

A Clinicopathological Study of Thyroid malignancy in Multinodular Goiter in a Tertiary Care Hospital

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Abstract: **Background:** Multinodular goiter is a most common endocrine disorder affecting 500 to 600 million people worldwide. In India 54 million people have goiter and estimated risk about 167 million. Incidence of malignancy in multinodular goiter varies from 0.9 to 13% in different parts of world. Among malignancy, Papillary thyroid carcinoma was the commonest malignancy. Most of the cases were diagnosed between the 5th and 6th decade of life and frequently seen in females. **Aims & Objectives:** 1) To Study age and sex wise incidence 2) To evaluate the various morphological types of thyroid malignancy in multinodular goiter 3) To study the thyroidectomy specimens by routine histo pathological examination. **Materials and Methods:** A Retrospective study done on 136 surgically resected thyroidectomy specimens of multinodular goiter in department of pathology with duration of two years, from January 2020 to December 2021 at santhiram medical college and general hospital, Nandyal, Andhrapradesh, India. **Results:** Among the 136 cases of multinodular goiter 107(79%) were female and 29(21%) were male. Histopathological examination shows, benign multinodular goiter present in 124 (91%) cases. Malignant thyroid lesion in 12 (9%) cases. Among malignancies, Papillary thyroid carcinoma was the commonest malignancy. **Conclusion:** Multinodular goiter could be assign of different types of thyroid malignancy. Most common type was papillary carcinoma.

Keywords: Multinodular goiter, Thyroid malignancy, Papillary carcinoma

1. Introduction

Multinodular goiter is a most common endocrine disorder affecting 500 to 600 million people worldwide ⁽¹⁾. In India 54 million people have goiter and the estimated risk about 167 million. ⁽²⁾

Thyroid carcinoma represents the most common malignancy of the endocrine system and accounts for only total 1 % of neoplasm with increasing incidence for the last four decades ⁽³⁾. Thyroid neoplasms usually present as a solitary palpable nodule or multiple discrete nodules. Epidemiologically, risk factors for thyroid malignancy are ionising radiation, the presence of thyroid adenoma and multinodular goiter (MNG).

Multinodular goiter has been considered be at a low risk for malignancy as compared to a solitary thyroid nodule ^(4,5,6). Incidence of malignancy in multinodular goiter varies from 0.9 to 13% in different parts of world ⁽⁷⁾. Various studies have reported a 7 to 17% incidence of malignancy in Multinodular goiter ^(8,9). Among malignancy, papillary carcinoma was commonest malignancy ⁽¹⁰⁾. Carcinoma of thyroid occurs at all ages ⁽¹¹⁾ and .Most of the cases, diagnosed between the 5th and 6th decade of life ⁽¹²⁾. Most frequently seen in females.

2. Materials and methods

Retrospective study done on surgically resected thyroidectomy specimens of multinodular goiter, in the department of pathology at Santhiram medical college and General hospital, Nandyal. Study period was 2 years from January 2020 to December 2021. Patients in and around Nandyal, attending to surgery outpatient department with clinical diagnosis of multinodular goiter were included in the study. Patients with solitary thyroid nodule were excluded in the study.

The present study, consisted of 136 patients with multinodular thyroid disease. The clinical details were taken from hospital records and analysed. All resected specimens were analysed in pathology department for histopathological examination. Hemi and total thyroidectomy specimens are fixed in 10 % formalin. After processing, H & E stained sections were examined under the light microscope and thorough analysis was done

Inclusion criteria: Patients with diffuse thyroid enlargement of all ages and sexes were included in the study.

Exclusion criteria: Patients with solitary thyroid nodule were excluded in the study.

3. Results

Table 1: Age and Sex wise Distribution of cases of MNG

Gender	0-20	21-30	31-40	41-50	51-60	61-70	71-80	No. of cases & %
Female	02	07	27	47	12	08	04	107 (79%)
Male	01	02	08	11	03	02	02	29 (21%)
Total no. of cases & %	03 (2.2%)	09 (6.6%)	35 (25.7%)	58 (42.7%)	15 (11%)	10 (7.4%)	06 (4.4%)	136 (100%)

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Table 2: Case wise distribution of MNG among age groups for both females and males

Histopathological diagnosis	Gender	0-20	21-30	31-40	41-50	51-60	61-70	71-80	No of cases	%
Pure multinodular goiter	F	01	04	16	28	7	04	02	62	45.6
	M	-	-	02	05	-	01	-	08	5.9
Colloid nodule	F	01	02	06	11	02	02	02	26	19.1
	M	01	01	03	03	01	01	01	11	8.1
Follicular adenoma	F	-	01	03	04	02	01	-	11	8.1
	M	-	01	02	01	01	-	01	06	4.5
Papillary carcinoma	F	0	0	2	3	1	1	-	07	5.1
	M	-	-	-	1	1	-	-	01	0.7
Follicular carcinoma	F	-	-	-	-	-	-	-	0	0
	M	-	-	1	1	-	-	-	2	1.5
Medullary carcinoma	F	-	-	-	1	-	-	-	1	0.7
	M	-	-	-	-	-	-	-	0	0
Anaplastic carcinoma	F	-	-	-	-	-	-	-	0	0
	M	-	-	-	-	-	-	-	1	0.7
Total	F+M	03	9	35	58	15	10	06	136	100

Table 3: Age & Sex wise distribution of cases of MNG with outthyroid cancer

Gender	0-20	21-30	31-40	41-50	51-60	61-70	71-80	No.of cases &%
Female	2	7	25	43	11	07	04	99 (80%)
Male	01	02	07	09	02	02	02	25(20%)
Total no & %	3 (2.4%)	9 (7.3%)	32 (25.8%)	52 (41.9%)	13 (10.5%)	09 (7.3%)	06 (4.8%)	124 (100%)

Table 4: Case wise distribution of MNG without thyroid cancer among age group for both females and males

Histo Pathological Diagnosis	Gender	0-20	21-30	31-40	41-50	51-60	61-70	71-80	No. of cases	%
Pure Mng	F	01	04	16	28	7	04	02	62	50
	M	-	-	02	05	-	01	-	08	6.5
Colloid Nodule	F	01	02	06	11	02	02	02	26	20.9
	M	01	01	03	03	01	01	01	11	8.9
Follicular Adenoma	F	-	01	03	04	02	01	-	11	8.9
	M	-	01	02	01	01	-	01	06	4.8
Total	F & M	03	09	32	52	13	09	06	124	100

Table 5: Age & Sex wise distribution of cases of MNG with thyroid cancer

Gender	0-20	21-30	31-40	41-50	51-60	61-70	71-80	Total No of cases &%
Female	0	0	2	4	1	1	0	8 (66.7%)
Male	0	0	1	2	1	0	0	4(33.3%)
Total no of cases &%	0 (0)	0 (0)	3 (25%)	6 (50%)	2 (16.7%)	1 (83%)	0 (0)	12 (100%)

Table 6: Case wise distribution of MNG with thyroid cancer among age groups for both females and males

Histo pathological diagnosis	Gender	0-20	21-30	31-40	41-50	51-60	61-70	71-80	No .of cases	%
Papillary carcinoma	F	0	0	2	3	1	1	-	7	58.4
	M	-	-	-	1	1	-	-	1	8.3
Follicular carcinoma	F	-	-	-	-	-	-	-	0	0
	M	-	-	1	1	-	-	-	2	16.7
Medullary carcinoma	F	-	-	-	1	-	-	-	1	8.3
	M	-	-	-	-	-	-	-	0	0
Anaplastic carcinoma	F	-	-	-	-	-	-	-	0	0
	M	-	-	-	-	1	-	-	1	8.3
Total	F & M	-	-	3	6	2	1	-	12	100

Table 7: Prevalence of malignancy in various studies

Study	Incidence of malignancy
Al Hashimi et al (2013)	3.03%
Sarjaevoet al (2005)	8%
Benzarti et al (2002)	10%
Prades et al (2002)	12.2%
Mofti et al (1991)	29%
Present study (2022)	8.8%

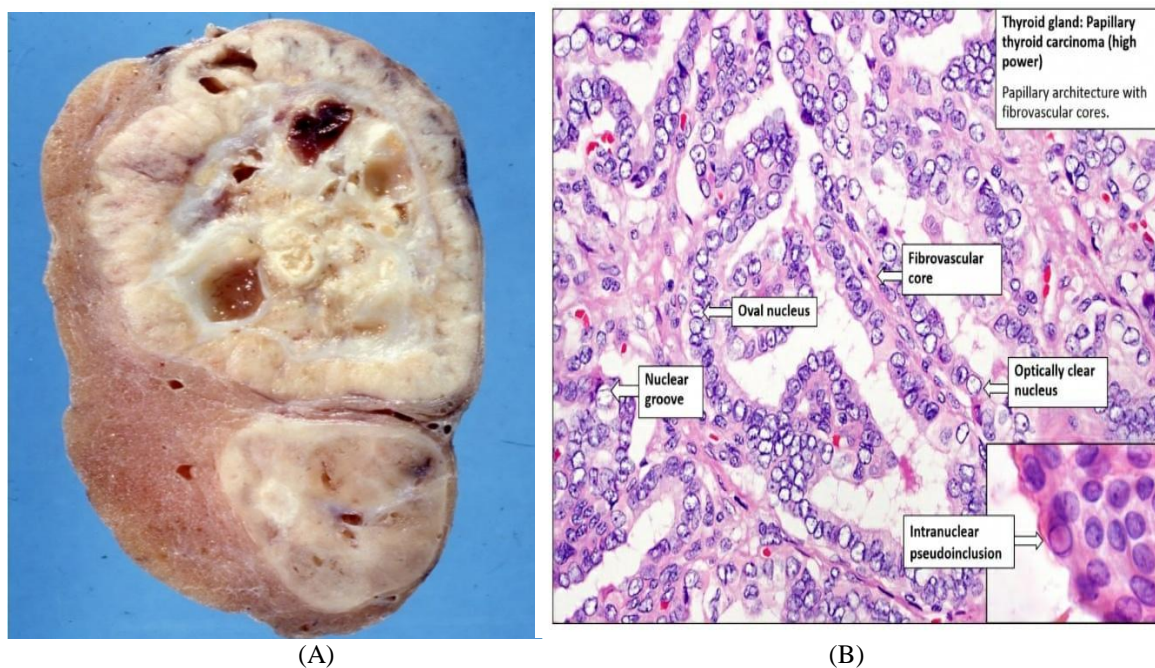


Figure 1: Papillary carcinoma of Thyroid (A) Gross picture, (B) High power view

4. Results

In present study, included 136 cases of multinodular goiter. Of these 136 cases, 107 (79%) were female and 29 (21%) were male. Maximum number of multinodular goiter, 58 (42.7%) cases were seen in 4th decade and 35 (25.7%) cases were seen in 3rd decade. (Table 1).

Histopathological examination of 136 cases of Multinodular goiter revealed that 70 (51.5%) cases were Benign MNG, 37 (27.2%) cases were colloid nodule, 17 (12.6%) cases were follicular adenoma, 08 (5.8%) cases were papillary carcinoma, 02 (1.5%) cases were follicular carcinoma, 01 (0.7%) case of medullary carcinoma and 01 (0.7%) anaplastic carcinoma (Table 2).

Among 136 multinodular goiter cases, 124 (91%) cases are benign, 12 (09%) cases are malignant. Of 124 benign multinodular goiter, 99 (80%) cases were female and 25 (20%) cases were male (Table 3). Maximum number of benign multinodular goiter 52 (41.7%) cases are seen in 4th decade (Table 4).

Among 12 malignant thyroid lesions, 08 (66.7%) cases were female and 04 (33.7%) cases were male. (Table 5). Maximum number of malignant thyroid lesions 06 (50%) cases are seen in 4th decade and most common malignant lesion was papillary carcinoma 08 (66.7%) cases (Table 6)

Gross examination of papillary thyroid carcinoma shows, encapsulated, multifocal, solid, grey white areas with a firm consistency, and a granular cut surface along with a variable cysts filled with colloid, fibrosis and calcification. Histopathological examination shows numerous papillae with fibrovascular core. Papillae lined by cuboidal cells shows nuclear features include, orphan annie nuclei, overlapping of nuclei, nuclear grooving and eosinophilic

pseudo inclusions (Figure 1). Another feature of papillary thyroid carcinoma is the presence of psammoma bodies.

5. Discussion

Thyroid carcinoma is most common endocrine tumor. Incidence of thyroid cancer has increased by up to five folds during last six decades^(13,14). Possible risk factors for malignancy in multinodular goiter are, history of radiation to the neck, family history of thyroid diseases and detection of calcifications by ultrasound⁽¹⁵⁾.

In our study, histopathological analysis of 136 cases shows that benign multinodular goiter was present in 124 (91%) cases and malignant thyroid lesion in 12 (09%) cases. Among 12 malignancy cases, papillary carcinoma 08 (66.7%) was most common malignant tumor. Hence our study correlated with various international studies.

In a study done by Pedamallu in 2008, MNG found to be higher in females (88%) compared to that of males (12%)⁶. In our study MNG found in females (79%) compared to that of males (21%). Hence our study correlated with above author.

Male to female ratio noted between 1:2.5 to 4 in different parts of the world¹⁶. Ratio was shown 1:5 by Rahman in 2006⁽¹⁷⁾, 1:4 by Welkar in 2003⁽¹⁸⁾, 1:2.5 to 4 by Zuberi in 2009⁽¹⁹⁾. In our study, male and female ratio was 1:3.7. Hence our study is correlated with above authors.

Aqeel Shakir Mahmood et al study in 2019, reported highest frequency of multinodular goiter 141 (32%) cases in 41-50 years age group⁽²⁰⁾. Yogendra Kumar et al study in 2019, also reported highest frequency of multinodular goiter 24 (40%) cases in 41-50 years age group⁽²¹⁾. In our study, The highest frequency of multinodular goiter 58 (42.7%) cases were seen in 41-50 years age group. Hence our study is correlated with above authors.

Incidence of malignancy in multinodular goiter varies from 0.9 to 13% in different parts of world⁽⁷⁾. Various studies have reported a 7 to 17% incidence of malignancy in Multinodular goiter^(8,9), and highly consistent with other studies. Al Hashimi et al(2013) in Iraq, the incidence was 3.03%²². Benzarti et al (2002) in Tunis, incidence was 10%²³. Sarjaevot et al (2005), noted with an 8% incidence of malignancy in his study²⁴. Prades et al (2002) documented, incidence of 12.2%²⁵. Mofti (1991) observed higher incidence of thyroid malignancy 29%²⁶. In our study, Incidence of malignancy in multinodular goiter was 8.8%. Hence our study correlated with above authors. (Table 7).

6. Conclusion

- 1) Multinodular goiter is common problem of thyroid disease.
- 2) In our study Male to female ratio was 1:3.7
- 3) Maximum number of multinodular goiter 58(42.7%) cases were seen in 41 -50 years age group
- 4) Incidence of thyroid carcinoma in MNG is high
- 5) Papillary carcinoma was Most common malignant tumor of thyroid among MNG patients.
- 6) Frequency of malignancy in our study was 8.8%.

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