

# Role of FNAC in diagnosis and management of multi nodular goitre

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## Abstract

**Problem statement:** FNAC is a safe and fairly accurate method in diagnosis and management of multi nodular goitre. It is also used for establishing whether MNG is a benign or malignant. Surgery can be avoided in many patients with benign disease. Complications of FNAC are negligible and patient acceptance is high. Enlargement of the thyroid gland is the most common manifestation of the thyroid disease. The enlargement may be either generalized or localized, which again may be, toxic or nontoxic. Nodular goiters are more common in women than in men and the modularity increases with increasing age. Multi nodular goitre can become malignant but it is rare. **Methods:** Present study consists of patients admitted with nodular thyroid swelling from Nov 2015 to Oct 2016 at Dept. ENT and Head Neck surgery of Darbhanga Medical College and Hospital Total 25 patients were admitted and treated during this period. X-ray of neck, AP and lateral views and X-ray of the chest were done in all the cases. **Results:** Clinical examinations were subjected for relevant investigations, taken up for surgery with prior FNAC. Carcinoma, were not evident. Total number of 25 cases studied, 5 were males (20 %) and 20 were females (80%) with a female to male ratio of 4: 1. FNAC of the thyroid was done in all the cases and the results compared with histopathological report of operated specimen. **Conclusion:** The main indications of surgery in MNG are cosmetic problem, pressure effect symptoms, secondary thyrotoxicosis and suspicion of malignancy. Subtotal thyroidectomy is the surgery of choice for MNG. But a trend towards total thyroidectomy is replacing subtotal thyroidectomy in the management of MNG as recurrence of goiter is avoided.


**Key Word:** FNAC, MNG, Thyrotoxicosis, Subtotal Thyroidectomy, Total Thyroidectomy.

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## INTRODUCTION

Different imaging techniques are now used for pre operative diagnosis of solitary thyroid nodule like radio nucleotide scanning, high resolution ultrasonography etc. but fine needle aspiration cytology is regarded as the single and most cost-effective procedure.<sup>1</sup> Fine needle aspiration cytology of malignant thyroid nodules reported to have sensitivity and specificity ranges from 65-98% and 72-100% respectively.<sup>2</sup> Although there is a large body of world literature claiming the accuracy and

usefulness of thyroid cytology, there is also evidence of showing possible limitations and pitfalls of this procedure.<sup>3</sup> Fine needle aspiration cytology of thyroid gland is now a well established, first line diagnostic test for the evaluation of diffuse thyroid lesion as well as of solitary thyroid nodule with main purpose of confirming benign lesion and by reducing unnecessary surgery. The main goal of evaluating these nodules by FNAC is to identify nodules with malignant potential and get prompt management of them, considering the limitations of open biopsy and advantages of FNAC.

Any solitary or dominant thyroid nodule larger than 1 cm should have cytology done as smaller nodules carry a very low risk of morbidity. FNAC is the most cost-effective invasive pre-operative investigation, whose simplicity and safety justify its use for “selective” surgery and is considered the “gold standard” in the management of thyroid nodules.<sup>4,5</sup> FNAC is usually performed without local anaesthesia and the patient does not require any previous preparation. In medical centres with longstanding experience, diagnostic (adequate) biopsies obtained from solid nodules range from 90–97%.<sup>6,7</sup> The

first well-documented partial thyroidectomy was undertaken in Paris in 1791 by Pierre Joseph Desault (1744-1795), during the terror of French Revolution. Guillaume Dupuytren (1777-1835) also in Paris, undertook total thyroidectomy in 1808 for a Goitre weighing 1.2 kgs, but the patient died. In 1821, Johann Hedenus (1760-1836) of Dresden, successfully removed six “suffocating goitre”, by dissection and ligation of all the arteries. This achievement was not equaled for next forty years.

## METHODS

Present study consists of patients admitted with nodular thyroid swelling from Nov 2015 to Oct 2016 at Dept. ENT and Head Neck surgery of Darbhanga Medical College and Hospital. Total 25 patients were admitted and treated during this period. The age group were 20 to 70 years. Age group most commonly affected in 31 – 40 years (9 cases) 36%. 5 were males (20 %) and 20 were females (80%) with a female to male ratio of 4: 1.

After admission, a detailed history was taken and thorough clinical examination was carried out which was entered in the proforma. The patients were investigated. The investigations included Hemoglobin percentage, urine analysis, blood sugar estimation, blood urea estimation, blood grouping and Rh typing, serum cholesterol, x-ray of the neck-AP and lateral views and chest X-ray and ENT examination. All patients had a Thyroid profile and FNAC done. Few selected patients underwent thyroid tc99 isotope scan before surgery. These patients underwent surgery and all the excised thyroid specimen were sent for Histopathological examination.

Patients were discharged after removing the sutures and were asked to come for follow up. Post-operative thyroid profile was done on post-operative week. Advised to take the needful medications accordingly.

## RESULTS

**Table 1:** Age and sex wise distribution

Age in Year	Male	Female	Total	Percentage (%)
20- 30	0	7	7	28
31-40	1	8	9	36
41-50	2	3	5	20
51-70	2	2	4	16
<b>Total</b>	<b>5</b>	<b>20</b>	<b>25</b>	<b>100</b>

**Table 2:** Period of Swelling

Period of Swelling	No. of Cases	Percentage(%)
2 months	18	72
2-6 months	4	16
1 year	1	4
2 years	1	4
5 years	1	4

**Table 3:** Pain in Thyroid swelling

Swelling	No. of Cases	Percentage (%)
Painless Swelling	21	84
Painful Swelling	4	16
<b>Total</b>	<b>25</b>	<b>100</b>

**Table 4:** Pressure symptoms

Symptom	No. of Cases	Percentage (%)
<b>1. Pressure Symptoms</b>		
Alteration in voice	0	0
Difficulty in swallowing	2	8
Difficulty in breathing	8	32
<b>2. No Pressure symptoms</b>	<b>15</b>	<b>60</b>
<b>Total</b>	<b>25</b>	<b>100</b>

**Table 5:** Cases of toxicity

Toxicity	Female	Male	Total	Percentage(%)
With Toxicity	3	1	4	16
Without Toxicity	17	4	21	84
<b>Total</b>	<b>20</b>	<b>5</b>	<b>25</b>	<b>100</b>

**Table 6:** Results of FNAC

Report of FNAC	No. of cases	Percentage(%)
Colloid goitre	21	84
Hashimoto's Thyroiditis	3	12
Follicular neoplasm	1	4
Malignancy	0	0
In conclusive	0	0
<b>Total</b>	<b>25</b>	<b>100</b>

**Table 7:** Histopathological investigation of Thyroidectomy

Histopathological Report	No. of cases	Percentage(%)
Colloid goitre	23	92
Hashimoto's thyroiditis	2	8
Follicular adenoma	0	0
Follicular carcinoma	0	0
Papillary carcinoma	0	0
Medullary carcinoma with papillary CA	0	0
<b>Total</b>	<b>25</b>	<b>100</b>

## DISCUSSION

25 patients with Multinodularity of the thyroid gland without evidence of malignancy were studied and evaluated in terms of history, clinical examination and subjected for relevant investigations, taken up for surgery with prior FNAC and histopathology of operated specimen done post operatively. The results were analyzed as depicted in the **table 1 to 7**. The age and sex distribution of the patients studied the total number of 25 cases studied, 5 were males (20 %) and 20 were females (80%) with a female to male ratio of 4: 1. Antonio Rios *et al* (2004) showed that 89% were females. Female to male ratio was 5: 1. In age group of 20-30 years, male and

Female were (28%). Maximum number of the cases at the age group was 31-40 years (36%). The Chief complaint in our patients (100%) was swelling in front of the neck. Duration of swelling ranged from 2 months to 5 years and 72% (18 cases) were found in duration of swelling at starting two months. Pain less swelling were 84% (21 Cases) and Painful swelling were 14% (4 Cases). Incidence of pressure symptoms there were no pressure symptoms cases was higher than pressure symptoms. Toxic symptoms and signs were seen without toxicity cases (84%) and toxicity cases were (16%). FNAC of the thyroid was done in all the cases and the results compared with histopathological report of operated specimen. In 1995, Agarwal *et al.*, in the Tata Memorial Hospital, Mumbai, evaluated thyroid nodules in 100 cases. FNAC demonstrated an accuracy of 90.9%, a sensitivity of 76.5%, and a specificity of 95.9%. False-positive 2%, false-negative 4%; positive and negative predictive value was 86.7% and 92.2%. They resumed FNAC as an adjunct to clinical judgment and not to replace it.<sup>(8)</sup> In 1980, Ghosal, Pal and Mazumdar reported that accuracy rate of FNAC was 93%.<sup>(9)</sup> In 1995, Mandreker *et al.*, in Goa Medical College favored the use of FNAC in thyroid lesions, especially solitary thyroid nodules.<sup>(10)</sup> Gardner *et al.*, reviewed the histological findings of 56 thyroid lobectomies in comparasion to FNAC observed that abundant colloid, regular spacing, and large follicles are helpful in distinguishing macro follicular and mixed lesions from micro follicular ones, which have a higher malignant potential.<sup>11</sup> Based on novel pattern analysis in the interpretation of a solitary thyroid nodule, the study at Salem showed a sensitivity of 66.7% and specificity of 98.9%. The positive predictive value and negative predictive value were 88.9% and 96% respectively and the overall diagnostic accuracy was 95.4%. The study demonstrated the feasibility and applicability of pattern analysis in diagnosing thyroid lesions by FNAC.<sup>12</sup> The study from Queen Elizabeth II Health Sciences Centre, Canada concluded that the introduction of a reporting template increased the diagnostic precision of thyroid FNAC reporting without impacting the overall diagnostic categorization or cytohistologic concordance.<sup>13</sup> FNAC is a common investigation in the diagnosis of superficial lumps though its success depends on the skill of the person performing the procedure.<sup>14</sup>

## CONCLUSION

MNG is the commonest thyroid disease in our hospital, more common in females, with chief complaints of

swelling In front of the neck. FNAC is very useful in the diagnosis and management in MNG. Radioisotope scan is used to know the functioning tissue and also retro sternal extension. The main indications of surgery in MNG are cosmetic problem, pressure effect symptoms, secondary thyrotoxicosis and suspicion of malignancy. Subtotal thyroidectomy is the surgery of choice for MNG. But a trend towards total thyroidectomy is replacing subtotal thyroidectomy.

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