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Liver Needle Biopsy in Children*

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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 procedure, was carried out on 947 children during the 10 year period between January 1968 and December 1977. 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. One hundred and seventeen (12.34 %) were younger than 3.5 months of age and 636 (67.15 %) were older than 24 months of age (Table I). 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 sec; N: 12 sec) and partial thromboplastin time (> 120 sec; N: 120 sec) were accepted as contraindications. Blood group was determined and blood was made ready for transfusion for each patient.

Prior to obtaining biopsy 1 ml/10 kg. Cardiology cocktail (Dolantin 35 mg+Largactyl 25 mg + 3 mg antihistin/ml) was given subcutaneously

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With very few exception all the liver biopsies were carried out in patients with enlarged liver subcostally from the right lobe. It was carried out when the patients were in supine position. Skin, subcutaneous tissue, muscles and peritoneum were infiltrated by the local anesthetic (cytanest or procanamide 1 %, 1 ml at most). Then Vim-Silverman needle (short trocar and cannula) was introduced till the needle was in the liver. Then trocar was removed and the 1 cm long biopsy punched out by the introduction of a longer cannula split longitudinally which turned around to cut the liver piece. Biopsied liver was withdrawn through the cannula. If the liver tissue was not obtained (rarely occured) from the same cannula it was tried once more. Subxiphoid approach was used on 7 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.

After obtaining the biopsy patient was kept in 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 controls were carried out within 6 hrs of biopsy. The diet was resumed within 3 hours if no distress was observed.

Results

Ninehundreds sixty liver biopsies were obtained from 947 patients. In 27 (2.85 %) patients it was not found represantative. The distribution of these biopsies according to age groups are shown in Table I. The most frequent complication related to biopsy was local hematoma and ecchymoses which occured in 3 patients, all older than 24 months. The perforation of gallbladder, discharge of ascitic fluid were observed each in one case. Blood transfusions were given to 11 patients because of tachycardia in 8 (6 of whom were in youngest age group) and drop of hematocrit in three cases (Table II). The most frequent attempts were three times in one patient in whom the first two were not adequate. The youngest patient was a three hours 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 and secondary biliary cirrhosis in 13, biliary atresia in 6 and marked cholestasis in 6, malignancy in 2 and congenital toxoplasmosis[2] in another two cases. In the oldest age group liver biopsies were obtained more frequently from patients with cirrhosis (235 cases) then from the

TABLE I

AGE AND SEX DISTRIBUTION WITH FREQUENCY NON-REPRESENTATIVE BIOPSIES

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

TABLE II

COMPLICATIONS OBSERVED

Complications	Age Groups ⩽ 3.5 mos.	3.5 mos. > ⩽ 24 mos.	> 24 mos.
Local Hematoma and Ecchymoses			3
Tachycardia	4	2	2
Drop of Hct	2	1	
Discharge of Ascites		1	
Perforation of Gall Bladder			1
Heart Failure	2		

patients with prolonged hepatitis (226 cases; 106 of which were diagnosed as chronic hepatitis)[3] glycogenosis in (22 cases) and lipidosis[4,5] (in 11 cases) steathosis (in 7 cases) and kala-azar[6,7] (6 cases). Hepatitis (in 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 and 24 months. (Table III).

TABLE III

MAJOR DIAGNOSIS OF THE PATIENTS VERIFIED BY THE HISTOLOGICAL EXAMINATIONS

Diagnosis	Ages of the Patients ⩽ 3.5 mos.	> 3.5 mos. ⩽ 24 mos.	> 24 mos.
HEPATITIS	71	64	226
Neonatal	42	6	
Cholestatic	13	5	6
Reactive[8]	6	17	37
Viral[9]	1 (cytomegolovirus)	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 DISORDERS		29	30
Glycogenosis		23	22
Niemann-Pick			3
Gaucher		2	3
Sea blue histiocytosis			2
Fatty Liver		22	7
Kala-Azar	1	4	6
Veno occlusive Disease		3	6
Malignancy	2	1	1
Cystic Disease of the Liver & Kidney			4
Congenital Hepatic Fibrosis		1	3
Benign Recurrent Intrahepatic Cholestasis[13]			2
Others[14-18]	23	47	51
No Disease	2	6	46
Nonrepresantative	2	6	19

Comments

The diagnosis and prognosis are largely dependent upon the microscopic examination of the liver. When diagnosis is doubtful, treatment, advise, prognosis are apt to be hesitant. Perhaps, in consequence, the handling of the patients might be ineffective. Although, the opened liver biopsy has been advised by a textbook of Pediatric Gastroenterology[20] we believe that needle liver biopsy is safe, easy and an adequate method of architectural examination of the liver. This is not to deny the potential risk of this procedure; however, as seen from our results it was safe if care is taken in selecting the patients and carrying out the procedure. 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 percutaneus 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 4 of our cases by 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 are 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 the cannula occured 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 if the deep jaundice is present. Subxiphoid approach was used successfully on 7 occasions but we still prefer the right lobe of liver because it is easier to obtain a specimen. Although, enough material was obtained in very large percentage of the patients we did not hesitate in making an immediate second and rarely third effort to procure a suitable specimen of the previous attempts appeared to be grossly unsuitable.

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

Summary

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.

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