Original Research Paper

Volume : 5 | Issue : 7 | July 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

Implementation of Bethesda System for Reporting Thyroid Cytopathology

Medical Science

KEYWORDS : Thyroid FNA, Thyroid Cytopathology. Bethesda system for reporting thyroid cytopathology (BSRTC)

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ABSTRACT

Back ground: The Bethesda system for reporting thyroid cytopathology (BSRTC) stratifies thyroid fine needle aspirations (FNAs) into 6 main diagnostic categories and conveys uniform language among pathologists and clinicians. It has standardized the diagnostic approach to cytomorphological criteria and reporting. Aim: To assess the feasibility of implementation of Bethesda system for reporting routine thyroid FNAs. Materials and methods: we retrospectively revived one year thyroid FNAs and classified according to BSRTC. Results: Total 109 thyroid FNAs were reviewed and categorized into diagnostic categories of Bethesda system. Among those 73.4% belonged to benign category (Bethesda II), followed by Non diagnostic (Bethesda I), 11%, Follicular neoplasm (Bethesda IV) 7.3, Malignant (Bethesda VI), Suspicious for malignancy (Bethesda V) and Atypia of undetermined significance (Bethesda III) 3.7%, 2.8% and 1.8% respectively. Conclusion: Interpretation of thyroid FNA varies from one laboratory to another resulting in confusion in few cases. Application of BSRTC may bring in objective guidelines for reporting thyroid cytopathology.

Introduction

Fine needle aspiration (FNA) of thyroid is cost effective, safe and accurate procedure of choice in evaluation of thyroid nodules. Thyroid FNA suffers as a modality because of confusion in multiplicity of category terminology, hindering the sharing of clinically meaningful data both among clinicians and multiple institutions. To address this and with the success of Bethesda for Pap smear, National Cancer Institute hosted thyroid FNA of the Science conference in 2007. In this conference, terminology and morphologic criteria for reporting thyroid FNA were concluded by forming the framework for Bethesda system for reporting thyroid cytopathology(BSRTC), stratifying thyroid FNA in to 6 main diagnostic categories. Each diagnostic category conveys specific risk of malignancy which triages patients for appropriate management. In spite of its flexible framework it's not been adopted in many institutions. It allows easy and reliable sharing of data from different laboratories for national and international collaboration and comparison by establishing a common language.[1, 2, 3]

Aim: To assess the feasibility of implementation of Bethesda system for reporting routine thyroid FNAs.

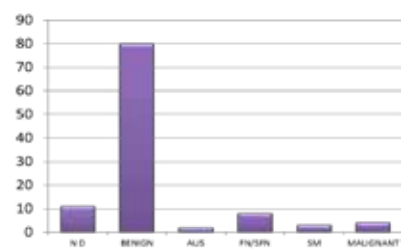
Material and methods

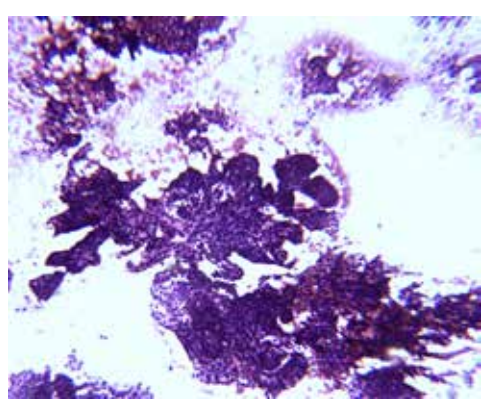
Present study is one year retrospective study, carried out in the department of Pathology, Tertiary care hospital. Patient's demographic data and clinical data are collected from the previous records. Slides were retrieved. Slides were hematoxylin and eosin, Giemsa or pap stained. The slides which were broken were excluded from the study. The slides were then analyzed , reviewed and classified based on diagnostic categories of Bethesda system viz, Non diagnostic(Bethesda I), Benign(Bethesda II), Atypia of undetermined significance(Bethesda III), Follicular neoplasm (Bethesda IV), Suspicious for malignancy (Bethesda V), Malignant (Bethesda VI).

Results

Total 109 thyroid FNAs were reviewed. Male: Female ratio is 1:7. Age ranged from 12 to 68 years with mean age of 38 years. 12(11%) FNAs were non diagnostic (Bethesda I) which included only hemorrhage, obscuring artifacts, cyst macrophages only and virtually acellular smears.80 (73.4%) FNAs belonged to benign (Bethesda II) category comprised of nodular goiter, lymphocytic/Hashimoto's thyroiditis, de quervain's thyroiditis, grave's disease, adenomatoid nodule. 2(1.8%) cases showed atypia of undetermined significance (Bethesda III). There were 8(7.3%) cases of follicular neoplasm or suspicious follicular neoplasm (Bethesda I V). 3 (2.8%) FNAs were suspicious for malignancy (Bethesda V). 4(3.7%) cases were positive for malignancy (Bethesda VI) which included papillary carcinoma and medullary carcinoma. Previously these FNAs were reported as non-diagnostic (n=8, 7.3%), benign (n=67, 61.5%) consisting of neoplastic and non- neoplastic lesions, positive for malignancy (n=4, 3.7%) and an intermediate class (n=30, 27.5%) consisting of nonspecific diagnostic terminologies, descriptive reports and suspicious for malignancy.

Graph 1: Distribution of diagnostic categories





DISCUSSION

FNA of thyroid gland is proven to be an important widely accepted simple, safe and accurate method for triaging patients with thyroid nodules. It reduces the rate of unnecessary surgery in thyroid patients. However, despite its widespread use thyroid FNA suffers from reporting confusion, multiplicity of categories, descriptive and variable surgical pathology terminology. [4,5,6]

In present study, numerous nonspecific diagnostic terminologies were used in previous reports. Few of which are consistent with neoplasia,

Neoplasia cannot be ruled out, Mild atypia, Cellular adenomatoid nodule with few atypical cells, occasional grooving and inclusions etc. These terms create confusion in triaging patients for management.

Previously a case of cyst fluid only was reported as cyst and possibility of papillary carcinoma cannot be ruled out. But in BSRTC cyst fluid only was reported under non diagnostic category which would imply repeat ultrasound guided FNA.

The three categories, atypia of undetermined significance, follicular neoplasm and suspicious for malignancy have been previously lumped together to intermediate class where surgery was treatment of choice.[7] According to BSRTC, atypia of undetermined significance would undergo repeat ultrasound guided FNAC or follow up.

After application of BSRTC, uniform, simple, succinct, flexible framework has cleared confusion in reporting thyroid FNAs. The distribution of FNAs among diagnostic categories correlates well with previous studies. Limitation of present study is surgical follow up of FNAs were not done, which would have assessed malignancy risk among each categories.

Table 1: BSRTC has proposed cut of values for diagnostic categories which were compared with present study

Diagnostic categories	Present study (%)	BSRTC[1] (%)
Non diagnostic	11	2-10
Benign	73.4	60-70
AUS	1.8	3-6
Follicular neoplasm	7.3	**
Suspicious for malignancy	2.8	**
Malignant	3.7	3-7
**It is intended as flexible framework that can be modified to suit the needs of particular laboratories		

Table2: Comparison of distribution of diagnostic categories with previous studies

Diagnostic Category	Present study %	Shankar SP et al[8] 2016(%)	Shagufta et al[2] 2012(%)	H Juing et al[9] 2011 (%)	Lee K et al[10] 2010 %
ND	11	10.7	11.6	20.1	10
BN	73.4	81.6	77.6	39	67.7
AUS	1.8	1.24	0.4	27.2	3.1
SFN	7.3	1.74	4	8.4	1.1
SM	2.8	2	2.4	2.6	5.1
MGT	3.7	2.7	3.6	2.7	13
*ND/UNS: non diagnostic, BN: benign, AUS: atypia of undetermined significance, SFN: suspicious for follicular neoplasm, SM: suspicious for malignancy, MGT: malignant					

Conclusion

Interpretation of thyroid FNA varies from one laboratory to another resulting in confusion in few cases. Application of BSRTC may bring in objective guidelines for reporting thyroid cytopathology. There is a need for clinician to be aware of BSRTC which helps in reliable sharing of data for national and international collaboration by establishing a universal language

References

1. Cibas ES, Ali SZ. The Bethesda System for Reporting Thyroid Cytopathology. Am J Clin Pathol 2009;132:658-65
2. Tahir SM, Molah R. The Bethesda system for reporting thyroid cytopathology: A five year retrospective review of one center experience. Int J Health Sci 2012;6(2):131-43
3. Nayar R, Ivanovic M. The indeterminate thyroid fine-needle aspiration: experience from an academic centre using terminology similar to that proposed in the 2007 National Cancer Institute Thyroid Fine Needle Aspiration State of the Science Conference. Cancer. 2009; 117(3):195–202.
4. Baloch ZW, Alexander E K, Gharib H, and Raab SS. Chapter 1; Overview of Diagnostic Terminology and Reporting In: Ali SZ and Cibas ES Edi, The Bethesda System for Reporting Thyroid Cytopathology. New York, NY: Springer; 2010:1-4.
5. Jo VY, Stelow EB, Dustin SM, Hanley KZ. Malignancy risk for fine-needle aspiration of thyroid lesions according to the Bethesda System for Reporting Thyroid Cytopathology. Am J Clin Pathol 2010;134(3):450-6.
6. Haider AS, Rakha EA, Dunkley C, Zaitoun AM .The impact of using defined criteria for adequacy of fine needle aspiration cytology of the thyroid in routine practice. Diagn Cytopathol 2011; 39(2):81-6. doi: 10.1002/dc.21324.
7. Bongiovanni M, Spitale A, Faquin WC, Mazzucchelli L, Baloch ZW . The Bethesda System for Reporting Thyroid Cytopathology: a meta-analysis . Acta Cytol . 2012;56:333-9 . Epub July 25, 2012; doi: 10 .1159/000339959 .
8. Shankar PS, Meenakshisundaram K, Rajalakshmi V, Satish SA, Giridharan B. The Bethesda system for reporting thyroid cytopathology a two year retrospective review in tertiary care hospital. Indian J Pathol Oncol 2016;3(1):48-54.
9. Her-Juing Wu H, Rose C, Elsheikh TM .The Bethesda system for reporting thyroid cytopathology: An experience of 1,382 cases in a community practice setting with the implication for risk of neoplasm and risk of malignancy. Diagn Cytopathol 2011; 16(6):4p. doi: 10.1002/dc.21754.
10. Lee K, Jung C K , Lee K Y , Bae JS , Lim DJ, Jung S L. Application of Bethesda System for Reporting Thyroid Aspiration Cytology. *Korean J Pathol* 2010; 44(5): 521-7.