

# Evaluation of side effects and safety profile of liver biopsy

## Abstract

**Background and objectives:** to evaluate the complication and indications of liver biopsy as a fundamental part of chronic liver disease investigation in GI ward of Ahvaz Imam Hospital in a 3years period.

**Materials and methods:** By evaluating the archive of Ahvaz Imam Hospital for files of liver biopsies.

**Results:** Overall 214 liver biopsies have been performed in a 3years period. 56% of patients were male. Average age was 38.5 y (9 To 81) and 33.3% were current or ex-smoker. The most common reasons of referring patients for liver biopsy were rising of liver transaminases (27.6%), HCV (17.6%), AIH (16.6%) and HBV (15.7%). The most common comorbidities included: HBV (16.4%), HCV (12.1%), diabetes Mellitus (3.7%), and major thalassemia (3.7%). Overall 17 patients (7.9%) complicated mostly with minors including local pain at site of biopsy (11 patients, 5.1%). Major complication happened in Only 4 patients (2%) and almost all of them managed conservatively (except one who need chest tube for managing pneumothorax). There was no mortality at all. 88% of complications happened immediately after or during 3 hours of liver biopsy and the rest of them were apparent up to 6 hours after biopsy. The specimen was sufficient in 96.3% of cases.

**Conclusion:** Liver biopsy could be achieve safely by accurate clinical examination and advertent patient selection without any significant hazard.

**Keywords:** liver biopsy, complication, liver transaminases, AIH

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## Introduction

Liver biopsy consider impractical and dangerous procedure until introduction of aspiration technique in 1950.<sup>1</sup> Since that time, technologic improvement has enhanced this procedure and liver biopsy evolved to practical and safe procedure for evaluating liver and many liver biopsies are performing annually by hepatologists and or radiologists around the world.<sup>2</sup>

Traditionally liver biopsy has been the gold standard in evaluation of chronic liver diseases and just recently few technics of assessing liver fibrosis have replaced liver biopsy in some instances.<sup>2</sup> Although the etiology of most of chronic liver diseases could be diagnosed by available biochemical, serologic, immunologic and molecular examination but histologic evaluation still has a close relation to treatment and control of chronic liver diseases<sup>3</sup> and in fact liver biopsy and histologic evaluation constitute an important part of control and monitoring of chronic liver diseases.<sup>4</sup>

In practical hepatology the prerequisite for performing liver biopsy is not only consideration of standard technique but also ability to estimate the potential hazards and complications and notification to the degree of information and clinical clues gathered by biopsy and also if any modification or change in clinical approach based on histologic information.<sup>5,6</sup> On the other hand, the rate of liver biopsy complication in any center depends on their experience and number of biopsies performing per week as the rate of complication among physicians with experience of less than 20 biopsies has been reported 3.2% in comparison with 1.1% among the ones with more than 100 cases<sup>7</sup> and generally the rate of liver biopsy mortality has been reported about 0.1 to 0.01%.<sup>8-11</sup> In this study we have evaluated the complication and indications of liver biopsy in GI ward of Ahvaz Imam Hospital in a 3years period (2010- 2012).

## Materials/patients and methods

By refer to archive of Imam Hospital and evaluation of files of patients admitted for liver biopsy from 2010 January to 2012 December, the DATAs recorded and in case of inconclusive or incomplete file, we contact with patients and asked them to bring their documents. After collection of all cases, the DATAs analyzed by statistician.

## Results

Overall in a 3years period 214 liver biopsies performed in GI ward (120 male, 94 female). Average age was 38.5 y (9 To 81). 33.3% of patients were current or ex-smoker. The most common reasons of referring patients for liver biopsy were raising of liver transaminases (27.6%), HCV (17.6%), AIH (16.6%) and HBV evaluation (15.7%) respectively (Table 1). In review of patient's past medical history, the most common comorbidities included: HBV (16.4%), HCV (12.1%), diabetes Mellitus (3.7%), and major thalassemia (3.7%) (Table 2). Average biochemical profile of patients included ALT 123 (11 to 1100), AST 116 (14 to 897), Alk P 498.4 (54 to 3700), Hb 11.97 g/dl (5.6 To 17.1), INR 1.16 (1 To 3.2), BUN 15.9 (6 To 63) and Cr 0.94 (0.5 To 4).

All of the liver biopsies performed by gastroenterologists or well-trained GI fellows. The method of biopsy was intercostal by using automatic needle size 16 or 18F. All of the patients were admitted in ward before performing liver biopsy and observed for at least one night after biopsy. They were under close observation in this period with regular monitoring of vital signs and blood pressure.

After performing liver biopsy, overall 17 patients (7.9%) involved by complication with mostly as minors including local pain at site of

biopsy (11 patients, 5.1%). Major complication happened in Only 4 patients (2%) (Table 3) and almost all of them managed conservatively (except one who need chest tube for managing pneumothorax). There was no mortality at all. 88% of complications happened immediately after or during 3 hours of liver biopsy and the rest of them were apparent up to 6 hours after biopsy. In 3 cases (1.4%), the biopsy was unsuccessful or the obtained tissue was from another organ (lung of striated muscle). In 5 cases (2.3%) the pathologist reported insufficient sample to interoperate (less than 6 portal tract).

**Table 1** The most common reasons of referring patients for liver biopsy (the sum of presents may be >100% because some of patients involved by more than one disease; miscellaneous refer to non-specified reasons such as drug toxicity)

Reason	Percent
Elevated Liver Transaminases	27.60%
HCV	17.60%
AIH	16.60%
HBV	15.70%
NAFLD	3%
HDV	2%
Wilson	1%
Hemochromatosis	0.50%
Miscellaneous	35.70%

**Table 2** Patients co morbidities (some of patients had not any specific comorbidity and just suffer elevated liver transaminases)

Co morbidity	Percent
HBV	16.40%
HCV	12.10%
HDV	1.40%
HEV	0.50%
HIV	0.50%
Diabetes Mellitus	3.70%
Major Thalassemia	3.70%
Arthritis	2.30%
HTN	1.90%
Hypothyroidism	1.90%
SLE & Vasculitis	1.80%
Cryptogenic Liver Cirrhosis	0.90%
Chronic Peritoneal Fibrosis	0.50%

**Table 3** Complication after liver biopsy (some patients involved by >1 complication)

Complication	Number
Pain at site of Biopsy	11 (5.1%)
Abdominal Pain	2 (0.9%)
Hb Drop	1 (0.5%)
Hemobilia	1 (0.5%)
Hemoptysis and Pneumothorax	1 (0.5%)
Convulsion	1 (0.5%)

## Discussion

For performing percutaneous liver biopsy, the patient is positioned prone and the location of biopsy determine by percussion. Abdominal ultrasound can confirm the accuracy of location and also evaluate for absence of any possible complicating factor (including dilated bile ducts, venous collaterals, or abnormal vascular findings). Some recent studies have reported reduced complications by using ultrasound and suggest its routine usage before biopsy.<sup>12,13</sup> Usually the subcostal route is prefer to intercostal route due to lower rate of complication<sup>10</sup> and in our center the routine method of performing liver biopsy is subcostal.

Usually one pass is enough for obtaining the specimen but in case first try failure, up to 3 passes could be done safely and after that the rate of complications will be raise with every additional pass.<sup>8</sup> In this study, the most common reason for referring patients for liver biopsy was elevation of liver transaminases (Table 1) which could point the growing prevalence of nonalcoholic fatty liver in community<sup>14-16</sup> and importance of differentiating this clinical possibility from seronegative autoimmune hepatitis.<sup>17,18</sup> The most common co morbidities of candidate patients were viral hepatitis and diabetes mellitus (Table 2).

According to population of Khuzestan province (about 4.5 million people) and the estimated growing prevalence of chronic liver diseases especially nonalcoholic fatty liver and autoimmune hepatitis,<sup>19,20</sup> it is clear that the hepatologists are still reluctant to performing liver biopsy although it is the gold standard for diagnosing chronic liver diseases.<sup>1</sup>

The explanation for this underperforming could be potential hazards of liver biopsy and fray of mortality and morbidity. In this study, during a 3 years period there was no mortality at all which is consistent with estimated range between 0.1 to 0.01% and negligible.<sup>7-9</sup> Almost 75% of the complications were minor and relived without any intervention (Table 3). The most common side effect was pain and in these cases, we just performed a close observation and monitoring and used analgesia by meperidine or morphine sulfate for pain. Major complications happened in 2% of cases which is consistent with previous studies from South Africa and transplant centers of United States.<sup>11,21,22</sup> On the other hand, this rate was similar to liver biopsy under sonographic guidance<sup>23,24</sup> with less economic cost. All of the complications got obvious during 6 hours of performing liver biopsy. So there is no need to keep the patients admitted for a whole night and for viewpoint of economic problems, they can safely discharge on the same day.

The obtained specimen was sufficient in 96.3% of cases which can prove the efficacy of percutaneous liver biopsy and importance of exact clinical examination before biopsy. In these cases, using clinical expertise and focus on percussion is the keystone of a safe and exact percutaneous liver biopsy.

## Conclusion

Liver biopsy is an important and impartible part of clinical hepatology which could be achieve safely by accurate clinical examination and advertent patient selection without any significant hazard. It is advisable to clinical hepatologists to lower their threshold for performing liver biopsy especially in management of chronic liver diseases.

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## Conflicts of interest

The authors declare there is no conflict of interests.

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