

STUDY OF NODULAR GOITRE OF THE THYROID: EPIDEMIOLOGY, MANAGEMENT, AND MALIGNANCY - AN OBSERVATIONAL STUDY

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Abstract

Background: Thyroid nodular swelling, prevalent with age, manifests as solitary or multinodular growths, encompassing adenomas, cysts, carcinomas, and more. Distinguishing between benign and malignant cases is crucial, as 10-20% of solitary nodules and 5-10% of multinodular goiters can be cancerous. Effective diagnostic techniques aid in selective management, avoiding unnecessary thyroidectomy. Studying nodular goiters is vital for identifying potentially curable cancers in both solitary and multinodular presentations.

Materials and Methods: A total of 62 consecutive patients were included in the study, and their physical examination, routine investigations, and specific tests were recorded. The patients were subjected to an ultrasonogram of the neck to determine cervical node metastasis, and a CT scan was performed selectively for the multinodular goitre to assess tracheal compression. The follow-up period of the patients ranged from 3 to 18 months. **Result:** All 62 patients reported swelling in front of their neck, 19 experienced pain, and 12 had difficulty swallowing. 82% of the patients had an uneventful postoperative period. However, one patient had reactionary haemorrhage that stopped after 4 pads were changed. 2 patients had transient dysphonia, which improved later, and another had a wound infection caused by staphylococci, which was treated with ciprofloxacin. 6 patients developed hypothyroidism and were treated with l-thyroxine. One patient experienced transient hypocalcaemia and was treated with calcium gluconate. Malignancy was most common in the 3rd decade of life, and its incidence was higher in males (25%) compared to females (10%).

Conclusion: Nodular goitre is more common in young and middle-aged patients, with females being seven times more likely to have it than males. Most nodular goitres are benign lesions. In patients with solitary or multinodular goitre managed by hemithyroidectomy, subtotal thyroidectomy, and total thyroidectomy, the incidence of malignancy was 11%. The incidence of malignancy in males with goitre is higher than in females, with a ratio of 5:2.

INTRODUCTION

Nodular swelling of the thyroid is a common clinical entity, and its incidence increases with age. Nodular swelling may present as a solitary or multinodular swelling. Adenoma, cyst, carcinoma, dominant nodule of MNG, thyroiditis, lymphoma, and parathyroid tumours may present as solitary thyroid nodules. Colloid goitre and medullary carcinoma thyroid (familial) may present as MNG. This clinical entity is important because 10-20% of solitary thyroid nodules can be malignant. 5-10% of malignant swelling of the thyroid arises from MNG. The approach for nodular goitre management is selective. Improvements in diagnostic techniques to reliably identify patients with malignant and benign

conditions that require surgery, thereby avoiding unnecessary thyroidectomy for all nodular goitres. A potentially curable cancer may present in solitary nodule thyroid and multinodular goitre; therefore, studying the nodular goitre of the thyroid is important.^[1-5]

Aim

This study aimed to investigate the prevalence and characteristics, the role of fine needle aspiration cytology in the management, and the incidence of malignancy of nodular goitre in the thyroid.

MATERIALS AND METHODS

This study was conducted on 62 patients admitted with solitary or multinodular nodular goitre at the

Annal Gandhi Memorial Govt. Hospital and KAPV Medical College, Trichy, between August 2008 and July 2010.

Inclusion Criteria

A total of 70 consecutive patients admitted at AGMGH, KAPV Medical College, Trichy, with Nodular goitre of the thyroid were followed up, and only 62 patients who satisfied the above criteria were included in this study.

Exclusion Criteria

Patients with severe comorbid illness, nodular goitre with regional lymphadenopathy, and distant metastasis were excluded.

A physical examination was performed, including solitary nodule size, nature of the nodule, multinodular swelling, regional lymph node enlargement, and signs of thyroid dysfunction. Routine investigations were recorded, including a complete haemogram, urine analysis, biochemical investigation, thyroid function test, chest radiography, and ECG. Specific tests were recorded, including erythrocyte sedimentation rate, ultrasonogram neck, FNAC, CT scan and MRI of the neck, and radioiodine uptake.

Selectively, the patients were subjected to an ultrasonogram of the neck to determine cervical node metastasis. A CT scan was performed selectively for the multinodular goitre to assess tracheal compression. In papillary carcinoma, the thyroid assesses cervical nodal status and peri-thyroidal invasion. Patients were assessed for surgery under general anaesthesia. Preoperatively, regional lymph node metastasis was evaluated, and hemithyroidectomy in adenoma thyroid and colloid nodules, subtotal thyroidectomy in multinodular goitres, and total thyroidectomy in thyroid carcinomas were performed.

Histopathology of the excised specimens was tabulated. Patients with lymphocytic thyroiditis underwent an autoantibody assay and were administered tablet L-thyroxine therapy. Patients with MNG who underwent subtotal thyroidectomy were maintained with suppressive l-thyroxine, and those who underwent total thyroidectomy were maintained with a therapeutic dose of l-thyroxine.

The follow-up period of the patients ranged from 3 to 18 months. The first review was conducted after two weeks, and the second was conducted after six weeks. A thyroid function test was performed in all patients at six weeks. During the follow-up, the patients

underwent physical examination, TSH, thyroxine, thyroglobulin, autoantibodies, and thyroxine therapy for selected patients.

Among patients with malignancy, those with postoperative papillary carcinoma were treated with suppressive L-thyroxine, and one papillary carcinoma had undergone completion. One metastatic papillary carcinoma, completion of the cortex, one medullary carcinoma, and one follicular carcinoma were referred to a higher centre for further follow-up. All data were entered into MS Excel and expressed as frequencies and percentages.

RESULTS

Most of the 62 patients were aged 21-50 years. The age of the patients ranged from 7 to 65 years, with 54 females and eight males. All 62 patients reported swelling in front of their neck, 19 experienced pain, and 12 had difficulty swallowing [Table 1].

All 57 patients were euthyroid, with five showing a mild elevation of serum TSH. No case of hyperthyroidism was observed. None of the patients had lymph node metastases. Colloid nodules were reported in 31 cases and adenomatous goitre in 28 cases on FNAC, while 3 cases were diagnosed with papillary carcinoma.

Out of the 62 patients who underwent surgery, 11% were found to have malignancy, 42% had benign follicular adenomas, 8% had inflammatory goitre, and 3% showed evidence of toxicity; notably, one patient with inflammatory goitre developed papillary carcinoma thyroid [Table 2].

Malignancy was most common in the third decade of life. Most patients (82%) experienced an uneventful postoperative period. However, one patient experienced reactionary haemorrhage, which stopped spontaneously after the four pads were changed. Two patients had transient dysphonia characterised by a loss of pitch in their voice, which improved later. Another patient developed a wound infection caused by staphylococci, which was responsive to ciprofloxacin. Six patients developed hypothyroidism and were treated with l-thyroxine. Additionally, one patient experienced transient hypocalcemia that was successfully treated with intravenous calcium gluconate. 25% of male nodules were malignant, and 10.2% were malignant in female nodules [Table 3].

Table 1: Distribution of age, gender, and symptoms in the study population

		Number of patients	Percentage
Age in years	1-10	1	<2
	11-20	11	<2
	21-30	18	29
	31-40	24	38
	41-50	12	19
	51-60	3	<5
	61-70	3	<5
Gender	Female	54	87
	Male	8	13
Symptoms	Swelling	62	100

	Swelling & pain	10	16
	Swelling & dysphagia	3	5
	Swelling, pain & dysphagia	9	14

Table 2: Thyroid function, cytology analysis, and histopathological in the study population

		Number of patients	Percentage
Thyroid Function	Euthyroid	57	92
	Hypo thyroid	5	8
	Hyperthyroid	0	0
Cytology	Colloid nodule	31	50
	Adenoma	28	45
	Papillary Ca	3	5
Pathological diagnosis	Multinodular goitre	22	35
	Follicular adenoma	26	42
	Thyroiditis	5	8
	Nodules with toxicity	2	3
	Papillary carcinoma	5	8
	Follicular carcinoma	1	<2
	Medullary carcinoma	1	<2

Table 3: Distribution of age and postoperative complication of malignant nodules in the study population

		Number of patients	Percentage
Age in years	1-10	0	0
	11-20	0	0
	21-30	3	5
	31-40	0	0
	41-50	2	3
	51-60	0	0
	61-70	2	3
Complication	Hemorrhage	1	<2
	Dysphonia	2	3
	Wound infection	1	<2
	Hypothyroidism	6	10
	Transient hypocalcemia	1	<2
	Un eventful	51	82
Nodular goitre of thyroid	Benign		Malignant
Sex	Male	6	2
	Female	49	5

DISCUSSION

The nodular goitre of the thyroid is a common clinical entity that requires careful evaluation to identify patients who need thyroidectomy correctly. The age group in the present study ranged from seven to 65 years. Most patients were young and middle-aged, between 21 and 50. The incidence of malignancy was high in the 21-50 years age group. There were 54 females and eight males. Nodular goitre of the thyroid was seven times more common in females than in males, which is very high compared to world statistics showing a male-to-female ratio of 1:3. The incidence of malignancy was higher in males (25%) than that in females (10%).^[6,7]

At admission, all patients had swelling of the anterior aspect of the neck. Nineteen patients complained of pain over the swelling, and postoperative, retrospective evaluation with the help of histopathology was attributed to thyroiditis and cystic degeneration or haemorrhage into a nodule and carcinoma. Twelve patients complained of neck discomfort during swelling due to the large size of MNGS and carcinomas.^[8,9]

Only six patients had hypothyroidism, which was attributed to lymphocytic thyroiditis and multinodular goitre diagnosed on postoperative

histopathological examination, and these patients benefited from postoperative L-thyroxine supplementation.^[10,11]

59 patients had benign thyroid swelling, while 3 patients had malignant thyroid swelling detected by FNAC. A retrospective comparison with histopathology of the excised specimen revealed a false-negative result in the detection of malignancy. Four colloid nodules diagnosed by FNAC revealed foci of thyroiditis on histopathology for malignant sweetening scenes reported as benign swellings. One adenoma diagnosed by FNAC revealed foci of thyroiditis, and two adenomas diagnosed by FNAC revealed features of toxicity on histopathology. Two adenomas reported by FNAC showed features of papillary carcinoma and medullary carcinoma. The two colloid nodules showed papillary and follicular carcinomas.^[12,13]

Twenty-two patients had MNG, 26 had follicular adenoma, and 7 had malignant goitre, among which 5 had papillary carcinoma, one had follicular carcinoma, and one had medullary carcinoma. The incidence of inflammatory goitre was 8%, and toxic features were noted in two adenoma patients.^[14]

Fifty-one patients had an uneventful operative period, one had a reactionary haemorrhage, and another had a wound infection that was managed appropriately. One patient had transient hypocalcaemia, which was

treated with intravenous calcium gluconate, and two experienced transient dysphonia that resolved without specific therapy. Six cases of postoperative hypothyroidism were detected, and the patient had either an inflammatory goitre or a multinodular goitre that was managed with L-thyroxine therapy.

Among patients with malignancy, three patients with papillary carcinoma were already treated with total thyroidectomy. They were reluctant to undergo further tests for metastatic workup and were placed on suppressive l-thyroxine. One patient underwent a complete metastatic workup and complete thyroidectomy, and one patient was referred to a higher centre.

CONCLUSION

In conclusion, nodular goitre of the thyroid is more common in young and middle-aged patients. Nodular goitre of the thyroid was seven times more common in females than in males, and most nodular goitre were found to be benign lesions. In individuals admitted with nodular goitre of thyroid-solitary or multinodular managed by hemithyroidectomy, subtotal thyroidectomy, and total thyroidectomy, the incidence of malignancy was 11%. The incidence of malignancy in the nodular goitre of the thyroid in males exceeds that in females, with a ratio of 5:2.

Limitations

Many patients did not undergo follow-up after the two reviews, and the exact incidence of postoperative hypothyroidism could not be evaluated. This

institution could not perform a frozen section study and relied on biopsy reports.

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