



**“ROLE OF INTRA OPERATIVE IMPRINT CYTOLOGY IN THE DIAGNOSIS OF THYROID SWELLINGS AND ITS CORRELATION WITH FNAC AND HISTO PATHOLOGICAL EXAMINATION”**

**KEYWORDS**

Imprint cytology, FNAC, Thyroid, Goiter, Follicular neoplasm

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**ABSTRACT**

**Objective:** Imprint cytology is more accurate than FNAC by comparing the two by Chi Square test. It helps in early detection and proper management of thyroid lesions using Histopathology report which is regarded as gold standard and help to reduce unwanted surgeries.

**INTRODUCTION:**

It is an Intra operative procedure introduced by Dudgeon & Patrick to help the surgeon pursue a proper course at the time of surgery since it is a rapid and economical procedure. Imprints prepared from surgical specimens gives excellent cytological details and provide valuable information when frozen section is equivocal. It is a valuable alternative or compliment to frozen section with a comparable level of accuracy<sup>2</sup>. It is an application using similar technique & diagnostic criteria as in FNAC<sup>3</sup>. Imprints cover a wide area of tissue & therefore difference of histological structure are more likely to be represented & clearly in these smears than in a conventional paraffin section taken from a small area.<sup>3</sup> Specimens too small for sectioning can still be studied at the cellular level by Imprint cytology & diagnosis is made in that order 4. By this rapid smear it is possible to determine the extent of spread of the neoplasm & to evaluate intra operatively the adequacy of excision. It is a simple, safe, rapid, time saving, cost effective & reliable Intra operative procedure with diagnostic accuracy higher than FNAC in detecting malignancy<sup>5</sup>. In spite of few drawbacks Intra operative Imprint cytology is probably the only means of obtaining a rapid Intra operative diagnosis where access to rapid histologic diagnosis is limited or no existing<sup>6</sup>.

**MATERIALS & METHODS:**

The study is a 20 months prospective study of thyroid swellings undertaken in the department of Pathology. The study comprised 147 cases presented with thyroid swelling. The patients were subjected to pre operative FNAC using 22 /23 Gauze needle. The smears were fixed with 95% ethyl alcohol/ 85 % isopropyl alcohol and stained with H & E and May Grunwald Giemsa stain.

Following thyroidectomy the specimens were sectioned immediately after the surgery in OT & glass slides touched on the surface focusing on point of gross pathological changes. Smears are fixed with 95% ethyl alcohol/ 85 % isopropyl alcohol and stained with H & E, May Grunwald Giemsa stain, papanicalou stain & congo red stains where ever necessary.

**RESULTS:**

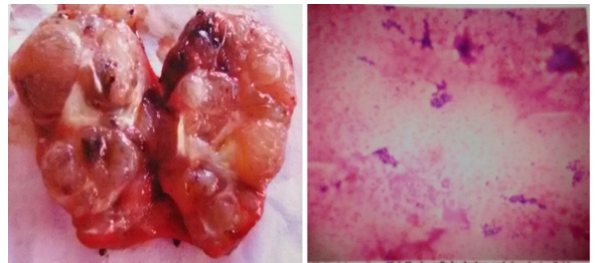
In the present study total number of 147 cases of thyroid swellings are analysed and compared with FNAC and final Histopathology report which regarded as the gold standard .The cytological report of thyroid imprints was given as Non neoplastic lesions (Goiters, thyroiditis), Neoplastic (benign & malignant) & tabulated as shown below.

**Lesion wise distribution of thyroid swellings:**

Lesion	No of FNAC cases	% Of cases	No of cases on Imprint cytology	% of cases
Non neoplastic	61	41.50%	76	51.72%

Benign	41	27.88%	41	27.88%
Malignant	20	12.93%	24	16.03%
Others	24	16.33%	06	4.07%
Miscellaneous	01	0.68%	-----	-----

The table revealed that both on FNAC & imprint cytology non neoplastic lesions are the most common followed by benign and malignant lesions.



Gross appearance of multinodular goiter By 1230/2008

Imprint smears cy 630/2008 – Nodular Goiter with follicular cells in clusters & abundant colloid

**Age wise distribution of thyroid swellings:**

Lesion	11-20 yrs	21-30 Yrs	31-40 Yrs	41-50 yrs	51-60 yrs	61-70 Yrs	No of cases	% of cases
Non neoplastic	2	29	23	16	6	nil	76	51.72%
Benign	5	15	15	2	3	1	41	27.88%
Malignant	4	6	9	3	2	nil	24	16.32%
Others	1	4	Nil	1	nil	nil	06	4.07%

The table reveals that out of 170 cases noticed highest incidence was noticed in 3<sup>rd</sup> decade followed by 4<sup>th</sup>, 5<sup>th</sup>, 2<sup>nd</sup> & 6<sup>th</sup> decades respectively.

**Sex wise distribution of thyroid swellings:**

Lesion	Male	% of cases	Female	% of cases
Non neoplastic	3	2.05 %	73	49.67 %
Benign	2	1.36 %	39	26.52 %
Malignant	5	3.40%	19	12.93 %
Others	nil	-----	6	4.08 %

**Among the total number of 170 cases females outnumber males with**

**M : F ratio of 1 : 13.7**

**DISCUSSION:**

In this study Patients with palpable thyroid swellings were subjected to pre operative FNAC. Patient whose FNAC report indicated surgery were followed to surgery. In the Operation Theatre during surgery

intra operative Imprint smears from the resected specimens were studied. The specimens were then sent for Histo pathological examination. In the present study the cases were distributed among the age group from 14 yrs to 65 yrs. Females are predominantly affected by thyroid lesions & outnumber males with a Male to Female ratio of 1: 13.7. In the present study cytological diagnosis by both FNAC & Imprint cytology was correlated with Histo pathological diagnosis and the overall diagnostic accuracy was 80.4% and 92.72% respectively. The results of the present study were compared with the results of published series and were found to be comparable.

Studies	No. of cases	Accuracy
Yashitavo Sakai & Kaleci Lausalahti et al	20	95.5 %
Suen et al	39	93.8 %
Kontozoglu et al	18	100 %
Bose et al	50	98 %
Rajiv et al	98	95.9%
Rashmi et al	50	94 %
Tung Kwang Lee	27	92.9 %
Present study	147	92.72%

#### Comparison of statistical analysis of Imprint cytology of different studies with present study

Studies	sensitivity	Specificity	Positive predictive value	Negative predictive value	Accuracy
Rajiv et al	71.4 %	100 %	100 %	95.5 %	95.5 %
Yashitavo et al	71.4 %	100 %	100 %	95.5 %	95.5 %
Rashmi et al	50 %	97.5 %	66.6 %	95.7 %	94 %
Present study	88.46 %	96.55 %	95.83 %	90.32 %	92.72 %

#### CONCLUSION:

FNAC and Imprint cytology are two important modalities in the diagnosis of thyroid lesions. Imprint cytology is a safe, simple, time saving, cost effective & reliable procedure with diagnostic accuracy higher than FNAC in detecting malignancy. Imprint cytology is a safe, simple, time saving, cost effective & reliable procedure with diagnostic accuracy higher than FNAC in detecting malignancy. It was found to be useful with significant correlation and is recommended in the diagnosis & evaluation of thyroid lesions. It was found to be useful in diagnosing benign and malignant lesions & Imprint cytology has an overall accuracy of 92.72% and sensitivity of 88.46% which is higher than FNAC in detecting malignancy. Both FNAC & Imprint cytology are complementary to the diagnosis of various non neoplastic and neoplastic lesions of thyroid though not substitute to the biopsy, which is still regarded as the gold standard.

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