



Original Research Article

Fine Needle Aspiration Cytology (FNAC) is the Excellent Diagnostic Procedures for Thyroid Lumps

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Abstract

Objective: *The present study was undertaken to evaluate the efficiency and prospect of fine needle aspiration cytology (FNAC) of thyroid swelling.*

Materials and Methods: *A total of 74 patients in between 15 to 65 years of age, both male and female were included in the study.*

Results: *67.5% patients are belonged to 31-50 years of age and sex ratio were 3.93:1. On cytological examination 54 (72.97%) patients had non malignant cells or benign goitre, hyperplastic cells were seen in 13(17.56%) cases, Out of which Follicular adenoma in 3 patients, 3 cases showed malignant cells. Out of 3 cases 2 showed follicular carcinoma patterns and 1 showed feature of papillary carcinoma. In 2 patients hashimoto thyroiditis was noticed and in 1 cases De Quervain thyroiditis was seen. All patients with cytological smears of non-neoplastic, were found to have colloid goitre on H.P.E. Out of 13 cases with hyperplastic cells on cytological evaluation, HPE showed colloid goitre in 5 cases. The diagnostic yields of FNAC was 94.59% and accuracy was 83.34%.*

Conclusion: *The technique has shown to provide with reliable, rapid and inexpensive method of diagnosis. In most instances, no hospitalization or anaesthesia was required for this procedure.*

Keywords: *FNAC, Thyroid swelling, Goitre, Smear.*

Introduction

Fine needle aspiration cytology is the sampling of a palpable or non palpable mass by means of a fine needle with negative pressure applied by an attached syringe. It is an interventional cytological procedure and the purpose of this procedure is to obtain diagnostic material for cytological study from organs that do not shed cells spontaneously.

The clinical value of fine needle aspiration cytology is not limited to neoplastic conditions only, but it is also valuable in the diagnosis of inflammatory, infectious and degenerative conditions. It has proven useful in the diagnosis and monitoring of graft rejection in transplantation surgery. Intraoperative cytology is another application and is a valuable alternative or

complement to frozen section examination. The technique has gained wide acceptance over the past three decades and is being increasingly used to sample a wide variety of body tissues. Palpable lesions commonly sampled are enlarged lymph nodes, breast lumps, enlarged thyroid lumps and superficial soft tissue masses. The salivary glands and palpable abdominal lesions are also frequently sampled by fine needle aspiration cytology. Non palpable lesions sampled with the help of Ultrasonography, CT scan, image intensifier and endoscopy guided, are from abdominal cavity, retroperitoneum, pelvic organ, thoracic cavity, prostate, orbit, bone and joint spaces. Almost all organ systems are accessible to this procedure and versatility of this technique has enormously increased the scope of diagnostic cytology.

Fine needle aspiration cytology of the thyroid gland was introduced by Soderstrom in the year 1952.

Thyroid swelling often presents diagnostic difficulties. The risk of carcinoma of the thyroid gland is higher in cases of solitary nodule. Darbhanga Medical College and Hospital, Laheriasarai, serves an area of Sub Himalayan region where iodine deficiency has been reported in endemic proportion. Consequently, large number of goitres are seen in the out and indoor patient department of this hospital.

The main limitation of thyroid fine needle aspiration cytology is the inability to distinguish between follicular adenoma and follicular carcinoma. The distinction depends mainly on the demonstration in tissue sections of capsular or vascular. In most cases, examination of a large number of blocks from surgically excised sample remains the only way to obtain a definitive diagnosis.

Materials and Methods

The present study was carried out in the Department of Pathology, Darbhanga Medical College, Laheriasarai, with the help of Department of ENT and Surgery, during the period of October 2016 to December 2017. A total of 74 patients

with thyroid lump were included in the study, thorough clinical examination and adequate routine investigation procedures were performed as per the Protocols. Out of 74 patients FNA yielded material for smear in 70 patients (94.59%) only. Blood was aspirated in 2 cases, while procedure failed in 2 patients.

A 1.5 inch 22 gauge needle attached to 10 ml disposable plastic syringe is used. After aseptic precaution and positioning the thyroid mass, needle is introduced and suction is applied while the needle is moved back and forth within the mass in different directions. Once cellular material is seen at the hub of the needle, the suction is released and needle is withdrawn cellular material or colloid is expressed onto the grease free glass slide and smear was prepared. Smears were both air dried and fixed with 95% alcohol. Air dried smear was stained by MGG and wet fixed smear was stained by H and E stained and examined under microscope. Patient underwent thyroidectomy as required tissue was sent for H.P.E. in our Department.

Results

Out of 74 patients 50 patients (67.5%), in the present study were 31-50 years of age, youngest was of 15 years old whereas oldest was 65 years old. Out of 74 patients, 15 (20.71%) were male and remaining 59 (79.73%) were female and female to male ratio was 3.93: 1.

All patients had palpable thyroid swelling, 48 out of 74 patients had thyroid nodule (single or multinodular) whereas remaining 26 patients had diffuse thyroid swelling, and duration of swelling was 6 months to 10 years.

On cytological examination 54 (72.97%) patients had non malignant cells, hyperplastic cells were seen in 13 (17.56%) cases, Out of which Follicular adenoma in 3 patients, 3 cases showed malignant cells. Out of 3 cases 2 showed follicular carcinoma patterns and 1 showed feature of papillary carcinoma. In 2 patients Hashimoto thyroiditis was noticed and in 1 case De Quervain thyroiditis was seen.

All patients with cytological smears of non-neoplastic, were found to have colloid goitre on H.P.E. Out of 13 cases with hyperplastic cells on cytological evaluation, HPE showed colloid goitre in 5 cases. The diagnostic yields of FNAC was 94.59% and accuracy was 83.34%.

Discussion

Fine needle aspiration cytology has been used as a preoperative diagnostic modality in disorders of a number of palpable or non palpable organs viz enlarged thyroid, lymph node, salivary gland, breast masses, superficial soft tissue masses, prostate, retro perineum, lungs, orbit, pelvis, bone and joint spaces, etc. several reports have appeared from groups in the Scandinavian countries (soderstorm, 1952, einkorn and franzen 1962, aspergen et al 1922, linjd et al 1997, chow tl 1999). More recently from North American countries, European countries, Australia and Asia showing successful application of this technique to the diagnosis of the lesions of the thyroid gland. Now this procedure has been carried out at several places in our country successfully.

This hospital serves as a part of the goitre belt population. Consequently, a large of patients with thyroid swelling attends and services of this hospital. Fine needle aspiration has been claimed as a very good diagnostic tool in identifying various thyroid diseases. The purpose of this study has been to evaluate the efficiency of this diagnostic modality in the diagnosis of thyroid swelling in Indian particularly north eastern India setup.

In the present study, majority of patients (67.5%) were of 31 to 50 years age group. The sex ratio was observed to be (3.93:1) in favour of females. (Similar findings have been reported by law Hagen et al 1979. in their study, 271 out of 412 (65.7%) patients were of 31 to 6 years age groups). Female predominated in there series with 6.64: 1 ratio.

In the present study, the duration of neck swelling was less than one year in three cases. These patients, having the thyroid swelling for last six

and seven months, were found to have a mixed papillary-follicular carcinoma and papillary carcinoma of the thyroid respectively. Thyroid cancer with duration of less than one year has been reported by various authors (parkas et al 1974; Dave and Patel 1983). In this study, none of the patients with goitre for more than 10 years had a demonstrable malignant pathology. All these 23 patients had non toxic multinodular goitre.

The diagnostic yields of fine needle aspiration cytology have been variously reported between 77 – 100%. Soderstorm (1952) reported a diagnostic yield of 77%. Einkorn and frazen (1962) and gershengorn et al (1979) showed a diagnostic yield of 97% in their hands. Low Hagen et al (1979) had a diagnostic yield of 100%. In our own country, Chary et al (1983) had an 83% diagnostic yield. In present study, fine needle aspiration cytology yielded a smear of interpretive value in 70 out of 74, patients. Thus, the diagnostic yield in the present study was 94.59%, which is a highly successful result. However, this procedure had to be repeated in 4 patients where a previous attempt had failed.

Cytological examination reported non neoplastic pathology in 54 patients. These cases showed mainly follicular cells without any features of cellular neoplasia. The cells were regular, with small nucleus and did not show hypercellularity. On the other hand, 3 cases with FNAC, showed highly evidence of malignancy. A diagnosis of papillary carcinoma of the thyroid was made which was later confirmed on histopathology. In 2 patients, a diagnosis of hashimoto's thyroiditis was made on aspiration cytology. Askanazy (oxyphilic) cells surrounded by lymphocytes were seen in this smear. The diagnosis of hashimoto's thyroiditis on the basis of FNAC smear has been reported by law Hagen et al (1979) reported difficulty in diagnosing cases of hashimoto's thyroiditis on aspiration cytology smear. In this study, there were only three cases of hashimoto's throiditis, which as diagnosed on FNAC smear and subsequently confirmed on histopathological examination. In 1 patients, a diagnosis of De

Quervain's thyroiditis was made on aspiration cytology. Multinucleate giant cells with macrophages, lymphocytes and degenerated features in follicular cells were found was subsequently confirmed on histopathological examination.

In the present study, there was difficulty in diagnosing 7 cases of FNAC smear. These smears showed increased cellularity. A doubt of malignant pathology was also raised in such cases. 54 patients with FNAC, diagnosis of colloid goiter were confirmed by subsequent histopathological examination. Similarly, in 3 cases where a FNAC diagnosis of malignancy was made were also confirmed of thyroid carcinoma were diagnosed by means of FNAC. The diagnostic accuracy for detecting thyroid carcinoma was 83.34%.

Out of 7 cases with hyperplastic results on FNAC, there were two cases of follicular carcinoma. These were the false negative result in this study (false negative result rate: 2.5%). The problem of diagnosing a well-differentiated follicular carcinoma with follicular adenoma has been well reported in the literature (Low Hagen et al; zajicek, 1979; zacks JF, Beazley RM, O'Brien MJ, 1988), Arum m et al (2006), pellizzo MR et al (2006), pappi G et al (2007), Bae WK et al (2009) and ferrag TY et al (2009 oct.). This study also endorses the opinion that a well-differentiated follicular carcinoma is difficult to differentiate from follicular adenoma and a histopathology is mandatory in such cases to show capsular or and vascular invasion.

Conclusion

Finally, the fine needle aspiration is an inexpensive and outdoor procedure. It can be performed under clinical setting and economy of the patients in our country. Moreover, there always a need to simplify the surgical procedure and to ensure that it should be done in the most effective manner, particularly in India.

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