

## Transjugular liver biopsy: experience with the trucut needle

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*OBJECTIVES:* We describe the use of transjugular liver biopsy with the automated trucut needle and emphasize the benefits of this procedure in patients with cirrhosis and fibrosis.

*METHODS:* Puncture of the right or left internal jugular vein was performed. A needle was advanced into the right hepatic vein through guides and catheters. Biopsies were obtained from the right liver lobe. Thirty-six transjugular biopsies were performed in 35 patients with clinical diagnosis of hepatopathy; all patients presented contraindication to the standard percutaneous liver biopsy.

*RESULTS:* Out of 36 transjugular liver biopsies, one patient had to repeat the procedure because the initial specimen did not allow diagnosis. In two patients, it was not possible to complete the biopsy due to inability to advance the needle into the right hepatic vein and due to the occurrence of extrasystole; in these cases, the procedure was discontinued. Biopsy was successfully performed in 34 patients (94%), and a conclusive diagnosis was obtained in 32 (89%). There were no relevant complications.

*CONCLUSIONS:* Transjugular liver biopsy allowed histopathological diagnosis in a group of patients presenting contraindications to the standard percutaneous technique. With the trucut needle, it was possible to obtain large, nonfragmented specimens, even in patients with cirrhosis and fibrosis.

*Key-words:* Liver; needles; biopsy needle; transjugular liver biopsy.

### Transjugular liver biopsy: experience with the trucut needle

*OBJETIVOS:* O estudo descreve o uso de biópsia hepática transjugular com a agulha trucut automatizada e salienta os benefícios deste procedimento em pacientes com cirrose e fibrose hepática.

*Métodos:* Foi realizada punção da veia jugular interna direita ou esquerda. Através de fio guia e cateteres, uma agulha foi introduzida na veia hepática direita. As biópsias foram realizadas no lobo direito do fígado. Trinta e seis biópsias hepáticas transjugulares foram realizadas em 35 pacientes com diagnóstico clínico de hepatopatia; todos os pacientes apresentavam contra-indicação à biópsia hepática percutânea.

*RESULTADOS:* Das 36 biópsias hepáticas transjugulares, um paciente precisou repetir o procedimento porque a amostra inicial não permitiu um diagnóstico conclusivo. Em

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*dois pacientes, não foi possível completar a biópsia devido à impossibilidade de passar a agulha para a veia hepática direita e devido à ocorrência de extra-sístole; os procedimentos foram suspensos em ambos os casos. A biópsia foi efetuada com sucesso em 34 pacientes (94%), e um diagnóstico conclusivo foi obtido em 32 (89%). Não tivemos nenhuma complicação relevante.*

*CONCLUSÕES: A biópsia hepática transjugular permitiu o diagnóstico histopatológico em um grupo de pacientes que apresentava contra-indicação à biópsia hepática percutânea. Com a agulha trucut, foi possível obter amostras maiores, não fragmentadas, mesmo em pacientes com cirrose e fibrose.*

*Unitermos: Fígado; agulhas; biópsia por agulha; biópsia hepática transjugular.*

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## Introduction

Liver biopsy is a very important method in the investigation of hepatopathies, and it has an essential role in the diagnosis of liver disease. Through liver biopsy, it is possible to determine liver activity and the staging of disorders, and the technique also serves to guide treatment decisions and to assess treatment efficacy (1,2). These considerations have led several authors to develop different techniques for liver biopsy (3-7). The choice of the most adequate method will depend on the patient's conditions and on the availability of material and personnel.

The use of transjugular liver biopsy is limited to certain indications, although in general the indications for transjugular liver biopsy are the same as for percutaneous liver biopsy (8). Thus, the transjugular liver biopsy becomes an important alternative whenever the standard technique poses risks for the patient; the main contraindications for the percutaneous liver biopsy are coagulation disorders and massive ascites.

The first transjugular liver biopsies were performed experimentally in 1964 by Charles Dotter (9). Many aspects of the procedure have evolved since its initial description, especially in terms of adequacy of specimens for histopathological study (3,10-14). The trucut needle was introduced with the aim of obtaining larger specimens (10,12) and avoiding the excessive fragmentation found in aspiration biopsies (4,10), so the efficacy of this method and the quality of specimens yielded may be compared to those obtained with percutaneous liver biopsy using the trucut needle.

The objective of this work was to show our experience and the results we found with the performance of transjugular liver biopsies using the automated trucut needle in a group of patients presenting hepatopathies.

## Materials and methods

The present study was carried out at Hospital São José (Irmandade da Santa Casa de Misericórdia de Porto Alegre) in the city of Porto Alegre, Brazil, with all adult patients submitted to transjugular liver biopsy between August 1997 and April 2001. A total of 36 transjugular liver biopsies were performed in 35 patients during this period. Of these patients, 20 (57%) were males and 15 (43%) were females; age ranged from 18 to 73 years.

All the patients were submitted to the same protocol, remained hospitalized for a minimum of 12 hours after the procedure, and signed an informed consent form. The study protocol was approved by the Ethics Committee of the hospital.

Biopsy consisted of puncture of the right internal jugular vein (IJV); in two cases, the left vein was used. Guides, catheters, and needle were advanced into the right hepatic vein (RHV). All specimens were analyzed by the same pathologist (CTSC) at a teaching hospital in the city of Porto Alegre (Hospital de Clínicas de Porto Alegre).

## Results

From the 36 transjugular liver biopsies performed with the automated trucut needle in 35 patients, one had to repeat the procedure because the initial specimen presented only one

portal triad and therefore did not allow a conclusive diagnosis to be reached. In two patients, it was not possible to advance the needle into the RHV, and extrasystole occurred; the procedures were discontinued in both cases. Thus, biopsy was completed in 34 patients (94%).

Diagnosis was possible in 32 patients (89%). In the two cases that did not allow diagnosis, the reasons were inadequate specimen (only one portal triad) and absence of liver tissue (the specimen was obtained from the wall of the RHV). Specimen length ranged from 0.2 to 2.0 cm (mean = 1.2 cm). The number of portal triads ranged from 1 to 21 (mean = 8.8).

There were no severe complications in our group. Two patients presented extrasystole during the procedure, which was reverted as soon as the catheter and the guide were removed. Three patients presented capsular perforation and one presented collection of contrast medium in the liver parenchyma; however, symptoms were no longer present after the procedure. One patient developed a hematoma in the liver parenchyma; this patient presented mild abdominal pain until the following day.

## Discussion

Most studies about transjugular liver biopsy have been carried out with the conventional aspiration technique, using the modified Ross or the Colapinto needles, and the samples have usually been small (10). According to Gilmore et al. (12), the transjugular liver biopsy with aspiration needles has not been widely adopted because the procedure is considered technically difficult and because the specimens are usually smaller and more fragmented when compared to those obtained percutaneously with the trucut needle, especially in patients with fibrosis and cirrhosis (4,10,12,15). This needle was first advocated by Gilmore et al. (12), and consisted of the association between a modified Vim-Silverman's needle (trucut) and a 50-cm long flexible coaxial cable (used in endoscopic forceps biopsies), which allowed proximal operation.

Some time later, with the association of the trucut needle with an automated system for transjugular liver biopsy, important advantages were incorporated. Specimens were larger and less fragmented, which increased the possibility of obtaining histopathological diagnosis (16).

Parker et al. (17), Bernardino (18), and Hopper et al. (19) mentioned that when using the automated needle system, a single biopsy may be sufficient to obtain an adequate specimen, thus reducing the duration of the procedure. Specific training is not required, as it is required in the case of tissue aspiration. In addition, the authors believe that the movements performed during aspiration may cause trauma and complications. In turn, transjugular liver biopsy with the trucut needle yields better-quality and more uniform samples, due to the standardized movement of the needle. The authors also mention that specimens obtained with this method contain less blood, differently from those obtained with the aspiration technique (17-19).

Colombo et al. (20) compared the diagnostic results of percutaneous liver biopsy performed with the trucut and the Menghini needles in 1,192 patients presenting diffuse hepatic disease. The authors obtained adequate specimens in 94% of the cases in which the trucut needle had been used and in 79.2% of the cases in which the Menghini needle had been used ( $P < 0.0001$ ). A diagnostic accuracy of 89.5% was obtained in cases of cirrhosis when using the trucut needle; with the Menghini needle, this value was 65.5% ( $P < 0.05$ ).

Sada et al. (21) performed 65 transjugular liver biopsies in 67 patients. Thirty-four patients underwent the aspiration technique, and 31 underwent the trucut needle system. Specimens obtained with aspiration biopsy were smaller and more fragmented. Although the authors do not specifically mention the length of the specimens, they report that those obtained with the trucut needle were significantly larger.

De Hoyos et al. (22) performed transjugular liver biopsy with the trucut needle in 52 patients and reported a 94.2% success rate (49 patients), with no fragmentation of specimens, even in cases of patients with cirrhosis or fibrosis.

In our study, the length of liver specimens of patients with and without cirrhosis did not present a statistically significant difference ( $p = 0.516$ ). So, the tendency of liver biopsy specimens to be small or fragmented, especially in cases of fibrosis or cirrhosis, was eliminated with the use of the trucut needle (20,21).

We agree with Lebrec et al. (23) in that transjugular liver biopsy is a very important procedure in hepatology departments. It is more

complex than the percutaneous liver biopsy. However, the radiologists involved in this technique do not consider the method very complex (24).

Although percutaneous liver biopsy is likely to remain as the standard method for liver biopsies, transjugular liver biopsy with the trucut needle offers a specific group of patients the possibility of establishing diagnosis and choosing the most adequate treatment.

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