Original Research Article

DOI: http://dx.doi.org/10.18203/2349-2902.isj20190820

A clinicopathological study of multinodular goitre

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Received: 12 February 2019 Revised: 15 February 2019 Accepted: 21 February 2019

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ABSTRACT

Background: Multinodular goitre (MNG) is a clinicopathological entity characterized by an increased volume of the thyroid gland with formation of nodules. The present study has been planned to study the various clinical presentations and diagnostic accuracy between operative findings and histopathological findings in a case of multinodular goitre.

Methods: The present study was a hospital-based prospective study conducted in Dr D.Y. Patil Medical College, Hospital and Research Centre, Pune between July 2016 to September 2018. 100 patients aged between 15 to 75 yrs. clinically diagnosed as multinodular goitre were included.

Results: FNAC finding of multinodular goitre in the study group showed colloid goitre was seen in 62 cases, 27 cases had multinodular goitre. 6 cases had neoplastic etiology, 3 cases had Hashimoto's thyroiditis and 2 cases had papillary carcinoma of thyroid. HPE finding wise distribution showed that 10 cases were malignant, and 90 cases were benign. FNAC finding was significantly associated with histopathological finding in detecting malignant or benign lesion of multinodular thyroid gland and diagnostic accuracy of FNAC is 92%. Clinical finding comparison with operative finding showed that diagnostic accuracy of detecting malignant or benign lesion was only 35%. There was no significant difference among the two methods for detecting type of lesion in multinodular thyroid.

Conclusions: Females are predominantly affected. About 8% cases of MNG are malignant. Considering the histopathological report as a gold standard, correlation of FNAC finding with histopathological finding was very much accurate and significant for detecting malignant and benign lesion of multinodular thyroid.

Keywords: Clinicopathological, FNAC, Goitre, Multinodular, Nodular, USG

INTRODUCTION

A goitre simply means an enlarged thyroid. Multinodular goitre (MNG) is a clinicopathological entity characterized by an increased volume of the thyroid gland with formation of nodules. The nodules can be very small, often only a few millimetres in size, or can be larger, perhaps several centimetres each. Histologically, MNG is defined as a thyroid enlargement with follicles that are

morphologically and functionally grossly altered. It usually develops over years.² 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.³ Multinodular non-toxic goitre is the most prevalent thyroid pathology characterized by unilateral or bilateral thyroid growth

with morphologically and/or functionally transformed follicles and euthyroidism. At thyroid sonography in unselected populations, 20 to 30% incidence of thyroid nodules has been reported.⁴

Treatment modalities include treatment with radio-iodine (I¹³¹), subtotal thyroidectomy, and total thyroidectomy. However, total thyroidectomy is the preferred mode of treatment of multinodular goitre.

The present study was planned to study the various clinical presentations and the pathological features of multinodular goitre with respect to their histopathological reports along with assessment of the diagnostic accuracy between clinical findings and operative findings in a case of multinodular goitre, diagnostic accuracy between pathological findings (FNAC) and operative findings in a case of multinodular goitre and diagnostic accuracy between operative findings and histopathological findings in a case of multinodular goitre.

METHODS

The present study was a hospital-based study to study the various clinical presentations and the pathological features of multinodular goitre with respect to their histopathological reports. The study conducted at the Dr D.Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune between July 2016 to September 2018. The present study was a hospital-based prospective study.

Study population

All eligible cases, after considering the inclusion and exclusion criteria, attending OPD of General Surgery and admitted to the surgery wards in Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune for the treatment of multinodular goitre during the period of study were included. The sample size was 100 cases. All patients fulfilling the inclusion and exclusion criteria were enrolled in the study. A detailed history clinical examination was done.

Inclusion criteria

- Those patients who gave informed, written consent with
- All patients attending surgery OPD clinically diagnosed as multinodular goitre
- Age Group: 15 to 75 years
- Both genders.

Exclusion criteria

- Pregnant and lactating women
- Patients presenting with solitary thyroid nodule
- Immunocompromised patients
- Patients less than 15 years of age and more than 75 years of age

Plan of study

Patients admitted with multinodular goitre at Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune from July 2016 to September 2018. Written and Informed consent of all patients was taken prior to their enrolment in the study. Patients were subjected to detailed history and thorough clinical examination. Patients underwent necessary laboratory investigations. Patient were subjected to other diagnostic investigations such as chest X-ray, X-ray of cervical spine, indirect laryngoscopy, ultrasonography of neck with high resolution probe, fine needle aspiration cytology with hypodermic needle of 21-24gauge. Computerized Tomography of Neck was done in selected patients.

Total thyroidectomy was performed for all patients diagnosed with multinodular goitre. All the surgical specimens were evaluated for histopathology. The final diagnosis was based on clinical, pathological and histopathological findings.

Statistical analysis

Data analysis was done using the SPSS (Statistical Package for the Social Science) Version 17 for Windows. The demographic variables, duration, clinical finding, USG finding, FNAC finding, Operative procedure, Intraoperative finding, HPE finding were calculated with number and percentage.

The Chi-square test was used to find significance and association between FNAC with HPE finding and Clinical, FNAC, HPE finding with operative finding. A probability value of 0.05 was accepted as the level of statistical significance.

RESULTS

The Table 1 shows age wise distribution of the cases in the study group. Majority of the cases i.e., 32 were in age group 31 to 40 years, followed by 24 cases in age group 21 to 30 years, 21 cases in the age group of 41 to 50 years, 13 cases in the age group of 51 to 60 years. 6 cases were in age group more than 60 years and 4 cases in the age group less than 20 years. The mean age was 39.48 years with a standard deviation of ± 12.68 .

Table 1: Age wise distribution of cases in study group.

Age (years)	No. of cases	Percentage
≤20	4	4
21 - 30	24	24
31 - 40	32	32
41 - 50	21	21
51 - 60	13	13
61 and above	6	6
Total	100	100

The gender wise distribution in the study group showed that 88 cases were females and 12 cases were males, with male to female ratio being 1:7.3 (Table 2).

Table 2: Gender wise distribution of cases in study group.

Gender	No. of cases	Percentage
Male	12	12
Female	88	88
Total	100	100

Table 3: Duration wise distribution of cases in study group.

Duration (years)	No. of cases	Percentage
<1	25	25
1-3	37	37
4-6	29	29
7-10	9	9
Total	100	100

The Table 3 shows distribution of the cases as duration of disease in the study group. Majority of the cases i.e. 37 had duration since 1 to 3 years, followed by 25 cases had duration of less than 1 years, 29 cases had duration since 4 to 6 years and remaining 9 cases had duration since 7 to 10 years.

Table 4: Clinical finding wise distribution of cases in study group.

Clinical finding	No. of cases	Percentage
Multinodularity	82	82
Smooth surface	18	18
Total	100	100

Table 4 shows clinical finding wise distribution of cases in the study group. 82 cases had multinodularity and 18 cases had smooth surface.

Table 5: USG finding wise distribution of cases in study group.

USG finding	No. of cases	Percentage
Multinodular goitre	56	56
Colloid goitre	37	37
Neoplastic etiology	7	7
Total	100	100

Table 5 shows USG finding wise distribution of cases in the study group. 56 cases had Multinodular goitre, 37 cases had colloid goitre and remaining 7 cases had neoplastic etiology.

Table 6 shows FNAC wise distribution of cases in the study group. 62 cases had colloid goitre, 27 cases had multinodular goitre, 6 cases had neoplastic etiology, 3

cases had Hashimoto's Thyroiditis and 2 cases had Papillary Carcinoma Thyroid.

Table 6: FNAC finding wise distribution of cases in study group.

FNAC finding	No. of cases	Percentage
Colloid goitre	62	62
Multinodular goitre	27	27
Neoplastic etiology	6	6
Hashimoto's thyroiditis	3	3
Papillary carcinoma thyroid	2	2
Total	100	100

Table 7: FNAC finding wise distribution of cases in study group.

FNAC finding	No. of cases	Percentage
Malignant	8	8
Benign	92	92
Total	100	100

Table 7 shows FNAC wise distribution of the cases in the study group. 8 cases had Malignant finding and 92 cases were benign on FNAC.

Table 8: Intraoperative finding wise distribution of cases in study group.

Intraoperative finding	No. of cases	Percentage
Multinodularity	44	44
Single lobe enlarged	30	30
Both lobes enlarged	17	17
Irregular mucosa	8	8
Cystic lobe	1	1
Total	100	100

Table 8 shows intraoperative finding wise distribution of the cases on the study group. Multinodularity was seen among 44 cases, 30 cases had single lobe enlarged, 17 cases had both lobes enlarged, 8 cases had irregular mucosa and one case had cystic lobe.

Table 9: Operative procedure wise distribution of cases in study group.

Operative procedure	No. of cases	Percentage
Hemithyroidectomy	31	31
Total thyroidectomy	69	69
Total	100	100

Table 9 shows operative procedure wise distribution of the cases in the study group. 31 cases underwent Hemithyroidectomy and 69 cases had total thyroidectomy. Total thyroidectomy was done for patients, in which intra-operatively malignancy was suspected.

Table 10: Histopathological finding wise distribution of cases in study group.

HPE finding	No. of cases	Percentage
Multinodular goitre	67	67
Colloid goitre	22	22
Follicular carcinoma	6	6
Papillary carcinoma	2	2
Medullary carcinoma	1	1
Multinodular goitre with Hurthle cell changes	1	1
Thyroid cyst	1	1
Total	100	100

Table 10 shows histopathological finding wise distribution of the cases in the study group. 67 cases had multinodular goitre, 22 cases had colloid goitre, 6 cases had follicular carcinoma, 2 cases had papillary carcinoma, 1 case had medullary carcinoma, multinodular goitre with Hurthle cell changes and thyroid cyst respectively.

Table 11: Histopathological finding wise distribution of cases in study group.

HPE finding	No. of cases	Percentage
Malignant	10	10
Benign	90	90
Total	100	100

Table 11 shows Histopathological finding wise distribution of the cases in the study group. 10 cases were having malignant finding and 90 cases had benign finding.

Table 12: Association between FNAC and histopathological finding in study group.

FNAC	Histopatholo	Histopathological finding	
finding	Malignant	Benign	Total
Malignant	5	3	8
Benign	5	87	92
Total	10	90	100
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Fisher exact test: P < 0.0001; Diagnostic accuracy = 92%.

Table 12 shows Association between FNAC and histopathological finding in the study group. Among 8 cases with malignant finding on FNAC, 5 were malignant on histopathology and 3 were benign. Among 92 cases benign on FNAC, 5 were malignant and 87 were benign on histopathology. To test whether this difference is significant or not, Fisher Exact test was used as test of significance. Fisher exact value was very highly significant with P <0.0001. Overall diagnostic accuracy was 92%. Table 13 shows association between clinical finding and operative finding in the study group. Among

Eighty two cases with multinodularity on clinical finding, 18 were malignant and 64 were benign on operative finding. Among 18 cases with smooth surface on clinical finding, 1 was malignant and 17 were benign on operative finding. To test whether this difference is significant or not, Fisher exact test was used as test of significance. Fisher exact value was not significant (P = 0.18). Overall diagnostic accuracy was 35%.

Table 13: Association between clinical and operative finding in study group.

Clinical	Operative finding		Total
finding	Malignant	Benign	Total
Multinodularity	18	67	82
Smooth surface	1	17	18
Total	19	81	100

Fisher exact test: P 0.18; Diagnostic accuracy = 35%.

Table 14: Association between operative and HPE finding in study group.

Operative	HPE finding		- Total
finding	Malignant	Benign	Total
Malignant	5	14	19
Benign	5	76	81
Total	10	90	100

Fisher exact test: P 0.02; Diagnostic accuracy = 81%.

Table 14 shows association between operative finding and HPE finding in the study group. Among 19 cases with malignant on operative finding, 5 were malignant and 14 were benign on HPE. Among 81 cases with benign on operative finding, 5 were malignant and 76 were benign on HPE. To test whether this difference is significant or not, Fisher Exact test was used as test of significance. Fisher exact value was very highly significant (P = 0.02). Overall diagnostic accuracy was 81%.

DISCUSSION

Majority of the cases with multinodular goitre were in age group 31 to 40 yrs., followed by24 cases in age group 21 to 30 yrs., 21 cases in age group 41 to 50 yrs. 4 cases were in age group less than 20 yrs. and 6 cases were in age group more than 60 yrs. The mean age was 39.48 years with a standard deviation of ± 12.68 (Table 1).

Among 100 cases of multinodular goitre, 12 were males and 88 were females (Table 2). Sanjeeva K et al, studied the age and sex distribution along with the mode of presentation of multinodular goitre (MNG). 100 cased were enrolled and epidemiological finding were 59% patients with multinodular goitre belonged to 3rd and 4th decade of life, 90% patients were females, 82% presented before 5 years. These findings are similar to our study finding.⁵ Anwar K et al, studied frequency of malignancy in nodular goitres. A total of 204 cases were studied and

results showed that ages of the patients ranged from 17 to 84 years with a mean age of 37±12.48 years. The male to female ratio was 1:3.5.6

Thirty seven cases with multinodular goitre were suffering from 1 to 3 yrs., 29 cases were suffering since 4 to 6 yrs (Table 3). Sanjeeva K et al, studied the age and sex distribution along with the mode of presentation of Multinodular Goitre (MNG). 100 cased were enrolled and epidemiological finding were 59% patients with multinodular goitre belonged to 3rd and 4th decade of life, 82% presented before 5yrs. These findings are similar to our study finding.⁵

Multinodular goitre on clinical finding showed that 82 cases had multinodularity and 18 cases had smooth surface (Table 4).

USG of multinodular Thyroid showed that 56 cases had multinodular goitre, 37 cases had colloid goitre and 7 cases had neoplastic aetiology (Table 5).

FNAC finding of multinodular goitre in the study group showed colloid goitre was seen in 62 cases, 27 cases had multinodular goitre. 6 cases had neoplastic etiology, 3 cases had Hashimoto's thyroiditis and 2 cases had papillary carcinoma of thyroid (Table 6). Amudhan J et al, studied the clinicopathological features of MNG and its management and its various post-operative complications. Total 50 cases enrolled in the study and post operation FNAC report showed that 64% of the cases had colloid nodular goitre, 22% had Hashimoto's thyroiditis, 8% had adenomatous goitre, 4% had follicular neoplasm and one case was non-conclusive.³

Malignant finding on FNAC was seen among 8 cases and 92 cases were benign among multinodular goitre cases in the study group (Table 7). Padmawar MR et al, studied the clinicopathological study of multinodular goitre at AVBRH. All the 57 studied subjects underwent FNAC, out of which 51 cases (89.47%) turned out to be benign and 6 cases (10.52%) were malignant.⁷

Total thyroidectomy was performed on 69 cases and 31 cases underwent hemithyroidectomy in the study group (Table 8). Kapoor S et al, studied the various presentation pattern of histomorphological changes of non –neoplastic and neoplastic lesions of the thyroid and their management. Among 33 patients, which showed colloid goitre on FNAC, 2 patients reported papillary carcinoma and 1 follicular adenoma on histopathology. Total thyroidectomy was most commonly performed surgery. Total thyroidectomy was performed along with neck dissection in 14% cases. This is similar to present study finding.⁸

Intraoperative finding showed that among all multinodular goitre cases, 44 had multinodularity, 30 cases had single lobe enlarged 17 cases had both lobes enlarged 8 cases had Irregular mucosa and one case had

cystic lobe (Table 9). Ali et al, thyroid malignancy in multinodular goitre. 100 cases were enrolled and intra operative finding showed that 33 cases had subtotal thyroidectomy, 21 cases had right lobectomy, 18 cases had left lobectomy and Near total thyroidectomy and 6 cases had total thyroidectomy.⁹

HPE finding wise observation showed that among 100 cases with multinodular goitre, 67 cases had multinodular goitre, 22 cases had colloid goitre, 6 cases had follicular carcinoma, 2 cases had papillary carcinoma, and one case had medullary carcinoma, multinodular goitre with Hurthle cell changes and thyroid cyst respectively (Table 10). Sanjeeva K et al, studied the age and sex distribution along with the mode of presentation of Multinodular Goitre (MNG). 100 cased were enrolled and histopathological finding showed that 77 cases had multinodular goitre, 14 cases had Hashimoto's thyroiditis, 6 cases had follicular adenoma, 2 cases had papillary carcinoma and one case had follicular carcinoma.⁵

Amudhan J et al, studied the clinicopathological features of MNG and its management and its various post-operative complications. Total 50 cases enrolled in the study and post operation histopathological report showed that 74% of the cases had colloid goitre, 14% had Hashimoto's thyroiditis, 4% had follicular adenoma, 2% had follicular carcinoma and papillary carcinoma respectively.³

HPE finding wise distribution showed that 10 cases were malignant and 90 cases were benign (Table 11). Anwar K et al, studied frequency of malignancy in nodular goitres. A total of 204 cases were studied and histopathological finding showed that Out of the total 83.82% cases were benign and 16.18% cases were malignant. This is similar finding with our study finding.⁶

Padmawar MR et al, studied the clinicopathological study of multinodular goitre at AVBRH. Out of 57 patients 35 underwent histopathological examination of which 28 cases (80%) were benign and 7 cases (20%) were malignant.⁷

FNAC finding was significantly associated with Histopathological finding in detecting malignant or benign lesion of multinodular thyroid gland and diagnostic accuracy of FNAC is 92% (Table 12). Padmawar MR et al, studied the clinicopathological study of multinodular goitre at AVBRH. Correlation of FNAC finding with histopathology finding showed 100% sensitivity, 93.33% specificity with 71.42% positive predictive value and 100% negative predictive value and diagnostic accuracy was 94.29%.

Ali et al, Thyroid Malignancy in Multinodular Goitre. FNAC confirmed the diagnosis of thyroid carcinoma in 81% of patients. Clinical finding comparison with operative finding showed that diagnostic accuracy of

detecting malignant or benign lesion was only 35%. There was no significant difference among the two methods for detecting type of lesion in multinodular thyroid (Table 13).

In a study by Sharma P et al, clinico-radiological profile of goitre and its correlation with histopathology, they have concluded that USG and FNAC have been shown to be more sensitive, specific and accurate than clinical findings alone.¹⁰

In a study by Gupta M et al, correlation of FNAC with HPE in the diagnosis of Solitary Thyroid Nodule, Cytologic and histologic diagnoses were compared in 4069 patients and the sensitivity and specificity of FNAC were found to be 91.8% and 75.5%, respectively. This is similar to our study finding.¹¹

CONCLUSION

Multinodular goitres are most common in 3rd and 4th decade of life. Females are predominantly affected. About 8% cases of multinodular goitre are malignant. Clinical examination is not accurate in detecting the malignant or benign lesion.

Considering the histopathological report as a gold standard, correlation of FNAC finding with histopathological finding was very much accurate and significant for detecting malignant and benign lesion of multinodular thyroid.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Athavale VS, Thakkar SM, Gope DD, Tulsian AR, Kumar SB, Gogineni JC. A clinicopathological study of multinodular goitre. Int Surg J 2019;6:892-7.