

A CLINICAL STUDY AND MANAGEMENT OF MULTINODULAR GOITRE

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Abstract

Background: A simple history and clinical examination are not adequate to reliably differentiate between benign and malignant causes for the enlargement of thyroid gland. The clinical assessment and management of the patient with MNG represent a much more difficult problem in the clinical setting than the solitary thyroid nodule. The aim is to study the clinical pattern and presentation of patients with Multinodular Goitre (MNG). **Materials and Methods:** Prospective study done in total of 100 patients with multinodular goiter who attended the surgical OPD and also referred to the Department of Surgery with the clinical diagnosis of multinodular goiter during the period of 2 years were taken up. **Result:** Most common age group affected were in between 21- 30 years of age, which constitutes to 35% , 84 are female, and 16 are male, which constitute to 86% and 14% percent, respectively. Most number of patients present with in is 1-6 months duration after the appearance of nodule, which constitute to 45%. There is a gradual increase in the size of swelling 87% of people, rapidly progressive in 3% and stationery in 10%. It is a painless swelling but is associated with pain in 10 patients MNG 78 (78%) patients presented without pressure symptoms. A most common symptom is difficulty in swallowing, followed by alteration in voice. 79 (79%) patients presented without toxicity, and 21(21%) patients presented with toxicity, among which 20(20%) are female, and 1(1%) is male. The lower border of swelling is seen in 98%, MNG trachea is in the midline in 97 (97%) patients. It was a colloid goiter in 80% of cases, Hashimoto's thyroiditis in 14% cases, follicular neoplasm in 6% of cases according to the FNAC report. Complications of surgery are seen in 18 patients who constitute 18%. A most common complication is transient hypothyroidism seen in 8 patients which is 8%. **Conclusion:** FNAC plays a key role in the diagnosis and management of MNG. In spite of no suspicion of malignancy clinically and FNAC reports, malignancy can be detected surprisingly on biopsy of post-operative specimen.

INTRODUCTION

The term goiter (Latin gutter = the throat) is used to describe generalized enlargement of thyroid gland. Thyroid gland gets hypertrophied due to many causes, most of which are benign, for example, physiological goiter like goiter of puberty, iodine deficiency state, inflammatory state secondary to autoimmune disease like thyroiditis. Thyroid gland is seat of differentiated type of carcinomas that have an excellent prognosis and undifferentiated or Anaplastic carcinoma, which have worst prognosis when compared to all other carcinomas of the body.

A simple history and clinical examination are not adequate to reliably differentiate between benign and malignant causes for the enlargement of thyroid gland. The clinical assessment and management of the patient with MNG represent a much more difficult problem in the clinical setting than the solitary thyroid nodule. Neither a well-formulated nor a simple procedure is available for the management of MNG. Surgical intervention for benign causes results in exposure of patients to all the complications and sequelae of thyroidectomy, whereas non-intervention of malignant lesions in

thyroid worsen the otherwise excellent prognosis of differentiated carcinoma of the thyroid gland.^[1,2]

In the study, 100 patients admitted with multinodular thyroid swellings were evaluated by detailed history taking, clinical examination, routine, and specific investigation include clinicopathological examination for efficient management of MNG. All the patients were subjected to surgery. Fine Needle Aspiration Cytology is the most common, simple, cost-effective outpatient procedure for evaluation of MNG, but several studies show that the accuracy of FNAC decreases as the size of gland increases. The validity of FNAC results was studied in comparison with the histopathology results of the operated thyroid specimen.

Aims and Objectives

1. To study the clinical pattern and presentation of patients with Multinodular Goitre (MNG).
2. To know the principles and management of Multinodular goitre.
3. To review the treatment adopted and to compare and correlate the findings of investigations with the histopathology of the resected specimen.

MATERIALS AND METHODS

A total of 100 patients with multinodular goiter who attended the surgical OPD and referred to the Department of General Surgery, ACSR Govt. General Hospital, Nellore with the clinical diagnosis of multinodular goiter during the period of study from April 2021 to March 2023 were taken up.

Duration of study: The data were collected from April 2021 to March 2023.

Sample size: A total of 100 cases were studied over the scheduled period.

Type of study: a prospective study.

Inclusion Criteria

Only patients with clinical evidence of multinodular goiter were taken up for the study randomly, after excluding malignancies which were detected preoperatively and the results were compared with other studies.

Exclusion Criteria

Thyroid malignancies which were detected preoperatively.

100 patients with clinical features of multinodular goiter who attended the OPD and those admitted to the Department of General Surgery, ACSR Govt. General Hospital, Nellore with the clinical diagnosis of multinodular goiter were interviewed as per the proforma designed for the study which included clinical features, examination findings, investigations, treatment, and complications arising following treatment. The cases were selected on a random sampling basis.

The patients were selected according to the inclusion and exclusion criteria, as mentioned below. The selected cases were studied in detail, clinically, and data recorded as per the proforma. The relevant investigations were performed whenever indicated.

The investigations included Haemoglobin percentage, complete urine examination, blood sugar estimation, blood grouping and Rh typing, blood urea estimation, serum cholesterol, an x-ray of the neck- AP and lateral views, and chest X-ray, and ENT examination. All patients were investigated for Thyroid profile and some patients for the Thyroid Isotope scan before surgery and submitted for FNAC of the thyroid swelling. All patients have undergone surgery, and all the excised specimens were sent for Histopathological examination.

Patients were discharged after suture removal and were asked to come for follow up. They were advised to take the necessary medications after surgery.

RESULTS

A study was carried out on 100 patients with multinodular goiter at Department of General Surgery, ACSR Govt. General Hospital, Nellore, over two years. The data obtained were tabulated and analysed.

The age-wise distribution of patients with MNG in the study group shows that most common age group affected were in between 21- 30 years of age, which constitutes to 35% and no patient is below 1-10 years of age, only 5% are between 11-20 years and 25% of patients were between 31-40 years of age. The majority of patients were aged between 21- 40 years. In this study, the minimum age group was 18 yrs., and the maximum age is 70 years. Regarding age-wise distribution, 84 are female, and 16 are male, which constitute to 86% and 14% percent, respectively. [Table 1]

Most number of patients present with in is 1-6 months duration after the appearance of nodule, which constitute to 45%, 20 % of patients presented during 6-12 months duration, 15% presented during 1-2 years duration, 14 % of patients presented during 2-5 years duration, 3% of patient presented during 5-10 years and 3% presented after 10 years of starting of symptoms. There is a gradual increase in the size of swelling 87% of people, rapidly progressive in 3% and stationery in 10%. [Table 2]

In 90 patients with MNG, it is a painless swelling but is associated with pain in 10 patients Among 100 patients with MNG 78 (78%) patients presented without pressure symptoms and 22 (22%) presented with pressure symptoms, among which alteration in voice constitutes 4 %, dysphagia constitutes 15 %, and difficulty in breathing constitutes 3%. A most common symptom is difficulty in swallowing, followed by alteration in voice. In present study 97(97%) patients are without a positive family history, and 3(3%) patients presented with a positive family history of goiter. [Table 3]

79 (79%) patients presented without toxicity, and 21(21%) patients presented with toxicity, among which 20(20%) are female, and 1(1%) is male. [Table 4]

The lower border of swelling is seen in 98% and not seen in the case of 2%, which suggests retrosternal extension. Among 100 cases of MNG trachea is in the midline in 97 (97%) patients and there is tracheal deviation in 3(3%) patients, and it has deviated to the left in all the 3 cases. [Table 5]

It was a colloid goiter in 80% of cases, Hashimoto's thyroiditis in 14% cases, follicular neoplasm in 6% of cases according to the FNAC report. According to histopathology report, it was colloid goiter in 80 patients, Hashimoto's in thyroiditis in 6 patients, follicular adenoma in 6 patients and papillary carcinoma in 6 patients and medullary cancer with papillary carcinoma in 2 patients. [Table 6]

Complications of surgery are seen in 18 patients who constitute 18%. A most common complication is transient hypothyroidism seen in 8 patients which is 8% least is wound infection seen in 3 cases. [Table 7]

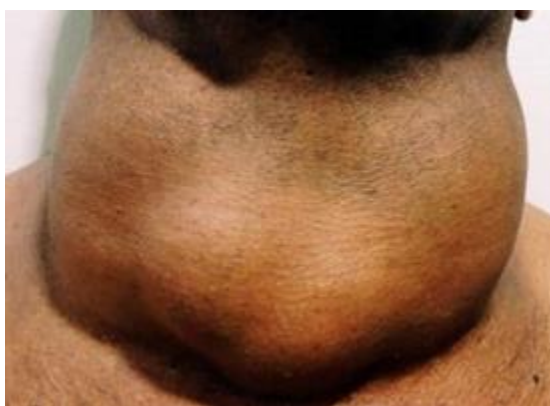


Figure 1: Clinical picture of multinodular goitre



Figure 2: strap muscles retracted and both the thyroid lobes exposed



Figure 3: Superior pedicle ligation of the right lobe of the thyroid



Figure 4: Inferior pedicle ligation of the right lobe of the thyroid



Figure 5: Gross specimen of the thyroid gland after total thyroidectomy.

Table 1: Showing age distribution of the patients with MNG

Age in years	Male patients with MNG	Female patients with MNG	Total patients with MNG	Percentage patients with MNG
01 – 10 years	00	00	00	00 %
11 – 20years	00	05	05	5%
21 – 30 years	05	30	33	35 %
31 – 40 years	02	23	25	25%
41 – 50 years	01	20	21	21 %
51 & above 50	06	08	14	14 %
TOTAL	14	86	100	100 %

Table 2: Showing duration and progression of swelling.

Duration of swelling	Total No. of cases	Percentage
1 – 6 months	45	45 %
6 – 12 months	20	20 %
1 – 2 years	15	15%
2 – 5 years	14	14%

5 – 10 years	03	03 %
10 years and above	03	03 %
Progression of swelling		
Gradual	87	87 %
Rapid	03	03%
Stationery	10	10 %

Table 3: Showing pain, symptoms and pressure symptoms of thyroid swelling.

Pain in the swelling	Total No. of cases	Percentage
Painless swelling	90	90 %
Painful swelling	10	10 %
Symptoms		
1) Pressure symptoms		
a) Alteration in voice	04	4%
b) Difficulty in Swallowing	15	15 %
c) Difficulty in breathing	03	03 %
2) No pressure symptoms	78	78 %
Family history of goiter		
With family history of goiter	03	3%
Without family history of goiter	97	97%

Table 4: Showing incidence of toxicity

Toxicity	Female	Male	Total	Percentage
With Toxicity	20	1	21	21 %
Without Toxicity	70	9	79	79 %
Total	86	14	100	100 %

Table 5: Showing situation of lower border and Tracheal position of thyroid swelling

Lower Border	Total No. of cases	Percentage
Lower Border seen	98	98 %
Lower Border not seen	02	2%
Tracheal position		
Tracheal Central	97	97 %
Trachea shifted to left	03	03 %
Trachea shifted to Right	00	00 %

Table 6: Showing FNAC and HPE findings of thyroid swelling.

Report of FNAC	Total No. of cases	Percentage
Colloid Goiter	80	80 %
Hashimoto's Thyroiditis	14	14 %
Follicular neoplasm	06	06 %
inconclusive	00	00
HPE report		
Colloid goiter	80	80%
Hashimoto's Thyroiditis	6	6%
Follicular Adenoma	6	6%
Follicular Carcinoma	0	0%
Papillary Carcinoma	6	6%
Medullary Carcinoma with papillary ca	2	2%

Table 7: Complications of surgery

Complications	Total No. of cases	Percentage
Reactionary Haemorrhage	00	00 %
Transient Hypoparathyroidism	08	08 %
Permanent Hypoparathyroidism	00	00 %
Temporary Recurrent laryngeal nerve palsy	06	06 %
Permanent Recurrent laryngeal nerve palsy	00	00 %
Wound infection	03	3%
Total	17	17 %

Table 8: Showing comparison of FNAC and HPE findings of thyroid swelling with other studies

FNAC Report	Present study	Sreenivas et al [4]
Colloid goiter	80	78
Hashimoto's thyroiditis	14	14
Follicular neoplasm	06	08
Malignancy	00	00
Inconclusive	00	00
HPE report		
Colloid goiter	80	78
Hashimoto's thyroiditis	06	6

Follicular adenoma	06	6
Follicular carcinoma	00	00
Papillary carcinoma	06	06
Medullary carcinoma	02	04

DISCUSSION

A hundred patients presenting with Multinodularity of the thyroid gland without clinical evidence of malignancy were studied and evaluated in terms of history, clinical examination and relevant investigations were done and taken up for surgery with prior FNAC and operated specimen was sent for histopathology post operatively.

In the study group out of 100 patients, 35% Of patients presented in the age group of 21-30 years. In studies conducted by Prabhakar et al,^[3] and Sreenivas et al,^[4] the presenting age group is more between 21-30 years, which is respectively 26% and which is in par with our study. However, in the western literature quoted by "Bremer and Moll Night" in an analysis of 1280 cases of Multinodular goiter, the age incidence was a maximum between 40 – 49 years. Hence the average age incidence in our study is low compared to western series. In the present study, the maximum age of presentation was 70 years, and the minimum age of presentation was 18 years, with an average age incidence of 35 Years. No case was presented between the age group of 1-10years. In a study conducted by Bhatti ZA et al.^[5] Majority of patients with MNG in their study were in the age group of 30-53 years.

A total of hundred cases were studied; among them, 14 cases were males (14 %), and 86 cases were females (86%) with a female to male ratio of 6:1. In studies conducted by Sreenivas et al,^[4] and Prabhakar et al,^[3] also the ratio was close to our study. Antonio Rios et al,^[6] showed that 90% were females. In the study conducted in Tsan et al,^[7] female to male ratio was 7:1. The age and sex distribution correlate well with the Indian literature rather than the foreign literature, which may be due to the socioeconomic status influences, the frequency of hospital visit, environmental conditions, and endemicity. In a study conducted by Bhatti ZA et al,^[5] Out of 94 cases, and 12 were males, 82 were females, with M: F ratio was 1:6.8.

Most of the patients (45%) in the present study presented between 1-6 months after the onset of swelling. In the study conducted by Sreenivas et al,^[4] also most of the patients presented during a similar duration after the onset of swelling.

There is a gradual increase in the size of swelling in 87% of people, rapidly progressive in 3% and stationery in 10% and is not associated with malignancy and does not give rise to pressure symptoms in rapidly progressive swellings.

Pressure symptoms were seen in 22% (22 cases) as against 29% in Antonio Rios et al,^[6] study. 61 In our study, 15 cases (15 %) presented with difficulty in swallowing and 3 cases (3%) with difficulty in breathing, and alteration of voice was seen in 4 cases.

Thus, difficulty in swallowing was the commonest pressure symptom. In 78% of the people, there are no pressure symptoms, and the size of the swelling is proportional to the pressure symptoms in case of benign swellings.

There was a family history of goiter in 3 cases in which the patient's mothers and sisters had multinodular goiter and had undergone surgery for the goiter. Toxic symptoms and signs were seen in 21 cases (21 %), which included 20 female (20 %) and 1male (1%). Among these, 4 female patients had eye signs, and 17 patients had tremors of hands and tongue and tachycardia. Toxic symptoms were seen in 12 % of cases, that is 6 cases in a study conducted by Prabhakar et al.^[3] Toxic symptoms were seen in 49% of cases in Antonio Rios et al,^[6] study. Eye signs are characteristic of primary thyrotoxicosis, and these include Stelwag's sign, Van Graef's sign, Joffroy's sign, and Moebius sign. In secondary thyrotoxicosis, the eye signs are not the characteristic feature.

All thyroid swellings in our study were moving with deglutition. Both lobes were involved in 66 cases with predominantly involving the right lobe and remaining 34 cases involving predominantly left lobe. In the majority of the patients, the size the gland was in stage 2 according to WHO classification, i.e., swelling visibly with the neck in normal position. There were 2 cases of retrosternal extension of MNG. They were examined by arm raising test, where we can see the congestion of the face and neck; this sign is known as Pemberton sign.

X-ray of neck, AP and lateral views and X-ray of the chest were done in all the cases. There were 3 cases of the tracheal shift to the left side due to a goiter, mainly involving right lobe of the thyroid.

FNAC of the thyroid was done in all the cases and the results compared with the histopathological report of operated specimens. FNAC report of thyroid swelling was similar to studies conducted by Sreenivas et al.^[4] The most common was colloid goiter (78%), and the least common is follicular neoplasm (8%).

Histopathological examination proved to be papillary carcinoma in 6 cases, medullary carcinoma with papillary carcinoma in 2 cases, and another 6 cases showed follicular adenoma. Diagnosis of Follicular carcinoma preoperatively by FNAC was not possible as angioinvasion and capsular invasion, which are features of Follicular carcinoma, were not evident in FNAC. This shows that FNAC is not 100% accurate in the diagnosis of follicular carcinoma. In studies by J Amudhan et al,^[2] Histopathological examination revealed colloid goiter in 74% of cases.

All cases were prepared to an euthyroid state before the surgery. Secondary thyrotoxicosis is treated with neomercazole, and the dose was adjusted accordingly. No complications of the neomercazole like agranulocytosis are seen. The main indication for

surgery in our series was the cosmetic problem. The next common indication was for pressure effects of the goiter, like dysphagia and dyspnoea and secondary thyrotoxicosis. The six cases of follicular neoplasms were operated to rule out follicular carcinoma. Of the 100 cases, 32 cases were subjected to total or near- total thyroidectomy, and the remaining 68 cases underwent subtotal thyroidectomy. For 8 cases completion thyroidectomy was done subsequently following histopathological examination showing papillary carcinoma

In the present study, postoperative complications were very few transient hypoparathyroidisms was seen in 8 patients (8%), which was observed during the first post-operative week, and all recovered completely with oral calcium and I.V. calcium therapy. There was no permanent hypoparathyroidism. T.A. Day et al,^[8] show that there was 28% of temporary hypocalcaemia and 0.9% with permanent hypocalcaemia. Temporary RLN palsy was seen in 6 cases (6%), both of which recovered within a month, which was like the study by Chang WF et al,^[9] in which Unilateral vocal cord palsy occurred in 5.5%(15patients) of which all recovered completely except 2 patients.^[8] There was no permanent recurrent laryngeal nerve palsy postoperatively in the present study. Temporary RLN palsy was seen in 8%; permanent RLN palsy was seen in 0.9% in T.A. Day et al.^[8] There were 3 cases of a surgical site infection that responded very well to broad-spectrum antibiotics. In studies by Sreenivas et al,^[4] complications are seen in 18 cases out of 100, which accounts for 18 % and is also comparable to our study, which is 17%. Transient hypoparathyroidism is seen in 8 cases, which same with the present study, temporary RLN in 5 cases, which is 6 cases in the present study, and wound infection was seen in 4 cases, which was 3 cases in the present study. No cases are seen with complications of permanent RLN and permanent hypoparathyroidism. There was no case of mortality in the present series. No cases of thyroid storm are seen as all the cases are in the euthyroid stage at the time of surgery. In studies by J Amudhan et al,^[2] post-operative complications occurred in three cases (two received laryngeal nerve injury and one hypoparathyroidism. the important factor for the low incidence of nerve injuries during surgery is visualization of the recurrent laryngeal nerve. but in present study attempt to identify RLN was not done routinely, and in spite of that no case of permanent RLN palsy is seen.

CONCLUSION

A hundred patients of MNG were evaluated with respect to age, sex, duration of swelling, and were

investigated with FNAC and radio isotope scan selectively. Operated specimens subjected to histopathological examination, and results were analysed. MNG is the most common thyroid disease in our institution.

Multinodular goiter is more common in females (Female to male ratio 6:1). The majority are in the age group of 21-40 years (60%). The chief complaint in most of the patients is swelling in front of the neck, and few patients presented with pressure symptoms. In the majority (94%) of the patients, the duration of the swelling before the presentation was 6 months to 5years. Secondary thyrotoxicosis is seen in 21% (21cases).

Radioisotope scan is useful in the evaluation of MNG to know whether the functioning tissue is a nodule or internodular tissue or toxic nodule. It also shows the retrosternal extension. FNAC plays a key role in the diagnosis and management of MNG. In spite of no suspicion of malignancy clinically and FNAC reports, malignancy can be detected surprisingly on biopsy of post-operative specimen. The most common indication of surgery in MNG is a cosmetic problem, pressure effect symptoms, secondary thyrotoxicosis, and suspicion of malignancy.

For MNG, Subtotal thyroidectomy is the surgical treatment of choice. However, nowadays total thyroidectomy is replacing subtotal thyroidectomy in the management of MNG as recurrence of goiter is avoided, and second thyroid surgery is difficult and associated with a high risk of complications.

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