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Incidence of midline neck mass (A retrospective cyto-morphological study, at Jorhat Medical College, Assam)

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Abstract
Introduction: Midline neck mass presents varying degrees of enlargements in front of the neck encompasses thyroglossal duct/cyst, solitary thyroid cyst, thyroid neoplasm.
Objective: To find out the incidence of midline mass by FNAC in Jorhat Medical College & Hospital from the period October 2020 to September 2021.
Materials and Method: one year retrospective, qualitative cross sectional, observational study done in 72 nos.of different cases of midline mass and FNAC was the first mode of examination in all cases referred to us.
Result: Reporting of the cases was followed by New Bethesda system of reporting thyroid cytopathology (TBSRTC) which offers very clean concept clinically well explainable to our clinician.
On FNAC reporting 60-70% of cases had simple colloid goiter, followed by hyperthyroidism that was associated with huge nodularity and thyrotoxic features.
Few cases of AUS/FLUS were reported as per criteria laid down by TBSRTC Bethesda grading.
Conclusion: In this study, goiter in females which constitute nearly 70-80% between the 3rd and 4th decades of life. FNAC resulted with 97 % sensitivity about 95 % specificity with high Positive predictive value. FNAC found to be most economical, quick and gold standard, easy to interpret by both the pathologist and the clinician till date.

Keywords: Neck mass, fine needle aspiration cytology, goitre

Introduction
Visible swelling in front of the neck in common scenario, especially in young and elderly females in developing countries. Persons residing in and around hills and mountains are the common sufferers, where the nutritional value is less food and water. Cases of such neck swelling are seen, near railway stations and most of them are otherwise healthy, mobile and can perform their day to activity without any difficulties. Only a few categories complain associated with cosmetic deformity or features of clinical thyroditis or toxic features requires clinical evaluation and surgical interventions.
Hurley D.L, Gharib L *et al.*, found that epidemiology of midline mass and in the United States; the incidence of such goiters was approximately 0.1% to 1.5% per year, translating into 250,000 new nodules annually. They also concluded that FNA results are pivotal to assess cancer risk in patient management for prominent palpable and suspicious nodules. Chest radiography, high-resolution ultrasonography, and computed tomography help to delineate the size and extent of a goiter in evaluating compression symptoms
Examining closely one can reveal a single solitary nodular (SN) swelling (solid or cystic) or in others multi nodular goiter (MNG) with huge swelling of varying sizes with tortuous superficial veins. Many of them complain of visible pulsations over the swelling with itching and redness.
Cases attending in ENT and General surgical OPD for midline neck swelling requires expert clinical evaluation from present history, up to thyroid function tests and presently cytological and histopatholical workup with immune histochemical analysis for grading and staging of clinical carcinoma cases as and when necessary. Now a day's genetic profiling, genomics of carcinoma are equally important using very sophisticated tools whenever possible for early detection, treatment and further management including assessing minimal residual disease in some patients under treatment.

Knobel M *et al*. found that the current classification divides goiter into diffuse and nodular, which, (is mainly due deficiency of iodine, increase in serum thyroid-stimulating hormone (TSH) level, natural goitrogens, smoking, and lack of selenium and iron) may be further subdivided into toxic (associated with symptoms of hyperthyroidism, suppressed TSH or both), or nontoxic (associated with a normal TSH level). Nodular thyroid disease with the presence of single or multiple nodules requires evaluation due to the risk of malignancy, toxicity, and local compressive symptoms. Measurement of TSH, accurate imaging with high-resolution ultrasonography or computed tomography, and fine-needle aspiration biopsy are the appropriate methods for evaluation and management of goiter.

Material and Method

The present study was a qualitative, hospital based cross sectional, retrospective study for a period of one year (October 2020 to Sept 2021) at Jorhat Medical College & Hospital, Jorhat, Assam. During the study period, detailed history and particulars of the patients were recorded. A history of short duration H/O of swelling, whether associated with pain or not, H/O sleep disorder, associated with hoarseness of voice, difficulty in swallowing, unusual fatigue, weakness, breathlessness etc.

The swelling was examined locally like raise of temperature, tests for deglutition, examination of presence of fluid, presence of pulsation.

As per protocol written consent was obtained from all the patients and explained to co-operate. FNAC was done under aseptic conditions using 23G needles with 10 cc or 20 cc disposable syringes. Usually two/ three passes were made, if necessary little more attempts were made. If the swelling was cystic, fluid was aspirated. The material so aspirated was immediately transferred onto glass slides, 2/3 nos of slides of which were air dried and half of them alcohol fixed for Giemsa stain and Papanicolaou stain, respectively.

After satisfactory stained, smears were satisfactorily evaluated according to the Bethesda system of reporting thyroid lesions. Smears and the number cellular smears examined by cytologist were considered adequate for evaluation if it good/satisfactory smear contained at least six well-preserved and well-stained follicular groups, each containing at least ten cells.

In cases of colloid cysts, abundant thick colloid obtained was considered as adequate for diagnosis, irrespective of a minimum number of follicular cells. Smears showing atypical cells were never considered inadequate, regardless of cellularity.

Observation and Results

Total 72 nos of cases were found in the study period from October 2020 to Sept 2021. Out of 72 no.of cases 52 female and 20 nos. males. Age representation was started from 15years to 70 yrs with, a mean age 40 yrs. The youngest patient was 15 yrs old girl with solitary thyroid nodule and the oldest patients was 70 yrs old lady multinodular goiter with thyro-toxic features with palpable neck gland.

Majority of the cases were presented with midline neck mass e.g, thyroid swelling moved with deglutition. 20 cases were found to swelling with deglutition and protrusion of tongue which later confirmed to cystic thyroid and benign swelling. Those cases were confirmed by FNAC that was consistent with clinical findings.

After explain the procedure (preferably in local language) the nature of FNAC all the patients co-operated with cytologist. Few of them required repeat FNAC due to some technical problem and they well tolerated in next settings.

Aspirated material were hemorrhagic (32 nos.), colloid and cystic 20nos) and rest of cases showed good cellularity of aspiration. Total 55 cases were satisfactory for interpretation based on Bethesda system of classification of thyroid cytology while rest of the cases showed un satisfactory.

As per routine cytological study more than 50 cases in the study were diagnosed goiter (n= 32) nos (44.4%), Colloid goiter with cystic change (n=3 nos) (4.16%), lymphocytic thyroditis (n=19) nos (26.39%), follicular adenoma (n=13) nos (18.05%), Follicular carcinoma(n= 3 nos) (4.16) and papillary carcinoma (n=2 nos) (2.8%) consecutively.

According to the Bethesda system of reporting thyroid lesions, nondiagnostic category (Group 1) included 26 cases (4.29%), and histopathology was not available in any of the case of this category. Out of 580 satisfactory samples, 501 (82.67%) cases were diagnosed as

benign (Group 2), 5 (0.82%) cases were in the category of atypia of undetermined significance (AUS)/atypical follicular lesion of undetermined significance (Group 3), 55 (9.07%) cases were diagnosed as suspicious for Follicular Neoplasm (SFN) (Group 4), 7 (1.15%) cases were suspicious for malignancy (SM) (Group 5), and 12 (1.98%) cases were malignant (Group 6).

- Group 1: Inadequate/nondiagnostic category-02 aspirates (2.8%) of total cases) were categorized as inadequate for evaluation or nondiagnostic
- Group 2: Benign lesions included colloid goiter (4.2%, *n* = 3), Goitre (44.4%, *n* = 32), Hasimoto/lymphocytic thyroiditis (22.2%, *n* = 16), adenomatous goiter/hyperplastic nodule (16.6%, *n* = 12),
- Group 3: AUS/atypical follicular lesion of undetermined significance (AFLUS) – Two cases (2.7%).
- Group 4: FN/SFN –FN, 03cases (4.2%) as adenomatous goiter.
- Group 5: SM – included two cases of papillary carcinoma (including a case of follicular variant of papillary carcinoma), one case of FN, (2.7%)
- Group 6: Malignant – nil.

Table 1: Male to Female ratio, in our study, out of 72 Nos. 52 were female and 20 male

Clinical cases	Male (%)	Female (%)
72	20 (27.7 %)	52 (72.3%)

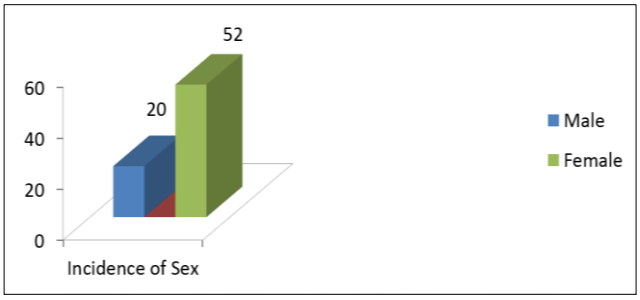
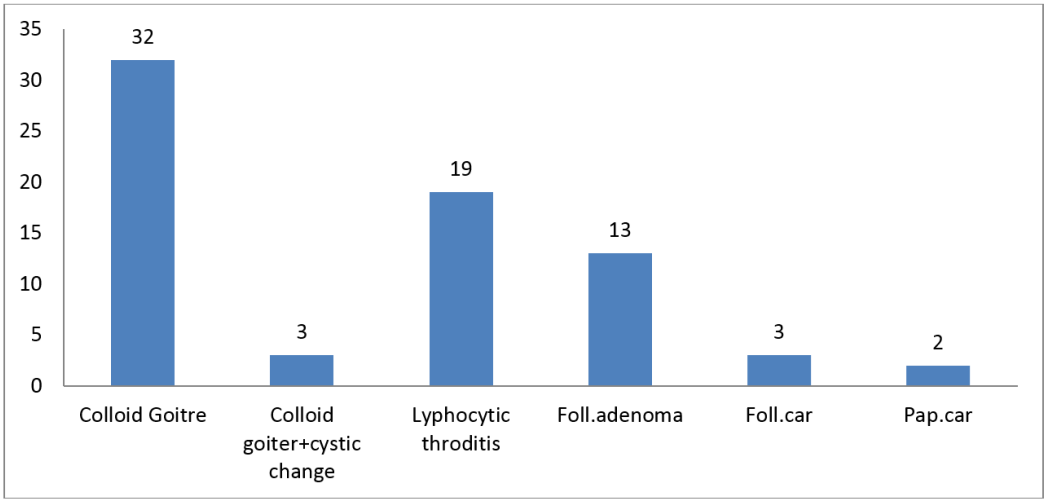


Fig 1: Bar showing the sex incidence

Table 2: Types of different tumors

Colloid Goitre	Colloid goiter+cystic change	Lyphocytic throditis	Foll.adenoma	Foll.car	Pap.car	Total
32	03	19	13	03	02	72 nos



*P- value is less than 0.0001, highly significant
Chi square= 59.33 with 5 d.f

Fig 2: Types of different tumors (Total cases 72)

Table 3: Table showing gender frequency of tumours

Types of Different tumurs	Male	Female	P- Value
Colloid Goitre	9	23	P-value = 0.9671 Chi square value= 0.9417 with 5 d.f
Colloid goiter+cystic change	1	2	
Lyphocytic throditis	5	14	
Foll.adenoma	4	9	
Foll.car	1	2	
Pap.car	0	2	
Total	20	52	

*P-value > 0.05, not significant

Table 4: Clinical features

Chief Complains	Total no. of cases	p-value
Visible swelling	**72**	P value is less than 0.0001 Chi square= 250.00
Pain	06	
Intolerance to heat/cold	03	
Increased appetite	04	
Insomnia	07	
Tremor	10	
Palpitation	15	
Dysphagia	12	
Hoarseness of voice	10	
Easy fatigability	05	
	72	

*P- value is less than 0.0001, highly significant

Table 5: One year: 72 nos.of cases: (From October, 2020- Sept.2021)

Age in years	Clinical presentation	Type of Tumor at diagnosis	Total
15-20yrs	Big swelling	6-Colloid goiter	9 nos

	Swelling +redness	3-lymphocytic growth	
21-25 yrs	Swelling Swelling +scratch	5-Colloid goiter 3-lymphocytic infiltrate	8 nos
26-30 yrs	0	5-colloid goiter 2-lymphocytic infiltrate 4-follicular	11 nos
31-35 yrs	0	10-colloid goiter 4-lymphocytic infiltrate	14 nos.
36-40 yrs	0	4-lymphocytic infiltrate 3-Follicular	7 nos
41-45 yrs	0	3- Colloid goiter 5-Follicular growth	8 Nos
46-50 yrs	0	3-lymphocytic 3-Follicular 1-Follicular Carcinoma	7 Nos
51-55 yrs	0	4-Colloid goiter 1-Papillary carcinoma	5 Nos
56-60 yrs		2-Follicular Carcinoma 1-Papillary Carcinoma	2 Nos.
➢ 60 yrs		1-Papillary Carcinoma	1 Nos
➢ Total			72 Nos.

Table 6: FNAC findings in our deptt. As per TBSRTC

FNAC findings	Total no. of cases
Non diagnostic (cyst fluid, only colloid, blood etc)	02
Benign consistent with follicular nodule	03
Goiter	32
Hyshimoto's thyroditis	16
Adenomatous swelling	12
Atypia of undermined significance/follicular lesion of undertermined significance	02
Suspicious of malignancy	0
Follicular neoplasm	03
Papillary neoplasm	02
Medullary neoplasm	0
Squmous cell carcinoma	0
Carcinoma with mixed feature	0
Metastatic carcinoma	0
Total	72

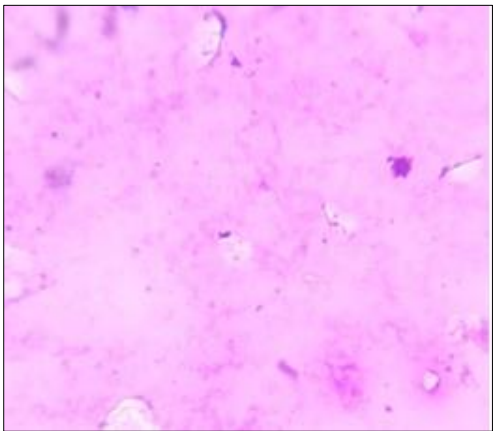


Fig 3: Simple coll oid goiter showing abundant coll oid material 40x power.

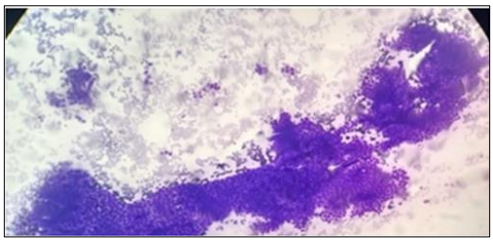


Fig 4: Papillary carcinoma, at low ower viws forming typical papillary fronts.

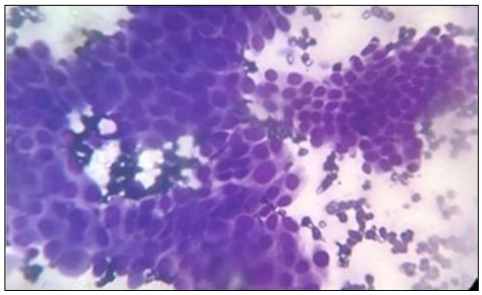


Fig 5: Showing papillary carcinoma micro-papillary with nuclear atypia 40x.

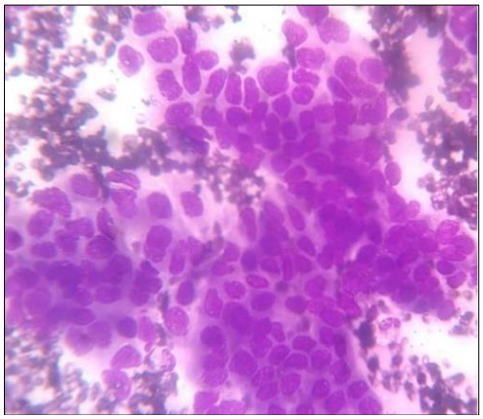


Fig 6: Follicular carcinoma arranged in cluster and macro follicle.

Discussion

A total 72 nos. of cases were studied in our hospital during the period of October 2020 to Sept 2021. In this study non neoplastic cases were more than the cancerous lesions among all groups. Iodized product especially with salt iodization by central government although reaches the peak, but still there is deficiency in the midst of plenty [1].

Incidence of thyroid disease is influenced by age, sex and natural geography location of the country [2]. In this study we tried to figure out the incidence of non malignant and malignant usual thyroid specimen in routine cytology deptt. of our hospital at Jorhat Medical College & Hospital.

In our study the occurrence of non malignant cases were more than malignant cases, as has been shown by many national studies.

Tsegaye B Ergete W *et al*. found that nodular colloid goiter is the most prevalent thyroid disease. Papillary carcinoma is the most frequent cancer seen in his series of study. Appropriate measures should be taken to reduce the iodine deficiency states in the diet to alleviate the social and medical consequences of the disease [8].

Kartha Priya P, Sadasivan Santha, *et al*. resolved that thyroid diseases has definite female predominance, with most of them occurring in an age group of 30-50 years. Multi nodular goitre remains the most common disease clinically, radiologically and cytologically. Fine needle aspiration findings and ultrasonogram findings showed moderate agreement with histopathology, which correlate with the present study [3].

Sukumaran Renu , Jayashree *et al*. concluded the cytology diagnoses cases that were further classified into nondiagnostic/unsatisfactory, benign, atypia of undetermined significance/follicular lesion of undetermined significance, follicular neoplasm/suspicious for a follicular neoplasm, suspicious for malignancy and malignant as per Bethesda guide line that correlates with our sudy [2].

Allen S Ho , Evan E Sarti, Kunal Jain S, *et al*. reported that The Bethesda System for Reporting Thyroid Cytopathology is the standard for interpreting fine needle aspiration (FNA) specimens. The "atypia of undetermined significance/follicular lesion of undetermined significance" (AUS/FLUS) category, known as Bethesda Category III, has been ascribed a malignancy risk of 5-15%, but the probability of malignancy in AUS/FLUS specimens remains unclear which correlate with present study significantly [7].

Gopalakrishnan UA and Menon usha V *et al*. reviewed the epidemiology of five common thyroid diseases in India; those were hypothyroidism, hyperthyroidism, goiter and iodine deficiency disorders, Hashimoto's thyroiditis, and thyroid cancer. This review will also briefly cover the exciting work that is in progress to ascertain the normal reference range of thyroid hormones in India that is consistent with this study [6].

In our study it has been seen that benign lesion of thyroid followed by various neoplastic lesions of thyroid, the most common cancer was papillary carcinoma, followed by follicular carcinoma. Some studies showed the association between multinodular goiter and papillary thyroid carcinoma was high which was very much significant with our present study.

Conclusion

Midline neck mass is very usual finding in our hospital especially showed definite female predominance. The commonest age group is 3rd to 5th decades of life. Most of the cases presenting with painless nodule while other group associated with pain as well as pressure effects e.g. difficulty in swallowing, breathlessness, palpitation, loss of sleep, hoarseness of voice etc. clinical cases were from simple thyroid nodule to multi nodular colloid goiter associated with thyrotoxic features.

Clinical evaluation associated with blood biochemistry to FNAC. Some cases were underwent thyroid scan, U/S guided FNAC etc. FNAC being the most popular, economical, easy to perform and very useful time saving procedure to take clinical decision and follow-up. TBSRTC has now available to differentiate early benign follicular nodule, inflammatory thyroditis and malignant counterpart. Risk of malignancy could be after histopatholgical where ever possible in the same hospital and further necessary evaluation.

Conflict of Interest: None

Source of Funding: Nil.

Authors Contribution: This is a departmental work-up among the authors of the same Institute.

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