

## A Clinical Study of Multi Nodular Goitre

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**Abstract: AIMS & Objectives** - To study the age and sex distribution. To study the various modes of clinical presentation. Usefulness of FNAC in the management of multinodular goitre. To study the pre-operative, per-operative and post-operative complications and its management.

**Methodology:** This is a randomized prospective clinical study of multinodular goitre patients admitted in THIRUVARUR MEDICAL COLLEGE HOSPITAL , A total number of 50 cases studied from the period April 2016 to August 2018 in a span of 24 months. Complete clinical examination and necessary laboratory investigations were performed.

**Conclusion:** FNAC is an invaluable, minimally invasive highly accurate and cost effective procedure for preoperative assessment of patients with thyroid lesions. FNAC is very useful in the diagnosis and management of MNG

**Keywords:** Thyroid , multinodular goiter , FNAC, Thyroidectomy

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### I. Introduction

Though the thyroid and its diseases were known to the physicians from the time immemorial, the subject still continues to evince great interest even today from the clinician and the pathologist alike. As Willis stated, for the thyroid gland, working in continuous state of interest having alternate periods of cellular activity and quittance in response to an array of exogenous and endogenous stimuli, it is not so surprising that it suffers from a wide variety of disease. A constant supply of thyroid hormones is necessary for growth, development and maintenance of metabolism and functional activity of most organs. Diseases of thyroid are manifested either qualitative and quantitative alterations in hormone secretion or enlargement of thyroid (goitre) or both.

The thyroid gland, reddish brown and highly vascular, is placed anteriorly in the lower neck. Level extends from the 5th cervical to the 1st thoracic vertebra. Its weight is usually 25 grams. The gland is slightly heavier in the female sex and enlarges during pregnancy and menstruation. 1

The thyroid gland functions primarily to produce thyroid hormones. It stimulates the oxygen consumption of most cells in the body, helps regulate lipid and carbohydrate metabolism and are necessary for normal growth and maturation. Nodular goitre is probably the most common endocrine problem in the world today. 3

#### Goitre:

The commonly accepted definition of Goitre "A Thyroid Gland i.e., at least twice its normal size". In general, the term is applied to the benign enlargement of thyroid gland. 4

Worldwide, nodular goitre remains a problem of enormous magnitude. It is estimated that no less than 5% of the world's population have goitres. Depending on the population studies, multinodular goitre occurs in upto 12% of adults. Multinodular goitre is more common in women than men and increases in prevalence with age. The incidence of carcinoma in multinodular goitre has been reported as 5% to 10%.5

Neither a well formulated nor a simple procedure is available for the management of patients with MNG. The main reason for such situation to exist is, nodular lesions may represent one of the many different cell types that cannot be distinguished from one another without histologic study. 6

These nodules may be benign or malignant. Ultimately, it is this threat of malignancy that poses a major problem.

FNAC is a diagnostic tool in which cells are extracted from the palpable swelling using FNAC gun, syringe and fine needle. It is simple, quick, safe and cost-effective. FNAC is increasingly being used for evaluation of thyroid swellings. 7

The study of multinodular goitre is essential, as it is a commonly encountered endocrine problem in clinical practice. The major concern in modern thyroid gland surgery is morbidity. Besides haemorrhage and hypoparathyroidism, damage to the recurrent laryngeal nerve is the complication most feared by both patient and surgeon. It represents a serious complication inducing, when bilateral, serious functional sequelae such as phonatory, respiratory and psychological problems that limit working capacities and social relationships of the patients.

Post- operative respiratory complications may need either life saving endotracheal intubation followed by tracheostomy or immediate tracheostomy.

## II. Aims & Objectives

- I. To study the age and sex distribution.
- II. To study the various modes of clinical presentation.
- III. Usefulness of FNAC in the management of multinodular goitre.
- IV. To study the pre- operative, per- operative and post- operative complications and its management.

## III. METHODOLOGY

This is a randomized prospective clinical study of multinodular goitre patients admitted in THIRUVARUR MEDICAL COLLEGE HOSPITAL , A total number of 50 cases studied from the period April 2016 to August 2018 in a span of 24 months. Complete clinical examination and necessary laboratory investigations were performed.

### Inclusion criteria:

Patients with enlargement of thyroid gland, with more than one nodule palpable or enlarged thyroid gland with nodular surface. Both toxic and non- toxic multinodular goitres were included in the study.

### Exclusion criteria:

Diffuse hyperplastic goitre, Solitary nodule of thyroid, Thyroid enlargement with the clinical features suggestive of malignancy and multinodular goitre patients not undergoing surgery were excluded.

The pre- operative treatment in most cases consisted of supportive treatment to control of toxicity in cases of toxic multinodular goitre. Patients operated after getting medical fitness for surgery. The operated specimen was sent for histopathologic examination in all cases. Movement of vocal cords was noted at the end of the operation in every case.

## IV. Results

In the present study the maximum age recorded was 65 years and minimum age recorded was 17 years with the mean age 36.36 years. Highest incidence was observed in the age group 31- 40 years (34 percent)

**Table 3.1:** Age Distribution

Age in Years	Total Number of Patient	Percentage
0-10	0	0
11-20	2	4
21-30	14	28
31-40	17	34
41-50	13	26
51-60	2	4
60 and above	2	4
<b>Total</b>	<b>50</b>	<b>100</b>

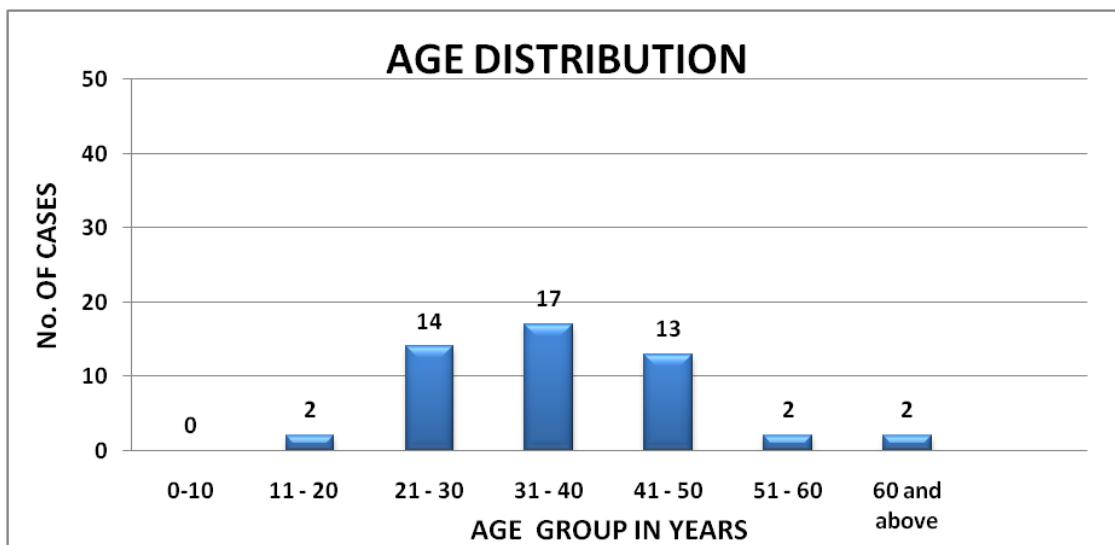


Fig 3.1: Age Distribution

Table 3.2: Sex Distribution

Sex	Number of Cases	Percentage
Female	47	94
Male	3	6
<b>Total</b>	<b>50</b>	<b>100</b>

### SEX DISTRIBUTION

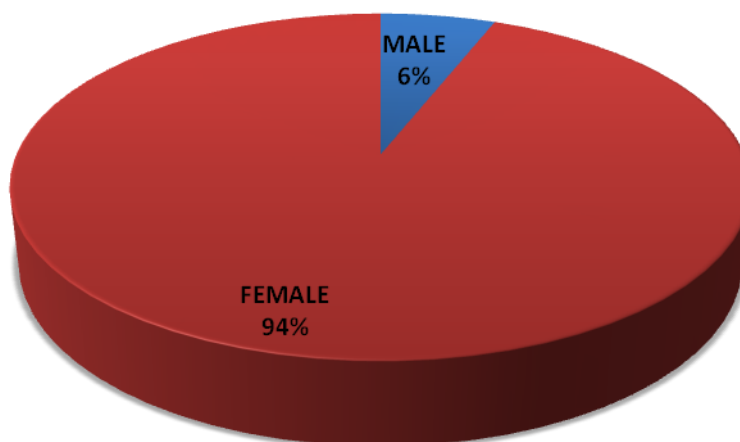


Fig 3.2: Sex Distribution

In the present study, out of 50 cases, 47 were females and 3 were males, with a female to male ratio 15.7:1

Table 3.3: Age and Sex Distribution

Age in Years	Males	Females	Total Number of Cases	Percentage
0-10	0	0	0	0
11-20	0	2	2	4
21-30	0	14	14	28
31-40	0	17	17	34
41-50	2	11	13	26
51-60	0	2	2	4
60 and above	1	1	2	4
<b>Total</b>	<b>3</b>	<b>47</b>	<b>50</b>	<b>100</b>

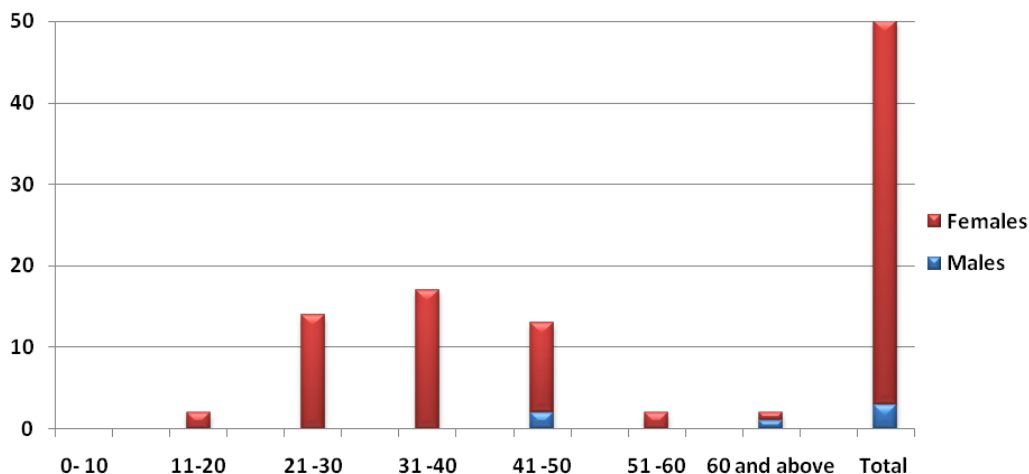


Fig 3.3: Age & Sex Distribution

Table 3.4: Symptomatology

Symptoms	Number of Cases	Percentage
Swelling in front of neck	50	100
Pain and discomfort	10	20
Palpitation	5	10
Dysphagia	1	2
Dyspnoea	1	2
Increased sweating	4	8
Increased appetite	3	6
Weight loss	3	6

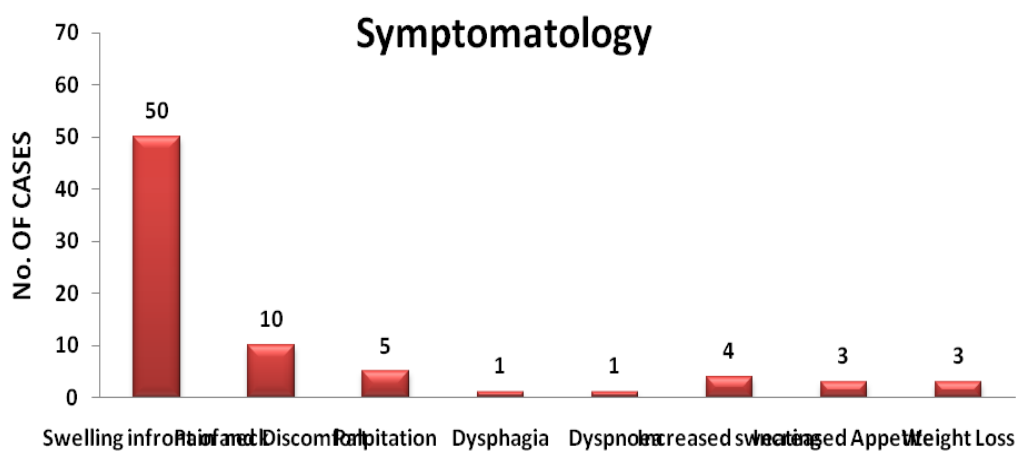


Fig 3.4: Symptomatology

All patients were presented with swelling in front of the neck (100 percent). Other symptoms were Pain and discomfort in 10 cases (20 percent), Palpitation in 5 cases (10 percent), Dysphagia in 1 case (2 percent), Dyspnoea in 1 case (2 percent), Increased sweating in 4 cases (8 percent), Increased appetite in 3 cases (6 percent) and Weight loss in 3 cases (6 percent).

Table 3.5: Physical Signs

Physical Signs	Number of Cases	Percentage
Mobility with deglutition	50	100
Left lobe enlargement	7	14
Right lobe enlargement	13	26
Both lobe enlargement	30	60

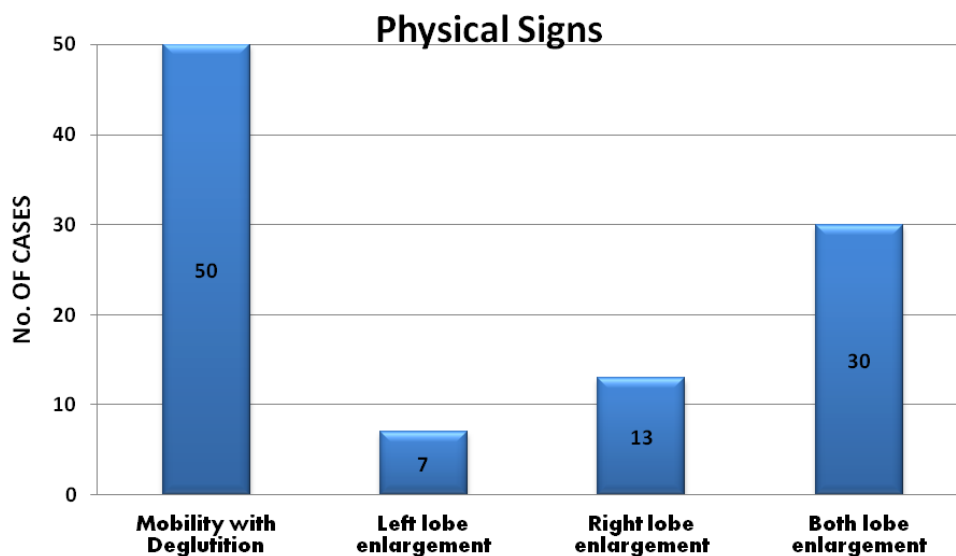


Fig 3.5: Physical Signs

Movement with deglutition was present in all patients (100 percent), multiple nodules in both lobes in 30 cases (60 percent), nodules confined to left lobe in 7 cases (14 percent), right lobe was seen in 13 cases (26 percent) was seen.

Table 3.6: Distribution of secondary thyrotoxicosis

Type of goiter	Number of cases		Total	Percentage
	Male	Female		
Nontoxic multinodular goitre	3	41	44	88
Toxic multinodular goitre	0	6	6	12

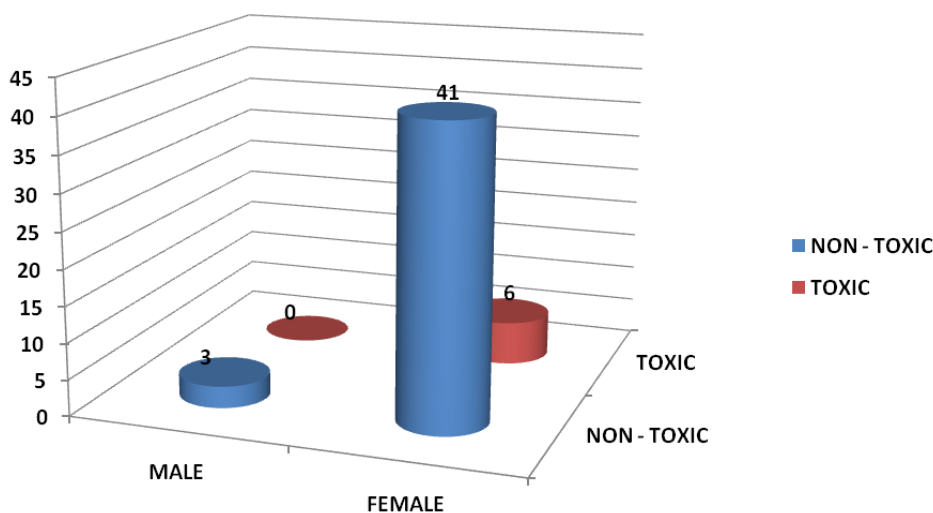


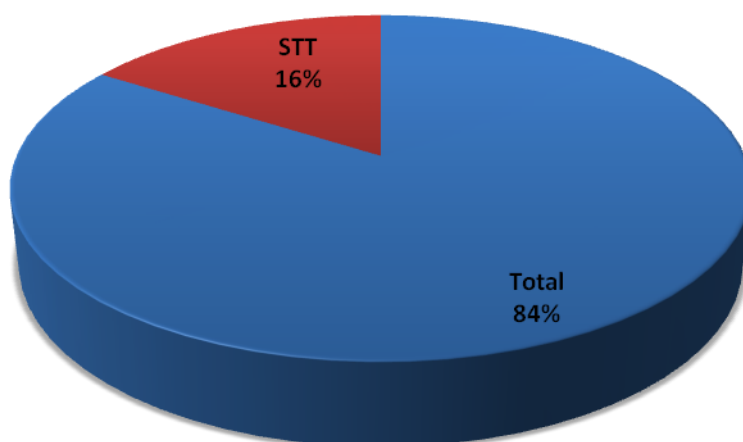
Fig 3.6: Type of Goitre

Out of 50 cases, 44 cases (88 percent) were nontoxic multinodular goitre and 6 (12 percent) were toxic multinodular goiter.

Table 3.7: Types of Surgery done

Type of Surgery Done	No. of Cases	Percentage
Total Thyroidectomy	42	84
Subtotal Thyroidectomy	8	16
<b>Total</b>	<b>50</b>	<b>100</b>

### TYPE OF SURGERY



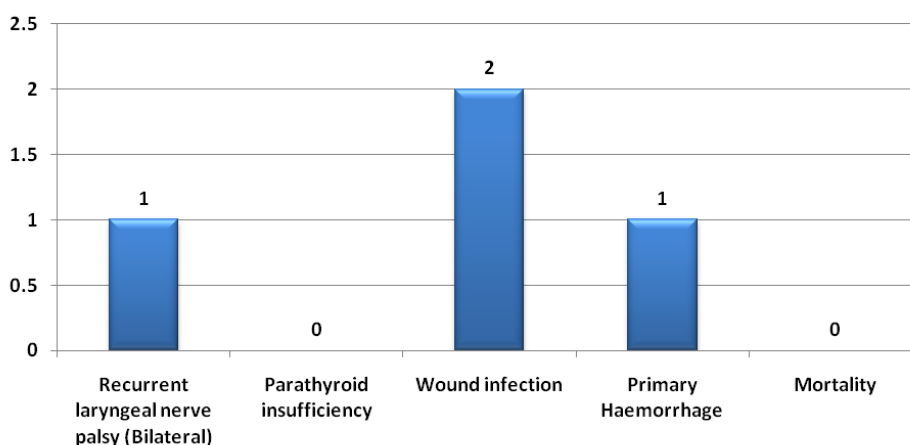
**Fig 3.7:** Type of surgery

Total Thyroidectomy was done in 42 cases (84 percent) followed by Subtotal thyroidectomy was done in 8 cases (16percent).

**Table 3.8:** Post operative Complications

	Number of Cases	Percentage
Recurrent laryngeal nerve palsy (Bilateral)	1	2
Parathyroid insufficiency	0	0
Wound infection	2	4
Primary Haemorrhage	1	2
Mortality	0	0

### Post operative Complications



**Fig 3.8:** Post operative Complications

No pre operative and per operative complications occurred in the present series. Recurrent laryngeal nerve palsy (bilateral) was found in 1 case (2 percent), which was transient and leading to tracheostomy. Primary Haemorrhage occurred in 1 case (2 percent) which was reopened and muscle bleed ligated. There is no parathyroid insufficiency. Wound infection in 2 cases (4 percent) was the other complication found in the present study. No mortality occurred in the present study.

**Investigations:**

Fine needle aspiration cytology was done in all cases. Majority reported as nodular colloid goitre, 7 cases as Hashimoto's thyroiditis and 1 case had a nodular goitre with cystic changes. Indirect laryngoscopy was done in all the cases, and bilateral vocal cord movement was normal. Thyroid function tests (T3, T4, and TSH) were done in all patients. In 6 cases, thyrotoxicosis was confirmed by thyroid function tests. Sleeping pulse rate were within normal limits in all patients except in 6 who had secondary thyrotoxicosis.

**Treatment:**

All cases were operated. Surgery was advocated for reasons of cosmesis, pressure symptoms and secondary thyrotoxicosis. In toxic cases, the toxicity was controlled with carbimazole 10mg, 3-4 times daily for a period ranging from 4- 12 weeks and Propranolol 40 mg, 3 times daily along with carbimazole.

**Histopathological analysis:**

According to histopathological analysis in present study of 50 cases, 37 cases (76 percent) showed features of benign goiter, toxic goitre showed sec toxic changes in 6 cases (12 percent), 7 Hashimoto's thyroiditis.

**Follow up:**

Follow up ranged from 2 months to 24 months. All 7 cases of Hashimoto's thyroiditis and majority of other cases who underwent subtotal thyroidectomy were put on tablet Levothyroxine 0.15 mg once daily.

**V. Discussion**

The present study was conducted during April 2016 to August 2018 with aims of assessing clinical presentation, age, sex distribution and Symptomatology indication and complications of surgery and comparison of FNAC with histopathological analysis of 50 cases of MNG admitted to thiruvapur medical college hospital. All cases were evaluated clinically and cytologically before the surgery followed by histopathological analysis.

**Age Distribution**

In the present study, the maximum age recorded was 65 years and a minimum of 17 years, out of 50 cases 17 belong to age group 31- 40 (36%) years. maximum distribution was observed in 3rd and 4th decade and least was seen in 7th decade onwards.

In the study conducted by Ahuja<sup>10</sup> majority of cases belong to the 3rd and 4th decades, least was in the 7th decade. Kapoor<sup>11</sup> reported that out of 226 cases. The majority 145 (64%) cases were in the age group of 21- 40 years with maximum distribution in the third decade and least in the 7th decade, 12 (5.3%) cases. The present study is comparable to the above studies.

The MNG is common in 3rd - 4th decades the reason being more TSH fluctuation noted during adolescence and in reproductive age group.<sup>8</sup>

**Sex distribution**

It was observed in the current study out of 50 cases 47 (94%) were females and 3 (6%) were males with a sex ratio of female to male is 15.7:1. Nygaard<sup>9</sup> reported that out of 69 cases, 62 cases (89.9%) were females and 7 cases (10%) were males with sex ratio 8.8: 1.

Study by Antonio Alfonso<sup>12</sup> showed a female to male ratio of 7: 1. In the study conducted by Ahuja, out of 205 cases 160 (78.1%) were females and 45 (21.9%) were males with a sex ratio of 3.5: 1. In all above studies there is a female preponderance. The result of the recent study is comparable to the above studies.

Almost all the thyroid related disorders are common in women and MNG is not an exception, the reason being more TSH fluctuation seen in women during adolescence, pregnancy, child birth and so on.

**Symptomatology**

All patients were presented with swelling in front of the neck (100 percent). Other symptoms were Pain and discomfort in 10 cases (20 percent), Palpitation in 5 cases (10 percent), Dysphagia in 1 case (2 percent), Dyspnoea in 1 case (2 percent), Increased sweating in 4 cases (8 percent), Increased appetite in 3 cases (6 percent) and Weight loss in 3 cases (6 percent).

In majority of patient the duration of swelling prior to presentation was 1- 3 months in 11 (36.67%) cases. In 5 (16.67%) patients presented with duration more than 5 years.

Involvement of both the lobes was seen in majority of patients 30 (60%). Predominant right lobe involvement was seen in 13 cases (26%). Left lobe involvement was seen in only 7 (14%) case.

### **Investigation**

FNAC was found to be very useful in the evaluation of MNG. In majority of the cases where the FNAC was benign it proved to be benign MNG on postoperative Histopathological examination.

This shows that FNAC is 100% accurate. FNAC is an invaluable, minimally invasive, highly accurate and cost effective procedure for pre- operative assessment of patients with thyroid lesions.

One of the cases was reported as thyroid cyst on ultrasound on scan and it was finally diagnosed as MNG.

Patient with vocal cord palsy diagnosed on indirect laryngoscopic examination and positive neck lymph nodes associated with thyroid swelling were excluded in this study.

### **Surgical Treatment**

The main indication for surgery in our series was the swelling itself either due to cosmetic reasons or fear of malignancy on the part of the patient. Subtotal thyroidectomy was done 8(16%) cases and Total Thyroidectomy in 42 (84%) were carried out when there was high suspicion of malignancy.

### **Postoperative complications**

We encountered Post operative bleeding in one patient on the same day and exploration was done and bleeder from strap muscle was identified and ligated. Irritation of the throat is early postoperative periods was present in almost all patients, which subsided without any active management. The average duration of stay in the hospital was 8 days.

### **Histopathology**

According to histopathological analysis in the present study of 50 cases, 37 (74%) cases showed features of benign goitre, 7 (14%) cases of Hashimoto's thyroiditis, and 6 (12%) case of toxic multinodular goitre. Rao and Reddy reported 7% distribution of Hashimoto's Thyroiditis and Ahuja reported 9%. The present study with 14% is comparable to above studies.

### **Follow up:**

Was done in all the patients and any complications treated appropriately.

## **VI. Conclusion**

FNAC is an invaluable, minimally invasive highly accurate and cost effective procedure for preoperative assessment of patients with thyroid lesions.

The main indications for surgery in MNG are cosmetic problem and Pressure effects. Total Thyroidectomy is the ideal treatment of MNG. FNAC had very large correlation. Whereas Hashimoto's thyroiditis, were negatively correlated as per the Goodman- Kruskal Gamma coefficient.

FNAC is very useful in the diagnosis and management of MNG.

## **VII. Summary**

1. This is a randomized prospective clinical study of 50 multinodular goiter patients admitted in thiruvapur Medical College and Hospital from April 2016 to Aug 2018 in a span of 24 months.
2. Highest age incidence of multinodular goitre was observed in the age group 31 - 40 years (36 percent). Average age of the patient 36.36 years, youngest was 17 years and oldest was 65 years.
3. Females were predominant in number over males.
4. The commonest complaint was swelling in front of the neck (in 100 percent of cases). Other symptoms were pain and discomfort, dysphagia, palpitation, dyspnoea, increased sweating, increased appetite and weight loss.
5. The standard surgery done was Total thyroidectomy in 84 percent cases. Subtotal thyroidectomy in 16 percent of cases.
6. Postoperative period was uneventful in all cases except in 3 cases, in whom one patient had transient bilateral recurrent laryngeal nerve palsy, which lead to Tracheostomy and 2 patients developed wound infection and one patient had post op bleeding.
7. On histopathological examination, 37 cases (74%) showed features of benign multinodular goitre, 7 cases (14%) Hashimoto's thyroiditis, and 6 cases (12%) of toxic goitre.



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