Evaluation of Liver Biopsies in Children

Sinasi Özsoylu[1], Nurten Koçak[2], Mustafa H. Gürsoy[3]

[1]Retired Professor of Pediatrics, Hematology and Hepatology.
[2]Retired Professor of Pediatris and Hepatology.
[3]Pediatric Surgeon

ABSTRACT

Percutaneous liver needle biopsies were carried out on 947 children with the age range of 3 hours to 17 years. Vim-Silverman needle was used mainly for the microscopic examination of the organ. It is proved to be safe, easy, and adequate method for the architectural examination of the liver.

Key words: Liver biopsy, children

INTRODUCTION

Liver diseases are unfortunately fairly frequent among Turkish children (1). In the evaluation of these patients, liver needle biopsy one of the most important diagnostic procedures was carried out on 947 children during the 10-year period. Therefore, we thought it would be worth discussing our fairly large experience on this topic.

MATERIALS AND METHODS

Liver needle biopsies were carried out on 947 children, with ages ranging from 3 hours to 17 years; 631 (66.6%) were males and 316 females. A total of 117 children (12.34%) were younger than 3.5 months of age and 636 (67.15%) were older than 24 months of age (Table 1). Almost all of the biopsies were obtained by one of the authors (N.K). The most important factors considered in the performance of needle biopsy were prothrombin time and partial thromboplastin time. In addition to marked thrombocytopenia (<80.000/μL), very prolonged prothrombin time (>20 s; N: 12 s) and partial thromboplastin time (>120 s; N: 120 s) were accepted as contraindications. The blood group was determined,and blood was made ready for transfusion for each patient.

Prior to obtaining biopsy, 1 mL/10 kg cardiology cocktail (Dilantin 35 mg + Largactil 25 mg + Antihistin 3 mg/mL) was given subcutaneously. With a very few exception, all the liver biopsies were carried out subcostally from the right lobe in patients with enlarged liver. Biopsies were performed with patients in the supine position. Skin, subcutaneous tissue, muscles, and peritoneum were infiltrated with the local anesthetic (cytanest or procainamide 1%, 1 mL at most). Vim-Silverman needle (short trocar and cannula) was introduced until the needle reached the liver. Then, trocar was removed and the 1 cm long biopsy punched out by the introduction of a longer cannula split longitudinally that turned around to cut the liver piece. Biopsied liver was withdrawn through the cannula. If the liver tissue was not obtained (rarely occurred) from the same cannula, it was tried once more. A subxiphoid approach was used on seven occasions. There was no hesitation making an immediate second effort to procure a suitable specimen if the original yield appeared to be grossly unsuitable or when the tissue was needed for enzyme studies.

Correspondence:
Sinasi Özsoylu
Retired Professor of Hematology, Hepatology and Pediatrics.
e-mail: sinasiozsoylu@hotmail.com

Table 1: Age and sex distribution with a frequency of nonrepresentative biopsies.

	Sex			Nonrepresentative	Representative
Age	Male	Female	Total		
≤3.5 mo.	78 (66.6%)	39	117	2 (1.68%)	115
>3.5 mo ≤24 mo	135 (69.6%)	59	194	6 (3.09%)	188
>24 mo	418 (65.7%)	218	636	19 (2.99%)	617
Total	631 (66.6%)	316	947	27 (2.85%)	920

Table 2: Complications observed.

	Age groups		
Complications	≤3.5 mo	>3.5 mo ≤24 mo	>24 mo
Local hematoma and ecchymoses			3
Tachycardia	4	2	2
Drop of Hct	2	1	
Discharge of ascites		1	
Perforation of gallbladder			1
Heart failure	2		

After obtaining the biopsy, the patient was kept on bed on his right side with a sandbag placed over the needle biopsy site. Pulse and blood pressure were checked every 15 minutes for an hour, every half an hour for two hours, then every 3 hours for a period of 12 hours. Hemoglobin concentrations were determined within 6 hours of biopsy. The diet was resumed within 3 hours if no distress was observed.

RESULTS

A total of 960 biopsy attempts were made in 947 cases (with 2.9% failure). The distribution of these biopsies according to age groups is shown in Table 1. The most frequent complications related to biopsy were local hematoma and ecchymoses that occurred in three patients, all older than 24 months. The perforation of gallbladder and discharge of ascetic fluid were observed each in one case. Blood transfusions were given to 11 patients because of tachycardia in 8 (6 of whom were in the youngest age group) and drop of hematocrit in 3 cases (Table 2). The most frequent attempts were three times in one patient in whom the first two were not adequate. The youngest patient was a three-hour-old baby in whom large hepatosplenomegaly was not related to hemolytic anemia, and reticulum cell storage disease was suspected from the bone marrow examination.

In the youngest age group, biopsies revealed neonatal hepatitis (2) in 71 cases, secondary biliary cirrhosis in 13 cases, biliary atresia in 6 cases, marked cholestasis in 6 cases, malignancy in 2 cases, and congenital toxoplasmosis (2) in another 2 cases. In the oldest age group, liver biopsies were obtained more frequently from patients with cirrhosis (235 cases) followed by patients with prolonged hepatitis (226 cases; 106 of which were diagnosed as chronic hepatitis) (3), glycogenosis (22 cases), lipidosis (11 cases) (4,5), steathosis (7 cases), and kala-azar (6 cases) (6,7). Hepatitis (64 cases; reactive hepatitis is the most frequent), cirrhosis (29 cases), glycogenosis (23 cases), steathosis (22 cases), and lipidosis (6 cases) were the frequent causes of liver biopsies in patients with the age range of 3.5 to 24 months (Table 3).

COMMENTS

The diagnosis and prognosis are largely dependent on the microscopic examination of the liver. When diagnosis is doubtful, treatment, advice, and prognosis are bound to be hesitant. Perhaps, in consequence, the handling of the patients might be ineffective. Although the open liver biopsy has been advised by the Textbook of Pediatric Gastroenterology (20), we believe that needle liver biopsy is a safe, easy, and adequate method of architectural examination of the liver. Although one cannot deny the potential risk of this procedure,

Table 3: Major diagnosis of the patients verified by the histological examinations.

	Age of the patients		
Diagnosis	≤3.5 mo	>3.5 mo ≤24 mo	>24 mo
HEPATITIS	71	64	226
Neonatal	42	6	-
Cholestatic	13	5	6
Reactive (8)	6	17	37
Viral (9)	1 (cytomegalovirus)	14	30
CHRONIC		9	66
Aggressive		3	26
Persistent			13
Granulomatous		2	11
OTHERS	9	8	37
CIRRHOSIS	16	11	235
Biliary (Secondary)	13	5	2
Cryptogenic	2	5	85
Postnecrotic	1	1	100
Portal			13
METABOLIC			
Hepatolenticular			25
Glycogenosis			1
Sea-blue histiocytosis			2
Tirosinosis (10)			1
Familial (11,12)			6
METABOLIC		29	30
DISORDERS		23	22
Glycogenosis			3
Niemann-Pick		2	3
Gaucher			2
Sea blue histiocytosis		22	7
Fatty liver	1	4	6
Kala-azar		3	6
Veno-occlusive disease	2	1	1
Malignancy			
Cystic disease of the liver and kidney		1	4
Congenital hepatic fibrosis			3
Benign recurrent intrahepatic cholestasis (13)			2
Others (14-18)	23	47	51
No disease	2	6	46
Nonrepresentative	2	6	19

it is safe if care is taken in selecting patients and carrying out the procedure as shown in our results. It does not carry the risk of general anesthesia of an open liver biopsy in patients with hepatocellular disease. We do not agree with the statement that percutaneous liver biopsies may not only limit the number of special studies but may miss the diagnosis of congenital hepatic fibrosis; the last diagnosis was made in at least four of our cases using liver needle biopsy.

The cooperation of the patient is hoped for but was not observed in most of our pediatric patients. We believe that the method of holding the patient is most important. The patients with marked thrombocytopenia were avoided. Severe hypoprothrombinemia was corrected to a certain degree by intravenous administration of vitamin K (5 mg at most) and by plasma transfusion before the performances of biopsies. The reduction of ascites was obtained in most cases by diuretic treatment. Bile discharge through a cannula occurred in cases with deep jaundice, but no bile fistula or bile peritonitis was observed in any of them. However, we agree that it should not be performed in the presence of deep jaundice. A subxiphoid approach was used successfully on seven occasions, but we still prefer the right lobe of the liver because it is easier to obtain a specimen. Although, enough material was obtained in a very large percentage of the patients, we did not hesitate in making an immediate second and rarely third effort to procure a suitable specimen if the previous attempts appeared to be grossly unsuitable.

In a recent report, the results of Tru-cut needle biopsies were compared with those of Menghini needle biopsies (19). Other types of needles were not available for our biopsies, but our experience with the Vim-Silverman needle demonstrated that they were good and safe in children.

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From the Hacettepe University, Faculty of Medicine, Department of Pediatrics, Section of Hepatology and Hacettepe Childrens Hospital, Medical Center, Ankara, Turkey.

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