

# LIVER BIOPSY

## PERCUTANEOUS LIVER BIOPSY BY SURECUT NEEDLE

ORIGINAL  
PROF-1864

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**ABSTRACT... Objective:** To study the safety and efficacy of Surecut needle in obtaining the liver tissue by percutaneous liver biopsy. **Design:** Single centered prospective hospital based study. **Place and duration of study:** Department of Internal medicine (Unit-1) & Family ward, Combined military hospital Lahore for more than one year from August 2002 to March 2004. **Materials and Methods:** One hundred and fifty patients of either gender having asymptomatic hepatitis C carrier state, healthy blood donors, with positive HCV-PCR were included in study. The patients liver biopsy was done with Surecut needle 16G with patient breath suspended in expiration from the periphery of right lobe of liver. **Result:** Majority of patients, 135 (90%) were male and 15 (10%) were female. The mean age was 30.3 years with range of 25-55 years. In 146(97.31%) patients successful biopsy was done while the biopsy was non-diagnostic in 4(2.69%) patients. Mean core length of liver tissue obtained was Mean+sd(1.2+0.42cm) and histopathologic diagnosis was made in 97.31% cases. Total number of attempts were 1-2. In 99% single attempt was done. No major complications related to procedure was seen. **Conclusions:** liver biopsy with Surecut needle is safe and effective in establishing the diagnosis of Chronic hepatitis.

**Key words:** Liver biopsy, biopsy needle, Surecut.

## INTRODUCTION

Liver biopsy has the distinction in medical literature to be the first human tissue biopsy performed. Paul Ehrlich performed first percutaneous liver biopsy in 1883 in Germany<sup>1</sup>. Biopsy of the other tissues for diagnostic purpose started after liver biopsy as Gwyn performed an open renal biopsy for the first time in 1923. The procedure became widely used after Menghini reported a technique for "one second needle biopsy of the liver" in 1958. The duration of intra hepatic phase of previous biopsy techniques had been 6 to 15 minutes<sup>2</sup>. Liver biopsy provides an accurate diagnosis in approximately 90 percent of patients with unexplained abnormalities revealed on liver function tests<sup>3</sup>. The size of the biopsy specimen varies between 1 and 3 cm in length and between 1.2 and 2mm in diameter, represents 1/50,000 of total mass of liver<sup>4</sup>. Usually a specimen of 1.5 cm is adequate for the diagnosis of diffuse liver disease. Trucut needle was introduced in 1980<sup>5</sup>. Basically needles for percutaneous liver biopsy are broadly categorized as suction needles (Menghini, Surecut needle, Klatskin needle, Jamshidi needle), cutting needles (Vim-Silverman needle, tru-cut needle), and spring loaded cutting needles. Cutting needles require a longer time in

the liver during the biopsy thus increasing the risk of bleeding<sup>6</sup>. All the needles usually provide adequate specimen, however the efficacy is variable depending upon the operator. Specimen obtained with standard thin-bore or spring loaded needles measure between 1.4 and 1.8 mm in diameter and those obtained with Menghini or Tru-cut needle measure up to 2mm in diameter<sup>7</sup>. There are no absolute contraindications for liver biopsy. It is now standard practice to perform liver biopsy on an out patient basis, if practical guidelines published by the patient care committee of the American Gastroenterology Association are met<sup>8</sup>. Froehlich et al<sup>9</sup> noted a lower complication rate for physicians who performed more than 50 biopsies a year. 60% of complication occur within 2 hours and 96% within 24 hours after the procedure<sup>10</sup>. The mortality rate for percutaneous liver biopsy is approximately 1 in 10,000 to 12000. Biopsy is usually done with the aspiration needle i.e Surecut except in cases of cirrhosis where cutting needle is preferred as the fibrotic tissue tends to fragment with suction needle<sup>11</sup>. Suction needle technique has several advantages which include smaller size of needle, mostly done in single attempt, less complications, simple and easy and moreover the

diagnostic yield and efficacy of biopsy specimen has been improved by histopathology and microscopic techniques. Various international studies have shown better efficacy and safety of the instrument.

### AIMS AND OBJECTIVE

To study the safety and efficacy of Surecut needle in obtaining liver tissue by percutaneous liver biopsy.

### MATERIAL AND METHODS

A prospective study was carried out at the department of Internal medicine, Combined military hospital Lahore from August 2002 to March 2004. A total of 150 asymptomatic patients of both gender, majority male with hepatitis-C carrier state i.e Anti HCV antibodies and HCV-PCR positive, were included in the study. Percutaneous liver biopsy was done in all patients after fulfilling the pre-requisite to establish the diagnosis of chronic hepatitis C.

### INCLUSION CRITERIA

Clinically healthy and asymptomatic patients who met the diagnosis of hepatitis-C carrier state with raised ALT and willing for liver biopsy were included in the study. Patient not willing for liver biopsy, having any evidence of hepatic decompensation or having any disease, involving cardiac, renal or pulmonary systems and if any contraindication to liver biopsy was present, were excluded from the study. An informed consent was taken from each patient for liver biopsy. After history and clinical examination, complete blood count, coagulation profile, Liver-function test and Blood grouping & cross matching were done. Liver biopsy was performed using 16G Surecut needle.

The subjects were kept under observation after the procedure for 6 hours in hospital for any complications, categorized as minor that include pain at the biopsy site, right shoulder tip pain, transient hypotension and major which include intraperitoneal haemorrhage, haemothorax, septicaemia and death. Biopsy specimen were put in formalin and send to histopathology department of Combined Military hospital Lahore. The database using Microsoft Access M.S office for professional 2000 were analyzed accordingly. Nominal variables were reported as frequency percentage.

Numerical ratio were reported as Mean+SD. Nominal variables were analyzed using Chi-square test.

### RESULTS

Of the 150 subjects 90%(135) were male and 10%(15) were female. The age range was 25 to 55 years with Mean+SD 30+5.2 years. In 146(97.31%) patients successful biopsy was done while it was non-diagnostic in 4(2.69%) patients. The overall success rate in obtaining the adequate liver tissue for histopathological diagnosis was 97.31% as shown in table-I. The number of attempts were one to two. In almost 99% single attempt was done for obtaining the liver tissue. No major complications related to procedure was seen. Only three patients complained of mild to moderate pain at the biopsy site, which was relieved by simple analgesic. However one patient developed hypotension (Vasovagal) just before biopsy.

Table-I. Liver biopsy result (n=150)

Liver tissue obtained	
Successful biopsy	97.31%
Biopsy failure	2.69%
Tissue length (cm)	1.2 ± 0.42

### DISCUSSION

The clinical experience of various physicians and hepatologist and the published data present on it spans over for more that 100 years since the first liver biopsy was performed. Starting with crude type of needle to Menghini, Trucut, Surecut, automated gun biopsy needle, now we have quite sophisticated instruments for liver biopsy which has made this procedure safe for the patients and popular among the physicians as an outdoor procedure if pre-requisites for the biopsy are met before. Chronic hepatitis C and B are the most common liver diseases in our part of world. However resource constraints make it essential to pick the right patient for treatment. Liver biopsy is usually the most specific test to asses the nature and severity of liver disease and can be useful in monitoring the efficacy of various treatments. Currently available techniques for obtaining liver tissue include percutaneous, transjuglar, laproscopic and fine needle aspiration biopsy. Each of these methods have

Table-II. Diagnostic yield of liver biopsy with needles

Studies	Year	Menghini needle	Trucut needle	Surecut needle	Inadequate
Gilmore IT, et al	1995	83%	83%	-	5%
Solmih, e al	1989	91.3%	91.5%	-	8.7%, 8.5%
Lichman et al	1987	83%	-	-	9%
Fuad et al	2003	-	-	97.31%	2.69%

their own indications and contraindications. Liver biopsy can give valuable information regarding staging, progress & management in patients with chronic hepatitis.

Ultrasound guided biopsy is usually done with fine needle aspiration when focal metastatic lesion are expected. In routine cases blind liver biopsies are done by experienced hepatologists & clinicians. Our study of 150 liver biopsies proves that percutaneous liver biopsy with the disposable Surecut needle can be done as an outdoor procedure without ultrasound guidance with almost 100% result. The safety and efficacy of the modern needles used for liver biopsy is well established in various international studies<sup>12,13</sup>. The complication rate reported in literature is quite variable in international studies, depending upon the needle, its size, technique, clinical parameters observed in patients. In our study results are excellent with Surecut needle without any major complications and any mortality seen. Littlewood ER, et al<sup>14</sup> compared Trucut and Surecut liver biopsy needles and showed that although surecut specimen were longer and heavier & they tend to fragment while processing, Trucut biopsy specimen were subject to less artefact and rated better by histopathologists. However for diagnostic purpose both were satisfactory. Solmi L, et al<sup>15</sup> compared Trucut needle with Surecut needle of 21 gauge. These biopsies were echoguided done on primary or metastatic hepatic neoplasms. Diagnostic material for Trucut 94.8% vs 70.5% in Surecut needle. A comparison of diagnostic yield is shown in table II.

Diagnostic accuracy for both needles 91.3vs91.5% respectively. No complication in either of the group. Trop- Pedersens et al<sup>16</sup> compared result of Surecut needle (0.6 mm) with Menghini's biopsy. No

complications with either of biopsies. They suggested to use Surecut needle for biopsy of cases of cirrhosis when conventional Menghini needle is contraindicated. Ali G, et al<sup>17</sup> compared vacu-cut 19.5G to 17 G Menghini needle in 20 patients. Menghini was superior, 90% in first pass biopsy (100% with 12 passes in 11 patients) as compared to 60% with the Vacu-cut needle (90% with 16 passes in 10 patients) Histological diagnosis was 100 % with both needles. No major complications occurred however minor complications with Vacu-cut, 10% and 65% in Menghini group. Rasmussen KB, et al<sup>18</sup> in a retrospective study of 147 liver biopsies with Menghini needle had 7.5% minor and 2.7% major complications. Tobkes et al<sup>19</sup> in review of methodology of liver biopsy showed complication rate of 0.06-0.32%. Death was reported in (0.009-0.12%) It has a high benefit/risk ratio and is often considered the final and definitive diagnostic test. Lichtman S, et al<sup>20</sup> showed that Menghini needle resulted in no complication in children. Diagnosis was done in 83% and no diagnosis in 9% of cases.

Scheimann AO, et al<sup>21</sup> proved that percutaneous liver biopsy in children using aspiration or spring loaded needle is superior. Maharaj B, et al<sup>22</sup> proved that complications directly attributable to the procedure occurred in 24 patients in whom one specimen, 20 in which two and 19 in which three biopsy specimen were taken. Whittle Ts Jr, et al<sup>23</sup> reported a case of Intrahepatic haemorrhage with Menghini needle which was fatal. Pongchairerks P, et al<sup>24</sup> proved that ultrasound guided liver biopsy can be an effective and safe out patient procedure for pathological diagnosis of liver diseases. Lapinski TW, et al<sup>25</sup> proved that only minor complication like pain at the biopsy site occurred in 30% and 0.5% had subcapsular bleeding. The comparison of complications is shown in table III.

Table-III. Comparisons of liver biopsy complications

Complication	Rasmussen KB et al 1993	Tabkes et al	Lapinski, et al 2001	Wildhurt, et al 1981	Fuad et al 2003
Overall rate	10.2%	0.06-0.32%	30.5%	0.08%	2%
Minor* complication	7.5%	-	30%	-	2%
Major# complication	2.7%	-	0.5%	-	-
Mortality	0%	(0.009-0.12%)	-	-	-

*Minor Complication\* Localized discomfort, Right shoulder tip pain, Mild transient hypotension etc.  
Major Complication.# Intraperitoneal-haemorrhage, haemothorax, septicemia, death.*

Piccinin F, et al. compared complications with Trucut needle 3/1000, Menghini needle 1/1000, 61% of those occurred within 2 hours & 96% within one day. Wildhirt E, et al<sup>26</sup> reported experience with 20,000 blind liver biopsies with Menghini needle, in which frequency of non-lethal complications was 0,08%. In another study done by Judmaier G, et al<sup>27</sup> proved that Trucut liver biopsy is superior to Menghini needle since tissue yield is better. Bateson MC, et al<sup>28</sup> proved in 77 biopsies that Menghini suction technique provided additional information as compared to Trucut needle. Vargas- Tank L, et al<sup>29</sup> proved that Trucut needle is better in identification of cirrhosis of liver. Gilmore IT, et al<sup>30</sup> showed that in 2/3rd biopsy with Trucut needle and 1/3rd with Menghini needle, both needles showed samples excellent or satisfactory in 83% and inadequate in 5%. Bleeding complications in 1.7%, mortality 0.13-0.33% and liver biopsy led to the diagnosis in 63% of patients. Liver biopsy remains an important diagnostic tool which can lead to changes in patient as proved by Spycher C, et al<sup>31</sup>.

Our study in which all biopsies were done by Surecut disposable needle of 16G, showed much lower rate of complications as compared to other international studies as the patients selected in our study were all healthy asymptomatic, hepatitis C carrier positive individuals who were not high risk cases. Our study is comparable and no major complications or mortality is seen in our.

## CONCLUSIONS

We conclude that liver biopsy performed by Surecut needle is a very safe procedure, when done by an experienced operator especially after clinically palpating

the liver. It is prudent to observe patient for 6 hours post-biopsy for any complications.

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BY THE DESIRE TO ACHIEVE,  
NOT BY THE DESIRE TO  
BEAT OTHERS.**

**AYN RAND**