

Original Research Article

# Analysis of inconclusive cytology reports on fine needle aspiration samples - A descriptive five-year study in Medical College Hospital in Southern India

Lingasamy Chennimalai<sup>1\*</sup>, Monica Vincent<sup>2</sup>

<sup>1</sup>Post Graduate, <sup>2</sup>Assistant Professor

Department of Pathology, Dhanalakshmi Srinivasan Medical College & Hospital, Perambalur, Tamil Nadu, India

\*Corresponding author email: [lingasamy78@gmail.com](mailto:lingasamy78@gmail.com)

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## Abstract

**Back ground:** Fine needle aspiration cytology (FNAC) is a reliable, rapid, cost-effective, and an accurate diagnostic modality for the evaluation or management of palpable breast lumps, thyroid, salivary gland, and soft tissue and lymph node swellings. This study sought to assess the setting, varieties and frequency of diagnostic uncertainty in the diagnostic line of cytology reports.

**Material and methods:** All inconclusive FNAC reports at the Department of Pathology, Dhanalakshmi Srinivasan Medical College, from 2013 to 2017 were reviewed. Frequency of each of these causes contributing to inconclusive cytology reports was determined.

**Results:** Among the total 4369 FNAC smears, 445 (10.8%) smears turned out to be inconclusive. Inconclusive diagnosis was seen in salivary glands, thyroid and breast followed by soft tissue and lymph node of neck. The most common cause of inconcusibe diagnosis was due to inadequate smear and due to cystic aspirate.

**Conclusion:** We concluded that inadequate cellularity was the predominant cause of inconclusive cytology the specimens. Cystic aspirate was the predominant cause of inconclusive cytology in thyroid and salivary gland specimens. Usage of Imaging guided techniques, multiple aspirations, Triple test, use of standard reporting systems and cell block preparation decreases the occurrence of inconclusive cytology reports.

## Key words

Fine Needle Aspiration Cytology (FNAC), Inconclusive cytology reports, Atypia of unknown significance, Inadequate smears, Cystic aspirate.

## Introduction

Fine Needle Aspiration Cytology (FNAC) is cost-effective, reliable, rapid and inexpensive procedure in diagnosis of various clinically palpable as well as deep seated swellings [1]. Nowadays FNAC is used routinely as a first-line diagnostic test. It is not only useful in the diagnosis of various lesions but can also help in deciding on appropriate management [2].

In few cases there may be need of repeat FNAC procedure. Because of repeat FNAC procedures the patient may feel tension and the pathologist have to face needless workload [3-6]. There is a significant proportion of cases with non-diagnostic FNAC results which varies from 10-20% [7, 8]. Among various causes of inconclusive diagnosis, common ones are inadequate cellularity, artifactual changes etc. [9]. Therefore, this study sought to assess the setting, varieties and frequency of diagnostic uncertainty in the diagnostic line of cytology reports.

## Materials and methods

All inconclusive FNAC reports at the Department of Pathology, Dhanalakshmi Srinivasan Medical College, Perambalur, from 2013 to 2017 were reviewed. Institutional ethical committee approval was obtained. The reason for inability to arrive at conclusive diagnosis are inadequate or scanty aspirate, nature of suspected lesions, artefactual changes, lack of access to vital clinical data, possibility of wide range of differential diagnosis, atypical or suspicious features of unknown significance, difficulty in interpretation. The data was represented in a tabular form in terms of number and frequency distribution.

## Results

The results of the study were tabulated. Most of the inconclusive diagnosis was seen in salivary glands, thyroid and breast followed by soft tissue and lymph node of neck. Overall inconclusive diagnosis was 10.8% (**Table - 1**).

**Table - 1:** Frequency distribution of inconclusive diagnosis.

	Total number of cases	Inconclusive diagnosis	Percentage (%)
Breast	881	122	13.8
Thyroid	871	119	14
Lymph node and neck	1779	108	6
Salivary gland	221	32	14.2
Soft tissue	259	24	9.3
Others	358	40	11.2
Total	4369	445	10.8

The most common cause of inconclusive diagnosis was due to inadequate smear and due to cystic aspirate (**Table - 2**). The FNAC of breast and thyroid are illustrated in **Figure - 1, 2**.

## Discussion

Among the total 4369 FNAC smears examined in the department of pathology in DSMCH, 445

smears turned out to be inconclusive; this makes about 10.8% of the total smears examined. In various institutions on all other international studies which have reported 10-20% of non-diagnostic FNAC results [6, 10].

Our study showed that salivary gland specimen reported the maximum inconclusive results

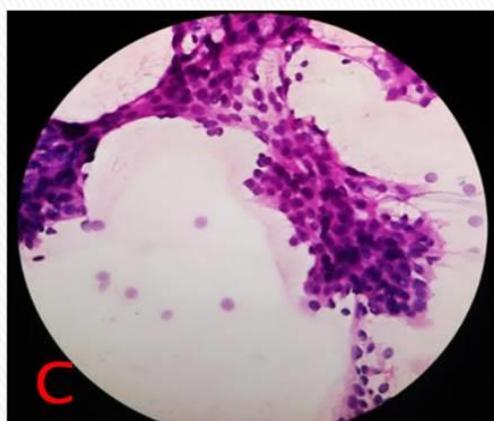
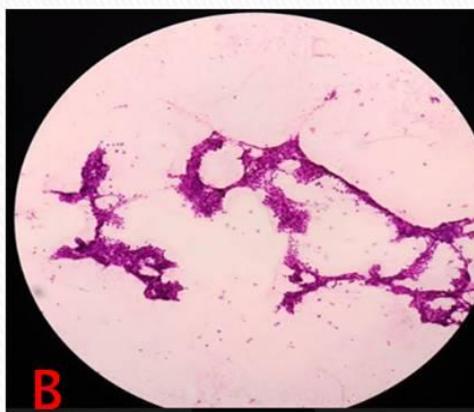
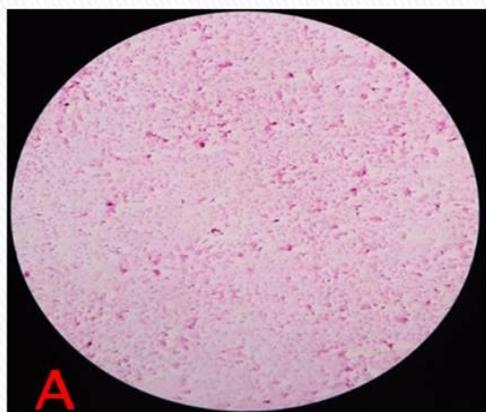
14.2%, followed by thyroid 14% and breast 13.8%. The lowest inconclusive results were reported among lymph node of the neck which was about 6%. On analysis of the inconclusive results, the commonest cause was predominantly due to inadequate smear in about 72% of the cases, the other causes being cystic aspirate 12%, difficult interpretation 8% and AUS 7.3%. This result is comparable with study by Gunvanti, et al. [11], which reported 51.61% inadequate smears. The reason for high % of inadequate

smears is high prevalence of hypocellularity, vague nodule, fibrosis, fat necrosis among breast specimens. This can be averted by usage of 5 tier system, image guided aspiration and triple test. Thyroid specimens-the commonest cause of inconclusive cytology among thyroid specimens was found to be cystic aspirate, 50%. This result are on par with study by Mayoaran N., et al. [12]. These inconclusive results can be reduced by usage of image guided aspiration, multiple aspiration and ROSE technique.

**Table - 2:** Frequency distribution of inconclusive diagnosis according to the site.

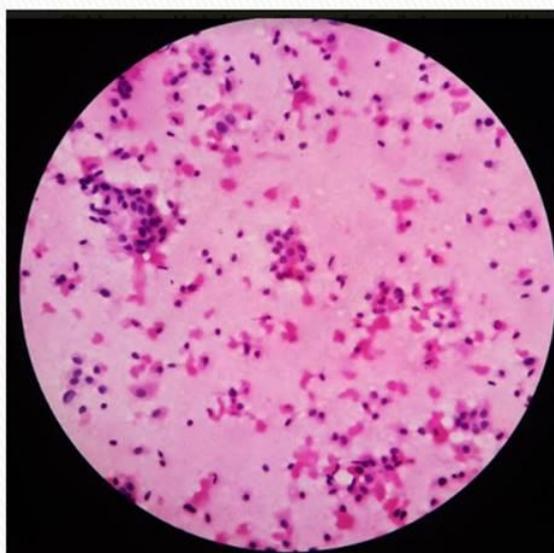
	Breast N (%)	Thyroid N (%)	Lymph node and neck N (%)	Salivary gland N (%)	Soft tissue N (%)	Others N (%)
Inadequate smear	88(72.1)	31(26)	62(57.4)	7(21.8)	14(58.3)	21(52.5)
Atypia of unknown significance	9(7.3)	8(6.7)	10(9.8)	13(40.6)	3(12.5)	8(20)
Difficult in interpretation	10(8.1)	20(16.8)	2(1.9)	1(3.1)	2(8.3)	2(5)
Cystic aspirate	15(12.2)	60(50.4)	34(31.4)	11(34.3)	5(20.8)	9(22.5)
Total	122(13.8)	119(14)	108(6)	32(14.2)	24(9.3)	40(11.2)

**Figure - 1:** Breast- FNAC.

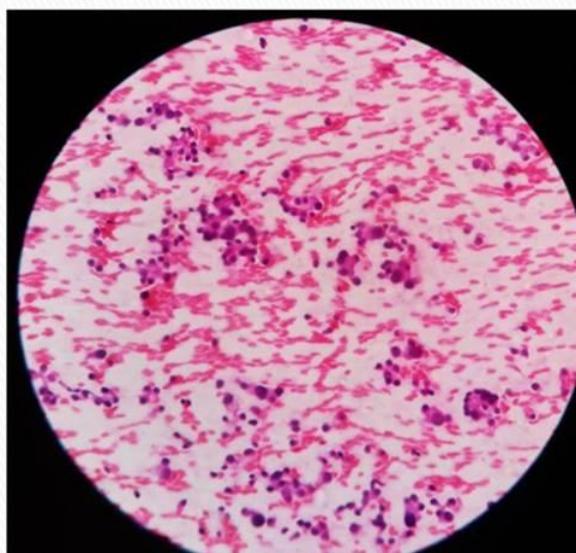


- A) Cystic aspirate, Breast, H&E stain, 40X
- B) USG guided FNAC, H&E stain, 10X
- C) USG guided FNAC, H&E stain, 40X

**Figure - 2:** Thyroid.



**FNAC of Thyroid, H&E stain 40x**



**FNAC of Thyroid, H&E stain 40x**

The cystic aspirate is the commonest cause of inconclusive results among lymph node specimens, 31%. This result confirmed the results of previous studies by Kolte S. S., et al. [13]. Usage of USG guided aspiration technique, multiple aspirations decreases the frequency of inconclusive smears. In case of salivary gland smears, inconclusive cytology, were due to AUS 41%, cystic aspirate 34%, inadequate smear 22%. These results were comparable with studies by Sandhu V. K., et al. [14]. High prevalence of AUS was due to hemorrhagic background of the salivary gland specimens. Good smear rate in salivary specimen can be increased by usage of cell block and pistol grip method. Other specimens-other system constituted by male genital tract, Pancreas and skin in these specimens' inconclusive cytology commonly due to inadequate smear (58%). Image guided biopsy is the remedy for conclusive results.

### **Conclusion**

On analysis of all the inconclusive cytology smears, we conclude that inadequate smear was the predominant cause of inconclusive cytology in breast, soft tissue, and male genital tract, pancreatic and skin specimens. Cystic aspirate was the predominant cause of inconclusive cytology in thyroid and salivary gland

specimens. AUS played a significant role in inconclusive cytology in salivary gland specimens. Usage of Imaging guided techniques, multiple aspirations, Triple test, 5 tier system and cell blocks increase the chances of significant conclusive cytology reports. By using the above methods, we can definitely bring down the inconclusive smear rate from the current level of 10.8%.

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