Transjugular liver biopsy: a comparison of aspiration and trucut techniques


Abstract: The results of 67 transjugular liver biopsies are described. Two failures were encountered due to inability to pass the needle into acutely angulated hepatic veins. Thirty-four patients underwent a liver aspiration biopsy using a Colapinto needle, while the remainder were biopsied using a trucut needle. The success rate with the Colapinto needle was 68% and with the trucut model, 97%. Capsular perforation occurred in three cases, but without significant morbidity or mortality. It is concluded that the trucut needle biopsy is more reliable than aspiration biopsy, when the transjugular approach is mandated, in obtaining optimal liver tissue for histopathological diagnosis.

A percutaneous biopsy of the liver is contraindicated in the presence of a prothrombin time prolonged more than 3 s over the control, a platelet count of less than 60,000 and ascites (1). Transjugular biopsies, which do not traumatise the liver capsule and reduce the chance of intraperitoneal bleeding, are needed in such cases (2-5). The trucut needle and the Colapinto aspiration biopsy needles are the most commonly used for this procedure. Most centres have used only one type of needle. Others have used a trucut needle if aspiration biopsy failed (6). In this study, the safety and efficacy of the Colapinto and trucut needle transjugular biopsies of the liver are compared.

Patients and methods

During the period August 1994 to October 1996, 67 patients underwent transjugular liver biopsy at the Christian Medical College Hospital, Vellore, India. In two patients, the procedure failed because the biopsy needle could not be passed through an acutely angulated hepatic vein. The first 34 patients underwent aspiration biopsy, during the 18 month period from August 1994 to January 1996; the subsequent 31 patients had trucut biopsies, during the 9 month period from February to October 1996, when these needles became available. Multiple passes were made when necessary.

The clinical features of both groups of patients were comparable (Table 1). The indications for transjugular liver biopsy were prolonged prothrombin time with or without thrombocytopenia or ascites. The right internal jugular vein was entered using the Seldinger technique. A 5 F visceral catheter was passed into the right hepatic vein, which in turn was exchanged for a 9 F covering catheter, which was advanced in the

Table 1. Comparison of study groups

<table>
<thead>
<tr>
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<th>Transjugular aspiration*</th>
<th>Transjugular trucut*</th>
<th>Significance (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>34</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26</td>
<td>20</td>
<td>p=0.50</td>
</tr>
<tr>
<td>Age (years)</td>
<td>36 (15)</td>
<td>40 (13)</td>
<td>p=0.88</td>
</tr>
<tr>
<td>Prothrombin time</td>
<td>4.94 (5.8)</td>
<td>9.1 (7.7)</td>
<td>p=0.03</td>
</tr>
<tr>
<td>prolonged (s)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platelet count</td>
<td>62 (36)</td>
<td>112 (147)</td>
<td>p=0.05</td>
</tr>
<tr>
<td>(1000/mm³)</td>
<td></td>
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<tr>
<td>Ascites (%)</td>
<td>18</td>
<td>19</td>
<td>p=0.48</td>
</tr>
<tr>
<td>Child's score</td>
<td>8.2 (2.0)</td>
<td>8.7 (1.9)</td>
<td>p=0.84</td>
</tr>
</tbody>
</table>

*Results are expressed as mean (SD).
wedged position with gentle pressure. The biopsy needle was advanced within the catheter to its tip and the specimen obtained by aspiration while pushing it into the parenchyma in an antero-inferior direction, and in the case of a trucut needle by activating the gun in the same direction. The needle and the specimen were retrieved leaving the catheter in place to obtain further samples if required. Fluoroscopy and ECG monitoring were maintained throughout the procedure. The biopsy samples were considered "inadequate" both on the basis of sample size and sample content, especially if a complete portal tract was not obtained.

Results

There was no significant statistical difference between the two groups with respect to age, prothrombin time, platelet counts, Child's score or male:female ratio (Table 1).

Biopsy samples were obtained from 65 patients: by aspiration biopsy in 34 and trucut biopsy in 31. In two patients biopsy samples could not be obtained. The adequacy of the sample by the aspiration technique was 68%; 5 out of 20 biopsies, performed during the first half of the period, and 6 out of 14 biopsies, performed during the second half of the period, were inadequate. By the trucut needle 97% of biopsies were adequate ($p<0.01$). There was a significant difference in the size of the biopsy samples obtained by the two techniques (Table 2). The majority (85%) of the patients had clinical evidence of chronic liver disease. The spectrum of liver disease diagnosed on histopathology showed similar predominance for chronic liver disease (Table 2). The complications encountered were supraventricular tachycardia in 22 patients, liver capsular perforations in three (aspiration biopsy), and a haematoma at the site of puncture in one patient (trucut biopsy).

Discussion

The success rate of 68% for aspiration biopsy and 97% for the trucut biopsy were comparable to the studies by Corr et al. (4) and Bull et al. (3). Since the study was sequential a "learning curve" effect cannot be excluded as the cause of increased adequate samples obtained by the trucut biopsy. However, biopsy failures were not the result of failure of catheter passage, but rather the nature of tissue obtained after successful positioning of the catheter. The aspiration biopsy samples were smaller and more fragmented. The trucut biopsies gave, on an average, a larger sample, the difference being statistically significant (Table 2). This has also been the experience of other centres (7, 8).

Three cases had capsular perforations, which were embolised with Gianturco coils during the procedure. Biopsies done with the catheter wedged centrally in the wall of the right hepatic vein may reduce the chance of capsular perforation (9). Transient supraventricular tachycardia, which was encountered in 22 patients, was easily overcome by remanipulation of the guide wire or catheter beyond the right atrium.

The procedure using the trucut needle appeared safer and easier to perform, even though there were no significant complications using either technique. This was primarily related to the presence of a metallic cannula within the covering catheter, allowing easy access into the right hepatic vein without any chance of piercing through the catheter. This metallic cannula does not accommodate the aspiration needle.

In conclusion, a trucut transjugular liver biopsy needle is more reliable than the aspiration needle in terms of ability to obtain unfragmented larger sample of tissue, thereby increasing the diagnostic success rate.

References