Original Research Article

Clinical pattern of thyroid swelling and their correlation with FNAC and HISTO-pathological diagnosis

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Abstract

Introduction: Thyroid diseases are, arguably, among the commonest endocrine disorders worldwide. FNAC is widely accepted as the most accurate, sensitive, specific, and cost-effective diagnostic procedure in the preoperative assessment of thyroid nodules. **Aims and objectives**: the study was planned to study the clinical pattern of thyroid swellings and their correlation with histopathological diagnosis and efficacy of FNAC in comparison to histopathology was studied.**Material and method**: Fifty patients of thyroid swellings presenting to the department of Surgery, Pt. B.D. Sharma PGIMS, Rohtak from January 2014 to December 2018 were studied. All the patients of thyroid swellings admitted for thyroid surgery during this period were included in the study.**Results**: Majority of patients in the present study were female adults in their 30s. Swelling neck was the commonest presenting complaint. Most of the patients had solitary nodule on examination. Preoperative diagnosis in 48 patients was colloid goiter and 2 patients had papillary carcinoma according to FNAC reports. On final histo-pathological study, majority were diagnosed as colloid goiter with cyto-histological concordance rate of 77% for colloid goiter. Concordance rate for papillary carcinoma was 100%. FNAC failed to detect follicular carcinoma preoperatively. Rate of malignancy in our study was 6% and majority were papillary carcinoma. The sensitivity,specificity, positive predictive value,negative predictive value and accuracy of FNAC for evaluating thyroid swellings in our study were 77.08%, 80%,80%, 85.38% and 78.5% respectively.**Conclusion**: FNAC is sensitive for diagnosing colloid goiter in cases of thyroid swelling and FANC should treated as first line diagnostic test for thyroid swelling to guide management though this is not suitable for histopathological examination.

Keywords: Goitre, Thyroid Swelling, FNAC, Histopathology

Introduction

Thyroid gland is the largest endocrine gland in body. Normal thyroid function is necessary for physiologic activity of most organs.[1] Disease of thyroid gland shows a great physiologic variation all over world, India too is no exception. According to a projection from various studies on thyroid diseases, it has been estimated that about 42 million people in India suffer from thyroid diseases.[2] Another study estimates around 140 million people suffered from thyroid diseases.[3] Thyroid nodules are common, seen in about 8.5% of thepopulation.[2] They are more common among women. In India the prevalence of a palpable thyroid nodule in the community is About 12.2%, according to a recent study.[4] Most common lesions found in palpable thyroid nodules are colloid goiter and less than 5% are actually malignant.[5] India has world's biggest "goitre Belt" in the subhimalayan region and the average prevalence of goitre is around 40%.[5] Incidence of thyroid cancer in India in women increased from 2.4% to 3.9% and in men from 0.9% to 1.3%; a relative increase of 62% and 48% respectively.[6]

FNAC is widely accepted as the most accurate, sensitive, specific, and cost-effective diagnostic procedure in the preoperative assessment of thyroid nodules. The accuracy of the FNAC analysis approaches 95% in the differentiation of the benign nodules from the malignant nodules of the thyroid gland. But there are some limitations of FNAC; the most important is the indeterminate or suspicious results i.e. inability to distinguish between follicular adenoma and carcinoma, others includes inadequate or nondiagnostic smear, sampling error due to large nodule or very small ones and

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inexperience of the cytopathologist.[7,8]Present study was planned to study the clinical pattern of thyroid swellings and their correlation with histopathological diagnosis and efficacy of FNAC in comparison to histopathology was studied.

Materials and Methods

Fifty patients of thyroid swellings presenting to the department of Surgery, Pt. B.D. Sharma PGIMS, Rohtak from January 2014 to December 2018 were studied. All the patients of thyroid swellings admitted for thyroid surgery during this period was included in the study.

Methodology

Detailed history was taken and physical examination of patients was done. All patients were investigated including thyroid function test, ultrasonography, indirect laryngoscopy and fine needle aspiration cytology. Patients who did not give consent and who did not undergo thyroid surgery were excluded from the study. After surgery, all resected specimens were sent for histopathological examination. Correlation between clinical findings and FNAC results were made with final histopathological report.

Statistical Analysis

The data was coded and entered into Microsoft Excel spreadsheet. Analysis was done using SPSS version 20 (IBM SPSS Statistics Inc., Chicago, Illinois, USA) Windows software program. Descriptive statistics like computation of percentages, means and standard deviations were used.Statistical significances were calculated by Chi square test and Fisher's exact test. P values < 0.05 were considered statistically significant.

Results

In our study we found that majority of patients(14) were in age group 31-40 year (28%), 12 patients were between 21-30 year of age (24%), 11 patients were between 41-50 year(22%), 7 patients were between 41-50 year (14%), 4 patients were between 11-20 years of age (8%) and 2 patients were more than 61 years of age(4%). The mean age was 38.48 years. Predominantly patients were females accounting for 45 out of 50 patients (90%), female to male ratio was 9:1. All the patients in our study presented with chief complaint of neck swelling, no patient had pressure symptoms like dysphagia or respiratory difficulty and no patient was having palpable lymphadenopathy at the time of presentation.In the present study right lobe of thyroid was more commonly involved as compared to left lobe. Right lobe was involved in 28 patients, left lobe was involved in 11 patients and both lobes were involved in 11 patients. On examination 39 patients had solitary nodule at the time of presentation and 4 patients had multinodular goitre and 7 patients had diffuse swelling at the time of presentation. On palpation 40 patients had firm swelling, 9 patients had soft swelling and only one patient had hard swelling. Forty four patients were euthyroid and six patients were hypothyroid at the time of presentation. Ultrasonography of thyroid swelling was done in all the cases. Thirty five patients had hyperechoic solid swellings, 14 patients had solid-cystic swellings and one patient had hypoechoic solid swelling.Preoperative FNAC was performed in all 50 cases, out of which forty eight patients had colloid goitre and two patients had papillary carcinoma.All the patients were subjected to surgery after pre anesthetic check up and detailed evaluation. Right hemithyroid-ectomy was performed in 28 patients, left hemithyroidectomy was performed in 10 patients and subtotal thyroidectomy was performed in 10 patients. Two patients who were diagnosed to be papillary carcinoma thyroid based on preoperative FNAC findings underwent modified radical neck dissection on the involved side along with total thyroidectomy.Post operatively no significant complications were noted in patients, only 2 patients presented with voice change which resolved spontaneously after 2 months of follow up.Diagnosis was confirmed histopatho-logically in all the cases and correlation was derived with preoperative clinical findings and FNAC results.

Table 1: Consistency of Swellings and Histopathological Correaltion

Histo-pathological findings	Consistency of swellings		
	Firm	Soft	Hard
Colloid Goitre	37	-	-
Follicular Adenoma	02	-	-
Follicular Carcinoma	-	-	01
Papillary Carcinoma	01	01	-
Lymphocytic Thyroditis	-	04	-
Multi nodular goitre with lymphocytic thyroiditis	-	03	-
AdenomatoidGoitre	-	01	-
Total	40	09	01

We found that out of 40 patients, who had firm swellings on palpation, 37 patients were having colloid goitre, 2 patients had follicular adenoma and 1 had papillary carcinoma on histopathology. Nine patients had soft swelling on palpation, out of which 4 patients had lymphocytic throiditis, 3 patients had multinodular goitre with lymphocytic thyroditis and 2 patients had papillary carcinoma and adenomatoid goitre each. Only one patient had hard swelling which was found to be follicular carcinoma on histopathology.

Out of 35 patients who were having Hyperechoic solid mass on USG, thirty patients had colloid goitre, two patients had follicular adenoma, and one patient was having lymphocytic thyroiditis and adenomatoidgoitre each on histopathology report. Out of 14 patients who were having solid cystic lesions on USG, seven of them had colloid goitre, one had follicular carcinoma and three patients had lymphocytic thyroiditis and multi nodular goitre each. One patient who had hypoechoic lesion on USG was found to have papillary carcinoma on histopathological report.

Table 2: Nodularity of Swellings and Histopathological Correlation

Histo-pathological findings	Nodularity		
	Solitary	Multi Nodular	Diffuse
Colloid Goitre	30	-	07
Follicular Adenoma	2	-	-
Follicular Carcinoma	1	-	-
Papillary Carcinoma	02	-	-
Lymphocytic Thyroditis	03	01	-
MNG with lymphocytic thyroiditis	-	03	-
AdenomatoidGoitre	01	-	-
Total	39	04	07

In histo-pathological report out of 39 clinical palpable solitary nodules, 30 were found to be coloidgoitre, 2 were follicular adenoma, 2 were papillary carcinoma, 3 were lymphocytic thyroidtis, 1 was follicular carcinoma and adenomatoid goitre each.

Table 3: Correlation of FNAC and Histopathology

Diagnosis	FNAC	Histopathology
	No. of cases	No. of cases
Papillary carcinoma	02	02
Colloid goiter	48	37
Follicular adenoma	0	02
Follicular Carcinoma	0	01
Lymphocytic thyroiditis	0	04
MNG with lymphocytic thyroiditis	0	03
Adenomatoid Goitre	0	01
Total	50	50

Out of 48 patients who had colloid goitre on FNAC, 37 were found to behaving colloid goitre, 4 were having lymphocytic thyroiditis, 3 were having multinoduar goitre with lymphocytic thyroiditis, 2 were follicular adenomas and one patient had follicular carcinoma and adenomatoid goitre each on histo-pathological findings.

Histopathological report of 2 patients who had papillary carcinoma based on preoperative FNAC showed papillary carcinoma.Rate of malignancy in our study was found to be 6% and incidence of papillary carcinoma was 4%.The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of FNAC for evaluating thyroid swellings in our study were 77.08%, 80%, 80%, 85.38% and 78.5% respectively.

Discussuion

In Our Study majority of patients belonged to age group 21-40 years (52%), our results were similar to study done by Pradeep kumar et al. which reported maximum number of patients between 31-40 year age group.[9]Kapoor et al also found similar results in their study where 52% of the patients were between age group of 21-40 years.[1] Study done by Rajkhowa et al found that majority of patients were between age group 20-39 years (50.4%).[10] Study done by Halbhavi found 67% of patients between age group of 31-40 years.[11]In our study we found female predominance (90%). Similar results were found in study done by Pradeep kumar et al who reported a female dominance of 91.3%.[9] Study done by Ojo et al found a female predominance of 88.7%[12].Study done by Halbhavi et al also found a female predominance in their study (90%).[11]

We found that right lobe was the predominant lobe involved in our study (56%). Study done by Gupta et al also reported right lobe involvement in 60% of patients and bilateral lobe involvement in 12% of patients.[13] Study done by Halbhavi et al reported bilateral lobe involvement in 71% of patients and right lobe involvement in 20% of patients.[11]All patients in our study presented with neck swelling as the chief complaint and no patient presented with pressure symptoms like dysphagia or respiratory difficulty. In study done by kapoor et al; all patients presented with neck swellings and 8% of them presented with pressure symptoms.[1] Instudy done by Jain et al, 21.8% of patients presented with pressure symptoms and all of them presented with neck swellings.[5]On examination solitary nodule was most commonly present in 39 out of 50 patients (78%), Multi nodular goitre was present in 4 patients (8%) and 7 patients had diffuse swelling. Study done by kapoor et al found that 44% of the patients were having solitary nodule, 36% of patients were having multi nodular goitre and 22% of patients were having diffuse swellings.[1] Study done by Kumar et al reported that majority of thyroid swellings were solitary nodules (58%) followed by multi nodular goitre (22%) and diffuse thyroid swellings (31%).[14]Out of 48 FNAC proven diagnosis of colloid goitre, histopathological examination confirmed the diagnosis in 37 cases with cyto-histological concordance rate of 77%. Two cases turned out to be follicular adenoma on histopathology. One case turned out to be follicular carcinoma on histopathology. Four cases turned out to be lymphocytic thyroiditis on histopathology. Cyto-pathological concordance rate of papillary carcinoma thyroid was 100%, two cases which were diagnosed as papillary carcinoma on FNAC turned out to be papillary carcinoma on histopathology. One case of follicular carcinoma was missed on preoperative FNAC and it was reported as colloid goiter.Colloid goiter was found in 74% of resected specimens which were in accordance with various studies documented in literature. Study done by Halbhavi et al found colloid goitre in 81.2%,Singh et al reported 85.71% incidence of colloid goitre. [11] Most of the patients had uneventful post operative period, only 2 patients had voice changes which resolved spontaneously and no patient had vocal cord palsy after 2 month of follow up. Francis et al in their study of 5670 operated cases found that 8.2% had unilateral vocal cord palsy and1.3% had bilateral vocal cord palsy. But the conventional cited vocal cord palsy rate in post operative period is 0.85%-3.5% for unilateral vocal cord palsy and 0.39% for bilateral vocal cord palsy.[20,21]Rate of malignancy revealed by histopathology of resected thyroid specimen in our study was 6%. Rate of malignancy found in study done by Kapoor et al was 22%. While it was 11.8% in study by Khageshar et al.[15] Rate of malignancy in study by Gupta et al was 20%.[13]In study done by Dorairajan et al and Jayashree et reported rate of malignancy was 20%.[16] The rate of malignancy was slightly lower in our cases.We found that 66% of the thyroid malignancy in our study was papillary carcinoma. Htwe et al found 70.9% of the thyroid malignancy was papillary carcinoma.[18] Arora et al found that 54.5% of malignancy was papillary carcinoma of thyroid.[19] Sensitivity, specificity, positive predictive value and negative predictive value of FNAC in diagnosing thyroid swelling reported in various studies is shown in table no.4.

Table 4: Sensitivity and Specificity of FNAC

Study name	Sensitivity	Specificity	Accuracy	Positive Predictive value	Negative predictive value
Gupta et al.[13]	80%	86.6%	84%	80%	86.6%
Kesslller et al.[18]	79%	98.5%	87%	98.7%	76.6%
Present study	77.08%	80%	78%	80%	85.38%

The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of FNAC for evaluating thyroid swellings in our study were 77.08%,80%,80%,85.38% and 78.5% respectively and it was consistent with reported in the literature in other studies.

Conclusion

FNAC is sensitive for diagnosing colloid goiter in cases of thyroid swelling and FANC should treated as first line diagnostic test for thyroid swelling to guide management though this is not suitable for histopathological examination.

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