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Is Liver Biopsy Safe - Assessment Of Complications Of The Procedure (A Two Year Retrospective Study)

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Abstract

Background: Liver biopsy, although an invasive procedure and complications is known to occur, but is very helpful in diagnosis, assessing and prognostication of various liver disease.

AIM: To foresee various risk factors of complications for doing liver biopsy.

Results: This study has been done retrospectively for two years (2019 -2020) in which we have studied 90 liver biopsy patients. Among them 42 were females and 48 were males. The main objective was to find out various parameters to predict the complication rate so that we can avoid rate of complications in future. Out of 90 patients, complications were seen in 10 patients which included pain (3/90) injury to neighbouring organs (2/90), Fever (2/9), Inadequate sampling (2/90) Hemoperitoneum (1/90) and the predictors of complications were: no. of passes (p value =0.001), size of needle (p=0.05), hematological parameters like platelet count (p value=0.64), INR (p value=0.7). However there was no mortality or a surgical intervention done in any patient.

Conclusion: Liver biopsy should be done in all selected patients after assessing various indications and contraindications. No doubt, this is invasive, but carries no to min fatal complications.

Keywords: NIL

Introduction

Percutaneous liver biopsy is a useful diagnostic procedure which has been used for 100 years [1-3]. Besides certain blood investigations ultrasonography, computed tomography, Fibroscan and magnetic resonant imaging are useful in investigation of liver disease, liver biopsy is still essential for diagnosis [4] in the majority of patients. To avoid fatal complications, biopsy must be performed in patients with indications for and no contraindications against biopsy [5].

Most biopsies are presently executed for parenchymal disease not for diagnosis but to assess the liver damage (the degree of inflammation, fibrosis) or the reaction to therapy [6]. Where as in past when almost all biopsies were done for diagnostic purpose, this is not the case in present era where more than 50% are being done for staging versus 15% for diagnosing the parenchymal liver disease [6]. Besides diagnosis and staging now a day's liver biopsy is done for guiding the management of hepatitis C and nonalcoholic steatohepatitis and to assess the response to therapy [6-8]. The increased use of liver transplantation as standard treatment of end stage liver disease of diverse etiologies has led to more biopsies being performed to differentiate the cause of graft dysfunction and to assess the aptness of potential liver donors for transplantation. The dramatic increase in obesity, diabetes, hyperlipidaemia and hypertension in western societies and its accompanying fatty liver problems are requiring liver biopsy for histological assessment. The main indications are

1. Chronic hepatitis- for grading, staging, establishing a therapeutic strategy and monitoring therapy,
2. Unexplained abnormal liver function tests or hepatomegaly.

3. Follow up of patients after liver transplantation.

However no liver biopsy is free of risk as it is an invasive procedure. Rational assessment of overall risk in Liver biopsy is to be considered in each case.

Methodology:

This is a retrospective two year study (2019-2020) done in one of the largest north Indian hospital (Sher-I-Kashmir Institute of Medical Sciences, Srinagar, J&K, India). All Liver biopsies were performed as day case procedures because of patient preference and reduction of costs.

Pre-Procedure Assessment:

Patients undergoing this procedure were assessed not to have conditions that might increase the risk of the biopsy including: encephalopathy, ascites, hepatic failure with severe jaundice or evidence of significant extra hepatic biliary obstruction, significant coagulopathies, or serious diseases involving other organs such as renal failure, severe congestive heart failure, or advanced age.. The method of biopsy is dictated by coagulation indices and percutaneous biopsies should not be performed if prothrombin time is more than 3s prolonged over control values. Whilst fresh frozen plasma was frequently used to correct coagulation indices. Additional risk factors have identified patients with an increased incidence of complications following standard percutaneous biopsy (the alternative techniques are in parentheses): the uncooperative patient (sedation, transvenous, or real time ultrasound guided), extrahepatic biliary obstruction (real time ultrasound guided), ascites (transvenous), cystic lesions (real time ultrasound guided), hepatic amyloidosis (transvenous), obesity (transvenous or real time ultrasound guided), sickle hepatopathy (transvenous), chronic renal failure (transvenous), and valvular heart disease (consider antibiotic prophylaxis). There is an increased risk of bleeding in patients with malignancy but often these biopsies are real time ultrasound guided using thinner needles, with less risk of complications. All patients which were being considered for liver biopsy were undergo a pre biopsy ultrasound in order to exclude anatomical variation associated with increased risk of visceral perforation – such as the presence of small bowel between a shrunken liver and the abdominal wall (Chilaiditi syndrome), or an intrahepatic gall bladder.

Informed consent was obtained in writing prior to the biopsy procedure in accordance with individual hospital policies.

Procedure:

After identifying 6^{th} or 7^{th} intercostal space in anterior axillary line, part was cleaned and draped by using betadine washes, in lignocaine 10 ml was injected into the identified intercostal space to anaesthetise the local area. 16g or 18 G bard biopsy gun was used and in a single prick one single liver tissue was obtained.

After proper labelling, this tissue was sent for histopathological examination.

After Care

Observations were done frequent (quarter hourly for 2h, half hourly for 2h, and hourly for 2h) and analgesia was adequately prescribed.

After 6 hours of procedure, repeat ultrasonography scan was done to look for any complications.

Results:

Table 1 Demographics

Parameter	N	Minimum	Maximum	Mean	Std. Deviation
Age	**90**	**20**	**75**	**44.68**	**12.232**
HB	**90**	**7.89**	**17.00**	**12.871**	**2.06045**
TLC	**90**	**1.10**	**55.00**	**6.6014**	**5.63423**
PLT	**90**	**39**	**385**	**132.01**	**55.522**
AST	**90**	**10**	**192**	**66.79**	**39.410**

Volume 5, Issue 1; January-February 2022; Page No 422-427

ALT	**90**	**16**	**403**	**89.16**	**73.440**
ALB	**90**	**3.46**	**5.01**	**4.0648**	**.53009**
INR	**90**	**0.80**	**1.80**	**1.0961**	**.16348**
TG	**90**	**68**	**865**	**214.79**	**118.033**
CHO	**90**	**108**	**300**	**185.13**	**39.865**
LDL	**90**	**35**	**183**	**103.26**	**28.523**
HDL	**90**	**28**	**119**	**42.18**	**13.753**
BARD score	**90**	**0**	**4**	**2.09**	**1.196**
FIB4 score	**90**	**-2.12**	**12.10**	**2.6421**	**1.75751**
NAFLD score	**90**	**-4.65**	**5.70**	**-.4336**	**1.81751**

Table 2 Diagnosis:

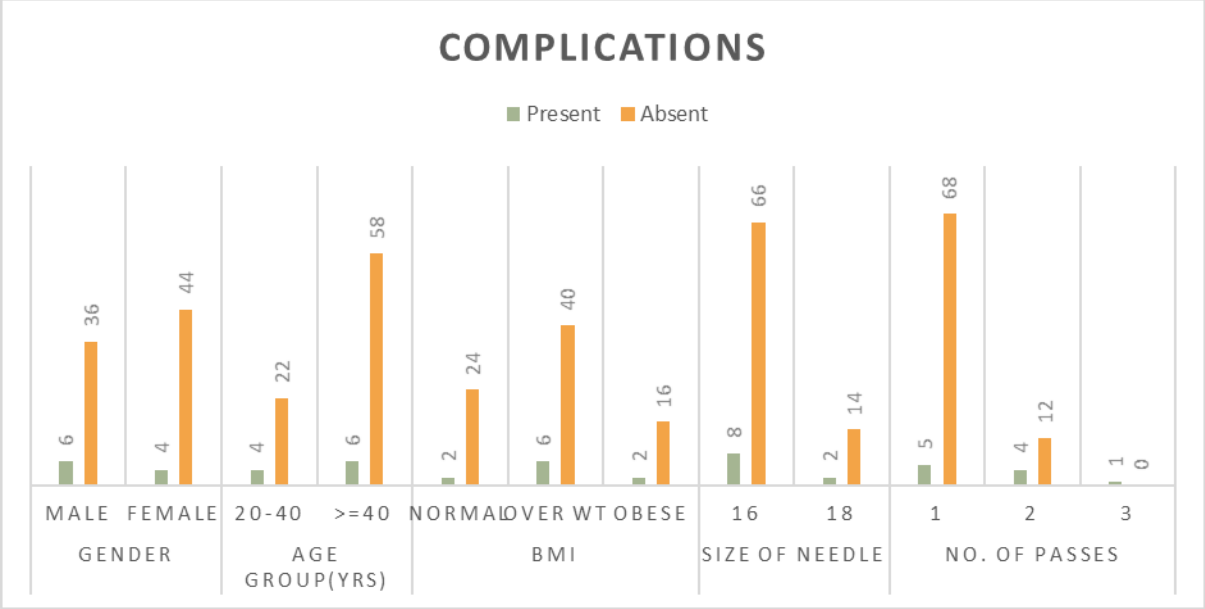
Diagnosis	Frequency	Percent	Valid Percent	Cumulative Percent
Nafld	60	66.7	66.7	66.7
Viral	13	14.4	14.4	81.1
Cholestatic Liver	7	7.8	7.8	88.9
Auto immune	5	5.6	5.6	94.4
Other	5	5.6	5.6	100.0
Total	90	100.0	100.0	

Complications of Liver Biopsy

COMPLICATIONS	Frequency	Percent	Valid Percent	Cumulative Percent
No complications	80	88.9	88.9	88.9
Pain	3	3.3	3.3	92.2
Fever	2	2.2	2.2	94.4
Haemorrhage	1	1.1	1.1	95.6
Injury to surrounding organs	2	2.2	2.2	97.8
Inadequate sampling	2	2.2	2.2	100.0
Total	90	100.0	100.0	

Volume 5, Issue 1; January-February 2022; Page No 422-427

Following given graph shows relationship of various parameters with complication rate



Predictors of complications:

variable	Complication	
	P value	chi-square
GENDER Male Female	0.884	1.74
AGE 20-40 yrs >40 yrs	0.9	0.07
HB <10g/dl >10g/dl	1.0	0.95
PLATELET COUNT < 1 LAC >1 LAC	3.3	0.64
INR <1.0 1.0 -1.5	2.5	0.7
INTERCOSTAL SPACE 6^{TH}	17.1	0.04

Volume 5, Issue 1; January-February 2022; Page No 422-427

7TH		
NO. OF PASSES **Single** **Multiple**	**50.8**	**0.001**

Discussion:

This study was done with the aim to study the complication rate of transcutaneous Liver biopsy for various diagnosis of various liver related diseases. This was a two year prospective study in which we have studied 90 liver biopsied patients done in our institution. The main Aim of this study is to find out various complications of liver biopsy and try to prognosticate the risk factors to avoid complication rate.

Mean age of studied liver biopsy patients were 44.68 ±12.23 (with maximum number in age group of 40-60 years), around 54.4% depicting fatty liver disease is a disease of fourth to sixth disease. In our studied population, females over-numbered males with percentage of 53.3% and 46.7% respectively. Out of 90 patients, complications were seen in 10 patients which included pain (3/90) injury to neighbouring organs (2/90), Fever (2/9), Inadequate sampling (2/90) Hemoperitoneum (1/90) and the predictors of complications were: no. of passes (p value =0.001), size of needle (p=0.05), haematological parameters like platelet count (p value=0.64), INR (p value=0.7). None of these complications needed any major surgical intervention as they settled by only conservative measures. Our studies were comparable to the study done by Sukran Kose et al [9] wherein approximately one-fifth had minor complications (analgesic-requiring pain in 19.8% and right upper quadrant pain and pain reflecting to the right arm in 22.6%), and 1.15% had major complications (pneumothorax in 0.17%, hemobilia in 0.08% and hematoma in 0.9%). Complications such as fever, abscess, anaphylaxis, bacteraemia, organ perforation, sepsis or death were not observed, depicting that major complications usually are very rare in performing liver biopsies. Our study was consistent with the literature, overall complication rate was 1.1% in the present study (pneumothorax in 0.17%, hemobilia in 0.08%, and hematoma in 0.9%). Fever, abscess, anaphylaxis, bile peritonitis, hemothorax, bacteraemia, organ perforation or sepsis was not observed. The majority of complications were minor with analgesic-requiring pain observed in 2.4% and right upper quadrant pain. All of the cases were discharged from the hospital on the same day without problem. Govender et al. [10] performed percutaneous liver biopsy in 597 patients, and serious complications were determined at a rate of 1.7% including pneumothorax, pseudo aneurysm and symptomatic hematoma. In a similar study, overall complication rate was found to be 2.0% (abdominal pain 0.9%, symptomatic hematoma 0.6% and infection in the intervention site 0.4%) [11].

We tried to assess relationship between frequency of complications and various factors like gender, age, BMI, mean platelet count, mean haemoglobin, intercostal spaces, size of liver biopsy gun and number of passes of puncture needle as to minimise the rate of complications in doing liver biopsies in future. Our results show that only intercostal space and number of passes of puncture needle were statistically significant in rate of complications. Among 90 patients, single pass was used in 73 patients and among them, 68 patients had no complications and only 4 patients (5.4%) had noticed complications. Multiple passes were done in 17 patients and among them 4 patients (23%) have complications. Other predictors have no statistical significance as depicted by P values as no. of passes (p value =0.001), size of needle (p=0.05), hematological parameters like platelet count (p value=0.64), INR (p value=0.7). age group (p value= 0.07) HB value (p Value= 0.95) .

Conclusion:

We conclude that in properly selected patients and after exclusion of risk factors for complications, liver biopsy is considered to be safe outpatient procedure and still the gold standard method and definitive diagnostic test for difficult cases of liver diseases.

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Volume 5, Issue 1; January-February 2022; Page No 422-427

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Volume 5, Issue 1; January-February 2022; Page No 422-427