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Study of fine needle aspiration cytology in palpable thyroid lesions

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Abstract

Aim: study of FNAC of palpable thyroid swelling in context of diagnosing the various thyroid lesions on the basis of cytology and correlating the cytological findings with clinical profile and other investigations.

Material and method: A detail clinical history was taken including duration, size and other complaints and review of the reports of ultrasonography, thyroid function test are done whenever available. The thyroid gland was palpated carefully and the nodule(s) to be aspirated identified. An informed consent was taken from the patient after explaining the procedure. The procedure was explained to the patient, and all the patient's questions answered completely to relieve their anxiety and make them comfortable. The patients were placed supine with the neck hyperextended to expose the thyroid; for support, a pillow was placed under the shoulders. The patient was asked not to swallow, talk, or move during the procedure. After giving the correct position and identification of the site to be aspirated, overlying skin was cleaned with disinfectant.

Result: In the present study we observed that in cases of goiter abundant brownish aspirate was obtained in 78 cases (88.64%) which could be grossly identified as colloid. Aspirate was abundant and many a times we needed CBC bulb to collect so and was hemorrhagic in 10 cases (11.36%). The neoplastic cases yielded scanty haemorrhagic aspirate but it was not specific as cases of thyroiditis too yielded haemorrhagic aspirate.

Conclusion: For overcoming the grey zone of thyroid cytology ki-67 proliferative index, silver nucleolar organizing region (AgNOR) counting, HBME-1 marker positivity and many more research are undergoing with the hope that this hurdle will be overcome soon.

Keywords: Fine needle aspiration, palpable thyroid lesions

Introduction

Thyroid gland is unique among the endocrine organs as it is the largest endocrine gland and due to its superficial location is the only one amenable to direct physical examination and fine needle aspiration. Fine needle aspiration cytology (FNAC) is the most useful component of clinical tissue cytology or non-exfoliative cytology. It is an interpretative art, unlike histology cytology mainly deals with the morphology of preserved cells^[1].

FNAC has brought about profound changes in the practice of medicine, and there is no better example than the introduction of FNAC into the evaluation of thyroid disease. Though the thyroid and its diseases were known to the physicians from the time immemorial, the subject still continues to evince great interest even today from the clinician and the pathologist alike. Diseases of thyroid are commonly manifested as enlargement of thyroid which is known as goiter and is recognized since 2700 BC. Thyroid enlargement is very common, especially in Indians, more so in mountain areas. It is neither indicated nor justifiable to operate on every patient with a thyroid mass, as incidence of malignancy is quite low compared with the overall incidence of thyroid swellings^[2]. Only 4-10% thyroid nodules are found to be malignant^[3, 4]. So, the goal of diagnostic workup now is to select those patients for surgery who have high likelihood of harboring malignancy in the swelling^[5].

We receive many patients in our outpatient department referred from surgery, medicine and E.N.T. departments for cytological evaluation of thyroid swellings^[6]. So, it prompted us to do the study and to evaluate the smears further along with detailed clinical history, radiological imaging, hormonal findings as these facilities are available in our institute^[7].

We proposed the study of FNAC of palpable thyroid swelling in context of diagnosing the various thyroid lesions on the basis of cytology and correlating the cytological findings with clinical profile and other investigations. FNAC is simple, rapid, minimally traumatic, without any complications, easily repeatable, requires minimal additional resources or equipments and is an outpatient procedure^[8, 9].

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Material and method

The present study is a two years prospective study of FNAC in patients with palpable thyroid lesions of 145 patients during a period from May 2008 to May 2010. The study is done in Krishna Institute of Medical Sciences, Karad; which is a tertiary care hospital. The basic equipments needed to perform FNAC are simple, relatively cost-effective and are available in the institute. The following items are essential. All the patients complaining of thyroid swelling were included in our study. A detail clinical history was taken including duration, size and other complaints and review of the reports of ultrasonography, thyroid function test are done whenever available. The thyroid gland was palpated carefully and the nodule(s) to be aspirated identified. An informed consent was taken from the patient after explaining the procedure. The procedure was explained to the patient, and all the patient's questions answered completely to relieve their anxiety and make them comfortable. The patients were placed supine with the neck hyperextended to expose the thyroid; for support, a pillow was placed under the shoulders. The patient was asked not to swallow, talk, or move during the procedure. After giving the correct position and identification of the site to be aspirated, overlying skin was cleaned with disinfectant.

A 10-mL plastic syringe was attached to a Camico syringe holder and held in the right hand. Two fingers of the free (left) hand firmly grasped the nodule while the other hand was holding a Camico syringe holder. The needle is then rapidly inserted through the skin and into the nodule. Once the needle tip was in the nodule, gentle suction was applied while the needle was moved in and out within the nodule vertically. This maneuver allowed the dislodging of cellular material and easy suction into the needle.

During this period of 5 to 10 seconds, suction was maintained. The function of the negative pressure is to hold the tissue against the sharp cutting edge of the needle. As soon as fluid or aspirate appeared in the hub of the needle, the suction was released and the needle was withdrawn. If the appearance of fluid suggested that the nodule is cystic; suction was maintained and all the fluid aspirated and reaspiration was done. 2 to 3 passes were made to obtain the adequate material. After the completion of the FNA, firm pressure was maintained on the FNA site for 10 minutes. The patients were then asked to sit for a few minutes. Patients were observed for a few minutes, and if no problems were noted, they were allowed to leave.

Results

The present study deals with the fine needle aspiration cytology of palpable thyroid lesions. A total of 145 patients with thyroid lesions were subjected to fine needle aspiration cytology during a period of 2 years from May 2008 to May 2010. All the patients tolerated the FNAC procedure without any complications. Of these 29 patients underwent surgery subsequently and the excised specimens were sent to the Department of Pathology for histopathological examination.

Age of the patients ranged from 5 years to 90 years with a mean age of 38 years. Majority of the patients referred for FNAC thyroid were females accounted for 124 (85.52%) and males accounted for 21 (14.48%) of the total 145 patients. This showed that in thyroid diseases, there is clear predominance of females over males with female to male ratio of 5.9:1.

All the patients with palpable thyroid swelling were included in the present study so all the patients were having swelling which was either diffuse or nodular. Other symptoms were less

common dysphagia was present in 15 patients pain in the thyroid region was seen in 7 cases each cases (2.76%), weight loss in 4 cases (2.76%).

In the present study we observed that in cases of goiter abundant brownish aspirate was obtained in 78 cases (88.64%) which could be grossly identified as colloid. Aspirate was abundant and many a times we needed CBC bulb to collect so and was hemorrhagic in 10 cases (11.36%). The neoplastic cases yielded scanty haemorrhagic aspirate but it was not specific as cases of thyroiditis too yielded haemorrhagic aspirate.

The single case of acute suppurative thyroiditis yielded turbid white aspirate. In 7 out of 8 cases of thyroid cyst aspirate was brown colored fluid while in one case it was clear fluid.

The 2 cases of thyroglossal duct cyst yielded clear fluid while in one case scanty whitish aspirate was obtained. In all the cases FNAC was performed by both aspiration as well as non-aspiration techniques. It didn't make any significant difference in terms of yield of sample or quality of sample by any one technique over other. Practically it caused minimal apprehension in patients as it used to give less psychological fear by looking at small needle in place of needle syringe with Camico holder.

Out of 145 cases, 114 (78.61%) were non (8.28%) were neoplastic lesions, 12 (8.28%) cases were reported as indeterminate on cytology and opinion.

Discussion

Thyroid enlargement, whether diffuse or in the form of a nodule, leads to a battery of investigations, mainly to rule out the possibility of a neoplasm or thyroiditis^[9]. FNAC is usually the first line of investigation and other investigations like ultrasound examination, thyroid function tests, thyroid scan, and antibody levels are done subsequently with an aim to select the patients who require surgery and those that can be managed

Conservatively^[10]. FNAC of the thyroid is widely used as it is safe, rapid, expensive, and reliable in the diagnosis of thyroid nodules.

The present study deals with the fine needle aspiration cytology of thyroid performed in 145 patients of which 29 underwent surgery subsequently in which histopathology could be studied and compared with the cytological diagnosis. As documented by various authors we too found that non-neoplastic lesions outnumber in the thyroid lesions. Indeterminate lesion included in our study included lesions reported as follicular lesion. Neoplastic lesions are less and consistent with the most of the studies in our study aspiration was done from 2 to 3 sites. Afroze *et al.* suggests repeated aspirations 2-3 times from different areas of the gland in case of major nodules. Gharib *et al.* (202) suggests upto six aspirations and an average of 2 to 4 aspirations should be done. Complications due to aspiration cytology are rare. In the present study, no complications were observed following aspiration procedure and all the patients tolerated the procedure well without any major complications^[11].

All the patients coming to our institute with palpable thyroid swelling were included in the present study so all the patients were having swelling which were either diffuse or nodular. 14 patients (9.66%) were having diffuse and remaining 141(90.34%) were having single or multinodular swelling. Among the 14 patients of diffuse swelling 9 were diagnosed as thyroiditis on cytology. Usually thyroiditis presents as diffuse swelling of thyroid (6) which stood true in our observation too

[12].

Size of the swelling varied from as small as 1cm to as large as 15cms. Increasing size of the lesion is associated with increasing risk of malignancy but this size consideration does not apply to papillary carcinomas, which can be quite small [13]. This stood true in our study too, in one case of papillary carcinoma the size was 2cms only. In one case of anaplastic carcinoma the size was huge i.e. 15cms; however it is not specific as we observed two cases diagnosed as thyroid cyst having swelling of 10cms size and one case with swelling of 9 cms diagnosed as cystic change in colloid goiter on cytology.

Various studies suggested combined USG and cytology i.e. USG guided FNAC gives better results for definitive management of the patient in mixed solid cystic lesions or difficult to palpate lesions US-guided FNAC is clearly superior to palpation-guided aspiration (219, 220). However, in our study we could perform only two FNAC under USG guidance hence no conclusion could be made as small data failed us to make any comparison. We feel that in one case of follicular adenoma diagnosed as colloid goiter on cytology in which needle failed to hit the lesion, could have been diagnosed correctly as follicular neoplasm, if the FNAC would have been done under USG guidance. Sonography remains an important tool for follow-up of both benign and malignant thyroid lesions. It provides an objective and sensitive indicator of whether a nodule is enlarging or decreasing in size over time, once the decision is made not to operate. An enlarging nodule would at least warrant a repeat FNA biopsy.

Conclusion

Gross nature of the aspirate suggests the possibility of goiter or neoplasm. FNAC is the best available modality for diagnosis among clinical, USG and thyroid function test. Clinical history and USG are not sensitive enough in coming to specific and more conclusive diagnosis of thyroid lesion independently; which is actually beneficial for the further line of management. Correlation of FNAC with clinical findings helps in increasing the accuracy of cytological diagnosis. USG guidance should be used to increase the accuracy of the cytological diagnosis and is of utmost importance in cases classified as Bethesda group I. For overcoming the grey zone of thyroid cytology ki-67 proliferative index, silver nucleolar organizing region (AgNOR) counting, HBME-1 marker positivity and many more research are undergoing with the hope that this hurdle will be overcome soon.

Conflict of interest: No conflict of interest

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