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ORIGINAL ARTICLE

Outcome of Ultrasound Guided Trucut Biopsy of Adnexal Masses with Suspected Malignancy

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ABSTRACT

Background: Ultrasound guided sampling techniques are frequently used in the tissue diagnosis of various tumours. Female patients commonly present with adnexal masses and require tissue diagnosis by trucut biopsy for initiation of the treatment. This study was done to determine the outcome of ultrasound guided trucut biopsy in patients presenting with suspected adnexal malignancy.

Methodology: This cross sectional study was done at the Department of Radiology, MCH Centre, PIMS hospital, Islamabad from October 2018 to September 2020. In this study, all female patients aged 18 years and above with suspected adnexal malignancy were included. Trucut biopsy was performed under ultrasound guidance, sample sent for histopathology and various histopathological outcomes were assessed. Patients were kept under observation for 2 hours following biopsy. The data was entered and assessed by using SPSS version 24.0. Frequencies and percentages were calculated for nominal data and mean and standard deviation for numerical data.

Results: Mean age of the subjects was 50.24±10.52 years and mean duration of symptoms was 2.97±1.23 months. Definitive diagnosis made in 59 (95.1%) out of 62 cases and only 3 (0.04%) cases were inconclusive; among which two showed inadequate sample and one showed normal tubo-ovarian tissue. 90% histopathological findings were conclusive and no complication was reported.

Conclusion: Trucut biopsy has high diagnostic yield with no complications and most common malignancy detected was serous cystadenocarcinoma followed by mucinous carcinoma.

Key words: Biopsy, Malignancy, Ultrasound

Authors' Contribution:
[1,2]Conception; Literature research; manuscript design and drafting; [2,3] Critical analysis and manuscript review; [5,6] Data analysis; Manuscript Editing.

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Introduction

Adnexal mass etiology accounts for a substantial number of gynaecologic diseases and approximately 10% of females undergo surgery for adnexal masses during their life. [1-2] Despite great evolution in cancer control and healthcare, mortality from ovarian cancer is still rising high due to late stage diagnosis of the disease thus significantly affecting the 5-year survival rate of only 47.4%, whilst only 14.9% of ovarian cancers are diagnosed when localized with a remarkable survival rate of 92.3%.[3]

The most common associated risk factors are higher age, postmenopausal status, radiation exposure, smoking and family history of malignancies. Abdominal pain, distension, weight loss and bleeding are the cardinal manifestations of these lesions and early and prompt diagnosis is the key to success.[4-5] Apart from the detailed history and clinical examination, ultrasonography (USG) and contrast enhanced computed tomography (CT) are the investigations of choice. The cardinal features leading towards malignant etiology include complex solid cum cystic mass, multiloculated mass with irregular walls, vascularity on colour Doppler, presence of ascites and the increasing biomarker production like CA125.[6]

With advent of neoadjuvant chemotherapy, biopsy is desired investigation for pathologic diagnosis to initiate therapy. In addition, metastatic gastrointestinal tumours such as colon, gastric, and pancreatic adenocarcinomas and even breast cancer can mimic ovarian cancer therefore tissue diagnosis is ultimately needed to reach a definitive diagnosis and to target management therapy.[7]

It can be done either through needle biopsy under image guidance or open or laparoscopic surgical biopsies where latter are invasive and require general anaesthesia. Belinga et al reported 6.77% complication rate in gynaecological laparoscopic procedures. [8]

Trucut biopsy is an easy and cheap method with relatively lesser risk associated to reach a definitive diagnosis. Addition of immunohistochemistry staining can also increase the probability of diagnosis. Biopsy sample can be obtained through various imaging modalities like ultrasound, fluoroscopy, CT and MRI. CT and fluoroscopy cause exposure to considerable amount of ionizing radiation. Leng et al. found that the mean DLP_{body} (dose length product) of CT-guided interventional procedure was 909 mGy cm thus resulting in significant exposure to patient as well as to the staff.[9]

MR guided biopsy also becomes tough with hefty price and requiring all instruments to be MR compatible. Therefore, ultrasound is the most convenient option with no radiation exposure, ease of portability, real time imaging and being cost effective. [10]

Perfection in imaging of adnexal mass characterization can lead to appropriate triage, resulting in better treatment outcomes. [11]So far very few studies have been reported on the outcome of ultrasound guided biopsy. Image guided biopsy plays an important role in providing quick and fast definitive histological diagnosis, making invasive debulking surgeries ineffectual and unnecessary for initiation of neoadjuvant chemotherapy. The current study was conducted to acknowledge the efficacy of the procedure by confirming it with the histopathological report as well as recognizing various tumour subtypes in adnexal lesions histologically.

Methodology

This descriptive cross-sectional study was performed in PIMS hospital, Islamabad from October 2018 to September 2020. The study included patients with suspected malignancy who were being referred on OPD basis to the Radiology department for establishing definite diagnosis through ultrasound guided trucut biopsy.

In this study, all female patients with age ranging from 18 years and above, presenting with abdominal pain with or without distension and with history of weight loss were recruited. They were assessed with ultrasound for adnexal mass with or without ascites. The inclusion criteria had specification for the mass that was solid/ complex cystic lesion containing thick septa or solid component with in it. The size of the mass not more than 2cm was considered for the study. Large cystic lesions without thick internal septation or solid component, patients having gut loops anterior to the adnexal lesion and patients

having bleeding diathesis were excluded from this study.

The sample size calculated was 62 using Epitools sample size calculator, by keeping the confidence interval as 95%, estimated proportion of 95.8% and desired precision of 0.05.[12]

The data was entered and assessed by using SPSS version 24.0. Frequencies and percentages were calculated for nominal data and mean and standard deviation for numerical data.

Ethical certificate was obtained prior to commencing the study from Hospital's Ethical Committee. (Reference number F.1-1/2015/ERB/SZAMBU/759).

For ultrasound-guided trucut biopsy, coagulation profile of the patient was done initially. If normal, then written consent from the patients/ patients' attendants was taken. Site of biopsy needle insertion was marked with ultrasound guidance. Under strict aseptic measures, local anaesthetic was administered (10 ml of 1% xylocaine) for trans abdominal biopsy.

A trucut monopty needle of 18 gauge was used for the procedure. The tip of the biopsy needle was carefully visualized on monitor of ultrasound machine (Aplio500) avoiding injury to gut loops, major vessels and areas with high vascularity with in the lesion. Biopsy sample was taken from solid component or thick internal septation avoiding cystic/ necrotic areas, preserved in formalin, and sent for histopathology and immunohistochemistry.

Figure 1. Needle tracking under ultrasound guidance with aided Colour Doppler to avoid areas with high vascularity with in the lesion.

If either a benign or malignant tumor was acknowledged on biopsy report, the procedure was labelled as accurately performed. In patients with inconclusive results on gross and microscopic histopathology report, immunohistochemistry staining was done to reach a definitive diagnosis and when that also failed to give result, report was considered inconclusive. The final outcome was recorded.

Results

In this study, 62 cases with suspected adnexal malignancy were included. Mean age of the subjects was 50.24±10.52 years and mean duration of symptoms was 2.97±1.23 months as shown in table I.

Table I: Demographics of study subjects (n= 62)

	Mean	Range
Age (years)	50.24±10.52	18-62
BMI (kg/m^2)	23.25±2.36	20-27
Duration of symptoms (months)	2.97±1.23	1-6

Table: II Type of lesion detected on trucut biopsy	
Biopsy outcome	**N (%)**
Ovarian serous cystadenocarcinoma	29 (46.77%)
Ovarian mucinous cystadenocarcinoma	13 (20.96%)
Spindle cell CA	3(4.83%)
Adenocarcinoma	3(4.83%)
Inconclusive (scanty tissue/normal tissue)	3(4.83%)
Smooth muscle neoplasm	2(3.22%)
Poorly differentiated neoplasm	2(3.22%)
Granulomatous inflammatory disease	1(1.61%)
Benign serous cystadenoma	1(1.61%)
Cystic teratoma	1(1.61%)
Dysgerminoma	1(1.61%)
Struma ovarii	1(1.61%)
Other benign lesions (fibroid/benign stromal tumors)	2(3.22%)
Total	62(100%)

On trucut biopsy, definitive diagnosis was made in 59 (95.1%) out of 62 cases and only 3 (0.04%) cases were inconclusive; among which two showed inadequate sample and one showed normal tubo-ovarian tissue.

On further analysis, ovarian serous cystadenocarcinoma was the most commonly detected lesion seen in 29 (46.77%) of the cases followed by mucinous CA seen in 13 (20.96%) of the cases. One of the samples also showed extensive necrotic material which on repeated biopsy yielded small fragments of adenocarcinoma with extensive necrosis that raised the possibility of metastatic disease with colorectal primary.

Discussion

Adnexal pathology has various etiological factors depending on congenital, inflammatory and neoplastic processes and are prevalent in women of all age groups.[13] Ultrasound is primary imaging modality for evaluation and management of adnexal pathology having significant correlation with histological features but some of the benign lesions also have similar appearance as malignancy requiring additional work-up. [14-15]. In approximately 70% cases, ovarian malignancy does not become clinically overt until it has metastasized therefore effective detection approaches are the need of the hour.[16-17]

Our results show that USG-guided trucut biopsy of adnexal masses is high yielding with definitive diagnosis in 59 (95.1%) out of 62 cases and only 3 (0.04%) cases were inconclusive. These results are fairly comparable to the findings of the studies done in the past confirming high reliability and safety of this minimally invasive procedure. According to a study done by Vlasak et al, ultrasound guided biopsy confirmed malignancy in 96.2% patients and the sample obtained was insufficient in three patients for complete identification of the tumor. [12]

Another study done by Oge T et al to assess the utility of USG guided trucut biopsy revealed a definitive diagnosis in 96.4% of the cases while in 3.6% of the cases, the tissue material was inadequate to reach a definitive diagnosis, and among various lesions detected primary ovarian CA was seen in 65.4% of the cases with its serous type most common 58.2%.[18] This is also similar to the present study where serous cystadenocarcinoma was the most commonly detected lesion seen in 29 (46.77%) of the cases followed by mucinous CA seen in 13 (20.96%) of the cases. Accurate diagnosis depends on the adequacy of the technique and an

experienced operator can definitely do best. Verschuere et al. reported increasing adequacy of the biopsy over the years likely due to the operators' improving skills with the procedure[19]. It has also been noticed that elevated CA-125 and ascites are good predictors and increase the yield of trucut biopsy while obesity is considered a factor hindering the accuracy of ultrasound thereby indirectly limiting yield of trucut biopsy as well.

Previous literatures do not signify any specific relationship between biopsy needle gauge and better diagnostic accuracy but Hoffmann P et al reported 16 G or wider needle more suitable for pelvic lesion biopsies, likely attributable to a fact that wider bore needles allow for extraction of more diseased tissue.[20] However the use of a 18 G needle is the most mentioned biopsy tool in literature therefore was needle of choice in our patients as well.

Like any other invasive procedure, ultrasound guided biopsies can also result in various complications like bleeding at the site of biopsy, visceral injury, hemoperitoneum and infectious complications reported previously in the scientific articles.[13] Post procedure, patients were again assessed with Doppler USG in our study which was beneficial in evaluating the target organ for any haemorrhage. The identification of a "track" or a haemorrhagic jet is a good indicator of post-biopsy bleeding.[21]

In our study no complication was noted. On completion of the procedure, bleeding from the biopsy site was checked for. Patients were kept under observation for 2 hours following the biopsy and then discharged. Mild subjective discomfort or momentary mild pain at the site of the biopsy was reported, however no major complication was reported. Thus with increasing incidence of malignancy worldwide, this minimally invasive procedure is an important step in patients' management.

Fine needle aspiration cytology of ascites has been done routinely which is easier and even less invasive but it has a poor predictive value for organ-specific tumor diagnosis. Furthermore, core needle biopsy yields tissue for immunohistochemistry and molecular profiling thus modifying the treatment according to the tumor genotype.[7]

The study has limitations, which include the fact that some patients with adnexal masses didn't show up on the given time for procedure even when advised for it by the clinician. It was a small sample size and further studies with larger sample size may better characterize the outcomes of biopsy.

Conclusion

Ultrasound guided trucut biopsy in adnexal masses is a befitting modality to reach the definitive diagnosis in adnexal masses with no major complication. It can help the patients' selection for surgery, chemotherapy as well as by providing fast definitive histological diagnosis in advanced disease patients, makes invasive debulking surgeries unnecessary for the initiation of neoadjuvant chemotherapy.

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