



## Original Article

# Study of Cytodiagnosis of Cutaneous and Subcutaneous Lesions: Experience in a Tertiary Care Hospital

Authors

**Anjali Bode<sup>1</sup>, Rasika Gadkari<sup>2</sup>**

<sup>1</sup>Assistant Professor, <sup>2</sup>Associate Professor

Department of Pathology, Indira Gandhi Govt Medical College, Nagpur

Corresponding Author

**Dr Anjali N Bode**

Add: 401 Shivali App Renge Layout Trimurti Nagar, Nagpur

Email: [anjalidhote@rediffmail.com](mailto:anjalidhote@rediffmail.com), Mobile No: +91-9421942423

## Abstract

*Skin nodule is a common site presentation in many diseases. Due to easy accessibility it is a preferred site if multiple nodules or masses are present. Fine needle aspiration cytology is increasingly preferred for diagnosis in cutaneous and subcutaneous lesion; as it avoids incisional biopsy and acts as quick, less expensive OPD based procedure. This study evaluates accuracy of FNAC as compared to gold standard of Histopathology in diagnosis of skin and subcutaneous lesions.*

**Material and Method:** *A total of 352 palpable cutaneous and subcutaneous nodules from different site of body were studied regarding their clinical and cytomorphological features. FNAC was performed. Air-dried smears were stained with May-Grunwald-Giemsa and wet fixed (95% ethanol) with haematoxylin and eosin and papanicoloeu stains. They were classified on cytology into inflammatory, benign and malignant neoplastic conditions. The malignant lesions were further typed as primary or secondary. Aspirates found inadequate for interpretation were excluded from the study.*

**Result:** *Out of 352 cases 196 were male and 134 were female. There were 41 malignant lesions and 4 inconclusive. Non-neoplastic lesions included keratinous cysts, Hydatid, Filariasis, fungus, Cysticercosis and reactive lymphadenitis etc. Primary malignancies included squamous cell carcinoma, melanoma, plasmacytoma, pleomorphic sarcoma, Kaposi's sarcoma. Of 5 metastatic lesions, three were from lung, one from thyroid and one with unknown primary. Out of 41 malignant lesions histopathology was available in 16 cases and all correlated cytologically.*

**Conclusion:** *FNAC offers rapid diagnosis in cutaneous and subcutaneous lesions, ruling out malignancy in benign conditions and typing of the malignancies which help in management.*

**Keywords:** *FNAC, cutaneous, subcutaneous lesions.*

## Introduction

Practicing FNAC (fine needle aspiration cytology) on palpable and non palpable lesion has advantages to patients and clinicians as it is

painless, inexpensive and rapid OPD based procedure. <sup>[1]</sup> It can be performed on any part of body or tissue. We can do multiple sampling from different parts of large heterogeneous lesions

without complication. By using rapid staining procedures, a preliminary diagnosis can be made within short time and surgery can be avoided if lesion proves to be non neoplastic. In the cases of metastatic malignancy it allows pre-operative staging and planning of the extent of surgery. Also by doing FNAC instead of surgical biopsy seeding of tumor cells to uninvolved tissue may be minimized [2,3]. So FNAC gains its place in clinician protocol for pre-treatment diagnosis of lesions whether inflammatory, benign or malignant. Skin is common site involved primarily in many neoplastic and non neoplastic diseases or secondarily in the form of metastasis. It is must to know which type of lesion is involving the skin. Sometime lesions are present on face in such condition biopsy from site causes cosmetic impairment. So FNAC of skin lesion is a now a day's gaining popularity as same as other sites. [4]

#### Material and Method

This is 2 year prospective study from January 2015 to December 2016. This study is carried out in one of the tertiary care hospital of Nagpur, Maharashtra. During study all palpable skin lesions referred to cytology OPD were included however paediatrics group below 12 years excluded from study. Total 352 cases were included in study with consent taken for diagnostic FNAC after explaining the procedure. Detail clinical history of patient including radiological findings and other investigation details were taken as required. FNAC were performed using 22 to 24 Gauge needle with all aseptic precaution. Repeat aspiration was done if needed. Smears were prepared and divided in to air dried and wet fixed in 90 % ethanol. Air dried smear were stained with May Grunewald Giemsa while wet fixed were stained with PAP and H & E. The lesions were categorised in inflammatory lesions, benign lesions and malignant lesions.

#### Observations

It was observed that there were various types of lesions seen from inflammatory to malignant. In our study male preponderance seen over females i.e. 241 male and 111 females. Epidermal cyst or keratinous cyst is most common lesion (72 cases) in non neoplastic condition followed by ganglion cyst involving in all studied age group. In inflammatory conditions there were variety of parasitic skin infection seen including Hydatid cyst, Filariasis, Cysticercosis and fungus like actinomycosis, phemycosis. In neoplastic conditions benign lesion are more common lipoma is on topmost in list (144 cases). Along with lipoma other benign lesions included were benign adnexal tumor, benign fibrous histiocytoma, pilomatrixoma, benign vascular tumor, myofibromatosis neurofibroma and tumoral calcinosis, pleomorphic adenoma. Malignancies were mainly seen in older age group above 45 years except two cases. First was squamous cell carcinoma seen in very young male of age 16. He was diagnosed as Xeroderma Pigmentosa and presented with ulceronodular lesion on forearm. Second condition was Kaposi's sarcoma seen in 30 yr male who was immune compromised and presented with multiple cutaneous skin nodules all over body.

During period of study there were total 41 malignant cases out of it, 7 were female and rest were male. Commonest primary skin malignancy was found to be squamous cell carcinoma (27 cases) in 16-58 yr of age. Histopathology was available in 18 cases and was confirmed.

There was a single case of extramedullary subcutaneous plasmacytoma, Kaposi's sarcoma and three cases of malignant melanoma. Plasmacytoma was confirmed on serum and urine electrophoresis. Histopathology was available for Kaposi's sarcoma and melanoma.

In our study metastatic deposit of lung malignancy were found to be more frequent. There were three cases of lung malignancy one from large cell carcinoma of lung and two were small cell carcinoma. Histopathology was available in only

one case of small cell carcinoma. In follicular carcinoma of thyroid metastasis, patient came with cutaneous nodule over shoulder. On cytology smears cells in sheets and micro follicle with small nucleus. In metastasis of poorly undifferentiated malignancy 58 yr male patient came with nodules over thigh and forearm without

any significant complaints. FNAC from both sites show similar cytology features. On searching we could not found any origin of this type of cells, so diagnosis was given metastasis of poorly differentiated epithelial malignancy of unknown origin and advised complete radiological investigation.

### Lesion wise classification of cases as follows

**Table I** - Distribution of patients by sex and age

Sex	No of cases	15-35	35-55	>55
Male	241	117	104	20
Female	111	32	67	12
Total	352	149	171	32

**Table II**- Distribution of inflammatory and cystic lesion

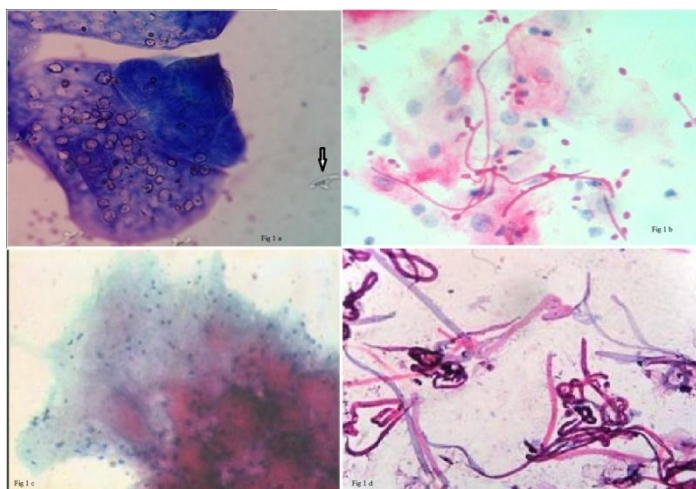
Sr no	Inflammatory lesions	No of cases	Cytology features
1	Keratinous cyst	72	Shows nucleated and anucleated squamous cell with inflammatory or giant cells
2	Ganglion cyst	28	Shows pale histiocyte like cells in Mucoïd material
3	Abscess	17	Shows acute inflammatory and degenerated neutrophils on necrotic background
4	Benign cystic lesion	7	Shows fluidy aspirate with cyst macrophages and cyst disappear after complete aspiration
5	Beckers cyst	2	Clinical history , site along with fluidy aspirate with histocytes
6	Hydatid cyst	1	Shows many hooklets and laminated membrane
7	Cysticercosis	1	Shows scolices ,hooklets and suckers
8	Filariasis	1	Shows microfilaria and eosionphills
9	Fungal infection	3	Shows Fungal hyphae on inflammatory background
10	Total	132	

**Table III** – distribution of benign lesion

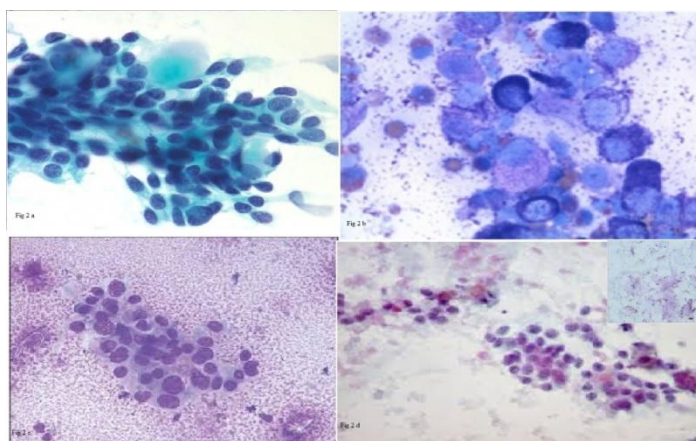
Sr no	Benign lesion	No of cases	Cytology features
1	Lipoma	144	Shows mature adipose tissue on fatty background
2	Benign adnexal tumor	7	Shows cluster or dissociated small basaloid cells in material
3	Tumoral calcinosis	5	Shows calcified chalky white material
4	Neurofibroma	5	Shows spindle cell in fibrillary background having wavy tapering nuclei
5	Benign fibrohistiocytic lesion	4	Shows variable cellularity with plump to spindle cells on myxoid background
6	Benign vascular lesion	3	Shows hemorrhagic aspirate with many endothelial cell lining channels
7	Nodular fasciitis	2	Shows abundant cellularity in myxoid background , cells are elongated having abundant cytoplasm with tapering end
8	Scar endometriosis	2	Shows glandular epithelium with hemosiderin containing macrophages
9	Pilomatixoma	1	Shows nucleated ghost cells with many basaloid cells and calcification
10	Giant cell tumor of tendon sheath	1	Shows multinucleated giant cells admixed with stromal cells
11	Myofibromatosis	1	Shows variable amount of cellularity , spindly cells embedded in collagenous stroma
12	Total	175	

**Table IV – Distribution of malignant lesions**

Sr no	Malignant lesion	No of cases	Cytology features
1	Squamous cell carcinoma	27	Show pleomorphic squamous malignant cells in sheets and singly
2	Melanoma	3	High cellularity with pleomorphic cells having large hyperchromatic nuclei with prominent eosinophilic nucleoli, melanin pigment may be or may not present
3	High grade pleomorphic sarcoma	3	Many large pleomorphic cells with hyperchromatic nuclei, many malignant binucleated, multinucleated cell seen
4	Kaposi's sarcoma	1	Shows high cellularity of spindle cells with many RBCs intermixed with it
5	Plasmacytoma	1	Sheets or singly malignant plasma cells , binucleated plasma cells
6	Metastasis of lung carcinoma	3	Shows metastasis of large cell carcinoma and small cell carcinoma
7	Metastasis of follicular carcinoma of thyroid	2	Many microfollicles show repetitive pattern , scanty or absent colloid
8	Metastasis of poorly differentiated carcinoma of unknown primary	1	Shows highly undifferentiated pleomorphic cells with unknown primary
9	Total	41	

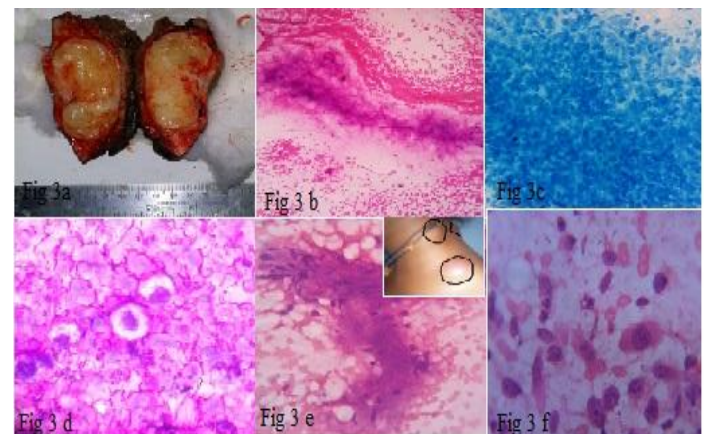


**Fig 1 a** – Smear shows scolices of Hydatid, arrow shows hooklets  
**Fig 1 b** – Smear shows fungal hyphae  
**Fig 1 c** – Smear shows showing wall of Cysticercosis cellulose  
**Fig 1 d** – Smear shows adult filaria

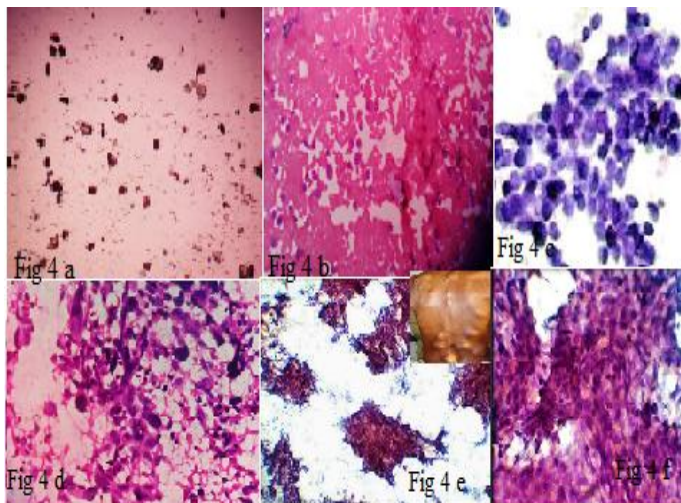


**Fig 2 a** – Smear of cylindroma shows small basaloid cells in basement like material

**Fig 2 b** – Smear of tumoral calcinosis shows calcified material  
**Fig 2 c** – Smear of endometriosis shows cells in glandular pattern  
**Fig 2 d** – Smear of pilomatrixoma shows basaloid cells with ghost keratinizing cells



**Fig 3 a, b, c** – Smear of benign myxomatous lesion shows benign spindle cells in myxoid stroma  
**Fig 3 d** – Smear of ganglion cyst shows macrophages in mucoid material  
**Fig 3 e** – Smear of myofibroblastoma shows collagenous material, inset shows nodular lesion of skin  
**Fig 3 f** – Smear of myofibroblastoma shows plump to spindle cells with oval hyperchromatic nuclei



**Fig 4 a** – Smear of malignant melanoma shows malignant cells with melanin pigment

**Fig 4 b** – Smear of plasmacytoma shows many dysplastic plasma cells

**Fig 4 c** – Smear of metastasis of small cell carcinoma of lung shows small cells with scant cytoplasm

**Fig 4 d** - Smear of pleomorphic sarcoma shows malignant pleomorphic spindle cells

**Fig 4 e,f** – Smears of Kaposi's sarcoma show spindle cells on hemorrhagic background with many RBCs

### Discussion

Initially role of FNAC in skin lesion cytology was limited to only primary skin tumors. There were some doubts about the needling of pigmented lesions for fear of spreading melanoma and interfering with staging, also skin lesions are easy available for incisional and excisional biopsy. Now in modern era FNAC of skin lesion getting popularity for all type of skin lesions because there are many studies by Pranab D et al <sup>[5]</sup>, Devanad B <sup>[6]</sup> Rajat G et al <sup>[7]</sup>, Karki s <sup>[8]</sup> who proves role of FNAC in skin lesion and established the practice .

In our study majority of neoplastic lesions were benign i.e. 147 cases (87.1%) and 41 were malignant (12.9%) which is compare to other studies.

Keratinous cyst were most common diagnosed lesion in non neoplastic, which is comparable to other studies done by Butler et al <sup>[9]</sup>. There was one case of pilomatrixoma, can be differentiated from

keratinous cyst by presence of ghost cells and basaloid cells. But some time aspiration cannot represent basaloid cells and mistakenly labelled as epidermal cyst <sup>[10,11]</sup>

In skin lesion one should not forget about parasitic and fungal infection and always take effort in necrotic and fluidy material to find out fungus and parasite. As in our study on cytology examination we found scolices and hooklets of Hydatid cyst, Cysticercosis and hyphae of fungus in cystic lesion. <sup>[12,13,14]</sup>

Study by Rajesh Kumar et al <sup>[15]</sup> shows lipoma and its variant as the commonest soft tissue tumour as in our study. Lipoma is seen in all age groups. But there are many benign lesions that presented as skin nodules. In our study a 14 yr female came with multiple skin nodules all over the body and clinically she was diagnosed as? Lipomatosis?? Neurofibromatosis .on aspiration smears show plump to spindle cells embedded in collagenous matrix and diagnosis given as myofibromatosis. This is rare entity seen in this age mainly it is seen in neonates and in early childhood. <sup>[16]</sup>

Squamous cell carcinoma mainly seen in age between 45-65 yr particularly involving cheek and lower lip presented as ulceronodular lesions. Only one case of squamous cell carcinoma seen in pt of age 16 yr who was diagnosed as Xeroderma pigmentosa. There are many cases reported in literature of very young patients of Xeroderma pigmentosa developed squamous cell carcinoma. <sup>[17]</sup>

Interestingly, we also encountered a single case of extra skeletal plasmacytoma and Kaposi's sarcoma. Plasmacytoma seen at an unusual site involving chest skin that revealed diffuse population of dysplastic plasma cells. Extramedullary plasmacytoma are found in the head and neck region, particularly in the upper respiratory tract, and to a lesser extent in gastrointestinal tract. <sup>[18]</sup> Kaposi's sarcoma seen in young male patient who was serologically positive presented with multiple skin nodule . Kaposi's sarcoma in India as compare to other developed country less common. <sup>[19]</sup>

Out of three melanoma cases histopathology were available in 2 cases and was confirmed as melanoma.

In metastatic lesion of skin lung malignancy is common to involve and showing similar features as of primary.<sup>[8]</sup>

Skin is common site to involve in neoplastic and non neoplastic conditions. Some time inflammatory lesions presented with big mass and mimic like a malignancy in such condition doing simple FNAC will save further unnecessary complications.

In benign condition of skin lesions though lipoma is common but there are benign adnexal tumor also. They are eccrine and apocrine tumors. Eccrine tumors included cylindroma, hidradenoma, spiradenoma, poroma, syringoma. These all tumor cannot be diagnosed on FNAC but in few we can offer a diagnosis. Like in cylindroma there are cluster and discrete small round to oval cells with hyperchromatic nuclei arranged around the basement membrane like material. This can mimic cytology features of adenoid cystic carcinoma but careful clinical examination and history help in diagnosis.<sup>[5]</sup>

Skin primary malignancy and metastasis both can be present as a nodule and sometime only secondaries presented without known primary. It is a challenge to differentiate between them. Few cytological features help us in diagnosis. In primary lesions of skin adnexal cells are small, basaloid with scant cytoplasm and less pleomorphic nuclei embedded in some material. While secondary malignancy cells are relatively large having pleomorphic nuclei and more cytoplasm. Diagnosis as primary or secondary helps patient and clinician in staging and managing patients. However in cases with overlap excisional biopsy and immunohistochemistry is needed for further interpretation.

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