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Metastatic cutaneous and subcutaneous nodules: Diagnosis by Fine Needle Aspiration Cytology

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Abstract

Introduction: Metastatic cutaneous and subcutaneous nodules are rare and late manifestation of an underlying malignancy. They indicate a poor prognosis and require an early diagnosis to offer some chance of survival. Fine needle aspiration cytology (FNAC) is accurate and useful modality in early diagnosis of these lesions. Aim of this study is to find out efficacy of FNAC as an alternative to biopsies in early detection of skin metastases so as to avoid unnecessary surgical intervention.

Materials and Methods: The study was conducted from January 2013 to December 2015 in which 170 patients of all sexes and ages with palpable skin nodules, underwent FNAC. Of these, 16 cases diagnosed as metastatic cutaneous and subcutaneous nodules were evaluated and included in the study.

Results: Out of 16 cases of cutaneous metastases, 8 were males and 8 females with age range between 31-76 years. 14 of the 16 patients presented with solitary nodules while only 2 patients had multiple nodules. Primary was known in 13 cases and 3 cases had an unknown primary. Abdomen was commonest site of metastases followed by chest wall. Most common cytomorphological type observed in metastatic skin nodules was adenocarcinoma.

Conclusion: FNAC is a reliable, minimally invasive and a quick diagnostic method and can be used as an alternative to biopsies for early recognition of cutaneous metastases. Early diagnosis of these lesions may help in deciding mode of treatment and prolonging the survival of patient.

Keywords: Cutaneous, Subcutaneous, Nodules, Metastases, Fine Needle Aspiration Cytology

Introduction

Cutaneous and subcutaneous metastasis of underlying visceral malignancies is infrequent [1]. The overall incidence of cutaneous and subcutaneous metastasis has been reported to range from 0.7% to 10%, with a larger analysis suggesting that 5% is usual [2,3,4]. In 0.5 to 1% of the cases, skin metastases may be the presenting feature of an internal cancer [4]. Metastasis can occur at any age but the incidence rises with advancing age, especially after fifth decade of life [5,6]. Skin metastases are of diagnostic importance

because they may be the first manifestation of an undiscovered underlying malignancy or as first indication of recurrence of a treated malignancy [7]. The common sites of cutaneous metastasis include chest wall, anterior abdominal wall, lower limb, neck, back, upper limb, face, pelvis [3].

Cutaneous metastases mainly present as solitary or multiple nodules or as plaques, papules and ulcers [4,8]. These lesions may mimic primary skin tumors or inflammatory lesions and therefore, need cytological or histopathological confirmation [9]. Fine Needle Aspiration Cytology (FNAC) is a fast,

minimally invasive and an inexpensive technique for an early and accurate diagnosis, thus, avoiding unnecessary surgical intervention [2,5].

This study evaluates the role of FNAC in the diagnosis of cutaneous and subcutaneous metastases in cases with known and unknown primaries and provides an insight to their clinical and cytological profile.

Aims and Objectives

1. To evaluate the role of FNAC in early diagnosis of cutaneous and subcutaneous metastases.
2. To study clinical features and distribution of metastatic skin nodules with reference to age, gender, site, source of primary tumor and type of malignancy.

Material and Methods

During 3 years (January 2013 to December 2015), 170 cases of both sexes and all age groups were aspirated for clinically diagnosed palpable skin nodules. 16 cases out of these, which were diagnosed as metastatic cutaneous and subcutaneous deposits, were evaluated and included in the study. All relevant clinical details and investigations were recorded.

FNAC was done using standard procedure after taking informed consent of the patients. A 22-gauge needle and 10ml disposable plastic syringe was used. Both air dried and alcohol fixed smears were prepared and stained by Giemsa and Papanicolaou stains respectively, using standard methods^[10,11].

Slides stained, were carefully examined for cellularity and cytological details. Slides with adequate cellularity with preserved

cytomorphological features were studied, to avoid any false negative results.

Observations and Results

In a period of 3 years, 16 cases of cutaneous and subcutaneous metastatic nodules were diagnosed. An equal number of male and female patients were noted (males-8 and females-8). Female patients were seen in the age range of 31 to 76 years (Mean-53.5years) and the age range for males was 40 to 75 years (Mean-62.12years).

Table 1 demonstrates the common sites to which metastases can occur. Abdomen was the commonest site for metastasis as observed in 8 patients; of which 5 were females and 3 were males. The second commonest site was chest wall, seen in 6 patients (4 males and 2females). One patient each with skin nodules on scalp and back was also found.

In 13 of the 16 cases, primary lesions were known. The characteristic features of these 13 cases are displayed in Table 2. However, in 3 cases primary was unknown; the features of which are shown in Table 3.

The most common cytological type noted was adenocarcinoma; present in 11 of the 16 patients. 2 cases of infiltrating duct carcinoma of breast were present followed by 1 each of small cell carcinoma of lung, renal cell carcinoma and squamous cell carcinoma.

Maximum number of patients presented with solitary nodules. Multiple nodules were seen in 2 cases; one in case of a male with gastric carcinoma with metastases to abdominal wall including umbilical region. The other was a case of breast carcinoma with nodules on chest wall and scalp.

Site of metastases	Males	Females	Total
Abdomen	3	5	8
Chest Wall	4	2	6
Back	1	0	1
Scalp	0	1	1
Total	8	8	16

Table 1. Site and Gender wise distribution of cutaneous metastases

Site of Primary Tumor	Gender		Site of Metastases	No. of Cases	Cytological Diagnosis	No. of Nodule	
	Male	Female				Single	Multiple
Colon	1	2	Abdomen	3	Adenocarcinoma	3	0
Gastric	2	0	Abdomen	2	Adenocarcinoma	1	1
Gall Bladder	0	2	Abdomen	2	Adenocarcinoma	2	0
Lung	2	0	Chest Wall	1	Small Cell Carcinoma	1	0
				1	Adenocarcinoma	1	0
Breast	0	2	Chest Wall	2	Infiltrating Duct Carcinoma	1	1
			Scalp				
Ovary	0	1	Abdomen	1	Papillary Adenocarcinoma	1	0
Kidney	1	0	Back	1	Renal Cell Carcinoma	1	0

Table 2. Findings in cases of cutaneous metastases with known primary

Gender	Site of Metastasis	Cytological Diagnosis	No. of Nodules
Female	Chest Wall	Adenocarcinoma	1
Male	Chest Wall	Adenocarcinoma	1
Male	Chest Wall	Adenocarcinoma	1

Table 3. Findings in cases of cutaneous metastases with unknown primary

Discussion

The skin and subcutis is an uncommon site for metastases accounting for an overall incidence of 0.7 to 10.4%^[1,2,3]. Cutaneous and subcutaneous metastasis is a symptom of a progressive disease with dismal prognosis^[2,12]. Appearance of such nodules may indicate failure of an ongoing treatment or a recurrence of cancer previously treated or rarely, it may be the first sign of an unsuspected malignancy^[1].

In present study, a total of 16 cases were observed. Age of these patients range between 31 to 76 years and was maximum over 50 years (11 cases). This range was close to the age range noted in study by

Bryne et al^[13]. More number of females presented at a younger age (Mean age-53.5 years) than males (Mean age-62.12 years). Similar observation was made in study done by Karki S et al^[5].

No sex preponderance was noted in our study. 8 cases each of male and female patients were seen. This was in concordance with the study of Chaudhury SR et al^[14]. A higher incidence of metastases was reported in males in the study by Karki et al^[5] while Bryne et al showed a female predilection^[13].

The range of clinical presentations traverse a gamut ranging from plaques, papules, ulcers to firm or hard skin coloured nodules. These nodules may be

single or multiple. Most cases present as multiple, firm, non ulcerated nodules^[8,14,15,16]. In our study all cases presented as solitary skin coloured firm to hard nodules. Only 2 cases presented with multiple lesions. In studies by Karki S et al and Bryne et al also solitary nodule presentation was more common^[5,13]. In study by Ayyamperumal et al nodules at multiple sites was a more common presentation^[8].

Skin metastasis can be contiguous (direct) or non contiguous (distant). The non contiguous spread is via lymphatics or vascular route, thus determining the site of localisation^[6,9,12]. The common sites for cutaneous metastases are chest and abdomen, followed by the head and neck and rarely the extremities^[16]. However in our study the commonest site was abdomen followed by chest. Chest wall was reported to be the commonest site in most other studies^[5,6,9,13].

Cutaneous and subcutaneous metastases often occurs close to the primary cancers. Chest is mostly involved by breast and lung cancers, abdominal malignancies tend to involve abdominal wall and lower back involvement is seen in renal cell carcinoma^[9,16]. Similar observation was made in our study as well. Gastrointestinal malignancies favour periumbilical region for metastases, which is known as Sister Mary Joseph Nodule^[17]. In our study also, 2cases of the GIT malignancies, one from colon and other from stomach, presented as periumbilical nodules.

Lung, colon, kidney and upper aerodigestive tract are the frequent sources of primary malignancy in males and breast followed by lung, kidney and ovary are common in females^[1,14,16]. In our study, the most common primaries were lung and gastric cancer in males and breast, colon and gall bladder malignancies in females. In other such research work, lung and breast were found to be the

commonest primaries for cutaneous metastasis in males and females, respectively^[13].

The commonest cytological type of malignancy to metastasize was observed to be adenocarcinoma, both in our research (11of the 16 cases) and other studies^[2,5,13]. Cytomorphology in many cases with known primary is often compatible with morphology of primary neoplasm. In cases with unknown primary immunohistochemistry can be helpful^[5,13].

Solitary cutaneous and subcutaneous nodules may often be misdiagnosed as primary skin adnexal tumors .These metastatic lesions need to be differentiated with primary skin tumors having similar cytomorphology^[18] . A common example of this is renal cell carcinoma which is often confused with a sweat gland tumor. Metastatic nodules are usually located in deeper dermis and subcutis^[16].

FNAC offers an alternative to biopsy, for it is a relatively cheap, simple, safe and a highly valuable diagnostic aid for an early recognition of these lesions^[2,9].Most of the studies including ours have highlighted the utilization of FNAC in the diagnosis of cutaneous and subcutaneous metastatic nodules, thus helping in decision making for further management.

Conclusion

Cutaneous and subcutaneous metastases are relatively rare but are important to recognize. They are a harbinger of late stage of a malignant neoplasm and as such portend a poor prognosis. Immediate initial evaluation is warranted to plan an effective course of action. FNAC serves the purpose, being an excellent, safe, cost effective and a non cumbersome diagnostic procedure for a rapid and a prompt accurate diagnosis of these metastatic skin nodules, from a known or an unknown primary.

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