Study of Radiologically Assisted Fine Needle Aspiration Cytology in Abdomino-Pelvic Lesions

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Abstract

Background: Clinicopathological evaluation of abdomino-pelvic lesions remain an enigma both to the clinician and pathologist . Radiologically assisted cytology namely Ultrasonography guided and Computed Tomography guided aspiration cytology is an accurate, safe, rapid and inexpensive method for diagnosing both neoplastic and non neoplastic abdomino-pelvic lesions.

Objectives: To evaluate the diagnostic utility of image guided cytology in abdomino-pelvic lesions.

Method: It is a retrospective descriptive study conducted in Department of Pathology of a tertiary health care centre, Bangalore. About 169 cases of abdomino-pelvic lesions diagnosed from period between January 2016 to December 2018 were reviewed retrospectively.

Results: In our study, abdomino-pelvic lesions were most common in the age group 41-50 years(32.5%) followed by 51-60 years(28.4%). Out of 169 cases, 85(50.3%) were males and 84(49.7%) were females. Out of 169 aspirates, cytodiagnosis revealed 71(42.01%) as primary malignant lesions, 40(23.67%) as metastatic malignant lesions, 31(18.34%) as non neoplastic lesions, 4(2.37%) as benign lesions and 23(13.61%) cases were categorised as inadequate. Liver was the most frequently aspirated abdominal organ and ovary-most frequently aspirated pelvic organ. Cyto-histopathological correlation was available in 37 cases. The diagnostic accuracy of image guided FNAC was 94.5%. The sensitivity, specificity, positive predictive value and negative predictive value were 92.5%, 100%, 100% and 83.3% respectively.

Conclusion: CT and USG guided FNAC is a preliminary diagnostic modality in inaccessible deep seated abdomino-pelvic lesions and can be done as an OPD procedure with less complications.

Keywords: *USG guided, CT guided, FNAC, Abdomino-pelvic lesions, Radiologicaly assisted.*

Introduction

Clinicopathological evaluation of abdomino-pelvic lesions remain an enigma both to the clinician and pathologist . Intra-abdominal and pelvic lesions can present as palpable or as deep seated non palpable masses. These lesions have to be categorised into benign, malignant and inflammatory for appropriate management of patients. Inflammatory and infective conditions like liver abscess and tuberculosis can be deceitful to the radiologists[(1)] , necessitating the need of the pathologist's assistance in arriving at a specific diagnosis to ease the management.

Radiologically assisted cytology namely Ultrasonography guided and Computed Tomography guided aspiration cytology is an accurate, safe, rapid and inexpensive method for diagnosing both neoplastic and non neoplastic abdomino-pelvic lesions.[(2)]

Interaction between radiologist and cytopathologist ensures accurate diagnostic yield.

The absolute contraindication of this procedure is uncorrectable severe coagulopathy.[(3)]

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Aims and Objectives

1) To evaluate the diagnostic utility of image guided cytology in abdomino-pelvic lesions.

2) To categorise intra-abdominal and pelvic lesions according to the site of occurrence.

Materials and Method

This is a retrospective descriptive study conducted in Department of Pathology of a tertiary health care centre, Bangalore, Karnataka, India between January 2016-December 2018. A total of 169 cases were included. Clinical and radiological data was obtained from the records. For superficial lesions 20 or 22 gauge spinal needle attached to 10ml disposable syringe and for deep seated lesions 22 gauge Chiba needle was used. Under aseptic conditions, percutaneous FNAC of lesion was done under USG guidance or CT guidance. A transabdominal approach using the most direct route was taken. The aspirate was smeared on an average of 4 to 5 glass slides. Air dried smears were stained with MGG stain and wet fixed smears were stained using Papanicolou stain and H&E stain . Prepared slides were examined under light microscope.The smears were classified as inadequate, non neoplastic, benign, primary malignant and metastatic malignant. Cyto-histopathological correlation was done in patients who underwent surgery or biopsy of lesions.

Results

In our study, USG was the more common imaging method used over CT for radiological assisted cytology with 12 cases being CT guided and 157 cases being USG guided. Out of 169 cases included in our study, abdomino-pelvic lesions were most common in the age group 41-50 years(32.5%) followed by 51-60 years(28.4%).

Out of 169 cases, 85(50.3%) were males and 84(49.7%) were females giving male:female ratio of 1.01:1.

Of 169 cases, maximum number of cases 72 (42.6%) were from liver followed by 33 (19.5%) cases from gall bladder, 23 (13.6%) cases were pancreatic lesions,16 (9.46%) abdominal lesions of unknown origin, 7 (4.14%) ovary, 7 (4.14%) peritoneal deposits, 7 (4.14%) abdominal lymph nodes, 2 (1.18%) retroperitoneal masses and 2 (1.18%) cases were renal masses (Table no.1). Out of 169 aspirates, cytodiagnosis revealed 71(42.01%) as primary malignant lesions, 40(23.67%) as metastatic malignant lesions, 31(18.34%) as non neoplastic lesions, 4(2.37%) as benign lesions and 23(13.61%) cases were categorised as inadequate. Out of 72 cases of liver, the most commonly encountered lesion was metastasis to liver (29 cases, 40.28%), followed by primary hepatocellular carcinoma (19 cases,26.39%) (Fig.1), liver abscess (8 cases,11.11%), simple cyst (4 cases,5.55%), hemangioma (2 cases,2.78%), benign parenchymal liver disease (1 case,1.39%), hepatocellular adenoma (1 case,1.39%), hydatid cyst (1 case, 1.39%) (Fig.3) and 7 cases (9.72%) were reported as inadequate. Out of 33 cases of gall bladder, 13 cases (39.39%) were adenocarcinoma, 7 cases (21.21%) were positive for malignancy, 4 cases(12.12%) were acute suppurative lesion, 2 cases (6.06%) were metastatic lesions, 1 case(3.03%) of abscess,1 case(3.03%) of cholangiocarcinoma and 5 cases(15.15%) were reported as inadequate. Cases which were categorised as positive for malignancy included those in which the smears revealed cells with hyperchromatic nucleus or clusters of poorly differentiated cells.

Out of 23 cases of pancreas, 9 cases(39.13%) were of adenocarcinoma, 4 cases(17.39%) were of pseudocyst of pancreas, 3 cases(13.04%) were positive for malignancy, 3 cases (13.04%) were of solid pseudopapillary pancreatic neoplasm (Fig.5), 2 cases(8.67%) were of chronic pancreatitis and 2 cases (8.67%) were reported as inadequate. Out of 16 cases of abdominal lesions of unknown origin, 3 cases(18.75%) were positive for malignancy, 3 cases(18.75%) were of metastatic deposits (1 was a known case of carcinoma lung and 2 were known case of carcinoma gall bladder), 3 cases(18.75%) were inflammatory lesions(not specified), 2 cases(12.5%) were of adenocarcinoma and 5 cases(31.25%) were reported as inadequate.

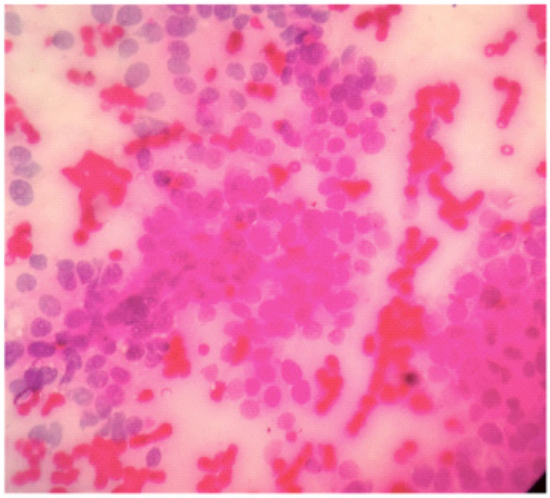
Out of 7 cases of the ovary, 3 cases(42.85%) were positive for malignancy, 3 cases(42.85%) were reported as papillary serous cystadenocarcinoma (Fig.4) and 1 case(14.29%) was reported as inadequate. Out of 7 cases of peritoneal deposits, 5 cases(71.43%) were metastatic deposits and 2 cases(28.57%) were inadequate to report.

Out of 7 cases of abdominal lymph nodes, 2 cases(28.57%) were reported as granulomatous lymphadenitis, 2 cases(28.57%) as Hodgkin's lymphoma, 1 case(14.29%) as acute suppurative lymphadenitis, 1 case(14.29%) as metastatic deposits and 1 case(14.29%)

was inadequate to report. Out of 2 cases of renal mass, 1 case(50%) was reported as clear cell variant of renal cell carcinoma and 1 case (50%) as benign cystic lesion. Out of 2 cases of retroperitoneal mass, 1 case (50%) was reported as spindle cell sarcoma and 1 case (50%) as non Hodgkins lymphoma (Fig. 2). Cyto-histopathological correlation was available in 37 cases. Out of 37 cases,35 cases were concordant and 2 cases were discordant which were false negatives. 2 discordant cases included benign liver disease with regenerative features and benign cystic lesion of the kidney which were histologically proven as hepatocellular carcinoma and renal cell carcinoma respectively. The diagnostic accuracy of image-guided FNAC was 94.5%. The sensitivity, specificity, positive predictive value and negative predictive value were 92.5%, 100%, 100%, and 83.3% respectively.

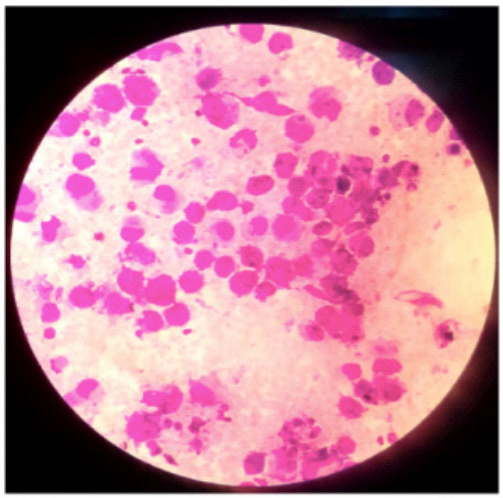
Table 1 Distribution of Lesions

Site	Inadequate	Non Neoplastic	Benign	Primary Malignant	Metastatic Malignant	Total	%
Liver	7	14 8-liver abscess 4-simple cyst 1-hydatid cyst 1-benign parenchymal disease (regenerative features)	3 2-hemangioma 1-adenoma	19 HCC	29	72	42.6%
Gall Bladder	5	5 4-acute suppurative lesion 1-abscess	0	21 13-adenocarcinoma 7-positive for malignancy 1-cholangiocarcinoma	2	33	19.53%
Pancreas	2	6 4-pseudocyst 2-chronic pancreatitis	0	15 9-adenocarcinoma 3-positive for malignancy 3-pseudopapillary neoplasm	0	23	13.61%
Abdominal lesions of unknown origin	5	3	0	5 3-positive for malignancy 2-adenocarcinoma	3	16	9.47%
Ovary	1	0	0	6 3-positive for malignancy 3-papillary serous cystadenocarcinoma	0	7	4.14%
Abdominal lymph node	1	3 2-granulomatous lymphadenitis 1-acute suppurative lymphadenitis	0	2 Hodgkin's lymphoma	1	7	4.14%
Peritoneal deposits	2	0	0	0	5	7	4.14%
Retroperi-toneal mass	0	0	0	2 1-spindle cell sarcoma 1-non Hodgkins lymphoma	0	2	1.18%
Renal mass	0	0	1 Benign cystic lesion	1 Renal cell carcinoma -clear cell variant	0	2	1.18%



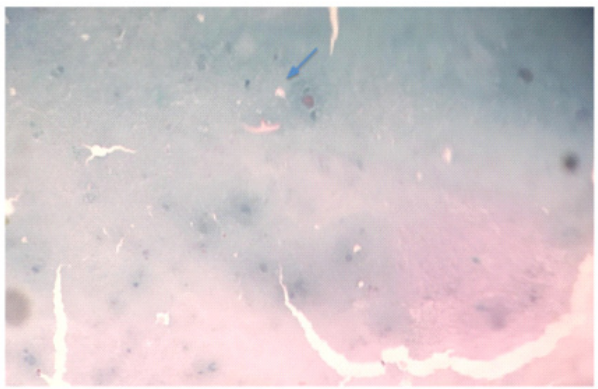
Intranuclear inclusions in Hepatocellular carcinoma (40X H&E)

Fig.1



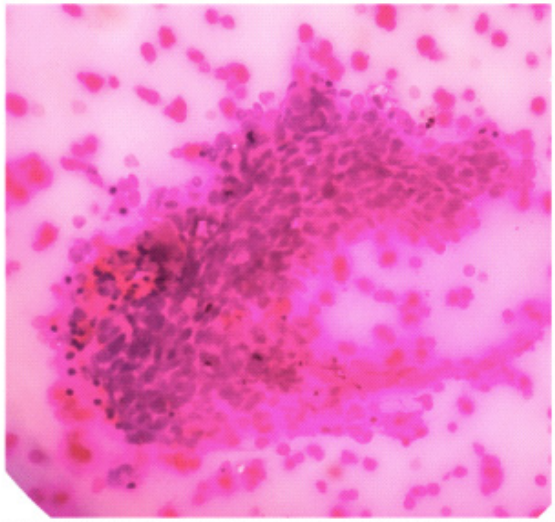
Atypical lymphoid cells and lymphoglandular bodies in Non Hodgkin's Lymphoma (40X H&E)

Fig. 2



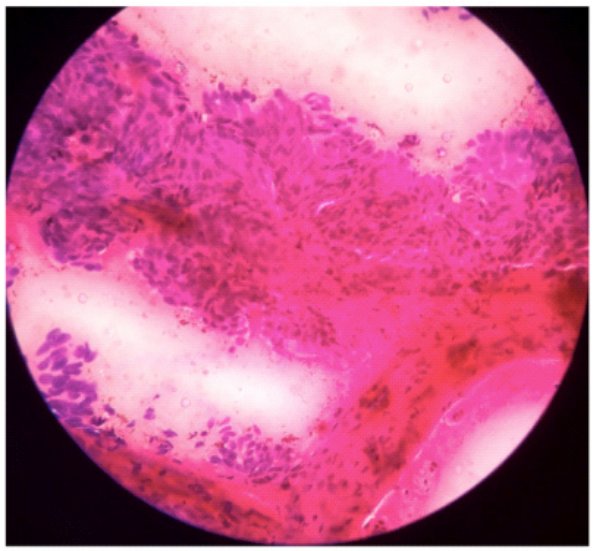
Hooklet in hydatid liver cyst (40X PAP stain)

Fig.3



Papillary arrangement of tumor cells in Papillary serous cystadenocarcinoma-ovary (40X H&E)

Fig.4



Pseudopapillary pancreatic neoplasm (40X H&E)

Fig.5

Discussion

USG guided and CT guided FNAC has been proven as safe, rapid and inexpensive technique for diagnosis of intraabdominal lesions and intrapelvic lesions. It is essential to differentiate between neoplastic and non neoplastic lesions for their appropriate management. The maximum number of cases in our study belonged to the age group 41-50 years which was comparable to the results obtained by Zawar et al.[4] and Reddy S et al.[5]

Of total 169 cases, 111 cases(65.68%) were malignant lesions which was similar to the studies done by Swaroop et al.[6] and Hemalatha et al.[7] In our study,

the most common site of aspiration was liver which was in accordance with study of Reddy S et al.[5], Stewart et al.[8] and Naiding et al.[9] (Table number 2)

Out of 72 cases from the liver, metastatic lesions(40.28%) were the most common followed by hepatocellular carcinoma(26.39%). This finding was similar to that reported by Dosi et al.[1], Barbhuiya et al.[10], and Reyaz TA et al.[11] Among the metastatic lesions of liver, adenocarcinoma was found to be the most common. This finding concurred with the study done by Rani SG et al[12] The diagnostic accuracy in our study was 94.5%. This was in accordance with the studies done by Reddy S et al.[5], Hemalatha et al.[7] and Stewart et al.[8] where diagnostic accuracy ranged from 86% to 96%. The sensitivity in our study was 92.5% which was comparable to the studies done by Reddy S et al.[5], Stewart et al.[8] and Islam T et al.(13) where sensitivity ranged from 86% to 98%. The specificity in our study was 100% which was similar to the studies done by Reddy S et al.[5] and Hemalatha et al.[7] (Table number 3)

Table no.2 Organ distribution of Abdomino-pelvic lesions- A comparative analysis

Organ	Reddy S et al. 2011	Stewart et al. 2002	Naiding et al. 2017	Present study
Liver	38%	74.5%	25%	40.6%
Gall bladder	2.6%	-	15.4%	19.5%
Pancreas	3%	12.1%	3.9%	13.6%
Kidney	5.2%	3.5%	-	1.18
Ovary	21.1%	-	1.9%	4.14%
Lymph nodes	7.9%	-		4.14%
Retroperitoneum	-	2.1%	17.3%	1.18%
Unclassified	11.3%	6.4%	-	9.46%

Table no. 3 Statistical results-A comparative analysis

Study	Number of FNACs	Sensitivity	Specificity	Diagnostic accuracy
Reddy S. et al. 2011	245	94.1%	100%	96.5%
Stewart et al.2002	141	86%	100%	86.5%
Hemalatha et al.2017	90	94%	100%	96.3%
Present study	169	92.5%	100%	94.5%

Conclusion

CT and USG guided FNAC is a preliminary diagnostic modality in inaccessible deep seated abdomino-pelvic lesions and can be done as an OPD procedure with less complications. USG and CT guided FNAC, as the first line investigation negates the necessity of expensive invasive investigations and reduces the length of hospital stay.

Source of Funding: Self.

Ethical Clearance: Taken from ethical committee of VIMS&RC, Bengaluru.

Conflicts of Interest: None

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