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Evaluation of abdominal mass with special reference to FNAC and Ultrasonography: a prospective study

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ABSTRACT

An intra-abdominal mass is an enigma in the surgical practice. The pre-surgical diagnosis of abdominal masses as to benign and malignant lesion is commonly made by clinical, cytological and sonographic findings. The present study was undertaken to critically analyze the usefulness of ultrasound and fine needle aspiration cytology in the evaluation of intra-abdominal masses. It was a prospective study conducted on 80 cases in the department of general surgery and dept of pathogy & radiodiagnosis, VSS Medical College, Burla, Odisha over a period of 2 yrs from oct 2011 to oct 2013. After clinical assessment and relevant investigations, ultrasound and fine needle aspiration cytology was performed. Histopathological diagnosis was considered final and on the basis of which the observation of fine needle aspiration cytology and USG were evaluated. Eighty cases of intra-abdominal lumps ranging from age 11/2 years to 65 years have been studied. Male predominate over female. Malignant lesions predominated over benign ones with a ratio of 3:1. Amongst the malignant ones carcinoma of stomach (45%) predominate & ileocaceal tuberculosis (25%) predominated amongst the benign ones. False positive and negative diagnosis with aspiration cytology in the present study was noted to be (2.5%) and (15%) respectively in FNAC and 2.5% and 18.75% in USG. The percentage of accuracy of F.N.A.C. in diagnosis of intra-abdominal masses has been recorded to be 82.5% and 78.5% for ultrasonography. Thus, this series substantiates the accuracy of (real time) ultrasound and fine needle aspiration cytology in a wide spectrum of abdominal neoplastic and non-neoplastic disorders.

INTRODUCTION

Abdominal masses are commonly addressed by surgeons, as well as by members of many clinical subspecialties. In terms of clinical importance, abdominal masses cover a broad spectrum; some have few or no apparent consequences, others significantly impair quality of life, and still others represent severe conditions that are associated with poor outcomes and high mortalities. An intra-abdominal mass is an enigma in the surgical practice.

The introduction of modern diagnostic imaging techniques, mainly ultrasonography (USG), has enabled the detection and location of lesions in sites and also diagnosis of the mass. It is readily available, relatively inexpensive and portable; it uses no ionizining radiation. [1]

Fine needle aspiration of abdominal masses has gained tremendous popularity, since it can have a major impact on the management of the patients and in many cases, it may obviate the diagnostic surgical procedures or expedite the planning for the therapy [2, 3]. Aspiration cytology helps in differentiating the cystic versus the solid lesions, the benign versus the malignant neoplasms, or an abscess versus a neoplasm[9]. However modem day radiology guided FNAC will definitely give better results than these two alone. [4, 6,]

The present study was undertaken to critically analyze the usefulness of ultrasound and fine needle aspiration cytology in the evaluation of intra-abdominal masses.`

MATERIALS & METHOD

This study was performed on 80 patients in Post-Graduate Department of General Surgery, Veer Surendra Sai Medical

College and Hospital, Burla, Sambalpur, Odisha, India, in collaboration with the Department of Pathology and the Post-Graduate Department of Radiology of the same institution during the period from October 2011 to October 2013.

Patients who presented at outpatient and inpatient department of general surgery with clinical features of abdominal masses were evaluated for ultrasonographic examination after written/informed consent. On confirmation of mass sonographically, fine needle aspiration was performed from suspected areas. Before doing the FNAC, The coagulation profile was routinely done in all the patients with abdominal masses. Only those patients with normal coagulation profiles were selected for the study taking the most convenient route, a 20-22 gauge needle attached to a10 ml syringe was used. Smears were made from aspirate, fixed in 95% alcohol and stained in hematoxylin and Eosin and Papanicolou stain. Fluid aspirates were processed using the cytospin technique

Those abdominal masses which were difficult to access by pathologist, were subjected for ultrasound guided fine needle aspiration. The technique was unaided of super investigations like, CT-Scan, fluroscopy, endoscopy etc.

After clinical diagnosis, ultrasonography , fine needle aspiration cytology and basic investigations, some of the patients in the course of management, were taken to operation theatre for laparatomy and open wedge biopsy. During, laparotomy, the site of puncture and needle tract were carefully observed for haematoma, inflammation and fibrosis. The tissue specimen were sent to Pathology Department of V.S.S. Medical College Hospital, Burla for interpretation, which was considered as final diagnosis. The finding of USG is correlated with finding of FNAC. These findings are compared individually to each other and combined together and compare to the histopathological finding.

RESULTS

The current study of "Fine needle aspiration cytology and Ultrasonography of abdominal mass" included 80 cases of intrabdominal lumps on which aspiration cytology, ultrasonography and histopathology were carried out. Even though fine needle aspiration and USG were done in 160 numbers of cases, 66 patients were not available for histologic study as they were unsuitable for surgery because of low general conditions and/or advanced stage of malignancy while 14 cases did not subject themselves for laparotomy. Out of total 80, cases studied in the present series, majority cases (37.50%) belonged to the 5th decade onwards, and male predominated over female. The youngest child was a male of the age 1 1/2yr having nephroblastoma.

The various quadrants were tabulated as per the aspirations. As could be observed from the table-1 most of the aspirations were done in epigastric region 30 cases (37.50%) followed by right hypochondrium 14 cases (17.50%). Thus more than half of the aspirations were in these two quadrants. Thus upper abdominal aspirations were more than lower abdominal aspirations. The table-2 illustrates the various organs aspirated and amongst them stomach was highest *27(33.75%)* followed by liver *9(11.25%).* There were almost 20 *(25%)* miscellaneous obscure lumps. The origin of the organs was not known in these groups by cytology which was obtained by laparotomy and biopsy *was* benign which were found to be mostly inflammatory lesions i.e. pyogenic or tubercular or nonspecific. The malignant

Table 1. Sites of aspirations per abdomen in different quadrants.

Sl No.	Quadrants	No. of aspirations	%
1	Epigastrium	30	37.50
2	Umblical	11	13.75
3	Hypogastrium	5	6.25
4	Right hypochondrium	14	17.50
5	Left hypochondrium	2	2.50
6	Right lumber	26	7.50
7	Left lumber	2	2.50
8	Right illiac fossa	8	10.00
9	Left illiac fossa	2	2.50
	Total	80	100.00

Table 2. Aspiration profile of abdominal organs and retroperitoneum

			Benign		Malignant	
Aspiration of viscera	No.	%	No.	%	No.	%
Stomach	27	33.75	0	0	27	100.00
Liver	9	11.25	4	44.44	5	55.55
Ovary	6	7.50	2	33.33	4	66.66
Colon	5	6.25	2	40.00	3	60.00
Kidney	5	6.25	3	60.00	2	40.00
Gall bladder	4	5.00	0	0	4	100.00
Retroperitoneum	4	5 .00	0	0	4	100.00
Miscellaneous	20	25.00	9	45.00	11	55.00
Total	80	100.00	20	25.00	60	75.00

Table 3. USG profile of abdominal organs and retroperitoneum

			Benign		Malignant	
	Total No	%	No	%	No	%
Stomach	24	30.00	0	0	24	100.00
Liver	9	11.25	4	44.44	5	55.55
Ovary	6	7.50	2	33.33	4	66.66
Colon	3	3.75	0	0	3	60.00
Kidney	4	5.00	0	0	4	40.00
Gallbladder	4	5.00	1	25.00	3	75.00
Retroperitoneum	2	2.50	**0**	0	2	100.00
Miscellaneous	28	35.00				
TOTAL	80	100	7	8.75	45	56.25

lesions among the miscellaneous groups were lymphomas, neuroblastoma, seminoma in undescended testis, adenocarcinoma and one case of carcinoma of pancreas. All the gastric, gall bladder and retroperitoneal lumps came out to be malignant.

The table-3 illustrates the various organs where

Table 4. Results of F.N.A.C

Histopathological diagnosis		Cytological diagnosis				
Nature of lesions	Number of cases	Benign	Malignant	False Positive	False Negative	% of accuracy
Benign	20	18	0	2	0	66/80 x 100
Malignant	60	0	48	0	12	
TOTAL	80	18 (90%)	48 (80%)	2 (2.5%)	12 (15%)	82.5%

Table 5. Results of U.S.G.

Histopathological diagnosis		Ultrasonographic diagnosis				
Nature of lesions	Number of cases	Benign	Malignant	False Positive	False Negative	% of accuracy
Benign	20	18	0	2	0	63/80 x 100
Malignant	60	0	45	0	15	
TOTAL	80	18 (90%)	45 (75%)	2 (2.5%)	15 (18.75%)	78.50 %

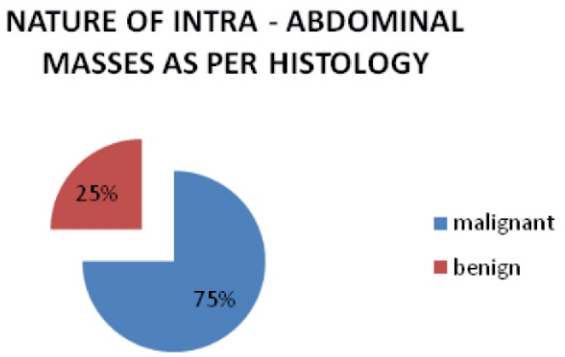

Diagram 1. Histopathology finding

ultrasonography was done. Among them stomach lump was highest 24 (30%) followed by liver 9 (11 *.25%).* There were almost 28 *(35.00%)* miscellaneous obscure lumps. The origins of the organs were not known in these groups by ultrasonologically which was obtained by laparotomy.

Out of 80 cases, there were 20 benign and 60 malignant cases (diagram-1). With cytology none of the benign lesions were misdiagnosed as malignant ones whereas 12 malignant cases were missed in the present series, giving the percentage of accuracy of aspiration cytology to be 82.5%, with false positive and false negative results *2.5%* and 15% respectively (table-4). In 90% of the benign lesions malignancy was excluded. In suspected malignant lesions, malignant cells were obtained in 80% of cases. In 16 cases repeated aspirations was needed. In *5* cases aspiration was thrice before reaching the specific cytologically diagnosis due to strong clinical suspicion. It was difficult to know the specific histologic pattern in cases of retroperitoneal soft tissue sarcoma, lymphoma and carcinoma of ovary. Out of 80 cases, there were 20 benign and 60 malignant cases with ultrasonography(table-5). None of the benign lesions was misdiagnosed as malignant ones, whereas 15 malignant cases were missed in the present series with accuracy of 78.5% as compared to 82.5% in FNAC.

DISCUSSION

Abdominal lumps are not uncommonly met within clinical practice both by surgeons and physicians. Because of the wide variety of tissues present within the abdomen the lesions vary widely and often it becomes difficult in coming to definite diagnosis without laparotomy . On many occasions, cases of simple acute inflammatory lesions, tubercular lumps and even malignant conditions have been subjected to simple exploratory laparotomy in spite of the complications and risks of surgical maneuvers. To avoid such situations various methods such as, C.T. scan, lymphangiography, percutaneous transhepatic cholangiography, endoscopic retrograde cholangiopan-creatiography (ERCP), have been devised to diagnose the conditions preoperatively and to plan proper operative procedures on desirable cases . However, these are sophisticated investigations, expensive as well as time consuming and require hospitalizations. In a developing country like ours even most of the teaching hospitals do not have such facilities and surgeons purely depend upon their clinical acumen and also proceed for

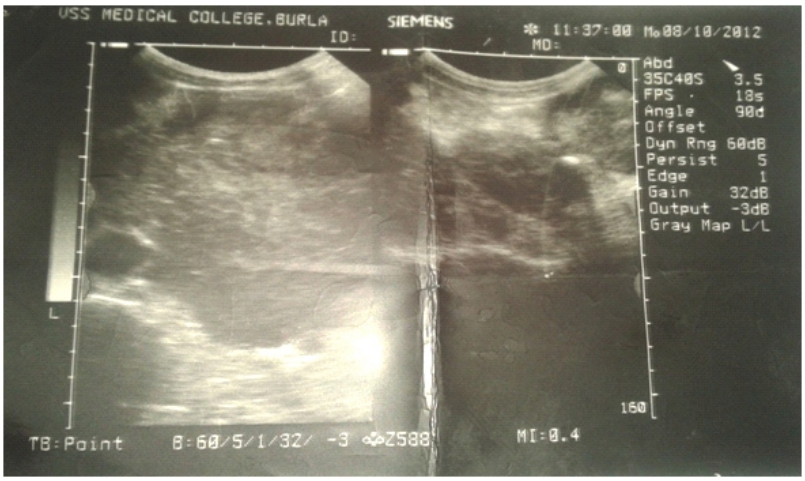

Fig. 1. HUltrasonography of case of seminoma of lt side undescended testis

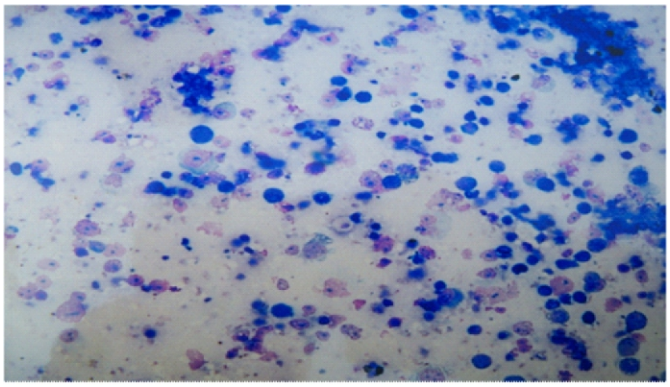

Fig. 2. F.N.A.C. of a case of seminoma

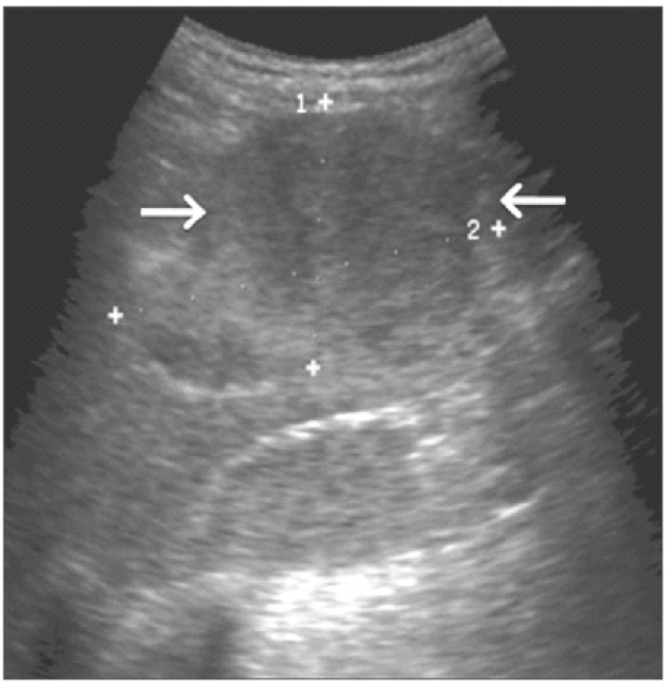

Fig. 3. Ultrasonography of a case of hepaocellular carcinoma

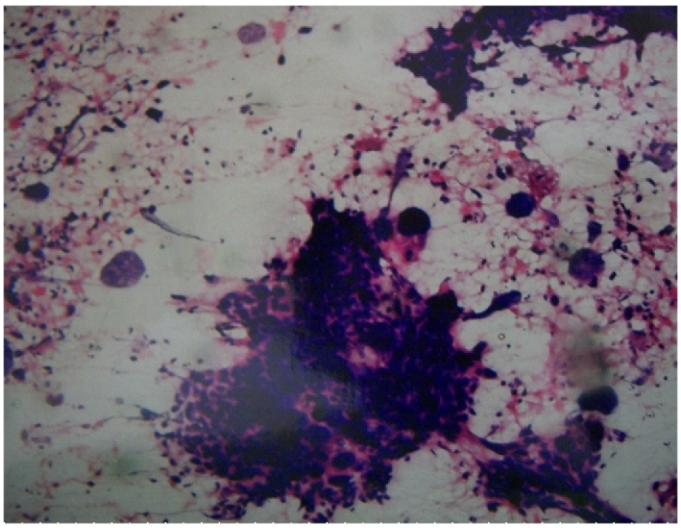

Fig. 4. F.N.AC. of a case of hepatocellular carcinoma.

exploratory laparotomy in most of the cases.

Out of the total 160 cases admitted to V.S.S. Medical College Hospital , Burla , during Oct 2011 to Oct 2013 , 80 cases were taken up for the present work who were subjected to F.N.A.C., USG and histopathological study. Other abdominal lumps i.e. 80 cases were not taken up into account due to various reasons , like (1) refusal for histopathological or F.N.A.C. study, (2) advance malignant state treated only by chemotherapy , (3) poor general condition and unfit for laparotomy and biopsy , (4) died in the course of hospitalization .In the current study, Eighty cases of intra-abdominal lumps ranging from age 11/2 years to 65 years have been studied. Malignant lesions predominated over benign ones with a ratio of 3:1. Amongst the malignant ones carcinoma of stomach (45%) predominated followed by lymphoma (11.6%) and hepatoma (8.33%) etc. The benign intra-abdominal lesions included ileocaceal tuberculosis (25%) followed by pyonephrosis (15%) and appendicular lump (10%) etc. Fine needle aspiration produced two cases (2.5%) of peritonitis and 25 cases (31.25%) of mild abdominal pain which lasted for few hours to two days. False positive and negative diagnosis with aspiration cytology in the present study was noted to be *(2.5%)* and (*15%)* respectively in FNAC and *2.5%* and 18.75% in USG. The percentage of accuracy of F.N.A.C. in diagnosis of intra-abdominal masses has been recorded to be *82.5%* and *78.5%* for ultrasonography.

From this study it has been observed that both the techniques are simple safe, quick, reliable inexpensive and bed side procedure with regards to diagnosis of intraabdominal lumps, particularly that of malignant ones. In a developing and populous country like ours where various sophisticated investigations are beyond the reach of the common people a simpler technique such as fine needle aspiration cytology and USG will definitely help in preoperative diagnosis of these masses. However modem day radiology guided FNAC will definitely give better results than these two alone. The techniques can help in planning out the surgical maneuver. Further in advanced cases of malignancies it will avoid the risk of morbidity and mortality due to surgery and such patients can be subjected to various palliative measures.

CONCLUSION

Thus, this series substantiates the accuracy of (real time) ultrasound and fine needle aspiration cytology in a wide spectrum of abdominal neoplastic and non-neoplastic disorders. No other diagnostic technique can be so simple, safe, rapid and inexpensive while giving such valuable information as these two investigations. Moreover these procedures help in decreasing use of hospital resources apart from reducing patient discomfort, morbidity and an increase in timeliness of diagnosis. Adequate sampling, experience and caution in interpreting the aspirate and a close working relationship between clinician, sonologists and cytopathologists are factors essential for its success.

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