ORIGINAL ARTICLE

Role of Image Guided FNAC in Assessment of Intra-Abdominal and Retroperitoneal Masses

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ABSTRACT

Introduction: Fine Needle Aspiration Cytology is a widely used method for palpable/nonpalpable masses. Radiological image guided Fine Needle Aspiration Cytology is less invasive, safe and cost effective method for diagnosis of masses in less accessible sites like intra-abdominal organs. Ultrasound or Computed Tomography guided methods are usually preferred. **Aims:** This study was done to evaluate the diagnostic utility of image guided Fine Needle Aspiration Cytology in an intra-abdominal and retroperitoneal lesions and confirmation by histopathology whenever available. **Methods:** This is a hospital based prospective study over a period of one year (October 2022 to September 2023) in department of Pathology, Nepalgunj Medical College, Kohalpur, Nepal. Patients who presented clinically and radiologically with intraabdominal or retroperitoneal masses were included in which direct Fine Needle Aspiration Cytology was not possible. A cytological opinion was made by correlating with clinical and radiological findings. Histological correlation was carried out in patients who went surgical excision or biopsy of lesion. **Results:** Among 52 cases studied, all were accessible via ultrasonography. Cytopathological diagnosis was obtained in 49 cases and three cases were unsatisfactory. Among them 44 were malignant, one was suspicious and seven were non-neoplastic. Liver was most frequently aspirated organ (23 cases) with commonest diagnosis being metastatic adenocarcinoma (17 cases). Cyto-histological correlation was available in 16 cases. This study shows 100% specificity and 93.3% sensitivity. Diagnostic accuracy was 94.2%. **Conclusion:** Image guided Fine Needle Aspiration Cytology plays an important role in diagnosis of deep-seated nonpalpable lesions. It is safe and provides rapid diagnosis with minimal complications.

Keywords: Cyto-histopathological correlation, Fine Needle Aspiration Cytology, Intra-abdominal mass, Ultrasonography guided

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INTRODUCTION

Fine needle aspiration cytology (FNAC) is widely used valuable and safe method usually applied for readily palpable masses. Recently its use is increasing in inaccessible and deeply located lesions/organs aspirated safely using radiological guidance. Radiological guided FNAC is widely accepted, less invasive, safe and cost effective diagnostic procedure and amenable to repeat procedure without significant complications.[1] Diagnosis of intra-abdominal lumps are often difficult and usually requires histopathological study, same applies for lesions in less accessible sites like retroperitoneum. In recent years, deeper organs like liver, spleen, pancreas and retroperitoneal masses are safely sampled and routinely aspirated using FNAC under radiological guidance. Among the various modalities available, ultrasound (USG) guidance and Computed Tomography (CT) are usually preferred.[2] Most of the intra-abdominal masses are non-palpable and their size and extent cannot be known. These lesions can be inflammatory, benign or malignant. The greatest advantage is that radiological guidance allows visualization of passage of needle tip into the target mass. Image guided FNAC is highly sensitive, highly specific, accurate and cost effective. However, aspiration cytology is not a substitute for histopathology. A definite diagnosis is not always possible, differential diagnosis can be provided in majority of cases for further management.[1]

This study was conducted to evaluate the usefulness of image guided FNAC as diagnostic procedure in intra-abdominal and retroperitoneal masses. All malignant and non-malignant

lesions aspirated will be studied and cytological diagnosis will be correlated with histopathology whenever possible.

METHODS

This is a hospital based prospective study conducted over a period of one year (October 2022 to September 2023) in department of Pathology, NGMC, Kohalpur, Nepal. Informed verbal consent from the patient and ethical approval from institutional review committee were obtained. Patients who presented clinically and radiologically with intra abdominal or retroperitoneal masses were included in which direct FNAC was not possible.

Inclusion Criteria: Patients with palpable or non-palpable inta-abdominal or retroperitoneal masses.

Exclusion Criteria: All the superficial and pulsatile swellings were excluded.

Bleeding test and Coagulation test were done when necessary. FNAC under radiological guidance was performed using 22G needle or 22G lumbar puncture (LP) needle fitted on 10ml disposable syringe depending on the depth of lesion.[3] Smears were prepared and stained with Giemsa and Pap stain. A cytological opinion was made by correlating with clinical and radiological findings. Histological correlation was carried out in patients who went surgical excision or biopsy of lesion. Histopathological samples obtained was fixed in 10% neutral buffered formalin. Gross features of specimen were noted and sections were taken. Routine tissue processing is done with final embedding in paraffin blocks and stained with Hematoxylin and Eosin (H&E) stain.[4] Special stains like Periodic Acid Schiff (PAS) and Ziehl Neelsen (ZN) stain were done whenever necessary.

Data were analyzed using Microsoft excel and standard statistical software SPSS 20.0.

RESULTS

A total of 52 cases were included in the study. The age of patients was from 17 to 77 years and most common age range being 41-50 years. The study included 22 male and 30 female patients with male to female ratio of 0.7:1. USG was the more common mode of radiological guidance and used in all cases as all the lesions were assessable by USG. Thus, CT guidance was not required. During and after aspiration no major complications were reported. Among the various organs/sites aspirated, maximum number of cases were from liver in 23(44.2%) cases followed by gallbladder in 8(15.4%) cases as shown in Table I. Cytopathological diagnosis was obtained in 49 cases and three cases were unsatisfactory. Among them 41 were malignant, one was suspicious and seven were non-neoplastic. Metastatic malignancy was the most common malignant lesion comprising 17(32.7%) cases. Among the benign and inflammatory lesions one case of TB, one case of suppurative lymphadenitis, one case of lymphoepithelial cyst, one case of abscess, one case diagnosed as inflammatory and two cases of reactive changes in hepatocytes were identified in FNAC as shown Table II. Cyto-histopathological correlation was available in 16 cases The sensitivity of the study was 93.3% and specificity was 100% with diagnostic accuracy of 94.2%. A positive predictive value of 100% was obtained while the negative predictive value was 50%. 14 cases were found to be true positive for malignancy and one true negative (Table III).

Site	Frequency	Percent
Liver	23	44.2%
Gallbladder	8	15.5%
Intrabdominal lymphnode	7	13.5%
Caecum	2	3.8%
Intrabdominal Lump	2	3.8%
Pancreatic mass	2	3.8%
Colon	2	3.8%
Ileum	1	1.9%
Left iliac fossa mass	1	1.9%
Psoas mass	1	1.9%
Retroperitoneal mass	1	1.9%
Right kidney	1	1.9%
Stomach	1	1.9%
Total	**52**	**100%**

Table I: Organ/sites of intra-abdominal and retroperitoneal lesions aspirated (N=52)

Cytological Impression	Frequency	Percent
Abscess	1	1.9
Adenocarcinoma	10	19.2
Adenosquamous Carcinoma	1	1.9
Gastrointestinal stromal tumor	2	3.8
Hepatocellular Carcinoma	4	7.7
Hodgkins Lymphoma	1	1.9
Inflammatory	1	1.9
Lymphoepithelial cyst	1	1.9
Metastatic Adenocarcinoma	17	32.7
Mucus secreting Adenocarcinoma	1	1.9
Non Hodgkins Lymphoma	3	5.8
Papillary Renal Cell Carcinoma	1	1.9
Reactive changes in hepatocytes	2	3.8
Small round cell tumor	1	1.9
Suppurative Lymphadenitis	1	1.9
Suspicious of Malignancy	1	1.9
Tuberculosis	1	1.9
Unsatisfactory	3	5.8
TOTAL	**52**	**100.0**

Table II: Cytological (FNAC) Diagnosis (N=52)

	Histopathology		Total
FNAC	**Malignant**	**Benign**	
Malignant	14	0	14
Benign	1	1	2
Total	**15**	**1**	**16**

Table III: Sensitivity and Specificity (N=16)

DISCUSSION

FNAC is indicated in almost every palpable or non-palpable deep seated masses. It results in reduction in open biopsy and provided diagnosis prior to open surgery.[2] FNAC is a safe, minimally invasive and cost-effective procedure. Image guided FNAC allows easy collection of study material with higher accuracy and allow planned management of patients with deep seated lesions.[5] The technique of image guided aspiration not only allows precise anatomical location and targeting of lesions but also is safe route with constant visualization of tip of needle during procedure, thus decreasing the risk of complications.[6] Maximum number of cases were seen in 41-50 years of age group, similar to other studies.[5] In some studied most common age group was 51-60 years.[2] A female preponderance was observed in this study with total of 30 cases (57.7%) as in study by Madhay N and Meenai FJ.[6] In this study of 52 cases, 49 FNAC cases yielded diagnostic material and three cases were inadequate for evaluation. This finding is similar to other studied which had adequate diagnostic material in higher number of cases.[2,7] The adequacy rate of cytology depends on the expertise of both guiding radiologist as well as pathologist along with the location and nature of lesion. Highly vascular lesions, cystic lesions and highly necrotic lesions are more likely to yield low diagnostic material.[2] In this study, 94.2% of the cases had adequate diagnostic material/cellularity for opinion. It could be because of repeat FNA attempted twice, at least, if the yield was non-diagnostic in first attempt.

In this study, most of the FNAC (23 cases) were done from liver as seen in other studies.[2,5,7] Liver is also the commonest site for malignant lesions (15 cases of metastatic adenocarcinoma and 4 cases of hepatocellular carcinoma) which is also similar to studies done by Namshiker AAN et al, Chowdhary M et al and Singh M et al.[2,5,7] The cytomorphological features helpful in identifying HCC are presence of sheets and clusters of polygonal tumor cells with prominent nucleoli, endothelial wrapping or vessels transgressing clusters of tumor cells and intranuclear inclusions. The diagnosis of metastatic carcinoma showed features of adenocarcinoma i.e. tumor cells arranged in glands or sheets or three-dimensional clusters, variable nuclear pleomorphism and dirty necrotic background. Second common site was intrabdominal lymphnodes comprising of total eight cases most of which were malignant followed by infective causes.Cyto-histological correlation was available in 16 cases out of 52 cases. This may be due to the fact that most of the cases (23 out of 52 cases) were from liver and most of the patients diagnosed with malignant lesion were referred to cancer institute for further specialized management. The overall diagnostic accuracy was 94.2%.[2,8,9] With available histopathological correlation, sensitivity was 93.3%, specificity was 100% with PPV of 100% and NPV of 50% with high diagnostic accuracy as seen in other studies.[10,11,12]

LIMITATIONS

One of the limitation of the study is availability of less number of cases for histopathological correlation. For some non-diagnostic/inadequate lesions on FNAC repeat aspiration could not be done to ascertain the nature of lesion which could be due to non-compliance of patient during repeat aspiration.

CONCLUSION

Image guided FNAC of deep seated lesion in individual with any age group can be done without major complications. Study of lesions can be done in variety of organs and it is a simple, rapid and cost-effective procedure. The accuracy of diagnosis can be improved by further comparing the lesion with biopsy which can also be used for further diagnostic approaches like IHC.

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