

Original Article

A Fine Needle Aspiration Study of the Abdominal Cutaneous and Subcutaneous Nodules

Nisha Marwah¹, Shweta Rana¹, Promil Jain¹, Sumiti Gupta¹, Sanjay Marwah², Rajeev Sen¹

1. Dept. of Pathology, Pt BDS PGIMS, Rohtak, India

2. Dept. of Surgery, Pt BDS PGIMS, Rohtak, India

ABSTRACT

Background & Objective: Abdominal cutaneous and subcutaneous nodules are uncommon lesions which may be benign or malignant. Majority of the malignant nodules are metastatic in origin and may be the initial presentation of primary malignancy, hence an early diagnosis is important. Our aim was to find out the spectrum of lesions (both non-neoplastic and neoplastic) that present as cutaneous and subcutaneous abdominal wall nodules and to assess the efficacy of fine needle aspiration cytology (FNAC) in early diagnosis of all such lesions so that need for histopathology can be minimized.

Material and Methods: The study was conducted on 46 patients of all age groups, presenting with various palpable cutaneous and subcutaneous abdominal wall nodules. FNAC was performed, smears stained with May Grunwald- Giemsa stain and Pap stains. Special stains were applied wherever required. Cytological diagnosis was subsequently correlated with histopathological diagnosis.

Results: Out of 46 FNAC cases; there were 13 non-neoplastic lesions, 15 benign neoplasms and 17 malignant lesions. One case was inadequate for opinion that on histopathology turned out to be metastatic deposits from renal cell carcinoma. The rate of unsatisfactory FNAC was 2.2% and the sensitivity was 89.47%. The specificity and positive predictive value was 100%.

Conclusion: FNAC is a simple, minimally invasive, highly accurate and cost effective technique for quick diagnosis of malignant metastatic abdominal wall nodules, thus minimising the need for histopathology and for deciding mode of treatment.

Keywords: Fine Needle Aspiration, Abdominal Wall

Received: 12 March 2012

Accepted: 25 September 2012

Address communications to: Dr Promil Jain, Dept of Pathology, 157, L-1, Model town, Rohtak, Haryana, India

Email: jainpromil@gmail.com

Introduction

Cutaneous and subcutaneous nodules of abdominal wall are uncommon. Though a variety of benign as well as malignant neoplastic lesions can be encountered, primary malignant cutaneous and subcutaneous tumors of abdominal wall are very rare. On review of literature, majority of malignant nodular lesions in the abdominal wall are metastatic tumors which may sometimes be the initial presentation of an underlying malignancy and early detection may play a role in the outcome for these patients (1-5).

An apparently insignificant umbilical nodule may sometime be the only manifestation of underlying malignant disease and therefore clinician should be aware of such nodules (6). Fine needle aspiration cytology (FNAC) is a simple, fast and inexpensive technique with high sensitivity and specificity and has proved to be very useful in quickly confirming the nature of the lesion (2,7,8).

The present study was aimed to find the efficacy of FNAC in early diagnosis of all these lesions so that histopathology could be avoided and mode of treatment be decided at the earliest.

Material and Methods

This prospective study was undertaken at Post-Graduate Institute of Medical Sciences, Rohtak, India from May 2006 to December 2009 after getting approval of Ethical Committee of the institute. The study was conducted on 46 consecutive patients of both sexes and all age groups presenting with abdominal wall nodules that were subjected to FNAC.

FNAC was performed in all the 46 cases as an

outdoor procedure using 22-23 gauge needle attached to a 20 ml plastic syringe without local anaesthesia. The lesion site was cleaned using povidone-iodide solution and ethyl alcohol. Aspirate from different portions of the nodule was collected by alternating the direction of needle inside the nodule and giving multiple passes. Both air dried and alcohol fixed smears were prepared and stained by May-Grunwald Giemsa stain and Hematoxylin & Eosin stain using standard procedures (9,10).

Wherever needed, special stains such as mucicarmine and Periodic Acid Schiff were applied. Detailed history, clinical examination and relevant investigations of all patients were recorded. Cytopathological diagnosis was made and correlated subsequently with histopathological diagnosis wherever possible.

Results

FNA was performed on 46 cases which included 30 males and 16 females of all ages ranging from 5 years to 82 years (mean age 43.5 years). There were 36 cases from the abdominal wall, seven cases from paraumbilical region, and three cases from umbilicus (Table 1). Thirteen non-neoplastic cases included 12 inflammatory lesions and one case of endometriosis (Fig.1). Out of 32 neoplastic lesions, 15 were benign and seventeen malignant.

The 15 benign neoplasms included 14 cases of lipoma and one case of spindle cell tumor on FNAC. All the malignant cases were metastatic carcinomas including 10 cases of metastatic deposits from adenocarcinoma, five from squamous cell carcinoma and two from poorly differentiated carcinomas. All the three nodules on umbilicus were metastatic nodules.

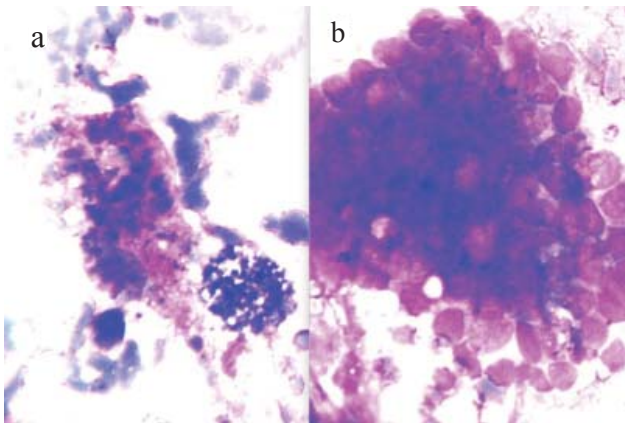


Fig.1-Endometriosis- FNAC* smears a) showing macrophages and cluster of stromal cells (Giemsa, ×100); b) A cluster of glandular epithelial cells, (Giemsa; × 400)

*Fine Needle Aspiration Cytology

Table 1- Cytological Spectrum of Cases In Abdominal Wall Cutaneous And Subcutaneous Nodules With Histological Correlation (n=46)

Type of Lesion on FNAC *	No. of Cases	Histological Diagnosis		Biopsy not Available	Unsatisfactory FNAC
		Consistent	Inconsistent		
Abdominal Wall Nodules	36				
Non neoplastic	10	09			
Inflammatory					
-Parasitic cyst	6	6		1	-
-Acute inflammatory lesion	3	2			
Endometriosis	1	1			
Neoplastic	25	22			
Benign					
-Lipoma	14	12			
-Neurilemmoma	1	-			
Malignant			1(MPNST)**	2	-
-Metastatic carcinoma	10	10			
Inadequate for opinion	1				1
Paraumbilical Region	7				
Non neoplastic	3	2			
Inflammatory					
-Parasitic cyst	2	2			
-Acute inflammatory lesion	1		1(SCC)***		
Neoplastic	4	4			
Malignant					
-Metastatic carcinoma	4	4			
Umbilical	3				
Non neoplastic	0	0			
Neoplastic	3	3			
Malignant					
-Metastatic carcinoma	3	3			
Total	46	40	2	3	1

* Fine Needle Aspiration Cytology

** Malignant peripheral nerve sheath tumour

*** Squamous cell carcinoma

Twelve out of 17 metastatic nodules were from internal carcinoma. The diagnosis of primary site was made on the basis of radiological findings in support with cytological and histopathological examination. Ovary was the most frequent site

of primary malignancy (n-3) followed by kidney (n-2), cervix (n-2), pancreas (n-2), and one case each from esophagus, gall bladder, and urinary bladder (Table 2).

Table 2- Spectrum And Distribution Of Cutaneous/ Subcutaneous Deposits From Internal Carcinoma (N=12)

No.	Primary Site	No. of cases	Diagnosis (No)	Site of metastatic deposits (No)
1	Ovary	3	Adenocarcinoma (2), Granulosa cell tumour (1)	Abdominal wall (2), Umbilicus (1)
2	Oesophagus	1	Squamous cell carcinoma (1)	Paraumbilical region (1)
3	Kidney	2	Renal cell carcinoma (2)	Abdominal wall (2)
4	Cervix	2	Squamous cell carcinoma (2)	Abdominal wall (2)
5	Pancreas	2	Adenocarcinoma (2),	Abdominal wall (1), Paraumbilical region (1)
6	Urinary Bladder	1	Poorly differentiated urothelial carcinoma (1)	Paraumbilical region (1)
7	Gall Bladder	1	Adenocarcinoma (1)	Abdominal wall (1)

Cytopathological and histopathological correlation was available in forty three cases. For three cases biopsy was not available. Table 1 shows cytological spectrum of cases in abdominal wall cutaneous and subcutaneous nodules along with their histopathological correlation. In 40 cases cytological diagnosis was confirmed on histopathology. One case was diagnosed as neurilemmoma on FNAC turned out to be malignant peripheral nerve sheath tumour (Fig. 2), another

case diagnosed as acute inflammatory lesion was squamous cell carcinoma and third case which was inadequate on FNAC was diagnosed as metastasis from renal cell carcinoma on histopathology. Eight of the 12 inflammatory lesions were cysticercosis (Fig. 3). Sensitivity in our study was 89.47% and specificity/ positive predictive value was 100%. *P* value by Pearson Chi-Square test applied on abdominal wall nodules was not significant ($P=0.804$).

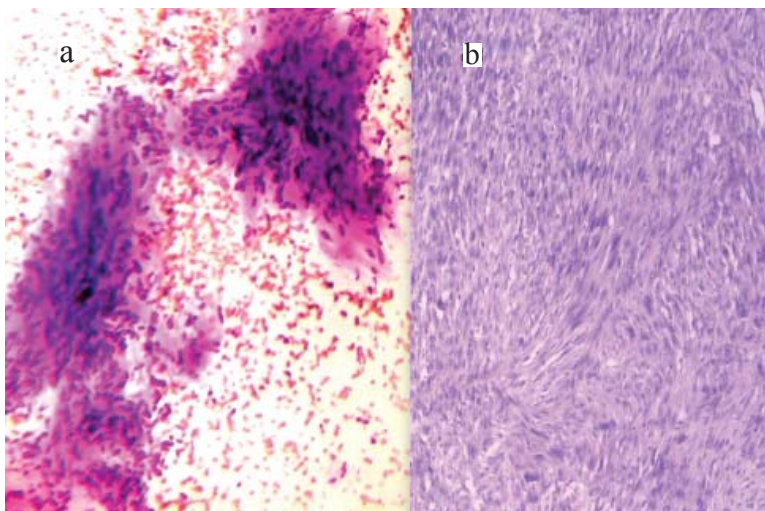


Fig.2- a)- Neurilemmoma: on FNAC*, smear showing cohesive tissue fragments, spindle shaped palisading nuclei in the fibrillar background (Giemsa; $\times 100$); b) On histopathology malignant peripheral nerve sheath tumour showing pleomorphic spindle cells and mitotic figures (H & E; $\times 100$)

*Fine Needle Aspiration Cytology

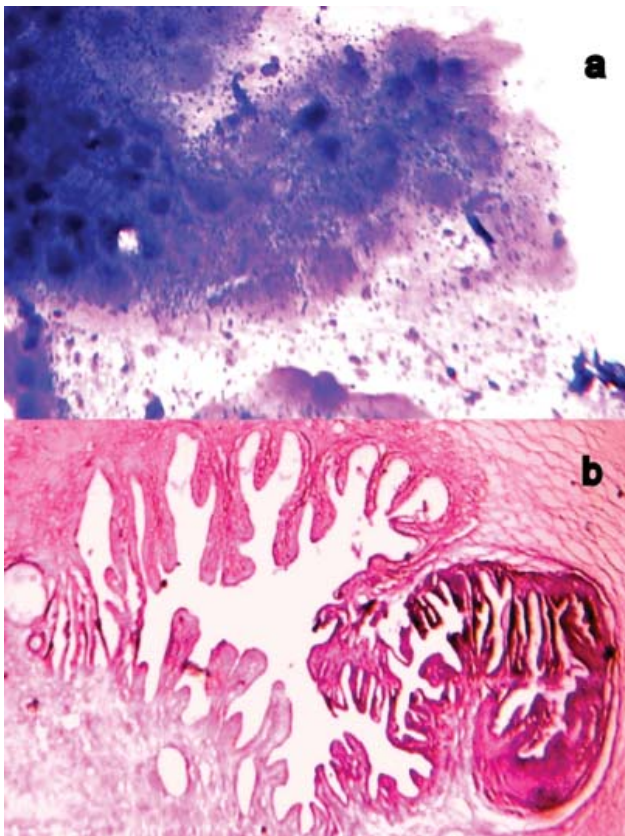


Fig.3- Cysticercosis: a) FNAC* smear- Bladder wall fragment of cysticercus cellulosae (Giemsa; ×100) b) Tissue section (H&E; ×400)
*Fine Needle Aspiration Cytology

Discussion

Majority of palpable nodular lesions in the abdominal wall are metastatic tumours originating from intra abdominal, pelvic and retroperitoneal organs. The overall incidence of cutaneous and subcutaneous metastasis ranges from 0.7% to 10% (3, 4). Although any region of skin can be involved, yet generally metastasis tends to occur close to the site of the primary malignancy (4). Umbilical metastases from intra-abdominal carcinomas are well documented and often represent the first sign of underlying advanced malignancy with dismal prognosis; hence an early diagnosis is important (5).

In our study, FNAC was performed for 46 cases, including 36 cases from abdominal wall, seven cases from paraumbilical and three cases from

umbilical region. The patients having benign and non-neoplastic lesions were relatively younger than malignant cases. With advancing age, the malignant lesions outnumbered the non-neoplastic and benign lesions. More than 80% of cases over the age of sixty were malignant.

Smears were adequate in 45 cases. One case of inadequate aspirate turned out to be metastatic deposits from high grade renal cell carcinoma on histopathological examination. As high grade renal cell carcinomas are highly vascular, the repeated aspirates yielded abundant blood. Inadequacy in other series has also been attributed to either the lesion being cystic or vascular or it may be due to small fibrotic lesions where the cells are difficult to aspirate (11,12).

Out of 46 cases aspirated, there were 13 non-neoplastic cases including 12 inflammatory and one case of endometriosis. As majority of inflammatory lesions turned out to be cysticercosis, these lesions should be included in differential diagnosis of nodular lesions as also emphasised by Patnayak *et al.* (13).

All the 17 malignant cases were metastatic carcinomas including 10 cases of adenocarcinoma, 5 squamous cell carcinoma and 2 poorly differentiated carcinoma. All the cases of umbilical and paraumbilical nodules in our study were metastatic deposits from adenocarcinoma, except one case of squamous cell carcinoma. Similar observations were made in other studies (1,5,14,15). A retrospective study on 38 cases of cutaneous deposits from internal malignancies comprised 12 cases of abdominal wall nodules, 11 of which were adenocarcinomas with primary in the intra-abdominal and pelvic organs (2). In a fine needle aspiration study on 22 malignant cutaneous and subcutaneous nodules, 17 cases were adenocarcinoma with ovary being the most common primary site. However the authors did not include umbilical nodules stating them not to be truly ab-

dominal wall lesions (1). Another large study of 420 cases with cutaneous metastatic nodules had 10% of cases on the abdominal wall and breast was the most common primary site (3).

“Sister Mary Joseph’s nodule” is the eponym used for metastatic involvement of the umbilicus. The umbilical nodule may be the presenting symptom in patients with internal malignancies or it may represent a late finding in patients with widespread disseminated disease. An apparently insignificant umbilical nodule may be the only manifestation of an underlying advanced malignant disease and therefore clinicians should be aware of such nodule (6). The umbilicus is an easy target for metastasis from an intraabdominal tumor because of its variation in vascularity and embryological development. Spread may either be contiguous, from intraperitoneal metastasis via portal vein or retrograde lymphatic flow from inguinal lymph nodes (14,15). Rarely the metastasis may be from prostate, ovary, lung, breast, haematopoietic malignancy and others (5,16,17).

The observations made in various other studies (2,18,19) in the past that the metastatic deposits usually occur close to the region of the primary growth has also been confirmed by our study. Most of the abdominal wall and umbilical metastases were from intra abdominal/pelvic organs. The factors which contribute to this pattern are poorly understood. In general, spread of the tumor to the regional skin is thought to be via the lymphatic route, while metastases distant from primary site are due to hematogenous spread (2).

All the studies including ours highlight the utility of FNAC in the diagnosis of umbilical and abdominal metastatic nodules and to decide on further management. However, it is also important to keep in mind that benign lesions such as endometriosis, fibroma, keloid, epidermal inclusion cyst or other non specific umbilical

cyst may rarely present as umbilical nodule and are called Pseudo Sister Mary Joseph’s nodule (5,6,19,20).

Conclusion

FNAC of cutaneous and subcutaneous nodules of abdominal wall plays an important role in rapidly confirming the diagnosis and avoids unnecessary surgical intervention in the majority of cases. It is a valuable tool in detecting metastasis from known and unknown primaries and in follow up of tumor recurrence. Easy and prompt diagnosis of cutaneous metastases can be made because cytologically skin lesions often mimic the primary tumor. Adequate FNA sampling and sufficient cellularity with preserved cytomorphological details is the prerequisite to avoid false negative cases.

Acknowledgements

The study did not receive any financial support. The authors declare that there is no conflict of interest.

References

1. David O, Kluskens L, Reddy V, Gattuso P. Malignant cutaneous and subcutaneous abdominal wall lesions: A fine needle aspiration study. *Diag Cytopathol* 1998;19(4): 267-9.
2. Srinivasan R, Ray R, Nijhawan R. Metastatic cutaneous and subcutaneous deposits from internal carcinoma. *Acta Cytol* 1993;37(6):894-8.
3. Lookingbill DP, Spangler N, Helm KF. Cutaneous metastatic carcinoma: a retrospective study of 4020 patients. *J Am Acad Dermatol* 1993;29:228-36.
4. Rosen T. Cutaneous metastases. *Med Clin North Am* 1980;65:885-900.
5. Sahai K, Kapila K, Verma K. Fine needle aspiration cytology of umbilical nodules: “Sister Joseph’s nodule.” *Diag Cytopathol* 2001;25(5): 309-10.
6. Aich RK, Karin MR, Chakraborty B, Gupta SD, Deb

- AR. Sister Mary Joseph's Nodule. *Indian J Med Paediatr Oncol* 2008;29(2):40-3.
7. Parate SN, Sankalecha SM, Anshu, Munshi MM, Bobhate SS. Utility of fine needle aspiration cytology in skin tumours. *J Cytol* 2003;20(4):180-4.
 8. Daskalopoulou D, Galanopoulou A, Statinopoulou P, Papapetrou S, Pandazis I, Markidou S. Cytologically interesting cases of primary skin tumors and tumor-like conditions identified by fine needle aspiration biopsy. *Diag Cytopathol* 1998;19(1):17-28.
 9. Inwood MJ, Thomson S. Basic hematologic techniques. In: Raphael SS, editor. *Lynch's medical laboratory technology*. 3rd ed. Philadelphia: WB Saunders; 1976. p. 1073-129.
 10. Culling CFA. Histology. In: Raphael SS, editor. *Lynch's medical laboratory technology*. 3rd ed. Philadelphia: WB Saunders; 1976. p. 916-33.
 11. Layfield LJ, Glasgow BJ. Aspiration biopsy cytology of primary cutaneous tumors. *Acta Cytol* 1993;37(5): 679-88.
 12. Spitz DJ, Reddy V, Selvaggi SM, Kluskens L, Green L, Gattuso P. Fine needle aspiration of scalp lesions. *Diag Cytopathol* 2000; 23(1): 35-8.
 13. Patnayak R, Kalyani D, Rao IS, Prayaga A, Sundaram C, Jena A. Cysticercosis: The hidden parasite with short review of literature. *The Internet Journal of Infectious Diseases*. 2007;6(1):DOI: 10.5580/1ac2.
 14. Edoute Y, Malberger E, Kuten A. Umbilical metastasis diagnosed by fine needle aspiration. *J Surg Oncol* 1990; 45: 56-8.
 15. Handa U, Garg S, Mohan H. Fine needle aspiration cytology of Sister Mary Joseph's (Paraumbilical) nodules. *Diag Cytopathol* 2008;36(5): 348-50.
 16. Deb P, Rai RS, Rai R, Gupta E, Chander Y. Sister Mary Joseph's nodule as the presenting sign of disseminated prostate carcinoma. *J Cancer Res Ther* 2009;5(2):127-9.
 17. Shukla P, Gupta D, Bisht SS, Pant MC. Ovarian adenocarcinoma in a young female with skin and umbilical metastasis. *Indian J Med Paediatric Oncol* 2009;30(4):144-6.
 18. Gupta RK, Naran S. Fine needle aspiration cytology of cutaneous and subcutaneous metastatic deposits from epithelial malignancies. *Acta Cytol* 1999;43(2):126-30.
 19. Reyes CV, Jensen J, Eng AM. Fine needle aspiration cytology of cutaneous metastases. *Acta Cytol* 1993;37(2):142-8.
 20. Fratellone PM, Holowecki MA. Forgotten node: A case report. *World J Gastroenterol* 2009; 15(39): 4974-5.