

Analysis on the Role of Fine Needle Aspiration Cytology in the Diagnosis of Cutaneous and Subcutaneous Swellings: A Retrospective Study**Apala Rajeswari¹, Neha Tiwari², Shweta³, Dilip Kumar⁴**¹Tutor, Department of Pathology, Patna Medical College, Patna, Bihar²Tutor, Department of Pathology, Patna Medical College, Patna, Bihar³Tutor, Department of Pathology, Patna Medical College, Patna, Bihar⁴Professor and Head of Department, Department of Pathology, Patna Medical College, Patna, Bihar

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Conflict of interest: Nil

Abstract

Background: A wide range of inflammatory as well as neoplastic lesions can present as cutaneous and subcutaneous swellings all over the body. FNAC (Fine Needle Aspiration Cytology) is considered to be the first reliable technique for diagnosing them. Aim of this study is to assess the cytological spectrum of lesions presenting as skin and subcutaneous swellings.

Methods: : The present retrospective study was carried out over a period of 6 months at the Patna Medical College, Patna, Bihar in the Department of Pathology and a total of 131 patients with diverse skin and subcutaneous swellings were evaluated cytologically (FNAC). The data collection using a structured clinical proforma were entered into Microsoft Excel sheet. SPSS (Statistical Package for the Social Sciences, SPSS Inc., v.16) was used to do the statistical analysis.

Results: There were 61 (46.6%) females and 70 (53.4%) males in total in this study. The study patient population ranged in age from 8 to 85 years old, with a mean age of 38.02±16.70 years. The youngest patient was eight years old. FNAC aspirate showed that the whitish aspirate was the most common type (44.3%).

Conclusion: Fine Needle Aspiration Cytology is a rapid, reliable technique for initial assessment of cutaneous and subcutaneous swellings and thereby guiding further management.

Keywords: Cytology, Cutaneous, Subcutaneous.

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Introduction

A wide range of inflammatory as well as neoplastic lesions can present as cutaneous and subcutaneous swellings all over the body.[1,2] Fine needle aspiration (FNA) is a simple, fast, and inexpensive technique with high sensitivity and specificity in the evaluation of these masses.[3] It can be effectively employed to diagnose nature of lesion, help to distinguish between neoplastic and reactive process likely to resolve spontaneously or with conservative treatment.[4–6] It helps to diagnose infections presenting as skin nodules.[7]

FNAC is of great value in the investigation of suspected skin and subcutaneous metastatic malignancy.[6] The present study was carried out with the aim to assess the cytological spectrum of lesions presenting as skin and subcutaneous swellings.

Material and Methods

The present retrospective study was conducted in the Department of Pathology, Patna Medical

College, Patna, and Bihar from February 2025 to July 2025. In the present study a total of 131 patients were cytologically evaluated who presented with various skin and subcutaneous swellings. Inclusion criteria for our study were skin and subcutaneous swellings in any part of body of any age group advised for FNAC. Exclusion criteria were deep intramuscular swellings and flat and papular skin lesions.

In each case, a detailed history like patient's age, gender, onset and progression of clinical symptoms and clinical examination findings including location, size, shape, consistency and number of swelling were noted with duly signed consent form. FNAC was performed in all the 131 cases as an outpatient procedure using a 22-23-gauge needle attached to a 20 cc plastic syringe. The lesion site was cleaned using the Iodine solution and ethyl alcohol. Aspirates from different parts of the swellings were collected by alternating the direction of the needle inside the swelling and

giving multiple passes. Both air dried and alcohol fixed smears were prepared and stained by May-Grunwald Giemsa and Hematoxylin & Eosin using standard procedures. The data was collected in a structured clinical proforma and recorded in Microsoft Excel sheet. The statistical analysis was

done using SPSS (Statistical Package for the Social Sciences, SPSS Inc., v.16).

Results

A total of 131 cases of cutaneous and sub-cutaneous swellings were analyzed.

Table 1: Age and gender distribution of study participants

Age Group	Gender		Total
	Male	Female	
0-20 years	12	8	20
	17.2%	13.1%	15.3%
21-40 years	25	35	60
	35.7%	57.4%	45.8%
41-60 years	22	15	37
	31.4%	24.6%	28.2%
>60 years	11	3	14
	15.7%	4.9%	10.7%
Total	70	61	131
	100.0%	100.0%	100.0%

Variables such as age and sex distribution were explained in Table-1. In this study, total number of females was 61 (46.6%) and males were 70 (53.4%). The mean age of patients in this study was 38.02±16.70 years and age range were 8-85 years.

Age of the youngest patient was 8 years. In this study, we found that most of the patients were males and most common age group affected was 21- 40 years with 60 (45.8%) affected participants (Table-1).

Table 2: Type of aspirates

Type of Aspirates	No. of cases	Percentage
Whitish Aspirate	58	44.3%
Cheesy Material	10	7.6%
Blood Mixed Aspirate	53	40.4%
Clear Watery	4	3.1%
Yellow	1	0.8%
Jelly Like	3	2.3%
Dirty White	2	1.5%
Total	131	100%

An observation of FNAC aspirate showed that the whitish aspirate was the most common type in 58 (44.3%) followed by blood mixed aspirate in 53 (40.4%) and cheesy material in 10 (7.6%) cases (Table-2).

Table 3: Distribution of cases according to Cytodiagnosis

Cytodiagnosis	No. of cases	Percentage
Lipomatous Lesion	60	45.8%
Epidermal Inclusion Cyst	38	29%
Benign Cystic Lesion	1	0.8%
Benign Spindle Cell Lesion	10	7.6%
Benign Giant Cell Tumor	4	3.1%
Hemangioma	5	3.8%
Ganglion Cyst	2	1.5%
Blood	2	1.5%
Descriptive Report	9	6.9%
Total	131	100%

Distribution of cases according to cytodiagnosis is explained in Table-3. Lipomatous lesion was the predominant diagnosis with 60 (45.8%) affected cases, followed by epidermal inclusion cyst with 38

(29%) cases and benign spindle cell lesion with 10 (7.6%) cases.

There were 5 (3.8%) cases of hemangioma, 4 (3.1%) cases of benign giant cell tumor and 2

(1.5%) cases of ganglion cyst. There was only 1 (0.8%) case of benign cystic lesion. During FNAC,

2 (1.5%) cases yielded only blood and there were 9 (6.9%) descriptive reports.

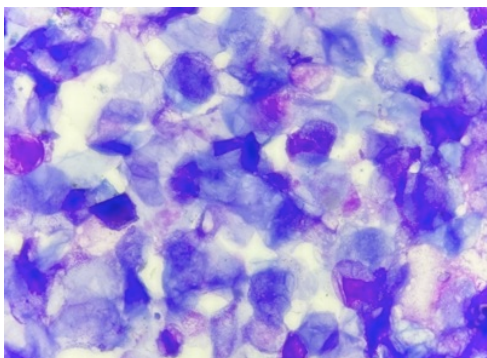


Figure 1: Photomicrograph from a case of epidermal inclusion cyst showing numerous anucleated squamous epithelial cells (MGG, 400X)

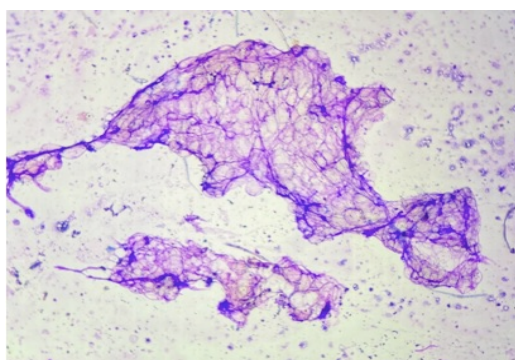


Figure 2: Photomicrograph from a case of lipoma showing fragments of mature adipose tissue (MGG, 100X)

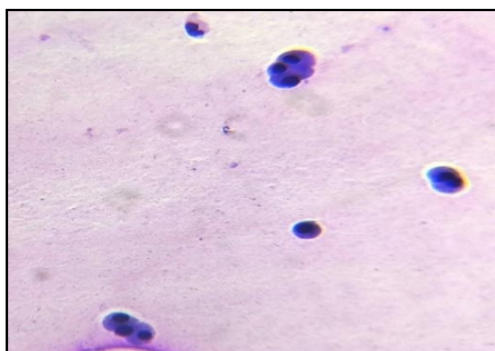


Figure3: Photomicrograph FNAC100X-Ganglion Cyst

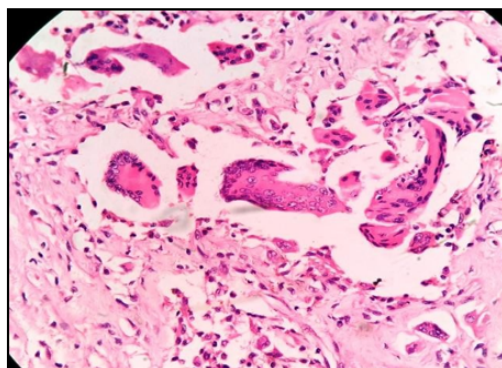


Figure4: Photomicrograph FNAC100X-Giant cell tumor

Discussion

With today's knowledgeable and critical lifestyle, the importance of a pathology report that is precise, timely, and well-structured has grown. In our study FNAC done for a total of 131 cases of cutaneous and sub-cutaneous swellings were analyzed.

It was reported that the mean age of patients in this study was 38.02 ± 16.70 years and age range was 8-85 years. Age of the youngest patient was 8 years and most the patients were males and most common age group affected was 21- 40 years. There was male predominance and the male female ratio was 1.14:1.

These findings are consistent with the study performed by Gupta C et al. (2023) who reported that the majority of the study subjects were male (male female ratio was 1.4:1).[8] The age of study subjects ranged between 6 months to 85 years and maximum subjects were in the age group of 31-40 years and 21-30 years. In similar study carried out by Patel DR et al. (2020) the age of the study subjects ranged between 1 year to 90 years and male predominance was found as the male: female ratio was 1.4:1.[9]

In our study FNAC aspirate observation revealed that the most prevalent form was the whitish aspirate, occurring in 58 (44.3%) instances, followed by blood mixed aspirate in 53 (40.4%) cases and cheesy material in 10 (7.6%) cases. These study outcomes are comparable with the study done by Kala P et al. (2014) in which FNAC aspirates were clear (69.3%) followed by purulent (16.9%), blood mixed (13.1%) and particulate (0.7%).[10] In other study Handa U et al. (2008) reported that FNAC aspirates were clear (48.8%) followed by purulent (28.8%), particulate (15.2%) and blood mixed (7.2%).[11]

Further it was reported that with 60 (45.8%) affected cases, lipomatous lesion was the most common diagnosis. There were 38 (29%) cases of epidermal inclusion cysts, and 10 (7.6%) cases of benign spindle cell lesions.

Four (3.1%) cases of benign giant cell tumours, five (3.8%) cases of hemangiomas, and two (1.5%) cases of ganglion cysts were reported. The percentage of benign cystic lesions was only 1 (0.8%). Nine instances (6.9%) produced descriptive reports during FNAC, while two cases (1.5%) produced only blood.

These results are similar to the study performed by Mazumder G et al. (2016) who evaluated 356 skin and superficial soft tissues and found that 72.04% lesions [lipoma (81.65%), benign spindle cell tumour (15.38%) and vascular lesion (2.95%)] were neoplastic and 27.95% lesions [containing epidermal inclusion cyst (51.17%), suppurative

lesion (31.76%), Granulomatous lesion (14.11%) and ganglion (2.94%)] were non neoplastic in nature.[12] In another study Beg S et al. (2012) observed that malignant lesions were reported among 16.7% study subjects.[13]

Conclusion

In our study FNAC was done for all the patients who presented with various skin and subcutaneous swellings. It was concluded that lipomatous lesion was the most common diagnosis followed by benign spindle cell lesions, epidermal inclusion cysts.

There were four benign giant cell tumor cases, five hemangioma cases, and two ganglion cyst cases recorded. There was only one benign cystic lesion (0.8%) out of the total.

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