

# Clinicopathological Study on Multinodular Goiter: A Prospective Study

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## Abstract

**Introduction:** Multinodular goiter (MNG) describes an enlarged, diffusely heterogeneous thyroid gland. Initial presentation may include diffuse enlargement, but the mass often develops asymmetrical nodularity. The cause of this mass is usually iodine deficiency.

**Aim:** To study the clinicopathological features of MNG and its management and its various post-operative complications.

**Materials and Methods:** The patients diagnosed as a case of MNG will undergo detailed history taking, clinical examination, and investigations. After surgery, the patients will be followed up for any immediate post-operative complications.

**Results:** Hyperthyroidism in MNG was present in 14% cases as a part of natural evolution of the disease. Post-operative complications occurred in three cases (two received laryngeal nerve injury and one hypoparathyroidism). Histopathological examination revealed colloid goiter in 74% of cases.

**Conclusion:** In our study, MNG was commonly observed in females. MNG is commonly observed in the fourth decade of life. In most of the cases, one can diagnose a number of nodules clinically. Visualization of the recurrent laryngeal nerve during surgery is an important factor for low incidence of nerve injuries in our study group.

**Key words:** Complications, Histopathology, Multinodular goiter, Thyroid gland

## INTRODUCTION

Thyroid gland is an endocrine gland situated in the anterior side of the neck. Its main function is regulation of the basal metabolic rate, stimulates somatic and psychic growth, and plays an important role in calcium metabolism. Multinodular goiter (MNG) is defined as the palpation of multiple distinct nodules in the enlarged thyroid gland. The etiopathogenesis of MNG is not very clear. A mild dietary deficiency of iodine, slight impairment of hormone synthesis, increased iodide clearance from the kidneys, and the presence of thyroid-stimulating immunoglobulins have been suggested as the various causes.<sup>1</sup> Initially, the mass

is euthyroid; however, with increasing size, elevations in T3 and T4 can occur and progress gradually into clinical hyperthyroidism. Workup and diagnosis include evaluation of thyroid function tests. Ultrasound and radioisotopic scanning demonstrate heterogeneous thyroid substance. Nodules with poor uptake can present as lesions suspicious for malignancy. Thyroid nodules have been reported to be found in 4-7% of the population on neck palpation and in 30-50% of the population by ultrasonography (USG).<sup>2,4</sup> It has been observed that 50.5% of the solitary nodules which are felt on palpation are actually a part of the MNG. The incidence of carcinoma in MNG has been reported as 5-10%. Therefore, fine-needle aspiration cytology (FNAC) for diagnosis and resection for suspicious lesions should be considered. Hyperthyroidism may be adequately controlled by drugs, but surgical management is the preferred treatment. Subtotal or total thyroidectomy may perform depending on the involvement of the thyroid gland. Radioactive iodine therapy is reserved for elderly individuals who represent a poor operative risk. The complications of thyroid surgeries are hemorrhage, respiratory obstruction,

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vocal cord paralysis, hypoparathyroidism, thyroid insufficiency, thyrotoxic storm, and wound infection. With this background, the present study was planned to study of clinical profile of MNG.<sup>5</sup>

### Aim

To study the clinicopathological features of MNG and its management and its various post-operative complications.

## MATERIALS AND METHODS

This is a prospective clinical study was conducted in the department of surgery, Sivagangai Medical College Hospital. The patients diagnosed as a case of MNG will undergo detailed history taking, clinical examination, investigations such as complete blood count, thyroid profile, FNAC, X-ray chest and neck, and USG of neck. After surgery, the patients will be followed up for any immediate post-operative complications. The specimen will be sent for histopathological examination (HPE), and the results will be recorded. Inclusion criteria were all cases admitted in the department of surgery diagnosed as a case of MNG, above the age of 20 years, and cases presenting with both toxic and nontoxic features. Exclusion criteria were pregnant women, cases presenting with solitary nodule, and cases with diffuse enlargement of thyroid gland.

## RESULTS

In our study, among the fifty cases, majority of cases were in the 30-40 years of age group and 94% of the cases were females (Table 1).

The presenting complaint was a swelling in the anterior aspect of neck in all the cases studied, which was associated with pain in 48% of the cases (Table 2).

The FNAC reports of the 50 cases showed nodular colloid goiter as the most common finding followed by Hashimoto's thyroiditis (Table 3). The HPE reports of 74% of the cases were colloid nodular goiter and 18% had features suggestive of Hashimoto's thyroiditis (Table 4).

The average post-operative stay among the 50 cases studied was 5.3 days and 76% of the cases were discharged between 4<sup>th</sup> and 6<sup>th</sup> post-operative days (Table 5). Post-operative complications occurred in three cases, two cases with recurrent laryngeal nerve injury, and case with hypoparathyroidism.

## DISCUSSION

In this study, 50 patients diagnosed as MNG without any evidence of malignancy were evaluated in terms of history

taking and clinical examination. Relevant investigations were performed, and surgery was performed after FNAC. The HPE of the specimen was done. The results were collected, compiled, and analyzed. In our study, 94% of cases were females comparable to the results of Zambudio *et al.*<sup>6</sup> which showed 89% incidence in females. Majority of cases were in the 30-40 age group, followed by the age group of 30-40 years. This is compared to the analysis of 1280 cases by Bremer and Night, which showed maximum incidence between 40 and 50 years, shows a lesser age group commonly involved in our population. The mean age of incidence was 42.26 years of age. The presenting complaint was a swelling in all cases (100%). The swelling was associated with pain in 48% of cases. Pressure symptoms were present in 44% of cases which is comparable to the study by Ríos *et al.*<sup>7</sup> who had a result of 28.5% of cases presenting with pressure symptoms. The FNAC reports showed that nodular colloid goiter (64%) as the most common finding followed by Hashimoto's thyroiditis. The report was follicular neoplasm for two cases, so total thyroidectomy was performed in those cases to rule out malignancy. All the cases were taken up for surgery, 88% cases underwent total thyroidectomy, and 10% cases underwent subtotal thyroidectomy. One case with multinodularity of one lobe of the thyroid - largest measuring 0.7 cm underwent right lobectomy, who was followed up for 3 months and the opposite lobe was found to be normal. Post-operative complications occurred in three cases (6%). Two cases developed recurrent laryngeal nerve injury of whom one patient developed stridor and tracheostomy was performed. The other patient recovered following management with elective ventilation and steroid therapy. Although identification has been associated with a lower rate of complications<sup>8-10</sup> and is crucial during extracapsular resection or resection of the posterior nodules,<sup>10-12</sup> there are authors such as Wheeler<sup>13</sup> who do not consider it necessary since manipulation can lesion them. Both recurrent nerves were routinely identified in our series. One patient developed hypoparathyroidism. The average post-operative hospital stay was 5.3 days. 76% of cases were discharged between 4<sup>th</sup> and 6<sup>th</sup> post-operative days. The HPE of the resected specimen showed that 37% of the cases were colloid nodular goiter and 18% of cases had features of Hashimoto's thyroiditis. There was one case of follicular carcinoma (Hurthle cell variant) and one case of papillary carcinoma whose FNAC report was inconclusive. Incidence of malignancy in MNG was 4% which is comparable to the studies by Gandolfi *et al.*<sup>14</sup>

## CONCLUSION

FNAC is a very useful investigation except in differentiation of follicular neoplasms. Carcinoma is not uncommon

**Table 1: Age distribution of MNG**

Age in years	Number of cases (%)
20-30	10 (20)
30-40	16 (32)
40-50	11 (22)
50-60	08 (16)
Above 60	05 (10)

MNG: Multinodular goiter

**Table 2: Incidence of various presenting complaints**

Presenting complaints	Number of cases (%)
Swelling	50 (100)
Pain	24 (48)
Heat/cold intolerance	6 (12)
Increased/decreased appetite	3 (6)
Dyspnea	9 (18)
Tremors	08 (16)
Insomnia	5 (10)
Palpitation	16 (32)
Dysphagia	22 (44)
Hoarseness of voice	10 (20)

**Table 3: FNAC in MNG**

FNAC report	Number of cases (%)
Colloid nodular goiter	32 (64)
Hashimoto's thyroiditis	11 (22)
Adenomatous goiter	4 (8)
Follicular neoplasm	2 (4)
Inconclusive	1 (2)

FNAC: Fine-needle aspiration cytology, MNG: Multinodular goiter

in cases of MNG. Hence, suspicion should always be present. Visualization of the recurrent laryngeal nerve during surgery is an important factor contributing to the low incidence of nerve injuries in our study group. Post-operative stay should be reduced and day case surgery should be promoted.

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**Table 4: HPE report in the operated cases**

HPE report	Number of cases (%)
Colloid nodular goiter	37 (74)
Hashimoto's thyroiditis	9 (18)
Follicular adenoma	2 (4)
Follicular carcinoma	1 (2)
Papillary carcinoma	1 (2)

HPE: Histopathological examination

**Table 5: Post-operative stay following thyroid surgeries**

Number of days	Number of cases (%)
<3	04 (8)
4-6	38 (76)
7-9	05 (10)
More than 9	3 (6)

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