18102-A Majid-Ultrasound guided percutaneous liver biopsy

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Ultrasound guided percutaneous liver biopsy:

A review of 41 cases in relation to hepatocellular carcinoma

Abstract:

Objective: Ultrasound guided (USG) percutaneous liver biopsies are commonly used to diagnose hepatic lesions. The aim of the article is to assess the correlation of image findings with histopathological diagnosis in USG percutaneous biopsies of liver lesions especially in relation to hepatocellular carcinoma (HCC).

Methods: The patient selection was based on findings on various image modalities, triphasic liver computed tomography (CT) or dynamic magnetic resonance imaging (MRI), in which percutaneous liver biopsy was indicated. An 18-G Bard Magnum Gun was used for percutaneous biopsy and it was ensured that the length of biopsy obtained remains between 15 mm to 20 mm. The biopsies were performed from 01-07-2017 to 30-09-2017.

Results: A total number of 82 USG percutaneous biopsies were performed on various sites out of which 41 (50%) were performed on liver lesions. On imaging 12 (30%) were diagnosed as hepatocellular carcinoma whereas 16 (39%) cases were confirmed on histopathology, which either showed Hep-Par-1 or arginase positivity. On imaging 11/16 (68.75%) were either diagnosed as HCC or were suspicious of it. A sensitivity of 75% and specificity of 95% was calculated for diagnosis of HCC on imaging.

Conclusion: The present study concludes that in our region the most common organ for percutaneous biopsy turns out to be liver with a more frequent diagnosis of HCC especially in a

middle-aged male which now shows an increasing trend to be associated with HCV as compared to HBV.

Key Words: Ultrasound guided biopsies, Hepatocellular carcinoma, HCV, HBV

Introduction:

The first percutaneous liver biopsy was performed by Paul Ehrlich in 1883 in Germany.[1] Ultrasound guided (USG) needle biopsy was reported in 1958 by Menghini.[2]

Traditionally the liver biopsy has been used for diagnosis of hepatic disease. This expanded to assessment of extent of fibrosis and inflammation that helps in staging and predicting prognosis in liver disease so that clinical management decisions become easier.[3] While serological tests for fibrosis (Fibro Test) and non-invasive tests (elastography) have been introduced, they have not been uniformly standardized nor are widely available.[4, 5] Histology based on liver biopsy continues to be the most acceptable test.

Worldwide nearly 50% of liver biopsies are still performed without imaging guidance. The use of USG reduces complications and increases the likelihood of specimen adequacy and procedural success. Nearly 50% of liver biopsies in the United States are performed by radiologists and USG is the favored modality.[6]

Other imaging modalities like computed tomography, transjugular biopsy, endoscopic ultrasound and laparoscopy exist for performance of liver biopsies but they have their own limitations.

The aim of the article is to assess the correlation of image findings with histopathological diagnosis in USG percutaneous biopsies of liver lesions particularly in relation to hepatocellular carcinoma (HCC).

Material and Methods:

The patient selection was based on findings on various image modalities, triphasic liver computed tomography (CT) or dynamic magnetic resonance imaging (MRI), in which percutaneous liver biopsy was indicated. Prior to biopsy the patients were evaluated for the procedure and an informed written consent was taken from them.

The skin site was sterilized and draped to ensure asepsis and the area was anesthetized with xylocaine 2%. Under USG, the deep soft tissues and liver pericapsular areas were also infiltrated with the local anesthetic. We used 18-G Bard Magnum Gun and ensured that the length of biopsy obtained remains between 15 mm to 20 mm to maintain the adequacy for histological diagnosis.

The biopsies were collected from patients reporting to Kuwait Teaching Hospital, Peshawar, KPK, Pakistan from 01-07-2017 to 30-09-2017.

Results:

A total number of 82 USG percutaneous biopsies were performed on various sites from patients referred to Kuwait Teaching Hospital Peshawar including abdomen, pelvis, liver, neck, breast, lung, lymph nodes and chest (table 1). Out of these 82 biopsies 41 (50%) were performed on liver lesions which makes the liver to be the most common site for percutaneous biopsies. These biopsies were sent to Shaukat Khanum Cancer Hospital & Research Center Lab Lahore and Agha Khan University Hospital Lab Karachi for immunohistochemical markers and ultimate diagnosis.

Table 1: USG percutaneous biopsies were performed on various sites			
S/ No	Organ	No of cases	% age
1.	Liver	41	50
2.	Lymph node	10	12.19
3.	Anterior Mediastinum	10	12.19
4.	Gall bladder	6	7.31
5.	Kidney	3	3.65
6.	Uterus and Adnexae	3	3.65
7.	Neck	2	2.43
8.	Adrenal gland	1	1.21
9.	Spleen	1	1.21
10.	Breast	1	1.21
11.	Pancreas	2	2.43
12.	Abdominal/ Pelvis	1	1.21
13.	Retroperitoneum	1	1.21
	Total number of cases	82	100%

The age ranged from 17 to 75 years with a mean of 51.4 years and standard deviation of 11.7. Thirty-seven patients were 40 years or older. Males were 25 and females 15 with a ratio 1.6:1.

Out of these 41 liver biopsies 16 (39%) were diagnosed as hepatocellular carcinoma (HCC) with 6 of them being HCV positive and 1 showed HBV positivity. Out of 16 cases of HCC 15 (93.7%) had age range from 40-65 years whereas only one (6.3%) was under 40. Among them 13 (81.2%) were males and 3 (18.7%) females with a ratio 3.2:1. On imaging 12 (75%) of them were either diagnosed as HCC or were suspicious of it but all the 7 cases of HCV or HBV were straight away diagnosed as HCC (table 2).

Table-2: Details of USG percutaneous liver biopsies			
S. No	**Histopathology Findings**	**No. of Cases**	**Percentage**
1	Hepatocellular Carcinoma	16	39
2	Metastatic carcinoma	13	32
4	Benign Non-Neoplastic lesions	6	14.6
8	Cholangiocarcinoma	2	4.8
5	Neuroendocrine Tumor	1	2.4
9	Lymphoproliferative	1	2.4
10	Hemangioendothelioma	1	2.4
12	Adenoma	1	2.4
	Total	41	100

The next common tumor was metastatic carcinoma with 13 (31.7%) cases diagnosed. Metastatic adenocarcinoma in this group was the most common with 11 (85%) cases followed by metastatic neuroendocrine tumor 2 (15%) cases.

Among primary malignant tumors next was miscellaneous group which included cholangiocarcinoma 2 cases and one each of neuroendocrine tumor, lymphoproliferative disorder and epithelioid hemangioendothelioma.

Among benign tumors a single case (2.43%) of adenoma was diagnosed.

The next group consisted of 6 (4.63%) benign lesions like cirrhosis 3 (50%) cases out of which 2 were HCV positive, fibrosis 2 (33.3%) cases and an abscess (16.6%). In this group 2 cases were strongly suggestive of HCC on imaging but the corresponding biopsy could not reveal malignancy perhaps due to extensive fibrosis in cirrhosis. In both the cases clinico-radiological correlation or a repeat biopsy was recommended.

In this study the HCV positivity came out to be 14.6% whereas HBV positivity only 2.43%. Out of HCV positive cases 66.7% developed HCC and 33.3% developed either cirrhosis or extensive fibrosis. The only HBV positive case turned out to be HCC.

All the 16 cases of HCC either showed Hep-Par-1 or arginase positivity which is a novel marker for lesions arising from hepatocytes.[7] All the metastatic tumors were Hep-Par-1 or arginase negative. The individual tumors diagnosed were positive according to their cell type, e.g., cholangiocarcinoma showed positivity for CK7 and CK19, neuroendocrine tumor for CDX-2, lymphoproliferative disorder for CK-30 and CD4 and epithelioid hemangioma for CD34.

Discussion:

Liver disorders which require a percutaneous liver biopsy commonly occurs in older age group with an average of 51.4 years in our setup. Usually the male population is affected and the common lesions are HCC, metastatic carcinoma, cirrhosis and fibrosis. HCC, cirrhosis and fibrosis may be related to HCV infection.

These findings correspond with Poynard T et al; and Thabut D et al; who concluded that the age of a patient at the time of HCV infection diagnosis has proven to be a risk factor for the progression of liver fibrosis, liver cirrhosis, and hepatocellular carcinoma. If a patient is more than 40 years old at the time of diagnosis of HCV infection, their progression of liver fibrosis is much faster than those under 40 years,[8] and for those aged more than 65 years, the relative risk of severe liver fibrosis is 3.78 times higher than that of those under 65 years.[9]

The prevalence of the HBsAg in a western, European hospital remained stable over the period 1993–2003, at 0.7%.[10] In our study we observed that among positive cases 6 out of 7 were HCV positive whereas only 1 case was HBV positive which reflects a rising trend for HCV and a decline in HBV infections in our population.

Hepatocellular carcinoma differs from most malignancies because it is commonly diagnosed based on imaging features alone, without histologic confirmation. This is because overt hepatocellular carcinoma does not have a portal blood supply; it is supplied solely by abnormal, unpaired hepatic arteries. This results in a characteristic vascular enhancement pattern that can be used to make a definitive radiologic diagnosis.[11] In contrast in our study the diagnosis of HCC on imaging was made in 12 (30%) cases out of which 9 (75%) turned out to be HCC on histology

whereas 3 (25%) cases were diagnosed as metastatic carcinoma, cirrhosis and fibrosis. A sensitivity of 75% and specificity of 88% was observed. These values are a bit higher than Lin MT et al; who obtained overall diagnostic sensitivity of HCC by single imaging as approximately 65-80% (liver CT or MRI).[12] Earlier in 2006 Colli A et al; reviewed HCC diagnosed on histopathology and compared findings on CT and MRI from 1966 to 2004 and found that for the 10 CT studies sensitivity was 68% and specificity 93%; and for the nine MRI studies sensitivity was 81% and specificity 85%.[13]

Metastatic carcinoma can mimic HCC whereas in cases of advanced cirrhosis and overwhelming fibrosis especially if the lesion is small, the percutaneous needle biopsy is likely to miss it. Therefore, in cases where there is strong suspicion of malignancy a repeat biopsy must be advised. This is supported by Kim TK et al; who concluded that although imaging techniques have markedly improved in detecting small liver lesions, they often detect incidental benign liver lesions and non-hepatocellular malignancy that can be misdiagnosed as HCC.[14]

Conclusion:

The present study concludes that in our region the most common organ for percutaneous biopsy turns out to be liver with a more frequent diagnosis of HCC especially in a middle-aged male. HCC now shows an increasing trend to be associated HCV. HBV positivity shows a remarkably declining trend.

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