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Original Research Article

Fine needle aspiration cytology- an accurate method for diagnosis of cutaneous and subcutaneous metastases

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ABSTRACT

Background: Cutaneous metastases from carcinoma are relatively uncommon, usually representing late events in the course of internal malignancies and indicate a dismal outcome of patients. Aim of the study was undertaken to evaluate the role of FNAC as a diagnostic tool for diagnosis of cutaneous metastases of various internal malignancies as it is of great value in the early diagnosis.
Methods: Study of cutaneous metastases was undertaken for the period from April 2013 to July 2017. Out of over 12000 cytology cases, 25 cases were diagnosed as cutaneous metastases. Fine needle aspiration was done using 22-gauge needle without anaesthesia and smears were air dried and stained with MGG.
Results: Out of 25 patients diagnosed with cutaneous metastases on cytology, 11 were males and 14 females with age ranging from 20-75 years. Chest wall was the most common site of metastases. Adenocarcinoma and Non-Hodgkin's Lymphoma were the most common cytomorphological types observed.
Conclusions: FNAC is minimally invasive, safe, rapid and reliable method for the diagnosis of cutaneous metastases.

Keywords: Cutaneous metastases, Fine needle aspiration cytology, Internal malignancies

INTRODUCTION

Cutaneous metastases can be defined as the spread of a tumor from the site of its primary origin to the skin.[1] Cutaneous metastases occur in 0.6 % to 10.4 % of all patients with cancer and represent 2 % of all skin tumors.[2] Cutaneous metastases may be the first sign of clinically silent visceral cancer and may help identify and locate the occult tumor. It indicates late representation of tumor progression and may constitute the first manifestation of relapse of a tumor in complete remission.[3,4] Some tumors have a predilection to metastasize to specific areas. This may help in search of the underlying primary tumor. It may occur at any age, but the incidence rises with advancing age, especially after the fifth decade.

Primary malignancy of breast, lung and gastrointestinal tract have a greater propensity to metastasize to the skin. Cutaneous metastases are due to systemic spread and it represents terminal stage of malignant disease with limited survival time. Often cutaneous metastases go unrecognized and are mistaken for primary skin tumors or inflammatory process and needs cytological or histopathological confirmation.[5] FNAC is an excellent, safe, rapid, minimally invasive and simple method for early diagnosis of such cases as the lesions are easily accessible and palpable.[6,7]

METHODS

The present study was carried out from April 2013 to July 2017. Out of the total of more than 12000 cases subjected

for Fine needle aspiration in cytology OPD, 25 cases were diagnosed as cutaneous and subcutaneous lesions. Clinical history and details of all relevant investigations performed was undertaken.

FNAC was done using 22-gauge needle and 10 ml disposable syringe without anaesthesia. At least 2-3 passes were done to obtain sufficient material. Smears were air dried and stained with MGG stain. No complications related to procedure was seen.

RESULTS

Out of more than 12000 cases subjected to FNAC during April 2013 to July 2017, 25 cases were diagnosed as cutaneous metastases from known or unknown primary site. The age range was 20 to 75 years and 11 were males and 14 were females. Patients presented with firm, painless, nodular cutaneous swelling for FNAC. Table 1 shows diagnosis and site of cutaneous metastases.

Table 1: Diagnosis and site of cutaneous metastases.

Site of primary cancer	Diagnosis	Sex	Site of cutaneous metastases	No. of cases
Lung	Squamous cell carcinoma	M	Chest wall, abdominal wall	02
	Adenocarcinoma	M (1), F (1)	All over body, cheek, near eye	02
	Neuroendocrine carcinoma	M	Abdominal wall	01
Lymph node	Non-Hodgkin's lymphoma	M (2), F (2)	Chest wall, forehead, cheek, abdominal wall, extremities	04
Cervix	Squamous cell carcinoma	F	Right iliac region	01
	Adenocarcinoma	F	Pubic region	01
Gall bladder	Adenocarcinoma	M (1), F (2)	Abdominal wall, cheek	03
Kidney	Renal cell carcinoma	M	Chest wall	01
	Leiomyosarcoma	F	Scalp, forehead, legs	01
Breast	Ductal carcinoma	F	Chest wall	03
Prostate	Adenocarcinoma	M	Lower abdominal wall	01
Intestine	Adenocarcinoma	M (1)	Abdominal wall	01
		F (1)	Gluteal region	01
Perineum	Malignant melanoma	M	Penis, scrotal skin	01
Bone marrow	Acute myeloid leukaemia	F	Neck	01
	Multiple myeloma	F	Chest wall	01

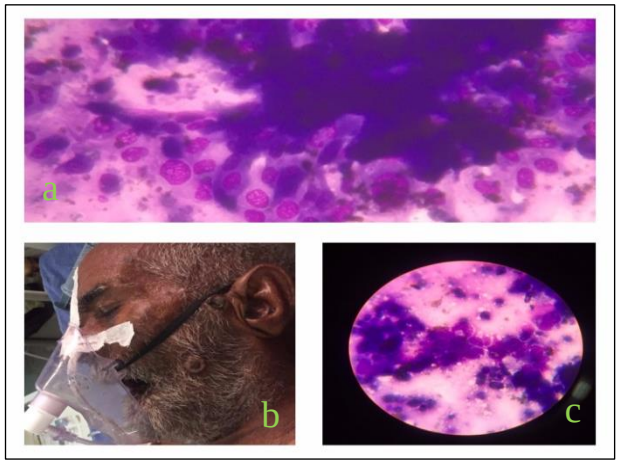

Figure 1: Adenocarcinoma of gall bladder, a) with cutaneous metastases on cheek, (b, c) MGG stain, 40x.

The smears show clusters of pleomorphic epithelial cells in acinar pattern with prominent nucleoli and abundant cytoplasm in Figure 1.

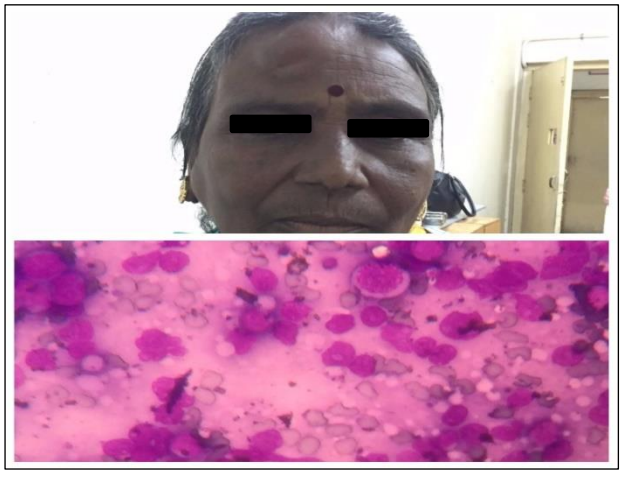

Figure 2: Non-Hodgkin's lymphoma, subcutaneous metastases on forehead and cheek, MGG stain, 40x.

The smears show singly scattered round cells with high N:C ratio, scanty cytoplasm in Figure 2.

Overall the most common site of metastases was chest wall followed by abdominal wall. The size of the lesions varied from 0.5 cm to 2.5 cm. The cytomorphology of the metastatic lesions was compatible with the morphology of the primary in all cases. The smears show pleomorphic cells in acinar pattern with prominent nucleoli in Figure 3.

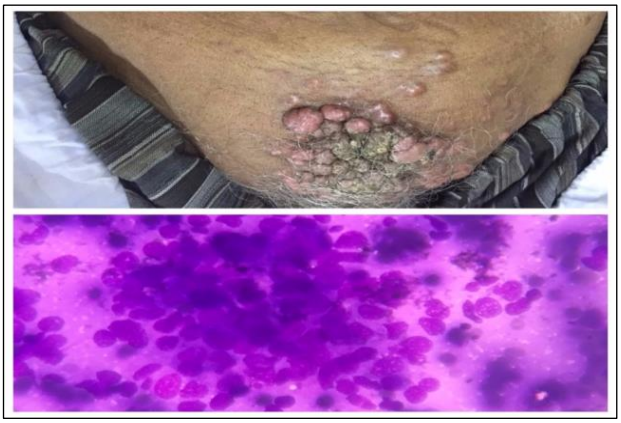

Figure 3: Prostatic adenocarcinoma, multiple cutaneous metastases on lower abdominal wall, MGG stain, 40x.

The smears show pleomorphic ductal epithelial cells in loose clusters and scattered singly with prominent nucleoli and abundant cytoplasm in Figure 4. The smears show pleomorphic cells in sheets arranged in acinar pattern and scattered singly, prominent nucleoli and abundant cytoplasm in Figure 5.

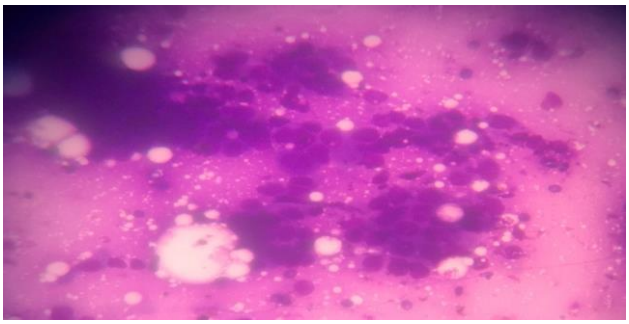

Figure 4: Subcutaneous metastases of breast carcinoma on chest wall. MGG stain, 40x.

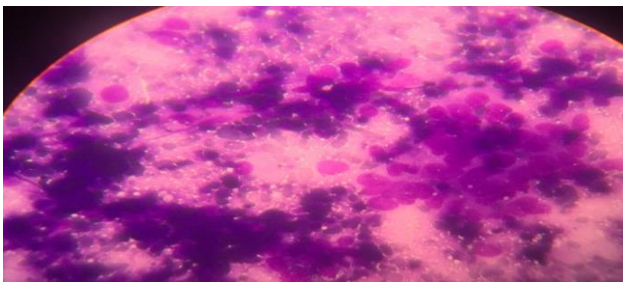

Figure 5: Cutaneous metastases of adenocarcinoma of lung on abdominal wall. MGG stain, 40X.

In this study, there was no false positive or false negative diagnosis. The common cytomorphological type was adenocarcinoma in 9 cases and Non-Hodgkin's lymphoma in 4 cases. This was followed by 3 cases of ductal carcinoma of breast, 2 case of squamous cell carcinoma of lung, 1 case each of squamous cell carcinoma of cervix, neuroendocrine carcinoma of lung, renal cell carcinoma, leiomyosarcoma of kidney, malignant melanoma of perineum, acute myeloid leukemia, multiple myeloma.

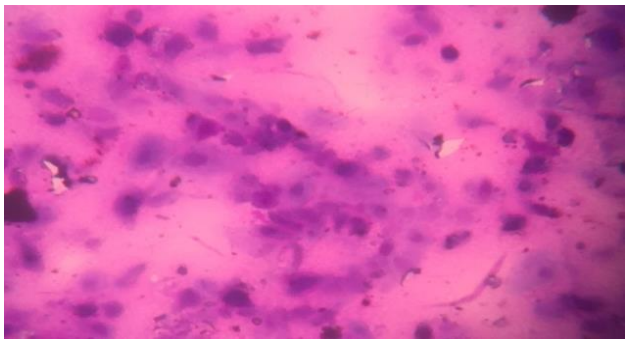

Figure 6: Smears from subcutaneous metastases of Squamous cell carcinoma of lung show isolated highly atypical keratinized cells with hyperchromatic nuclei in dirty necrotic background, MGG stain,40X.

The smears in cases of metastatic adenocarcinoma showed clusters of tumor cells with high N:C ratio, vesicular nucleus, prominent nucleoli and abundant cytoplasm. In squamous cell carcinoma, scattered cells with hyperchromatic nucleus, keratinization of cytoplasm in dirty background was seen. Cases with Non-Hodgkin's lymphoma showed monomorphic atypical cells with coarse chromatin nucleus, conspicuous nucleoli and scanty cytoplasm. In Ductal carcinoma of breast, dis-cohesive clusters of atypical epithelial cells and scattered singly with prominent nucleoli and abundant cytoplasm was seen.

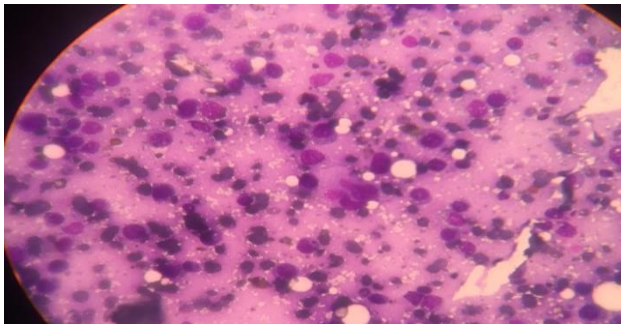

Figure 7: Smears from subcutaneous metastases of multiple myeloma on abdominal wall, show singly scattered plasma cells with high N:C ratio, MGG stain, 40X.

Smears in case of renal cell carcinoma showed loose clusters of tumor cells with high N:C ratio, prominent nucleoli and abundant clear cytoplasm. There was one

case of very rare metastases of primary leiomyosarcoma of kidney which showed atypical spindle shaped cells in sheets and mitotic activity.

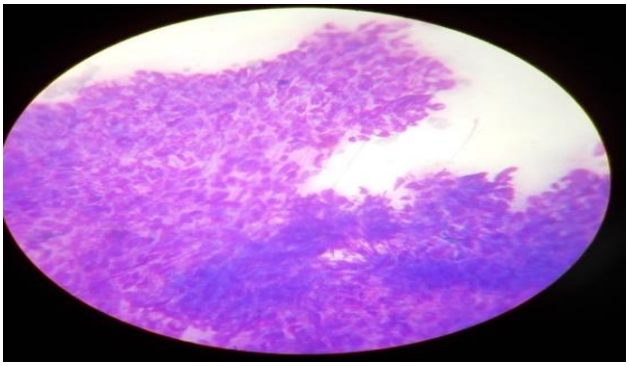

Figure 8: Smears from cutaneous metastases of renal leiomyosarcoma on scalp show sheets of pleomorphic spindle shaped cells, MGG stain, 40X.

There was also one case of neuroendocrine carcinoma of lung metastatic to abdominal wall, the cytosmears of which showed atypical small round cells with speckled chromatin and scanty cytoplasm.

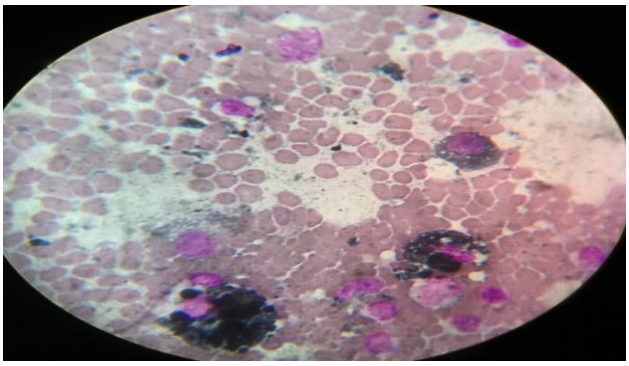

Figure 9: Smears from subcutaneous metastases on penis of malignant melanoma of perineum show singly scattered cells with high N:C ratio, prominent nucleoli and melanin pigment. MGG stain, 40X.

Cytosmears from malignant melanoma revealed large epithelial cells with prominent nucleoli, abundant cytoplasm and intracellular and extracellular melanin pigment. Smears from cutaneous lesion of multiple myeloma showed atypical plasma cells. The smears from cutaneous metastases to the soft tissue of neck from acute myeloid leukemia shows predominantly blasts cells. These features of metastatic lesions correlated with the histopathological features of the primary tumor.

DISCUSSION

Cutaneous metastases are a poor prognostic indicator for majority of patients with malignancy. Such lesions may indicate failure of ongoing therapy or recurrence of a cancer which was previously cured or, rarely it may be the first sign of unsuspected malignancy.[6]

Subcutaneous metastases of malignancies can be secondary to direct extension from tumor or by lymphatic or vascular route.[4] Metastases can occur everywhere in the subcutaneous tissue but it usually tends to be close to the primary cancer.[7] Subcutaneous tissue of chest is mostly involved by breast and lung cancers, abdominal wall subcutaneous tissue in gastrointestinal malignancy, lower back in renal carcinoma.[4] Chest wall was the most common site of metastases in present study. Chest and abdominal wall followed by head and neck are the most common sites of metastases reported in literature.[10]

Schwartz reported cutaneous metastases presenting as first sign of malignancy commonly seen with cancers of lung, kidney and ovary.[12] In some studies, cases of cutaneous metastases failed to find primary site even after autopsies.[13,14]

In present study, out of 25 patients diagnosed as cutaneous metastases, 8 patients presented with multiple nodules whereas the rest had solitary nodules. In similar studies, Mendonca et al reported multiple site involvement in only one out of their seventeen cases and Sharma et al reported multiple site involvement in only 9% of their cases.[8,9] The primary sites of carcinoma in males with cutaneous metastases in our cases were lung, lymph node, gall bladder, intestine, kidney, prostate, perineum. In females, the primary sites were lung, lymph node, gall bladder, cervix, kidney, breast, intestine, bone marrow. It is essential to distinguish metastatic skin lesions from primary adnexal tumors and primary squamous cell carcinoma of the skin. Metastases is usually located in the deeper dermis of sub cutis and they are free from the overlying skin.[9,11]

FNAC of metastatic nodules offers rapid diagnosis of malignancy as they are easily accessible. Response of cutaneous metastatic lesions is similar to primary tumor.

CONCLUSION

Cutaneous metastases may be the presenting symptom in many cases with underlying occult malignancies and is usually a late manifestation of an internal malignancy. FNAC is simple, rapid, cost effective and minimally invasive procedure. It is useful in determining the nature of palpable skin lesion and is an important diagnostic tool in such cases. It may give clue to underlying malignancy in unsuspected cases.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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