

ULTRASONOGRAPHY AND COMPUTED TOMOGRAPHY GUIDED FINE NEEDLE ASPIRATION CYTOLOGY IN DIAGNOSING INTRA-ABDOMINAL LESIONS- A 6-YEAR RETROSPECTIVE STUDY IN A TERTIARY CARE HOSPITAL IN MANIPUR

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ABSTRACT

BACKGROUND

Fine-Needle Aspiration Cytology (FNAC) is a widely used method, which is accurate and safe in a readily palpable masses. But, in those inaccessible lesions and deeper organs are safely aspirated using fine needle radiological procedure like ultrasound or computed tomography guided.

The aim of the study is to assess the utility of FNAC in the diagnosis of intra-abdominal lesions and different pattern of lesions in particular to the sites.

MATERIALS AND METHODS

This retrospective study was done in the Department of Pathology, Regional Institute of Medical Sciences (RIMS), Imphal, between June 2010 and June 2016. The study included 128 intra-abdominal masses. Giemsa and Papanicolaou's stains were used. The cytological diagnosis was correlated with clinical and radiological data to arrive at a final diagnosis.

RESULTS

Reports on FNAC smears were retrospectively analysed, which had been done in various anatomic sites- liver (70 cases), colon (19 cases), gallbladder (17 cases), mesenteric lymph nodes (12 cases), ovary (3 cases), adrenals (2 cases) and 1 case each of pancreas, peritoneal wall, pelvic, suprapubic and flank masses. The mean age was 42.16 years with M:F of 1.3:1. The diagnostic yield was 85.2% in combination for Ultrasound Guided (USG) and Computed Tomography (CT) guided aspiration. The smears were classified as benign neoplastic, malignant neoplastic, non-neoplastic, inconclusive and unsatisfactory for interpretation. There were 79 (61.7%) malignant neoplastic lesion, 5 (3.9%) benign neoplastic lesion, 25 (19.5%) non-neoplastic lesion, one (0.7%) inconclusive lesions and 18 (14.1%) unsatisfactory smears. The liver and the colon were the most common sites. Adenocarcinomas and Hepatocellular Carcinoma (HCC) were the most common malignant lesions comprising of 35 (44.3%) and 25 (31.6%) of the total malignant lesions diagnosed.

CONCLUSION

Intra-abdominal FNA is a simple, economical and a safe procedure with high sensitivity, specificity and diagnostic accuracy and it can be utilised as a preoperative procedure for the management of intra-abdominal lesions.

KEYWORDS

USG Guided, CT Guided, FNAC, Intra-Abdominal Lesions.

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BACKGROUND

Fine-Needle Aspiration Cytology (FNAC) is nowadays widely used tool for the diagnosis of superficially palpable lesions as well as lesions of deep-seated thorax and abdomen. The

technique is relatively painless and reliable, produces speedy result and is cheap.¹

Distinction between malignant and non-malignant lesions and particularly inflammatory lesions is vital for patient management. Clinical presentations such as organomegaly, weight loss, anaemia and jaundice are usually associated with malignancy, but can be misleading at times. Nonneoplastic conditions such as pyogenic abscesses and tuberculosis can produce focal lesions that maybe mistaken for malignancy. Although, distinction between malignant and non-malignant lesions is often suspected from imaging techniques, the increasing use and sensitivity of radiological techniques has led to the identification of relatively small lesions, which require the

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use of image guidance for reliable targeting,² but the diagnosis is dependent on obtaining an accurate tissue diagnosis usually by percutaneous sampling.³

Although, computerised tomography/ultrasound-guided fine-needle aspiration of abdominal organs is practiced extensively throughout the world.⁴ Complications that have been reported are haemorrhage, septicaemia, biliary peritonitis and acute pancreatitis. Needle tract tumour implantation after FNAC has been reported, but the survival outcome of these patients has not been studied in detail.⁵⁻⁶ Various modalities of imaging like x-ray, ultrasound, CT and MRI are being routinely used nowadays. But, ultrasound is the most commonly used imaging technique because of its greater scanning flexibility, speed and absence of radiation exposure. But, a disadvantage of ultrasound is poor needle visibility. A CT scan provides accurate localisation and excellent needle visibility, but is time consuming, costly and risk of radiation exposure is present.⁷

This study was conducted to further confirm the usefulness of FNAC as a diagnostic procedure in the management of intra-abdominal and retroperitoneal lesions. Our main objectives were to determine the anatomic site wise distribution of the lesions, the age and sex distribution of patients with intra-abdominal and retroperitoneal lesions, to classify and study the prevalence of non-malignant (benign and non-neoplastic) and malignant lesions aspirated and to correlate the cytological diagnosis with histopathology wherever possible.

MATERIALS AND METHODS

This study was conducted in the Departments of Pathology and Radiology and all the intra-abdominal FNACs performed under USG and CT guidance during the period of June 2010 to June 2016 were included in the study. These cases were referred from different medical and surgical departments of our institution. Initially, the clinical histories of the patients were taken and then thorough clinical examination and relevant laboratory investigations including coagulation profile like Prothrombin time, Partial thromboplastin time and platelet counts were performed. Slides are stained with May Grunwald Giemsa (MGG) and Papanicalou (Pap) stains. The advantages and the risks involved were explained to the patient and a written consent was obtained in all the cases prior to the procedure. Imaging was carried out and initial provisional diagnosis was made on the basis of radiological and clinical findings. In all the cases (both USG and CT guided), aspiration was carried out using 22 G LP needle with 10 mL disposable syringes. Slides were stained routinely with MGG and Pap stains. Special stains were carried out in relevant cases if unstained slides were available after routine staining. The smears were classified as acellular smear, inconclusive smear, non-neoplastic lesion, benign neoplastic lesion and malignant neoplastic lesion.

RESULTS

A total of 128 image-guided intraabdominal FNACs were performed during the above-mentioned period. The age of

the patient ranged from 4 months to 84 years with a mean age of 42.16 years. The male-to-female ratio were 1.3:1 (Table 1).

Age in Years	Male	Female	Total
<1	0	1	1
1-9	2	0	2
10-19	2	0	2
20-29	6	2	8
30-39	13	8	21
40-49	6	10	16
50-59	17	10	27
60-69	14	15	29
70-79	8	9	17
80-89	5	0	5
>90	0	0	0
Total	73 (57%)	55 (43%)	128

Table 1. Age and Sex Distribution of the Cases

In present study, liver was the most common site of FNAC, 70 cases (54.5%) followed by colon 19 cases (14.8%), gallbladder 17 cases (13.3%), mesenteric lymph nodes 12 cases (9.4%), ovary 3 cases (2.4%) and adrenal 2 cases (1.6%). Flank, pelvis, suprapubic region, peritoneal wall and pancreas 1 case each (0.8%) (Table 2).

Sites	No. of Cases	Percentage
Liver	70	54.5
Colon	19	14.8
Gallbladder	17	13.3
Mesenteric lymph node	12	9.4
Ovary	3	2.4
Adrenal	2	1.6
Flanks	1	0.8
Pelvis	1	0.8
Suprapubic region	1	0.8
Peritoneal wall	1	0.8
Pancreas	1	0.8
Total	128	100

Table 2. Site of Distribution of Intra-Abdominal Lesions

Out of total 128 aspirates, 79 (61.7%) were categorised as malignant, 5 (3.9%) as benign, 25 (19.5) as non-neoplastic lesions, 18 (14.1%) as acellular smear and 1 (0.8%) as inconclusive, because as radiologically, it was suspicious of malignancy and the smears were contained normal cells and blood only (Table 3).

Cytological Category	No. of Cases	Percentage
Acellular smear	18	14.1
Inconclusive smear	1	0.8
Non-neoplastic lesion	25	19.5
Benign neoplastic lesion	5	3.9
Malignant neoplastic lesions	79	61.7
Total	128	100

Table 3. Cytological Categorisation of the Intra-Abdominal Lesions

Image guided of the liver show the following cytological diagnosis. Among the malignant lesions, hepatocellular carcinoma was the most common lesion comprising 25 cases (19.4%), followed by metastatic adenocarcinoma 16 cases

(12.5%), metastatic carcinoma 5 cases (3.9%) where the primary were not able to identified and 1 case (0.8%) of non-Hodgkin lymphoma. We don't encountered any benign neoplastic lesion in the liver. In the category of non-neoplastic lesion, diffuse parenchymal liver disease

comprised of 6 cases (4.7%), hepatic abscess in 1 case (0.8%) and nonspecific inflammatory lesion in 7 cases (5.4%). Inconclusive and acellular are 1 (0.8%) and 8 (6.2%), respectively (Table 4).

Site of Aspiration	Cytological Category	Cytodiagnosis	Number of Cases	Percentage
Liver	Malignant neoplastic lesions	Hepatocellular carcinoma	25	19.4
		Metastatic adenocarcinoma	16	12.5
		Metastatic carcinoma	5	3.9
		Non-Hodgkin lymphoma	1	0.8
	Benign neoplasm		0	0
	Non-neoplastic lesions	Diffuse parenchymal liver disease	6	4.7
		Hepatic abscess	1	0.8
		Inflammatory lesion	7	5.4
	Inconclusive		1	0.8
Acellular		8	6.2	

Table 4. Cytological Diagnosis of the Liver Lesions

Aspirates from the colon show 9 cases (7%) of adenocarcinoma in the malignant category, 2 cases (1.6%) of Gastrointestinal Stromal Tumour (GIST) in benign neoplasm, 4 cases (3.1%) of suppurative lesion and 4 cases (3.1%) in acellular category. Among the 17 cases aspirated from the gallbladder, adenocarcinoma was the commonest comprised of 9 cases (7%) followed by squamous cell carcinoma and metastatic adenocarcinoma of 2 cases (1.6%) each. Anaplastic carcinoma and cholangiocarcinoma 1 case (0.8%) each (Table 5).

Site of Aspiration	Cytological Category	Cytodiagnosis	Number of Cases	Percentage
Colon	Malignant neoplastic lesions	Adenocarcinoma	9	7
	Benign neoplasm	GIST	2	1.6
	Non-neoplastic lesion	Suppurative lesion	4	3.1
	Inconclusive		0	0
	Acellular		4	3.1
Gallbladder	Malignant neoplastic lesion	Adenocarcinoma	7	5.4
		Squamous cell carcinoma	2	1.6
		Anaplastic carcinoma	1	0.8
		Cholangiocarcinoma	1	0.8
		Metastatic adenocarcinoma	2	1.6
	Benign neoplasm		0	0
	Non-neoplastic lesion		0	0
	Inconclusive		0	0
Acellular		4	3.1	

Table 5. Cytological Diagnosis of the Colon and Gallbladder Lesions

Site of Aspiration	Cytological Category	Cytodiagnosis	No. of Cases	%
Mesenteric lymph node	Malignant neoplastic lesions	Non-Hodgkin lymphoma	1	0.8
	Non-neoplastic lesions	Tuberculosis	7	5.4
		Nonspecific reactive lymphadenitis	2	1.6
	Acellular		2	1.6
Peritoneal wall	Malignant neoplasm	Metastatic squamous cell carcinoma	1	0.8
Ovary	Malignant neoplasm	Mucinous carcinoma	1	0.8
	Benign neoplasm	Immature teratoma	1	0.8
		Benign cystic lesion	1	0.8
Adrenal gland	Malignant neoplasm	Adrenocortical carcinoma	1	0.8
		Adenocarcinoma	1	0.8
Flanks	Malignant neoplasm	Small round cell tumour	1	0.8
Pelvis	Malignant neoplasm	Adenocarcinoma	1	0.8
Suprapubic region	Malignant neoplasm	Metastatic papillary carcinoma of ovary	1	0.8
Pancreas	Malignant neoplasm	Anaplastic Ca (giant cell variant)	1	0.8

Table 6. Cytological Diagnosis of the Remaining Sites

Imaging-guided FNAC from mesenteric lymph nodes reveal one case (0.8%) of non-Hodgkin lymphoma, seven cases (5.4%) of tubercular lymphadenitis, two cases (1.6%)

of nonspecific reactive lymphadenitis and two cases (1.6%) of acellular material. Aspiration from peritoneal wall show one case (0.8%) having features of metastatic squamous cell

carcinoma. Ovarian aspirates show one case (0.8%) each of mucinous carcinoma, immature teratoma and benign cystic lesion. Two cases from adrenal gland show one case (0.8%) each displaying features of adrenocortical carcinoma and adenocarcinoma. Aspirate from the flank show one case (0.8%) of small round cell tumour. One case aspirated from the pelvis shows morphological features of adenocarcinoma suprapubic mass show one case of metastatic papillary carcinoma of ovary. Pancreatic mass shows anaplastic carcinoma (giant cell variants) (Table 6).

DISCUSSION

USG-guided fine-needle aspirations have facilitated easy collections of cellular material increasing accuracy rate.⁸ Ultrasound assistance for fine-needle aspiration is useful in deep-seated thoracic and abdominal lesions to yield cellular material. It would be further effective when it is done jointly by pathologist and radiologist. It is an opportunity for a pathologist to know the clinical status including radiological finding of patient, which is very useful to make a conclusion while assessing the cytological findings.⁹ In the present study, aspirate was conclusive and definite diagnosis was made in 99.21% cases indicating high adequacy rate. In 14.2% cases, no opinion could be made due to inadequate material or absence of material. The diagnostic confirmation is of utmost importance for rapid and appropriate planning of management of cases. Differentiation between benign and malignant disease is at times vital to avoid an exploratory laparotomy, especially in advanced unresectable malignant cases. Ultrasound-guided FNAC is a rapid, accurate, economical and a safe diagnostic procedure that can be used in various neoplastic and non-neoplastic diseases. As a diagnosis is rapidly available on FNAC, the appropriate medical or surgical therapies can be started earlier, thus avoiding unnecessary, expensive and often invasive diagnostic procedures.¹⁰

The age incidence in the present study ranged from 4 months to 84 years with a majority of the cases being in the age group of 30-69 years, which was comparable to the results, which were obtained by Zawar MP et al¹¹ and Shamshad et al.¹²

The male-to-female ratio of 1.3:1 was in accordance with the observations, which were made by Zawar MP et al,¹¹ Govind Krishna et al,¹³ Aftab A Khan et al¹⁴ and Ennis and MacErlean¹⁵ showed a male preponderance, but the observations, which were made Shamshad et al¹² and Joao Nobrega et al⁸ in the studies. This could be due to the inclusion of the ovary in this study was done by Shamshad et al.¹²

Liver was the common sites for FNAC in this study as shown in table 2, which is comparable to the studies done by Sheikh et al, Adhikari RC et al⁹ and Zawar M.P. et al.¹¹ Liver was also the most common site of aspiration performed in the abdomen in a study done by J Nobrega et al.⁸ In the present study, hepatocellular carcinoma was the commonest lesion of the liver comprising of 19.4%, which is comparable with Tasleem Ahmad Reyaz et al¹⁶ and Zawar MP et al.¹¹ Metastatic adenocarcinoma of liver was found in 12.5%,

which was a little lower than those studies in the western world.¹¹

In the present study, adenocarcinoma was the commonest type of all the malignancies followed by hepatocellular carcinoma. This was in accordance with the observation, which were made by Shamshad et al¹² and Aftab A Khan et al.¹⁴ This type of malignancy were found in colon, gallbladder, adrenal gland and pelvis.

The findings of Arnab Gosh et al¹⁷ was found higher in case of colonic adenocarcinoma form ours. This may be due to less number of cases aspirated from this location and the prevalence of colon carcinoma is less as compared with other regions.

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