

Study of Image Guided Fine Needle Aspiration Cytology (FNAC) in Intra-abdominal and Intra-thoracic masses

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ABSTRACT

Objectives: To evaluate diagnostic accuracy, usefulness and limitations of image guided FNAC of intraabdominal and intrathoracic masses. **Materials and Methods:** This prospective study was done in the Department of Pathology and T.B Chest, RNT Medical College, Udaipur between February 2016 and September 2016. The study included total of 35 cases of which 14 abdominal and 21 thoracic masses. Adequate smears obtained. Smears were stained with Field and May Grunwald Giemsa stain. The cytological diagnosis was correlated with clinical and radiological data to arrive at a final diagnosis. **Results:** Fine needle aspiration cytology was performed from various anatomic sites: liver (5 cases), ovary (3 cases), pelvis (2 cases), gall bladder (2 cases), omentum and retroperitoneal lymph node each (1 case). Thoracic aspirations were done from the lung (20 cases) and mediastinum (1 case). The most common malignancy encountered in the abdomen was Adenocarcinoma (7 cases). Squamous cell carcinoma was the most common diagnosis amongst the lung lesions (14 cases). **Conclusion:** Ultrasonography and computed tomography guided fine needle aspiration cytology had a high yield and was helpful in diagnosing deep seated lesions.

Keywords: Retroperitoneal, Angiomyolipoma, female.

Introduction

Intra-abdominal and thoracic masses are mysterious in surgical pathology.[1] These lesions can be demonstrated by radiological investigations, but they don't allow us to distinguish them into malignant and benign lesions. On the other hand, a firm pathological diagnosis is essential both for treatment and staging of cancer. Fine needle aspiration cytology (FNAC) is nowadays a widely used tool for the diagnosis of superficially palpable lesion as well as deep seated lesions of thorax and abdomen. The technique is relatively painless and reliable, less time

consuming and nonexpensive. In 1939, Blady carried out aspiration cytology using imaging techniques & in 1952, Lindblom and Edholm reported on Roentgen television the guided needle puncture examination of renal cysts and tumors.[2,3] Holm H Pedersen JF used percutaneous needle biopsy under CT scan and USG guidance in 1975. The techniques of image guided FNAC not only permits precise anatomic imaging and targeting of the lesions, but also allows the planning of a safe access route, with constant visualization of the needle tip during insertion, thereby reducing the risk of complications.[3] The aim of present study was to evaluate diagnostic accuracy and effectiveness of image guided FNAC of intraabdominal and intrathoracic masses i.e. deep seated lesions (malignant lesions) which will avoid unnecessary hospitalization and other invasive diagnostic procedures as well as help clinician to decide the further management.

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Material and Methods

A prospective study done in Department of Pathology, RNT Medical College, Udaipur, Rajasthan for a period of nine months from January 2016 to September 2016 by using medical records and pathology reports. Thirty five (35) procedures were done under image-guidance in collaboration with Department of Radiology and Department of Chest& TB, RNT Medical College, Udaipur. The aspirates were obtained from various anatomic sites such as the liver, lungs, lymph nodes, omentum, gallbladder and ovary. Deep seated lesions in the sites like retro peritoneum were also included in the study. The mass to be aspirated was relocalized by In the present study, a total 35 image guided aspirations (25 ultrasound guided and 10 computed tomography) cases were done from various body intercostal space, gallbladder and pelvis respectively, 1 case each (2.9%) were from

US and or CT scanning and the aspiration was carried out by a trained pathology resident with the help of a cytotechnician. The site of puncture was marked on skin and the area was cleaned with antiseptic solution. The lumbar puncture needle of 20 gauge was inserted under image guidance into the lesion by rotatory movement and moved in 0.5- 1 cm increments back and forth in vertical plane several times before the suction was released. The aspirate was spread on glass slides, air dried and fixed in 90% alcohol, followed by staining with May Grunwald Giemsa (MGG) and Field Stain.

Results

organs. Of the 35 cases, 18 cases (51.4%) were from lung, 5 cases (14.3%) were from liver, 3 cases were from ovary (8.6), 2 cases each (5.7%) were from mediastinum, omentum and retroperitoneum respectively.

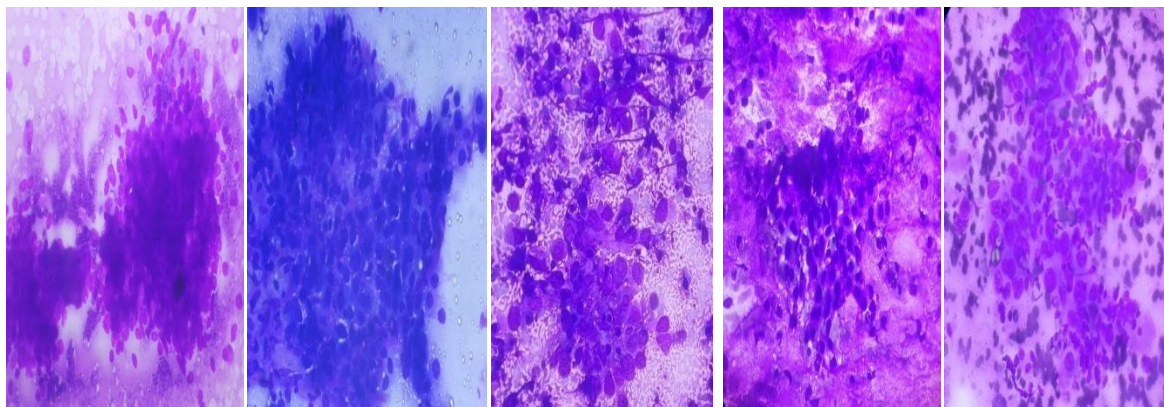


Fig 1:
cholangio
carcinoma

Fig 2:
hepatocellular
r carcinoma

Fig 3:
Metastatic
seminoma

Fig 4:
mucinous
adenocarcino
ma

Fig 5:
Squamous cell
carcinoma

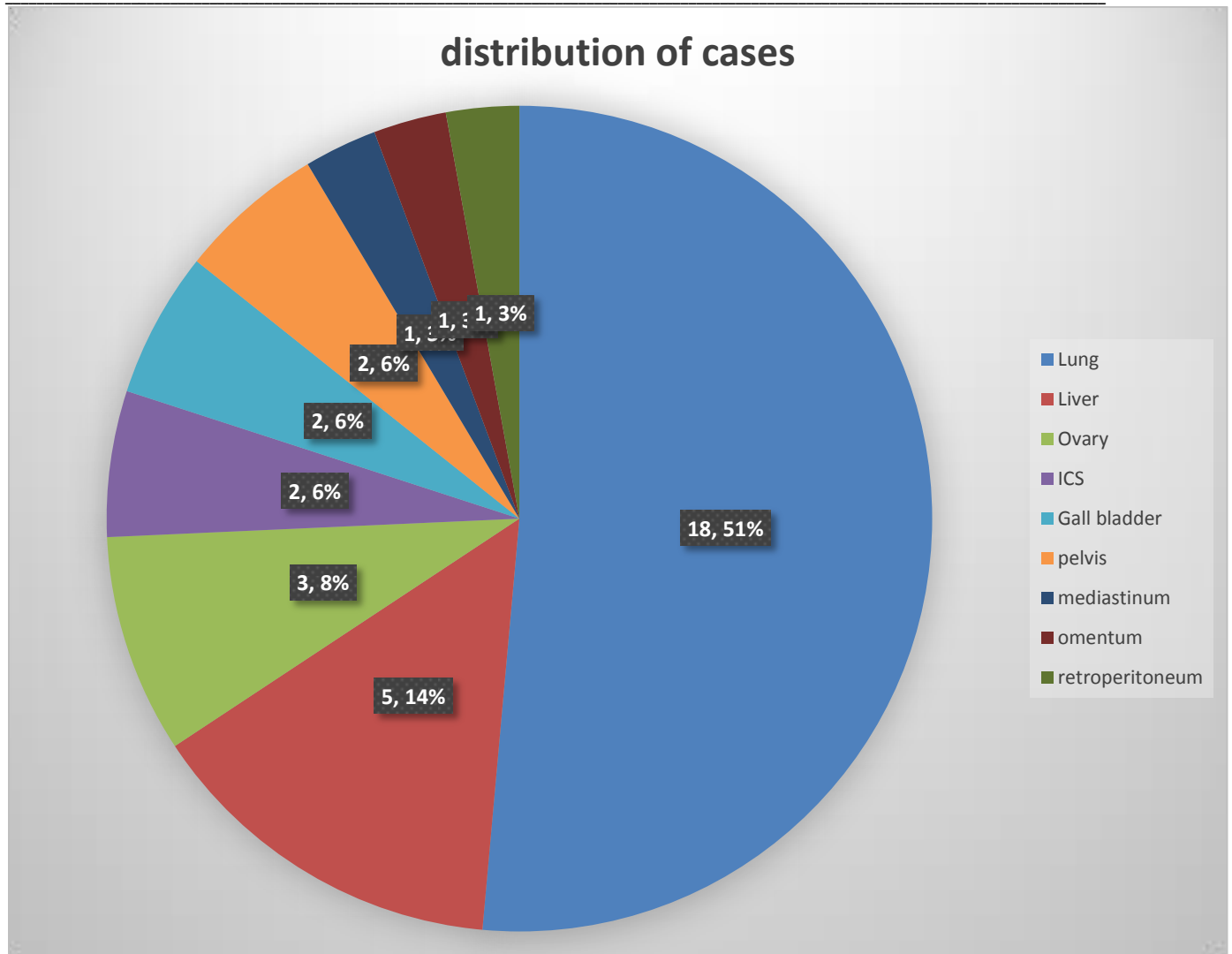


Fig 6: Distribution of cases

Intra-thoracic lesions

This group comprised of 21 cases of which all were malignant in nature are stated in following table. The samples were taken by CT guided (10 cases) & rest were of USG guided(11 cases) aspiration.

Table 1: Site, lesion and cases

Site/organ	Lesion	Cases
Lung	Squamous cell Carcinoma	11
	Adeno carcinoma	4
	Small Cell Carcinoma	3
Mediastinum(Lymph node)	Non- Hodgkins Lymphoma	1
Intercostal Space	Mucinous Adenocarcinoma	1
	Adenocarcinoma	1
Total		21

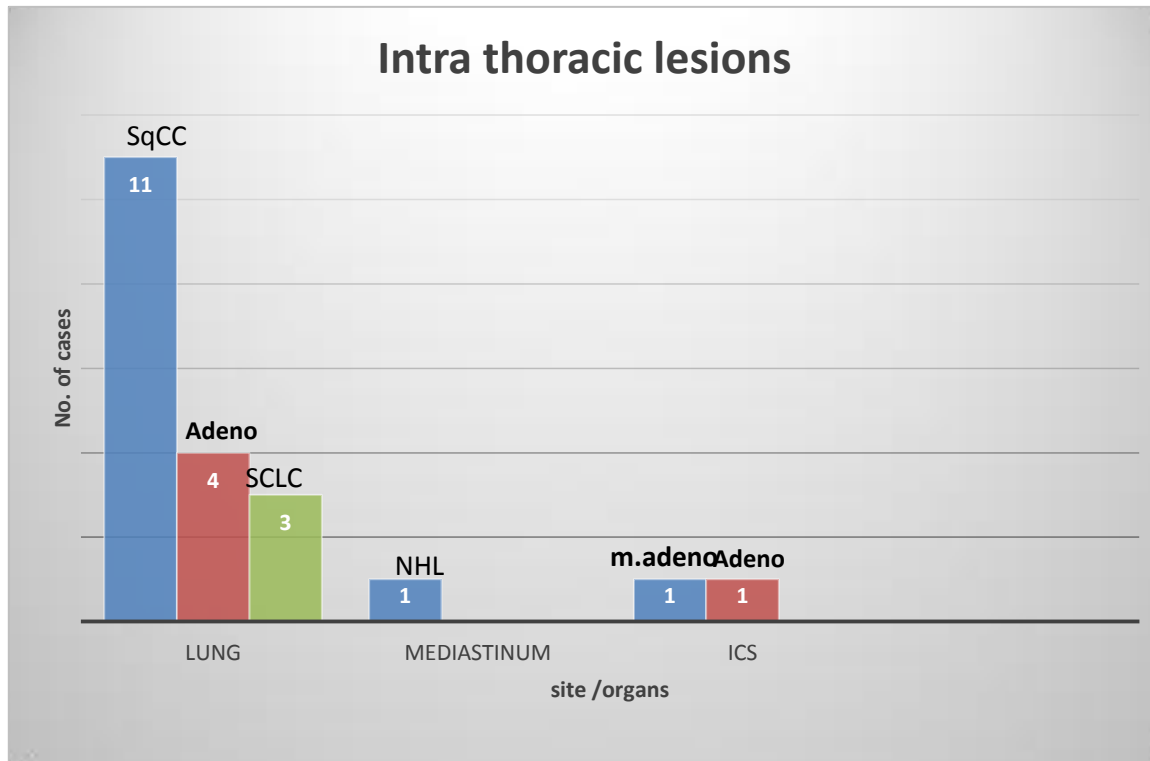


Fig 7: Intra thoracic lesions

Intraabdominal lesions-This group comprised of 13 cases of which all were malignant in nature are stated in following table. The samples were USG guided (13 cases) aspiration.

Table 2: Site, lesion and cases

Site/organ	Lesion	cases
Liver	Metastatic Squamous cell Carcinoma	2
	Hepatocellular Carcinoma	1
	Metastatic cholangiocarcinoma	1
	Metastatic Adenocarcinoma	1
Ovary	Adenocarcinoma	3
Gallbladder	Adenocarcinoma	2
Pelvis (Lymph node)	Metastatic Adenocarcinoma	1
	Metastatic Squamous cell Carcinoma	1
Omentum	Metastatic Adenocarcinoma	1
Total		13

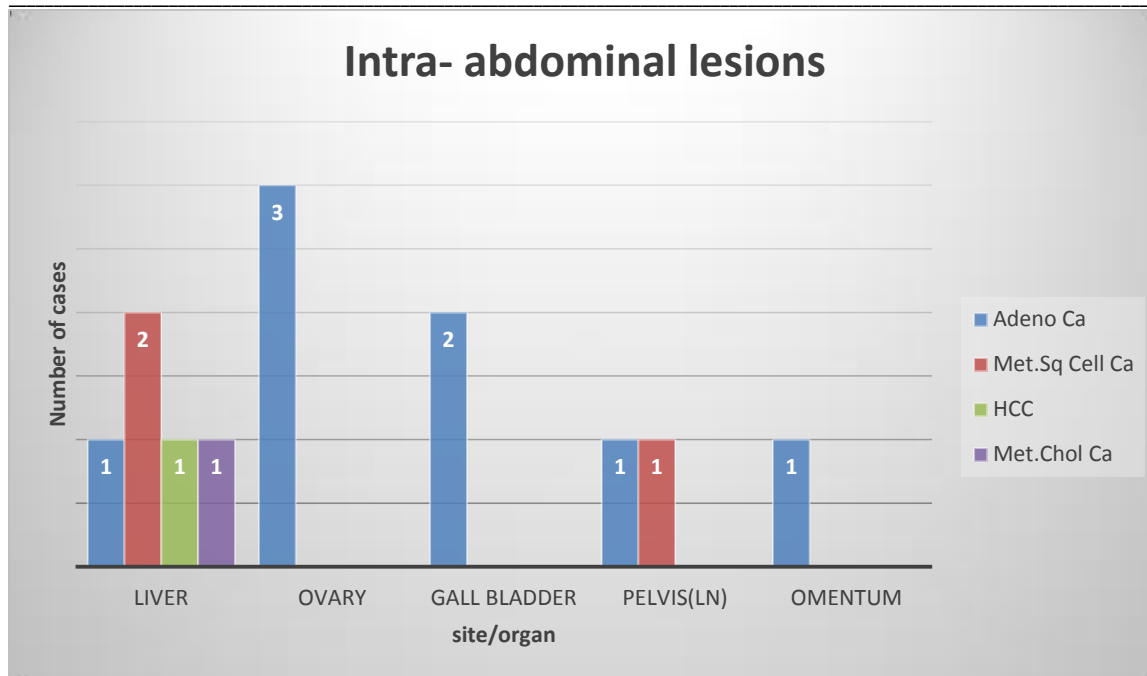


Fig 8:Intra-abdominal lesions

Retroperitoneal Lesions:- This comprised of 1 case which was diagnosed as metastatic Seminoma, sample was taken from retroperitoneal lymph node by USG guided aspiration.

❖ **Table 3:Age wise distribution of Intra-thoracic, intra- abdominal& retroperitoneal lesions [table(3)]**

Lesion /Age Group	15-30	30- 45	46- 60	61- 75	>75	Total
Squamous cell Carcinoma	-	1	4	9	-	14
Adeno carcinoma	-	2	7	4	1	14
Small Cell Carcinoma	-	-	2	1	-	03
Non- Hodgkins Lymphoma	1	-	-	-	-	01
Hepatocellular carcinoma	-	-	-	-	1	01
Cholangiocarcinoma	-	-	1	-	-	01
Metastatic Seminoma	-	1	-	-	-	01
Total	1	4	14	14	2	35

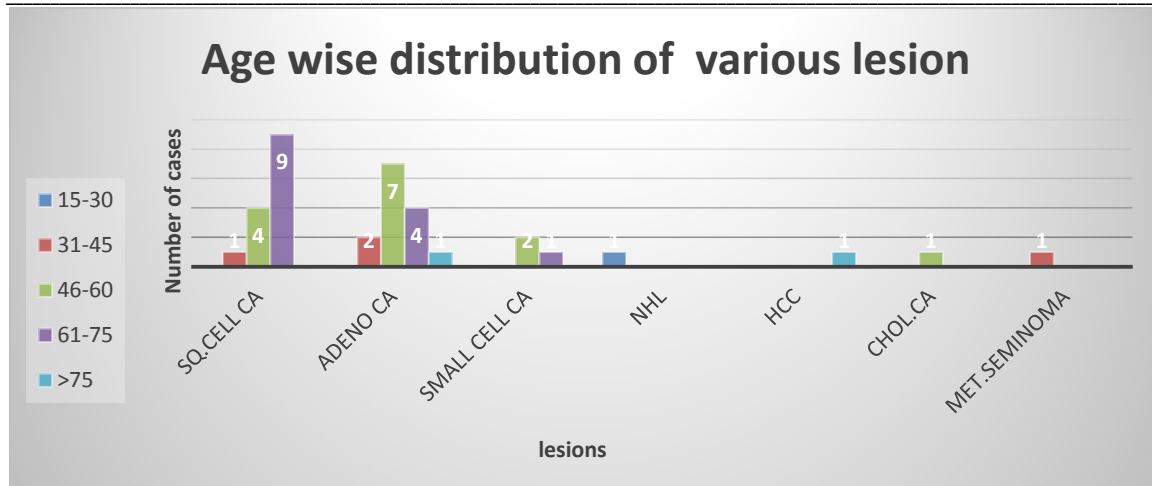


Fig 9: Age wise distribution of various lesions

❖ Table 4: Gender wise distribution of Intra-thoracic, Intra- abdominal & retroperitoneal lesion[table(4)]

Lesion /Sex	Male	Female	Total
Squamous cell Carcinoma	12	2	14
Adeno carcinoma	5	8	13
Small Cell Carcinoma	3	-	03
Non- Hodgkins Lymphoma	-	1	01
Hepatocellular carcinoma	1	-	01
Cholangiocarcinoma	-	1	01
Metastatic Seminoma	1	1	01
Total	22	13	35

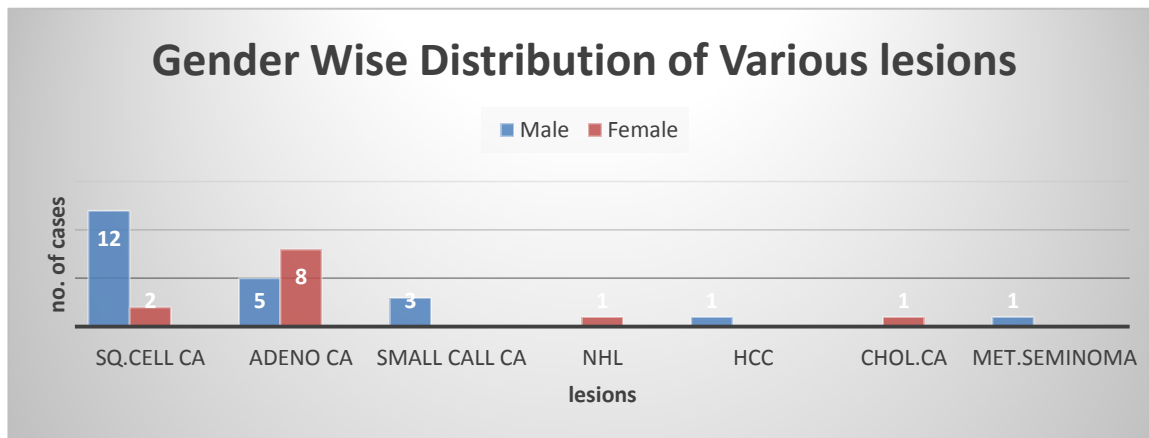


Fig 10:Gender wise distribution of various lesions

Discussion

FNAC under image guidance facilitates immediate management of the patient presenting with intraabdominal, intrathoracic and retroperitoneal lesions that are deep seated and at inaccessible site. For increasing the accuracy of sampling, CT/ US room should have a microscope so that the pathologist can look for the adequacy of the aspirated sample with the help of fast stain (Toluidine blue) and thus cytological specimen can be interpreted immediately.[4] In present study no major complication was observed, however there was complaint of mild pain and discomfort at the puncture site for short duration. Liver and lungs were the common sites for FNAC in this study as shown in table 1 and 2 which is comparable to the studies done by Sheikh et al. [5] and Adhikari RC. [6] Liver was also the most common site of aspiration performed in the abdomen in a study done by J Nobrega et al.[7] The male:female ratio for this study is 1.69:1. The age range of patient in our study was 15- 90 years. The table given below states the maximum incidence of malignant lesion in the age group. The most common malignancy encountered in the abdomen was metastatic carcinoma of liver 4 cases followed by ovarian Adenocarcinoma 3 cases. The incidence of carcinoma gallbladder in our study was 2 cases. RC Adhikari et al.[6] found metastatic tumor of the liver as the most common malignancy encountered in the abdomen (38.4%) followed by hepatocellular carcinoma (24.8%). Parahjuli et al.[8] found hepatocellular carcinoma of the liver, 12 cases (22.6%) most common malignancy followed by metastatic carcinoma of liver, 7 cases (13.2%) and incidence of carcinoma gallbladder was 3 cases (5.7%). Amongst the lung lesions; non-small cell carcinoma (15 cases) was the most common in our study, similar to the findings by Mukherjee S et al. [9] and Parahjuli et al. [8] A total of 4 cases (%) were of lymph nodes from various sites such as mediastinum retro

peritoneum each with one case were diagnosed as Non-Hodgkins Lymphoma and Seminoma; in pelvic region (2 cases) diagnosed as Adenocarcinoma and Squamous Cell carcinoma. Cherukuri et al. [10] found metastatic deposits from Squamous cell carcinoma, Adenocarcinoma, Small cell anaplastic carcinoma in lymph nodes of mediastinum, retro peritoneum, hilar region and deep cervical region. Two cases (13.3%) of Non-Hodgkin's lymphoma were reported in their study which was similar to the study done by RC Adhikari et al.[6] where four cases (13.8%) were reported and comparable to our study. Therefore, USG and CT-guided FNAC should be used as a routine procedure in the study of abdominal and thoracic lesions due to high sensitivity and specificity rate and very low complication rate. Barrios et al and others. [11-14] recommended that image guided FNAC should be used as routine procedure in the study of abdominal lesions and pulmonary lesions. Histopathological follow up was available for 35 cases and no discrepancy was found between diagnoses obtained by cytology and histopathology.

Limitations

It is often difficult to provide ancillary techniques in our hospital setup hence image guided FNAC plays a pivotal role in such condition helping in management of patients suffering from various tumours.

Conclusion

In this study neoplastic lesions of the intra-abdominal and intra-thoracic were diagnosed by this simple outpatient procedure with the lowest cost to the patient as compared to higher cost, morbidity and lengthy hospital stay in surgical biopsies.

Table 5: Amongst the lung lesions; non-small cell carcinoma (15 cases) was the most common in our study, similar to the findings by Mukherjee S et al. [9] and Parahjuli et al

Parahjuli et al.[8]	Mukherjee et al.[9]	Present study
61- 70	41- 70	46-75

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