Radiological guided Fine needle aspiration cytology in lymphadenopathy in Head and Neck Masses

Ahmed Mohamed Seleim[1], Tarek Mohamed Abdelhamed Elzayat[2], Ibrahim Hasan Mohamed Yousef[3], Ibrahim Ibrahim Eldsoky[1], Yahya Mohamed Dawood[1], Ahmed Lotfy Abd Elhamed Mohamed[1]

[1]Otorhinolaryngology Department, Faculty of Medicine, AL-Azhar University, Egypt
[2]Diagnostic Radiology Department, Faculty of Medicine, AL-Azhar University, Egypt
Pathology Department, Faculty of Medicine, AL-Azhar University, Egypt

Abstract: US guided FNAC is the most reliable imaging technique to assess the presence of metastases in cervical lymph nodes in patients with head and neck cancer. This review also indicates that further studies on diagnostic performances of radiological imaging modalities should be done, focused on patients with clinically N0 necks, because especially in these patients imaging may play an important role in directing treatment. US guided FNAC can be recommended as a cheaper and most feasible alternative to the CT scan in the evaluation of the neck node metastasis.

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1. Introduction

The most important prognostic factor in patients with Head and neck carcinoma is the presence or absence of cervical metastases **(1).**

The occurrence of nodal metastasis has a profound effect on the treatment, prognosis and survival of patients with head and neck cancer **(2).**

Metastatic spread to one side decreases the survival by 50%, whereas bilateral metastasis decreases survival by a further 25%. Metastasis that is higher than 20% is the most important indicator for elective neck treatment **(1, 3).**

It is possible to reduce the risk of undiagnosed metastasis with accurate imaging techniques. Various tools for the staging of lymph nodes are palpation, US guided fine needle aspiration cytology (FNAC), ultrasound (US), computed tomography (CT), magnetic resonance imaging (MRI) **(4).**

Fine needle aspiration (FNA) is a test that should be interpreted with the entire clinical circumstances. False-negative and false-positive FNA results are reported in almost every series. Therefore, reliance upon FNA findings at the expense of clinical, radiographic, or other findings is unsafe **(5).**

Aim of the Work

This work is aiming to evaluate the diagnostic role of (US) guided Fine needle aspiration cytology (FNAC) in patients presenting with head and neck lymphadenopathy.

2. Patient and Method

The patient population consisted of 90 patients presented with palpable cervical lymph node with different known primary tumor site within head and neck region who were referred to the Department of Otorhinolaryngology, ALHussein University Hospital between October 2016 and August 2017.

3. Results

The pool of this study was 90 patients 62 males (68.9%) and 28 female (31.11%) their age ranged from: 17 -79 mean age 50.13 ± 14.22, 31 (34.4%) of them located in the age of range from 40-49.

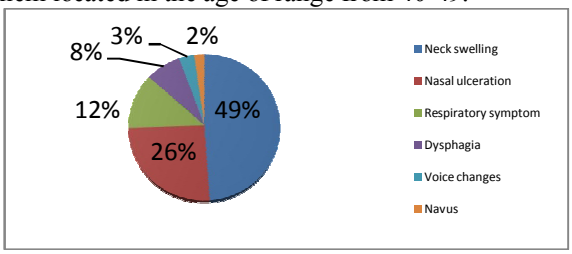

Figure (1): pie chart shows clinical presentation in 90 cases

Table (1): Histopathology of primary tumor in 90 cases

Histopathology	No.	Percentage%
Squamous cell carcinoma	39	43.3%
Papillary thyroid carcinoma	27	30.0%
Follicular thyroid carcinoma	6	6.7%
Mucoepidermoid Carcinoma	8	8.9%
Acinic cell carcinoma	3	3.3%
Malignant melanoma	2	2.2%
Adenocarcinoma	2	2.2%
Medullary carcinoma	3	3.3%
Total	90	100 %

Table (2): Frequency of Ultrasound guide FNAC, Ultrasonography, and Computed tomography with histopathologic examination of the biopsy

		No.	Percentage%
US	**N**	**36**	**40.0%**
	P	**54**	**60.0%**
US guided fna cytology	**N**	**33**	**36.7%**
	P	**57**	**63.3%**
CT	**N**	**33**	**36.7%**
	P	**57**	**63.3%**
Open biopsy (bengin. Malig)	**N**	**27**	**30.0%**
	P	**63**	**70.0%**

US: Ultrasound, CT: Computed tomography, P: Positive, N: Negative

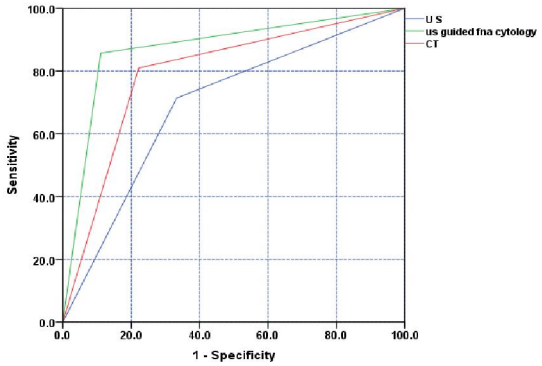

Figure (2): ROC curves comparing the accuracy of Ultrasound guided fine needle aspiration cytology (USgFNAC), Ultrasound (US) and Computed tomography (CT) in the detection of cervical lymph node metastases in head and neck tumor.

Table (3): Comparison of sensitivity, specificity, positive predictive value, negative predictive value, and accuracy between US guided fna cytology, Ultrasonography, and Computed Tomography

	True Positive	False Negative	True Negative	False Positive	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)
U S	45	18	18	9	71.4	66.7	83.3	50	70
US guided fna cytology	54	9	24	3	85.71	88.89	94.74	72.73	86.67
CT	51	12	21	6	80.95	77.78	89.47	63.64	80.00

PPV: Positive predictive value **NPV**: Negative predictive value

4. Discussion

Our study was conducted on 90 patients 62 males (68.9%) and 28 female (56.7%) their age ranged from: 16 -79 mean age 50.13 _+14.22 Location of the primary lesion were divide into 36 thyroid gland, 5 submandibular gland,2 melanoma of the skin, 6 tongue,9 cheek, 7 hypopharynx, 8 lower lip, 6 nasopharynx, 8 parotid gland and 3 tonsils.

In our study we compared Ultrasound guided FNAC of the neck in patients with head and neck malignancy, with computerized tomography (C.T), ultrasound (US), regarding their sensitivity, specificity and their accuracy in detection of metastatic lymph nodes.

In our study, we were able to obtain tissuefrom head and neck lesions that was adequate fordiagnostic purposes in 100% of our patients.

Regarding C.T Finding:

In our study, The CT was characterized by (80.95%) sensitivity and (77.78 %) specificity and accuracy (80%), with positive predictive value of (89.47%) negative predictive value (63.64%). this concordance with that reported in the literature. Our results Matches with **(6)** who reported The sensitivity of CT was)82.09%(and the specificity, 85.71%. The positive predictive value (PPV) was)93.22%(and the negative predictive value (NPV) was)66.67%(. The diagnostic efficiency or ability of CT to identify only true positives and negatives was)83.16%(.

Also the same in **(7)** The CT was characterized by (83%) sensitivity and (70%) specificity.

Regarding ultrasound (US):

Several authors have addressed the subject of ultrasound in metastatic neck disease in patients with upper aerodigestive tract tumor. Early reports were focused on the ability of US to quantify lymph node size and volume and the possibility of defining the relationship of palpated nodes to adjacent structures.

In our study US showed lowest sensitivity of (71.4%) and (66.7%) specificity and accuracy (70%), with positive predictive value of (83.3%) negative predictive value (50%). which is similar to **(8)** The US was characterized by (78.3%) sensitivity and (44.6 %) specificity and accuracy (60.8%), with positive predictive value of (56 %) negative predictive value (69%).

Bozdemir et al., 2015(9) Reported the US was characterized by (66%) sensitivity and (76%)

specificity and accuracy (73%), with positive predictive value of (58 %) negative predictive value (82%).

Regarding US guided FNAC:

In our study The US guided FNAC was characterized by (85.71%) sensitivity and (88.89 %) specificity and accuracy (86.67%), with positive predictive value of (94.74%) negative predictive value (72.73%). this concordance with that reported in the literature, the reported sensitivity of US guided FNAC ranges from 84 to 90 % whereas the specitifity ranges from 98 to 100% **(10).**

This was in agreement with a recent study **(11)** showed) 92.3%(sensitivity and)90.9%(specificity. Positive predictive value and negative predictive value of the test were)96.0%(and)83.3%(respectively and accuracy was)91.89%(.

The accuracy of 86.6 % for USgFNAC in our study can be compared to previous studies **(12))**90 %(, **(13)**)89.7%(**, (8))**88%(.

In our study, this technique was well tolerated by the patients without any complications. The advantage of US and US guided FNAC over CT are the low cost of US, more convenient in elderly and/or dyspneic patients. FNAC is less invasive procedure than the administration of intravenous contrast material in CT. If it is performed by an experienced examiner it is proved to be quick (10–20min) and safe (no complications) technique, causing only moderate discomfort to the patient. It can usually be repeated during patients' followup visits. This is extremely important for patients who do not undergo elective neck dissection and it ensures early detection of regional recurrence in the neck **(14,15).**

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