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Pathology

CYTOLOGICAL DIAGNOSIS OF METASTATIC MELANOMA BY FNAC : A CASE REPORT

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ABSTRACT Malignant melanoma (MM) is a highly aggressive neoplasm with an increasing incidence worldwide. It is not unusual for the disease to have already metastasized by the time of initial presentation. Regional lymph nodes are the first and most common metastatic sites, followed by distant visceral sites (lungs, liver, and central nervous system) and bone. In this clinical setting, fine needle aspiration (FNA) is often the first diagnostic approach. FNA is a useful tool for obtaining a rapid and accurate diagnosis in conjunction with ancillary techniques.

KEYWORDS : Malignant melanoma, FNAC, Lymph node

INTRODUCTION

Melanoma is an aggressive tumor of melanocytes, accounting for approximately 3% of all cancers. Metastatic spread is seen in two-thirds of patients with malignant melanoma.(1,2) Early detection of both primary malignant melanoma and metastatic disease is important to initiate appropriate treatment. (1-3)

CASE HISTORY

A 57-year-old patient with no known comorbidities showed swelling in the right inguinal region for 2 weeks. On examination, the right inguinal lymph node was enlarged with dimensions of 3 x 3 cm and a firm consistency. He also complained of swelling on his leg, which on examination showed an ulcerated lesion measuring 1 x 0.5 x 0.5 cm. A fine-needle aspiration of the right inguinal lymph node was performed, which revealed individually scattered and loose clusters of malignant cells with moderate to abundant cytoplasm, many containing a finely granular brown pigment resembling the pigment melanin. Nuclei are round to ovoid, show slight pleomorphism and have prominent nucleoli. Occasional nuclear inclusions were noted. Several plasmacytoid cells, binucleate and multinucleate cells were also seen. (FIG. 1). Cytological features were suggestive of metastatic malignant melanoma. This led to clinical suspicion to look for a primary and a biopsy from the ulcerated leg lesion was sent for histopathological examination.

Gross examination revealed a single skin-covered soft tissue measuring 1.5 x 1 x 1 cm. The surface showed an ill-defined nodule measuring 1 x 0.5 x 0.5 cm. Microscopic examination revealed a tumor composed of epithelioid to spindle-shaped cells forming sheets, nests and islands. The tumor cells showed marked nuclear pleomorphism, vesicular nuclei with prominent nucleoli, and coarse melanin granules in a few cells (FIG. 2). The histopathological diagnosis was consistent with malignant melanoma of the leg. The patient was sent to the surgical department for further treatment. After 2 weeks, Ray amputation of the right big toe and dissection of the right inguinal lymph node were performed

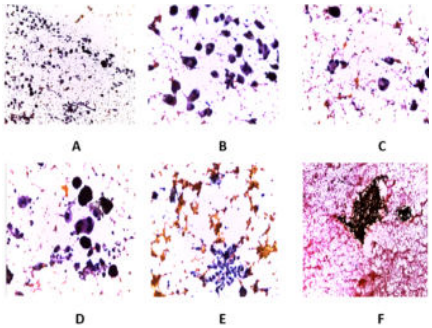

Figure 1 - Cytological smears of right inguinal lymph node :
A – Singly dispersed tumour cells (Pap stain , 4x) ,
B- Plasmacytoid tumour cells (Pap stain,40x) ,
C – Intranuclear inclusions in tumour cells (Pap stain, 40x) ,
D –Multinucleated tumour cells (Pap stain, 40x),
E and F – Melanin pigment (Pap stain, 10x)

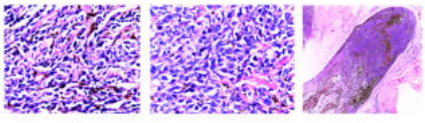

FIG 2 – Histopathologic pictures of Malignant melanoma :
A - Spindled tumour cells(H and E , 40X) ,
B – Tumour cells with nuclear pleomorphism (H and E , 40X)
C – Melanin pigment (H and E , 4X)

DISCUSSION

Malignant melanoma is a potentially aggressive tumor with the ability to metastasize widely.[2] As with most cancers, early detection and proper treatment can prolong disease-free survival and reduce patient mortality.[3] Fine needle aspiration is a commonly used, quick and minimally invasive procedure. It is a cost-effective, highly reliable technique that is well tolerated by patients when performed by properly trained operators.[4] Nodal metastatic melanoma can be diagnosed with FNAC and biopsy. FNAC as a fast, cheap and minimally invasive method of diagnosis is preferred over biopsy, it has a sensitivity and specificity of 97% and 99% respectively. [5]

Direct smears of metastatic melanomas are probably cellular with a predominance of single cells. Metastatic melanoma tumor cells often show overt cytologic features of malignancy, such as significant pleomorphism with a mixture of round, epithelioid, spindle-shaped, and multinucleated giant tumor cells.[1,3,5] According to relevant literature, 8-42% of metastatic melanoma cases show mixtures of epithelioid and spindle cells.[6] Epithelioid cells are often dominant, have moderate to abundant cytoplasm, and are most commonly found in lymph node aspirates. The spindle cells in melanomas are elongated with bipolar, tapering cytoplasmic ends.[7] In this study, FNA smears showed only epithelioid cells. FNA findings in metastases may be independent and distinct from those of the primary melanoma, or the two may closely parallel each other.

The only morphological finding that makes it possible to ensure a diagnosis of melanoma without the help of histochemistry or immunohistochemistry is the presence of melanin pigment in tumor cells.[6,7] It may be "dusty" or finely granular and is usually evenly distributed in the cytoplasm. Pigmentation can be so dense that it causes a "brown stain" of the tumor cell population that largely obscures morphologic details[8]

Classic cytologic characteristics of melanoma cells include the presence of eccentric nuclei, prominent nucleoli, intranuclear

inclusions, and multinucleation. If the cells are scattered individually, the nuclei are usually eccentrically located, giving them a plasmacytoid appearance. This feature is a relatively common diagnostic criterion and may be evident in 70% of cases[7,8] Intranuclear cytoplasmic inclusions are considered an additional criterion for the diagnosis of malignant melanoma. They are invaginations of cytoplasm into nucleus, so they have the same color and quality as the cytoplasm itself. These inclusions have diagnostic significance only in conjunction with other cytomorphological and clinical features. Multinucleation was frequently observed in several published series, and some publications even reported this finding in 100% of cases. The presence of multinucleated tumor cells does not appear to be related to topographic sites for FNA, but is statistically more frequent in aspirates showing a predominance of epithelioid cells[.6,7,8] All classic cytological characteristics of melanoma cells were observed in this study.

Documentation of lymph node metastases by FNAC may prompt definitive regional lymph node dissection and subsequently alter treatment protocols to include chemotherapy and immunologic adjuvant therapy. Five-year survival of patients with melanoma metastasizing to the lymph nodes ranges from 12-45%, and detection of metastasis is an important prognostic indicator.[8] Several studies have documented the utility of fine needle aspiration in the diagnosis of both primary cutaneous melanoma and metastatic melanoma. A recent study showed that treatment with interferon-alpha-2b improves survival in patients with lymph node metastases. [8]

CONCLUSION

FNAC is a highly accurate , rapid and cost effective procedure for the diagnosis of metastatic melanoma and should be considered as the initial diagnostic procedure of choice in patients with melanoma with clinically suspected metastases.

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