Transjugular Liver Biopsy Using Tru-cut Biopsy Needle: KEM Experience

K Rathod*, H Deshmukh*, L Nihal+, S Basappa*, P Rathi+, Shobna Bhatia**

Abstract

Background and Aim: Transjugular liver biopsy is accepted procedure in patients in whom percutaneous liver biopsy is contraindicated. We report our experience with this procedure, its indications, efficacy and safety in Indian population over 5 years.

Material & Methods: A retrospective study of 145 consecutive patients who had undergone transjugular liver biopsy from May 2002 to Nov. 2007 was done from the database maintained in our department. We evaluated the indications, technical success, complication and impact of histological diagnosis on the management of those patients.

Results: 145 Transjugular liver biopsies were performed of which 74 were males and 71 were females aged between 5 and 74 years. Two procedures were abandoned due to failed hepatic vein cannulation because of venous occlusion. Out of 143 biopsies, 4 were inadequate while 139 yielded adequate tissue for histopathological examination. Histopathological examination in our study showed cirrhotic changes in 56, hepatitis including both acute and chronic in 48, periportal fibrosis in 9, Wilson’s disease in 5 and obstructive cholangiopathy in 2 patients. The remaining 19 were normal. Minor complications occurred in 2 patients.

Conclusion: Transjugular liver biopsy is a safe procedure in the trained hands and provides adequate tissue for diagnosis when percutaneous liver biopsy is contraindicated.

INTRODUCTION

Transjugular liver biopsy is a procedure for obtaining adequate liver tissue sample for histopathological examination by passing the biopsy device into the hepatic vein through internal jugular access. Transjugular liver biopsy is the preferred procedure when the percutaneous liver biopsy is contraindicated. Hence the transjugular liver biopsy is performed in patients with thrombocytopenia, coagulopathies, ascites, and in whom ancillary procedure like wedge pressure measurement to be carried out. We present our experience with this procedure in 145 patients over the last five years.

MATERIAL AND METHODS

This is a retrospective study of case records of 145 transjugular biopsies performed between May 2002 to Nov. 2007 at our institute. Clinical data included: the indications for biopsy, clinical diagnosis, histopathological diagnosis and early and late complications if any.

All the procedures were done through right internal jugular route under local anesthesia. Electrocardiogram was monitored to keep a watch on the cardio-vascular status of the patient during the procedure as the catheter passes through the right atrium after obtaining right transjugular access (5-F), a multipurpose catheter was used to selectively cannulate the right hepatic vein. Subsequently, the vascular sheath was exchanged with Balkin’s vascular sheath (Cook) advanced into the right hepatic vein over an Amplatz Super-stiff 0.035-inch guide wire (Boston Scientific). Contrast venography was performed to determine the actual position of the sheath before the biopsy. An 18-gauge, 60-cm-long automated biopsy device (Quick-Core; Cook) was then inserted through the set to its tip and oriented toward the anterior surface of the liver (Fig. 1), and the histology specimen was taken. One or several passes were performed to obtain an adequate sample. Contrast venogram was then repeated to evaluate the presence of complications. In cases, previously decided wedged and free hepatic venous pressures were obtained before the biopsy procedure.

Assessment of the sample was done for its size and fragmentation. Samples were fixed in formalin solution and sent for histopathological diagnosis.
Reports and relevant data are collected from the records maintained.

After removal of the needle and sheath the patient was nursed in the sitting position for 4 hours. This keeps the jugular vein collapsed and prevents puncture site haematoma formation. The abdominal girth and vital parameters are monitored.

RESULTS

From May 2002 to November 2007, we have performed 145 Transjugular liver biopsies at our institute. Age of the patients range from 5yrs to 74yrs with an average age of 28 yrs. Out of 145, there were 11 children, 24 adolescents and 110 adults. There were 74 males and 71 females.

Indications for carrying out transjugular liver biopsies in patients are shown in Table 1. The most common indications were coagulopathy and ascites. Combination of coagulopathy and ascites in 50 of 145 patients. Coagulopathy alone was the indication in 55 patients. In 3 patients Transjugular liver biopsy was performed because of failed percutaneous liver biopsy. Transjugular liver biopsy was aborted in 2 patients because of suspected venous occlusion, which was confirmed on sonography.

Diagnosis as noted in our study is shown in Table 3. The most common diagnosis was cirrhosis in 56 patients followed by hepatitis including both acute and chronic in 48 patients, 9 were periportal fibrosis, 5 Wilson’s disease and obstructive cholangiopathy in 2 patients. Rests 19 were normal.

The complications were seen in 2 patients, both were liver capsule perforation. Liver capsule perforations were noted while injecting the contrast in hepatic vein after the biopsy (Fig. 2A). Both the perforations were sealed off using the gelatin sponge (Abgel) in the same sitting (Fig. 2B). Thus overall complication rate is 1.94%. Rest of the patient underwent the procedure without complications.

DISCUSSION

Dotter did transvenous biopsy of the liver in dogs in 1964. Hanafee and Weenier et al described the transjugular technique for liver biopsy in man in 1967. Rosch J et al published first patient series of transjugular liver biopsy in which percutaneous liver biopsy was
Transjugular liver biopsy is indicated in patients with coagulopathies and/or ascites in whom percutaneous liver biopsy is contraindicated. Coagulation disorder is said to present when the prothrombin time is greater than 3 seconds as compared to the control value and/or platelet count is less than 60,000/cm.

In a study of 932 patients by D Lebrec et al indications were ascites in 96 and/or bleeding disorder in 928. In a series by MacAfee et al in 55 coagulopathy, in 23 ascites and in another 23 combined coagulopathy and ascites were the indications out of 154 indications. In a study by P Corr et al indications were coagulopathy in 36% and ascites in 32% of 200 patients. Smith et al reported coagulopathy in 205, ascites in 36 and combination of coagulopathy and ascites in 81 patients as indication for the procedure. In our study the commonest indication was coagulopathy in 55, followed by ascites in 32 and the combined in 50 patients. Three procedures were carried out because of failed percutaneous route and in 5 because of miscellaneous causes. All these indicate that in the majority transjugular liver biopsy is performed in patients with coagulopathies and/or ascites. Other reported indications are presence of obesity, planned ancillary procedures like pressure measurements and/or hepatic venography, suspected vascular tumour or peliosis hepatic and failed percutaneous liver biopsy.

Several studies were published on transjugular liver biopsy where in, the procedure was done with end-hole needles and an aspiration technique. Draw back with this procedure was smaller size and fragmentation of the tissue samples. Gilmore et al in 1978 and Bull et al in 1983 achieved adequate biopsy specimen in 97% with modified core biopsy needle. Little et al in 1996 and Smith et al in 2003 published their experience with semi automated quick-core biopsy needle in which they achieved adequate biopsy specimen in 98%. Kardache et al in 1997, Choo et al in 2000 and Chau et al in 2002 achieved adequate biopsy specimen in 100% but patients studied were 29, 7 and 18 respectively with the same semiautomated quick-core biopsy needle. Our study of transjugular liver biopsy using quick-core biopsy needle is the second largest study next to Smith et al’s.

Our success in getting adequate tissue 97.2% is comparable with previous studies. Fragmentation and smaller tissue samples seen in 16.78% were in cirrhotic livers, as we encountered 24 samples out of 56 cirrhotic patients. 4 of which were inadequate for diagnosis had small, shrunken, nodular livers on sonography and had clinical diagnosis of cirrhosis.

Gamble et al reported, minor complications like pyrexia with or without rigors, hematoma, bleeding and pain at the puncture site, carotid artery puncture and temporary numbness of the arm and major were cardiac arrhythmias and intra peritoneal hemorrhage. Mortality was reported by Gamble et al, Smith et al and Bull et al. We encountered complication in 2 patients (1.38%); both were liver capsule perforations, which were identified immediately during post biopsy check

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Type of study</th>
<th>No. of patients</th>
<th>No. of biopsies</th>
<th>Type of needle used</th>
<th>No. of technical successes (%)</th>
<th>No. of adequate tissue samples (%)</th>
<th>No. of complications (%)</th>
<th>No. of deaths (%)</th>
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<tbody>
<tr>
<td>Little et al</td>
<td>1996</td>
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<td>Quick-Core</td>
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<td>Quick-Core</td>
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<td>371</td>
<td>410</td>
<td>Quick-Core</td>
<td>370 (99)</td>
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<td>145</td>
<td>143</td>
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<td>143(100)</td>
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Venogram. Liver capsule perforations were sealed with the Agbel particles immediately in the same sitting. Both patients recovered well. The procedures in other patients were uneventful.

Corr et al and Gamble et al's stressed the importance of wedging the catheter centrally on the wall of the right hepatic vein reduces the occurrence of capsular perforation.\textsuperscript{1} The advantages of Transjugular liver biopsy over Percutaneous liver biopsy is its safety in coagulation disorders and ascites, ability to do ancillary procedures like measurement of pressures and opacification of hepatic veins and Inferior venacava, avoiding of potential capsular artifact on histopathology by getting the hepatic tissue from deep inside the liver substance. Disadvantages include needs trained personnel to do, time consuming, costlier, and need for hospitalization and sedation of the patient and smaller biopsy core with fragmentation of the tissue specimen.

In conclusion, Transjugular liver biopsy is a safe procedure in which either percutaneous liver biopsy is contraindicated or failed. Transjugular liver biopsy yields adequate tissue sample for histopathological diagnosis in the vast majority of patients.

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REFERENCES


