Original Research Article

A clinico pathological study and management ofmultinodular goitre

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Abstract

Background: The incidence of clinically apparent thyroid nodules in the general population is 4-5%.The prevalence of goitre is more than 40 million in India with more than 2 billion globally. Goitreis an enlargement of the thyroid gland. The gland can be generally enlarged or have multiple growths (nodules) leading to enlargement of the whole thyroid gland. The latter is termed Multinodular goitre(MNG). There are three forms of Multinodular goitre: MNG in euthyroid state, toxic MNG and malignant. The exact etiological factors of thyroid nodules or Multinodular goitres are less understood. In general, the development of goitre is due to a complex mix of several factors including iodine deficiency. In view of the increasing number of cases and varied presentations, a detailed study is needed in and around Chennai**. Material and methods:** This is a prospective observational study of 50 cases admitted with nodular thyroid swelling from October 2017 to October 2018 at the surgical units of Chettinad Medical College, Chennai.**Results:** Of the fifty cases, 9 were males (18%) and 41 were females (82%) with a female to male ratio of 4.5:1. 33.3% (3 cases) of the males presented in the age group of 51 years and above. Majority of the females 60%, (25 cases) presented in the age group between 31 – 50 years. The Chief complaint in our patients (100 %) was swelling in front of the neck. Duration of swelling ranged from 4 months to 15 years and 90% (45 cases) were seen in the range of 1 month to 5 years. Only 2 cases (4%) had pain. Pressure symptoms were seen in 4% (2 cases).Toxic symptoms and signs were seen in 16 cases (32%). Most of the patients showed colloid goitre (72%) on FNAC. 38 patients underwent total or near total thyroidectomy and remaining 12 cases underwent subtotal thyroidectomy with a complication rate of 18%. There was no mortality in our series.**Conclusion:** MNG is the commonest thyroid disease in our hospital, more common in females, with chief complaints of swelling in front of the neck. FNAC is very useful in the diagnosis and management of MNG. Malignancy can still come as a surprise on post-operative histopathological examination, even when there is no suspicion of malignancy clinically and with FNAC.The main indications of surgery in MNG are cosmetic problem, pressure effect symptoms, secondary thyrotoxicosis and suspicion of malignancy. Near total thyroidectomy is the surgery of choice for MNG.

Key words:MNG, FNAC, HPE, thyroid isotope scan, thyrotoxicosis, subtotalthyroidectomy, total thyroidectomy.

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INTRODUCTION

MNG is one of the common presentations of various thyroid diseases. The thyroid gland is an endocrine gland situated in the lower part of front and the sides of the neck. Its main function is regulation of the basal metabolic rate, stimulates somatic and psychic growth and plays important role in calcium metabolism. The term thyroid is derived from Greek, which means shield (Thyros –shield, eidos – form).Thyroid nodules have been reported to be found in 4% to 7% of the population on neck palpation and in 30% to 50% of the population by ultrasonography [1, 2]A long standing and hitherto unresolved issue is whether MNG is significantly associated with malignancy[3].MNG had been traditionally thought to be at a low risk for malignancy as compared to

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a solitary nodule thyroid. However, various studies have reported a 7 to 17% incidence of malignancy in MNG[4,5,6]The most common variety of malignancy which has been documented in the literature is papillary carcinoma [7]. The management of a solitary nodule has been refined by FNAC, unlike MNG, in which a nodule of a carcinoma can't be differentiated clinically or radiologically amidst other benign nodules [8, 9]The incidence of the thyroid malignancy ranges from 0.9% to 13% in different parts of world [10].Such an incidence increases further if cases of occult carcinoma are also taken into consideration. The exposure to ionizing radiation and the availability of more sensitive diagnostic tests may be the possible explanations for a worldwide increase in the incidence of thyroid carcinoma [11, 12]

MATERIAL AND METHODS

The material of the present study consists of patients admitted with nodular thyroid swelling from October 2017 to October 2018 at the surgical units of Chettinad medical college and Hospital, Chennai. Totally, 50 patients were admitted and treated during this period. Among these, 41 patients were female, and remaining 9 were males. After admission, a detailed history was taken and thorough clinical examination was carried out which was entered in the proforma. The patients were investigated. The investigations included Hemoglobin percentage, urine analysis, blood sugar estimation, blood urea estimation, blood grouping and Rh typing, serum cholesterol, x-ray of the neck-AP and lateral views and chest X-ray and ENT examination. All patients had a Thyroid profile and FNAC done. These patients underwent surgery and all the excised thyroid specimen were sent for Histopathological examination. Patients were discharged after removing the sutures and were asked to come for follow up. Post operative thyroid profile was done on 1st post operative week and at 1 month. They were advised to take the needful medications accordingly. Only those patients with clinical evidence of multinodular goiter were taken up for the study randomly, excluding diffuse hyperplastic goitre, solitary nodule of thyroid, Grave's disease, recurrent goitre ,pregnant and lactating women,patients denying treatment/surgery and these results were compared with other studies.

OBSERVATION

Period of Study : October 2017 to October 2018.
Total Number of cases : 50
Age group : 19 to 70 years
Average age group of Patient: 43 years.

Surface was nodular in all 50 cases and among them largest was 15 cms / 12cms in size and smallest was 3 cms / 3 cms in size on clinical examination.

Table 1: Age and Sex Incidence

Age in years	male	female	total	percentage
00-20	00	02	02	04%
21-30	01	02	03	6%
31-40	03	15	18	36%
41-50	02	10	12	24%
51-60	02	07	09	18%
61-70	01	05	06	12%
Total	**09**	**41**	**50**	**100%**

Age group most commonly affected: 31 – 50 years, 30 cases (60 %)
Next age group affected : 51 – 60 yeas, 09 cases (18%)
Total Male patients : 9(18 %)
Total Female patients : 41 (82%)
Ratio of female to Male patients : 4.5:1

Table 2: Duration of swelling

Duration of swelling	Total cases	Percentage
1-6 months	05	10%
6-12 months	22	44%
1-2 years	10	20%
2-5 years	08	16%
5-10 years	03	06%
>10 years	02	04%
Total	**50**	**100%**

Table 3: Progression of thyroid swelling

Progression of swelling	Total no of cases	Percentage
Gradual	**44**	**88%**
Rapid	**02**	**04%**
Stationary	**04**	**08%**
Total	**50**	**100%**

Table 4: Incidence of pain in thyroid swelling

Pain in the swelling	Total cases	Percentage
Painless swelling	48	96%
Painfullswellilotng	02	04%
Total	**50**	**100%**

Table 5: Incidence of pressure symptoms

Symptoms	Total	Percentage
1) pressure symptoms		
a)alteration in voice	00	00%
b)difficulty in swallowing	02	04%
c)difficulty in breathing	01	02%
2) no pressure symptoms	47	94%
Total	**50**	**100%**

Table 6: Incidence of Toxicity

Toxicity	Female	Male	Total	%
With toxicity	16	00	16	32%

Without toxicity	25	09	34	68%
Total	**41**	**09**	**50**	**100**

Table 7: Incidence of tracheal shift

Tracheal position	Total no of cases	Percentage
Tracheal center	49	98%
Trachea shifted to left	01	2%
Trachea shifted to right	00	00%
Total	**50**	**100%**

Table 8: FNAC findings of Thyroid

Report of FNAC	Total no of cases	Percentage
Colloid nodular goiter	**36**	**72%**
Hashimoto`thyroiditis	**8**	**16%**
Follicular neoplasm	**3**	**06%**
Malignancy	**3**	**06%**
In conclusive	**0**	**00%**
Total	**50**	**100%**

Table 9: Histopathology (HPE) of Thyroidectomy Specimen

HPE report	Total no of cases	Percentage
Colloid goitre	36	72%
Hashimoto`s thyroiditis	7	14%
Papillary carcinoma	5	10%
Follicular carcinoma	0	00%
Follicular adenoma	2	04%
Medullary carcinoma	0	00%
Total	**50**	**100%**

Correlation between fnac and HPE

True positive	False positive
5	0
False negative	**True negative**
2	43

In our study sensitivity was 71.43%, specificity was 100%, positive predictive value was 100% and negative predictive value was 95.56%.

Table 10: Complications of Surgery

Complications	Total no of cases	Percentage
Reactionary haemorrhage	00	00
Transient hypoparathyroidism	04	08%
Permanent hypoparathyroidism	00	00
Temporary recurrent laryngeal nerve palsy	03	6%
Permanent recurrent laryngeal nerve palsy	00	00
Wound infection	02	4%
Total	**09**	**18%**

DISCUSSION

Fifty patients presenting with Multinodularity of the thyroid gland without obvious evidence of malignancy were studied and evaluated in terms of history, clinical examination and subjected for relevant investigations, taken up for surgery with prior FNAC and histopathology of operated specimen done post operatively. The results were analyzed as depicted in the table.Of the fifty cases studied, 9 were males (18 %) and 41 were females (82%) with a female to male ratio of 4.5:1. Borsaikia and Patar (2015) showed that 83% were females and female to male ratio was 5:1. [13] Table 1 shows the age and sex distribution of the patients studied. 43.2% (3 cases) of the males presented in the age group of 51 years and above. Whereas among females 36% presented in the age group of 31 – 40 and 41 – 50 years equally. Majority of the females 60 %, (30 cases) presented in the age group between 31 – 50 years. But in the western literature quoted by "Bremer and Moll Night" in analysis of 1280 cases of Multinodular goiter, the age incidence was maximum between 40 – 49 years. In our study maximum age of presentation was 70 years and minimum age was 19 years with an average age incidence of 43 Years.The Chief complaint in our patients (100 %) was swelling in front of theneck. However few patients had associated local symptoms like difficulty inswallowing and/or breathing. Duration of swelling ranged from 4months to 15 years and 44% (22 cases) were seen in the range of 6 month to 1 year. ReddyVS (2015) showed a result of 40% between 4month to 1 year.[14]The size of the swelling increased gradually in 44 cases (88%), rapidly in 2 cases (4%) and was stationary in 4 cases (8%). Both the cases, which showed rapid increase in size, were not malignant, and did not give rise to any pressure symptoms.48 cases (96%) were not associated with pain and only 2 cases (4%) had pain. Patar (2015) it showed 9% of pain in swelling.[13]Pressure symptoms were seen in 6% (3 cases) as against 5% in Borsaikia, Patar (2015)[13] study and 26% in Satyanarayana Rao S V (2014) [52]. In our study 2 cases (4 %) presented with difficulty in swallowing and 1 case (2%) with difficulty in breathing. Thus difficulty in swallowing was the commonest pressure symptom.Toxic symptoms and signs were seen in 16 cases (32 %), which included 16 female (32 %). Toxic symptoms were seen in 20% of cases in Venkata Reddy (2015) study.All thyroid swellings in our study were moving with deglutition. Both lobes were involved in 40 cases with predominantly involving right lobe and remaining 10 cases involving predominantly left lobe.In majority of the patients the size the gland was in stage 2 according to WHO classification i.e. swelling visible with neck in normal position.The clinical features of the nodule were not helpful in the diagnosis of malignancy. There was no correlation between the consistency, duration and size of the nodules

and malignancy.X-ray of neck, AP and lateral views and X-ray of the chest were done in all the cases. There was one case of tracheal shift to 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 histopathological report of operated specimen. Most of the patients showed colloid goitre in 36cases (72%),3 follicular neoplasm ,3 malignancy and 8 hashimotosthyroiditis in FNAC .Of that three follicular neoplasm's proved to be two follicular adenomas and one papillary carcinoma on histopathological examination and among 8 hashimotos thyroiditis in FNAC ,one turned out to be papillary carcinoma. Diagnosis of Follicular carcinoma preoperatively by FNAC was not possible as angioinvasion and capsular invasion, which are features of Follicular carcinoma, were not evident. This shows that FNAC is not 100% accurate in the diagnosis of follicular carcinoma.

The advantages of FNAC are:

1. It is safe and fairly accurate method for establishing whether MNG is a benign or malignant. Surgery can be avoided in many patients with benign
2. Complications of FNAC are negligible and patient acceptance is high.
3. It requires no anaesthesia.

The disadvantages of FNAC are:

1. It is not 100% accurate.
2. It cannot distinguish between benign from malignant follicular neoplasms.

In our study sensitivity was 71.43%%, specificity was 100%, positive predictive value was 100% and negative predictive value was 100%. Which correlates with the findings suggested by venkat (2015)[16] which shows 80%sensitivity and specificity 98%.We had 8 cases of MNG with thyroiditis and were operated for cosmetic reasons.The main indication for surgery in our series was cosmetic problem. The next common indication was for pressure effects of the goiter like dysphagia and dyspnoea and secondary thyrotoxicosis. The three cases of follicular neoplasm's were operated to rule out follicular carcinoma.Of the 50 cases, 38 cases were subjected to total or near total thyroidectomy and remaining 12 cases underwent subtotal thyroidectomy.In our study postoperative complications were very few.Transient hypoparathyroidism was seen in 4 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* (2003) shows that there was 28% of temporary hypocalcaemia and 0.9% with permanent hypocalcaemia.Temporary recurrent laryngeal nerve palsy was seen in 3 cases (6%), both of which recovered within a month. There was no permanent recurrent laryngeal nerve palsy. Temporary RLN palsy was seen in 8%, permanent RLN palsy was seen in 0.9% in T.A. Day *et al* (2003).Therewere 2 cases of wound infection which responded very well to broad spectrum antibioticsThere was no mortality in our series.

SUMMARY AND CONCLUSIONS

Fifty patients of MNG were evaluated with respect to age, sex, duration of swelling and were investigated with FNAC. Operated specimen subjected to histopathological examination and results were analysed.

1. MNG is the commonest thyroid disease in our hospital.
2. Multinodular goiter is more common in female, majority are in the age group of 31-50 years
3. The chief complaint in majority of the patients is swelling in front of the neck and few patients with pressure symptoms.
4. In majority of the patients, duration of the swelling prior to presentation was 6 months to 5 years.
5. Secondary thyrotoxicosis is seen in 32% (16 cases).
6. FNAC in our study has high specificity. Hence malignant lesions are diagnosed fairly accurately. However, its sensitivity is relatively low
7. Malignancy can still come as a surprise on post-operative histopathological examination, even when there is no suspicion of malignancy clinically and with FNAC.
8. The main indications of surgery in MNG are cosmetic problem, pressure effect symptoms, secondary thyrotoxicosis and suspicion of malignancy.
9. Near total thyroidectomy is the surgery of choice for MNG. But a trend towards 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 high risk of complications.

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