicolaou, ×400).

not observed. Mitotic cells were occasionally detected.

Case 2 : A 20 year-old male patient who had been diagnosed as embryonal rhabdomyosarcoma of the oral cavity visited this hospital due to bilateral chest pain. Roentgenography revealed an irregularly marginated soft tissue mass in the right upper lung, and right side pleural effusion. An effusion cytology revealed a few small tumor cells individually scattered or forming small clusters. The nuclei were hyperchromatic, and nucleoli were not prominent. The cytoplasm was scanty. These fingings were consistent with metastatic embryonal rhabdomyosarcoma.

Case 3 : This 22 year-old female patient showed more or less unusual clinical presentation. She had a history of perianal abscess drainage at a local clinic, and following development of back pain, an inguinal mass, easy bruisability, and lower abdominal pain. She visited other hospital, where inguinal lymph node and bone marrow biopsies were done, and the impression was malignant histiocytosis. We reviewed the slides of the inguinal lymph node and bone marrow, and carried out immunohistochemical stain. The histologic section revealed malignant small round cells with hyperchromatic nuclei and scanty cytoplasm. The tumor showed positivity for vimentin, desmin and myoglobin, but no staining with EMA, LCA, lysozyme, and S-100 protein. Our diagnosis was embryonal rhabdomyosarcoma with bone marrow involvement. This patient presented as group IV in respect to the clinical staging of Intergroup Rhabdomyosarcoma Study without knowledge of the primary site. One week after the diagnosis, pleural fluid was submitted to the laboratory. The cytologic smear revealed abundant small round tumor cells in inflammatory background. The tumor cells had a scanty to moderate amount of cytoplasm and hyperchromatic nuclei, and were isolated or formed small clusters. Occasionally tumor cells were closely admixed with histiocytes and mesothelial cells (Fig. 2).

Generally speaking, the carcinoma cells in effusion have more tight cohesiveness than the sarcoma cells. Therefore the margins of cell clusters

Fig. 2. Case 3. Small round cells with hyperchromatic nuclei are arranged in loose clusters or isolated and ase admixed with inflammatory cells (Papanicolaou, × 200).

are more smooth and less ragged. Multinucleated giant cells are not usually seen in ordinary carcinoma. The cytologic features in case 1 previewed the nature of sarcoma than carcinoma. The metastatic small cell carcinoma would have showed similar features to those of case 2 and 3. Tumor cells of small cell carcinoma, howeves, form short chains and considerable nuclear molding with cell in cell configuration[2]. In case 2 and 3, the rosary shape and nuclear molding were not found. According to Koss, the effusion cytology of embryonal rhabdomyosarcoma shows elongated cells and pleomorphic cells mimicking pleomorphic rhabdomyosarcoma[3]. But these features were not found in these two cases. In conclusion, in the diagnosis of effusion cytology, clinical informations are important, especially in cases of metastatic sarcoma.

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=국문 초록=

횡문근육종의 체액 세포학적 소견
-3례 보고-

원자력병원 해부병리과

고 재 수·하 창 원·조 경 자·장 자 준

저자들은 비교적 접할 기회가 흔치 않은 횡문근육종의 체액 세포학 3예를 경험하였기에 그 임상 소견과 함께 세포학적 소견을 간결히 기술하였다. 제 1예는 흉벽에 다형 횡문근육종이 있는 환자의 늑막 삼출액 소견으로서, 세포들은 느슨한 군집을 형성하거나 개별적으로 흩어져서 도말되었고 핵은 다형성이 심하였으며 다핵을 가지는 세포도 관찰되었고 과염색상을 보였다. 횡문근육종의 특이 소견인 가로무늬는 관찰되지 않았고 세포질은 미세 공포형이었다. 나머지 2예는 구강 원발성 및 원발 병소를 알 수 없는 배형 횡문근육종으로서 이들의 늑막 삼출 세포학적 소견은 서로 유사하였다. 군집을 형성하거나 개별적으로 흩어진 세포들은 작고 둥근 세포들로서 이들은 미미한 세포질과 과염색상의 핵을 가지고 있었으며 소 세포 암종에서 관찰되는 염주형 배열 또는 주물 현상은 인정되지 않았다. 육종의 체액 세포학은 원발 병소 및 아형이 알려진 경우에 진단적이라고 여겨진다.