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ACCURACY OF FNAC AS A DIAGNOSTIC MODALITY IN THE MANAGEMENT OF SOLITARY THYROID NODULE

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ABSTRACT

Objectives: The purpose of this study was to exclude or demonstrate malignancy using the Fine Needle Aspiration Cytology (FNAC) in a patient with solitary thyroid nodule.

Material and Methods: It was a cross sectional study conducted in Surgical C unit of Khyber Teaching Hospital, Peshawaw from May 2001 to May 2003. All patients with solitary thyroid nodules presenting to our out patient department were recruited in this study. Fine needle aspiration was performed on all these patients and the aspirates were sent to cytopathologist. After getting the reports surgery was planned for the indicated cases and then the final histopathology was compared with pre operative cytological reports. Sensitivity, specificity and accuracy were calculated.

Results: FNAC was performed in all 100 patients. The cytology reported 9 Neoplastic aspirates, 78 Non neoplastic, 6 Suspicious and 7 Unsatisfactory reports. Histology reported 11 Neoplastic cases and 89 Non neoplastic. The sensitivity of the FNAC in this series of cases was 100%, specificity was 95.12% and accuracy was 95.69%.

Conclusion: The results are comparable to the current published data and demonstrate that FNAC in expert hands is accurate investigation for preoperative diagnosis of thyroid malignancy.

Key words: Cytology and biopsy, needle, neoplasm, sensitivity, thyroid gland.

INTRODUCTION

FNAC is a well established out patient procedure used in the primary diagnosis of palpable thyroid swellings[1]. The limitations include false negative results, false positive results and a proportion of FNA results that are not obviously benign or malignant and fall into the indeterminate and suspicious group[2].

An FNAC sample is considered to be adequate if a minimum of 6 clusters of benign follicular cells in at least 2 slides are present[3]. Smears are categorized as inadequate if it shows less than 6 fragments of group of follicular cells[4]. Currently FNAC is shown to be the investigation of choice in thyroid, breast and lymph node swellings and it is shown to be simple, safe and cost effective[5-7]. The aim of this study was to determine the accuracy of FNAC in the detection of thyroid malignancy in our surgical unit.

PATIENTS AND METHODS

A prospective study of 100 patients with solitary thyroid nodules of either sex were included in the study and patients with MNG and any major blood disorders were excluded. FNAC was done in the first presentation of the patient and they were booked subsequently for surgery.

FNAC was done using a 23 gauge needle and then slides were prepared and handed over to the pathologist. A proforma was designed which included demographic data, signs, symptoms, confirmatory investigations, diagnosis and final treatment. Post operative histology reports were compared with FNAC results. All the data collected was compiled and systematically analyzed.

RESULTS

A total of 100 patients were included in the study. Out of these 100 patients, 87 were females and 13 were males, thus male to female ratio was 1:6.69. Most of the patients (64%) were in the age group 20-40 years. FNAC was performed in all 100 patients. The reports showed Neoplasia in 9 cases, Non neoplasia in 78 cases, suspicious in 6 and 7 reports fell in the category of unsatisfactory results (inadequate and in determinate).

The histology reports showed 89 Non neoplastic cases and 11 Neoplastic cases. Preoperative FNAC reports were then compared with definitive histological reports (after excluding the inadequate and indeterminate FNAC samples where as neoplastic and suspicious samples were combined

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to calculate accuracy, specificity and sensitivity) as shown in Tables 1 and 2 respectively.

Table 1: FNAC Reports

FNAC Results	Total
Neoplastic/ Suspected Neoplastic	15
Non-Neoplastic	78
Unsatisfactory	07
Total	100

Table 2: Histopathology Reports

Histology Results	Total
Neoplastic	11
Non-Neoplastic	89
Total	100

For diagnosis of thyroid nodule neoplasia; FNAC had a sensitivity of 100%, specifity of 95.12%, Negative Predictive Value of 100%, Positive Predictive value of 73.33% and Accuracy of 95.69%.

DISCUSSION

Fine needles aspiration is regarded as the gold standard initial investigation in the diagnosis of thyroid swellings. The technique is safe, simple and quick with a low complication rate and it's the most accurate and cost effective screening test for the rapid diagnosis of thyroid swellings. FNAC has been shown to have similar or higher sensitivity and accuracy levels than frozen section examination[8-10]. There is a larger group of lesions which overlap benign and malignant features. For instance the distinction between a cellular colloid goiter and follicular lesion may be impossible. Cytological diagnosis of follicular adenoma and carcinoma is not possible on FNAC and the diagnosis is dependent on histological assessment of capsular and vascular invasion. Another limitation of the FNAC is the large number of inadequate aspirates, published data suggest inadequate sample ranges between 9-13%[11-13]. In our study the inadequate sample range was 7%. The most important factors include the experience of the aspirator and the criterion used to define a satisfactory sample.

FNAC correctly diagnosed 11 nodules giving a Specificity of 95.12% for malignant nodules, this figure corresponds well with statistics cited by other authors giving a range from 75- 96.7%[14,15]. The specificity and Accuracy of FNAC in detecting malignancy also ranged from 52-86% and 65-79% as cited by other studies. The positive predictive and Negative predictive values of our study are also comparable with published data[15-17].

We found FNAC highly efficient investigative modality. In 11 patients preoperative diagnosis of malignancy enabled the surgeon to perform a near total thyroidectomy. Several patients with benign lesions were spared from radical surgery.

CONCLUSION

FNAC is an excellent, safe and cost effective diagnostic procedure. The most significant advantage of FNAC is the high degree of accuracy, rapid results and a less invasive procedure than tissue biopsy. It can immediately relieve patients anxiety with a benign diagnosis or set the stage for psychological assistance of treatment options with a malignant diagnosis.

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