

II. PEDIATRICS

THE ECHOGRAPHICAL EXAMINATION IN CHILD CHOLESTATIC SYNDROME

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Summary

The sonographical exploration of the child cholestatic jaundice brings its real contribution to diagnosis when the children's age and pathology particularities are taken into account by the sonographer.

The patients group with cholestatic syndrome taken into study is significant (20 cases) and the diagnostic criteria (clinical examination and laboratory tests) are scientifically and accurate argued.

The abdominal echographical examination completed with the Doppler techniques of pulsatory emission and colour codified, made sensitively evident specific paediatric diseases such as: bile cyst stone, bile cyst hydrops, cholestatic chronic hepatitis, biliary atresia, choledochocyst etc.

Through the supplied informations, the ultrasonography has become the essential method for the child hepatic disease, allowing in the same time the dynamical supervision of the existing pathological elements. The Doppler techniques have a remarkable contribution and prove a very high accuracy in the etiological diagnosis of the cholestatic syndrome in Pediatrics.

Key words: cholestatic syndrome, liver diseases, child, abdominal echography, Doppler techniques

Introduction

The appearance and the development of the ultrasonography has improved the study of the child cholestatic syndrome, with the mention of informing the sonographer of the age and pathology particularities.

The cholestatic jaundice sonographical examination must include a liver, biliary tract and the proximity organs global examination, and must indicate: the liver size and structure, the intra- and extra hepatic bile tract size and appearance, the bile cyst size and the wall thickness, the pancreas and spleen appearance, the evidence of the portal hypertension signs.

Thus, the ultrasonography became the lead method for the bile cyst and biliary tract visualization, having a high accuracy for the obstructive feature specification of

the icteric syndrome and in the differentiation between intra- and extra hepatic cholestasis.

Material and method

The study was performed in the Pediatrics Clinic II Timisoara during a period of 5 years (1997-2002), on a 20 cases group with cholestatic syndrome. The cases selection was made on the basis of the well defined clinical and laboratory criteria:

-Clinical manifestations: nausea, vomiting, flatulence, right hypochondrium pains, pruritus, hyperchrome urines, acholic stools, fever, asthenia, jaundice.

-Laboratory investigations:

- Enzyme tests (SGOT, SGPT, LDH, Alkaline phosphatase, γ GT, $\pm\alpha$ fetoprotein)
- Biochemical tests (bilirubin, serum iron, cholesterol, triglycerides, electrophoresis, PT);
- Hematological tests
- Immunological tests: immunoassay, viral markers, antinuclear antibodies, specific antibodies for hepatitis, cytomegalovirus and mononucleosis
- Cholecystoangiography was performed at 5 subjects
- Fibroscopy was performed in 2 cases
- Computerized tomography was needed in 5 cases
- Hepatic bioptic puncture was performed on an empty stomach, after a premedication administrated to prevent abdominal meteorism, using 3.5 and 5 MHz probes upon the size of abdomen and the explored zone. We used pulsing and color mapping Doppler method to differentiate biliary ducts of blood vessels

Results

Sex and age distribution of the cases are represented in Fig. 1 and Fig. 2:

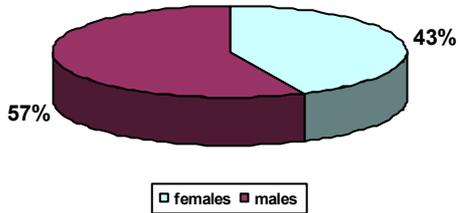


Fig. 1. Sex distribution of the patients.

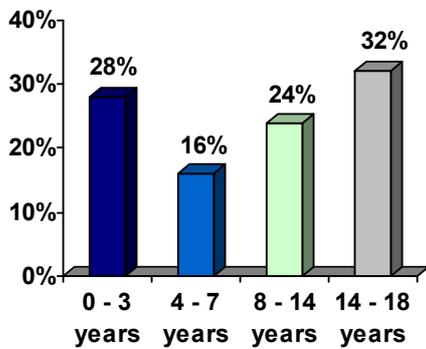


Fig. 2. Age distribution of the patients.

The echographic classification of the diseases was: 6 cases with vesicular pathology, 14 cases with primary impairment of the biliary tracts.

Obstructive pathology of the biliary system revealed: 4 children with vesicular lithiasis, 2 cases with

vesicular hydrops, 6 cases with chronic cholestatic hepatitis, 2 patients with biliary atresia, 4 cases with neonatal hepatitis, 1 case with choledocal cyst, 1 case with primary sclerotic cholangitis.

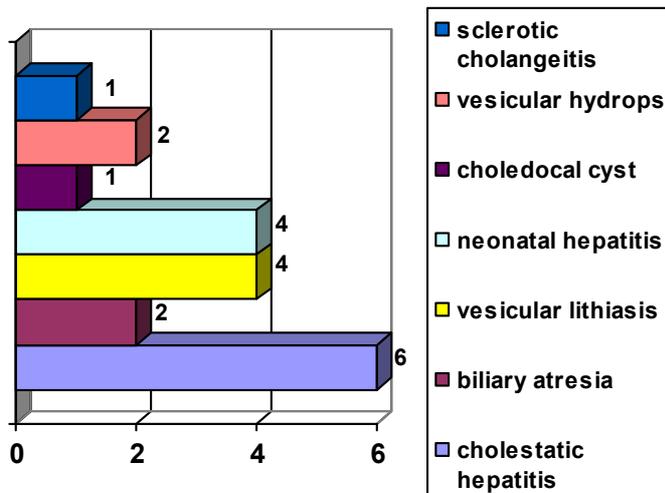


Fig.3. Classification on morbidities.

Using Doppler techniques we could perform a precise differentiation of the biliary tract dilatation from the venous or arterial dilatations.

Color Doppler ultrasonography visualized the specific venous and arterial blood flow, the direction,

velocity and turbulence of the sanguine flow through | different colors.

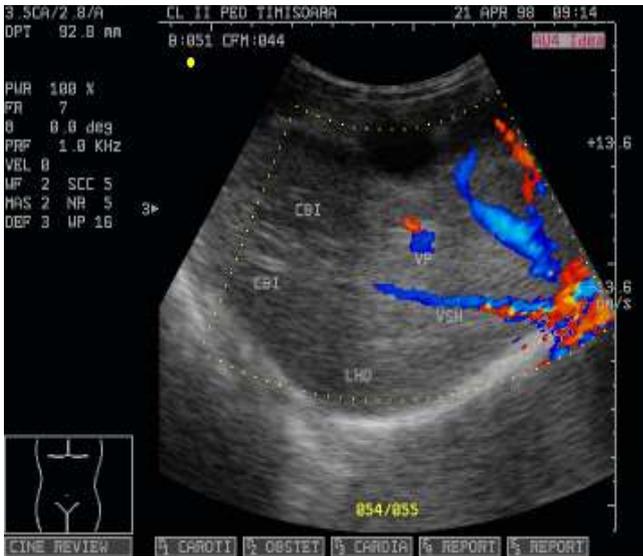


Fig.4 Doppler techniques for the diagnosis of the biliary tract dilatation from the venous or arterial dilatations

The dilated intrahepatic biliary tracts had been visualized as tubular elongated images, with hiperreflective walls, parallel with the intrahepatic port branches, which converged thru the hill, without Doppler pulsations and no color.

The liver is easy to visualize due to his topographic position, and it must be explored entirely on the screen. To perform a precise localization of the pathologic elements it is very useful the segment division of the liver lobes.

We obtained the following echographic aspects:

1. In the vesicular lithiasis we visualized hyperechogenic images with declive localization, with posterior shadow conus, mobile with patient position. We met solitary or multiple calculi. The biliary vesicle wall was hyperechogenic, over 3 mm thick, dilated and torsioned. The precision of ultrasonography to diagnose lithiasis is approximately 95%. In one case we noticed the migration of a 3 mm wide calculi in choledocus, which dilated the biliary extrahepatic vessels.



Fig.5 Vesicular lithiasis

2. Vesicular hydrops was defined by an augmentation of the cholecystic volume with the diameters over 10/4 cm, resulting in a globular shape,

with hyperechogenic images in the infundibular region double contoured ticked wall, with focal hypoechogenities (micro abscesses) or focal hyperechogenities

(hemorrhages, necrosis) and irregularities of the wall contour (ulceration) with floating intraluminal membranes

and sludge. The Murphi sign was positive.

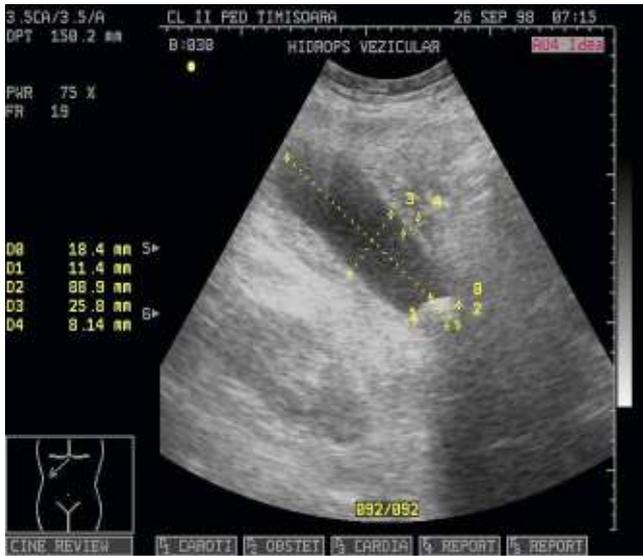


Fig.6 Vesicular hydrops

3. Cholestatic chronic hepatitis presented: hepatomegaly with nonhomogenous structure, marked hyperechogenicity with posterior attenuation, intrahepatic

dilated biliary vessels, different grades of splenomegaly, shape and parietal modifications of the cholecyst.



Fig. 7 Intrahepatic cholestasis. Right subcostal oblique sonogram.



Fig. 8 Common biliary duct dilated. Right oblique sonogram.



Fig. 9 Dilated intrahepatic biliary tract. Right oblique sonogram.

4. Biliary atresia was discovered in one new born with severe progressive cholestatic jaundice, who presented dilated intrahepatic biliary vessels being impossible to visualize the lumen of the main biliary way and cholecyst.

5. The choledocal cyst clinically presented transient episodes of pain and jaundice and was illustrated

through a marked pseudocystic choledocal dilatation, generating the aspect of choledochocel. In one case we noticed segmental cystic dilatations of the intrahepatic biliary vessels (Caroli disease).

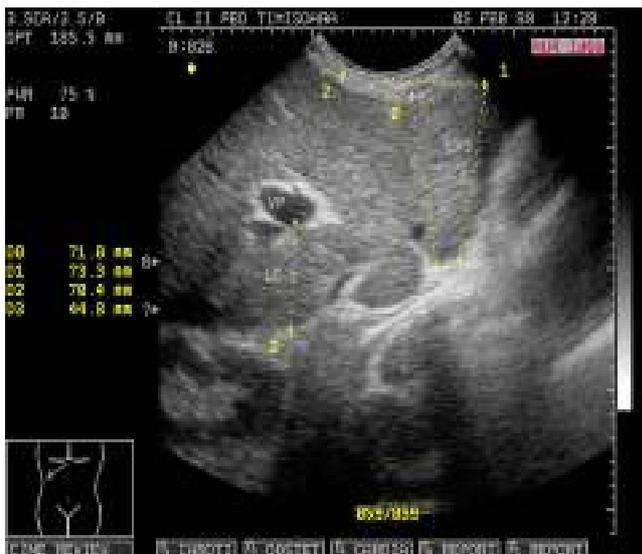


Fig.10 Choledocal cyst

6. Idiopathic sclerotic cholangitis was identified through the thickness of the intra- and extrahepatic vessel

walls, with doubled contour and narrowing of the main biliary way lumen and an increased periportal echogenity.

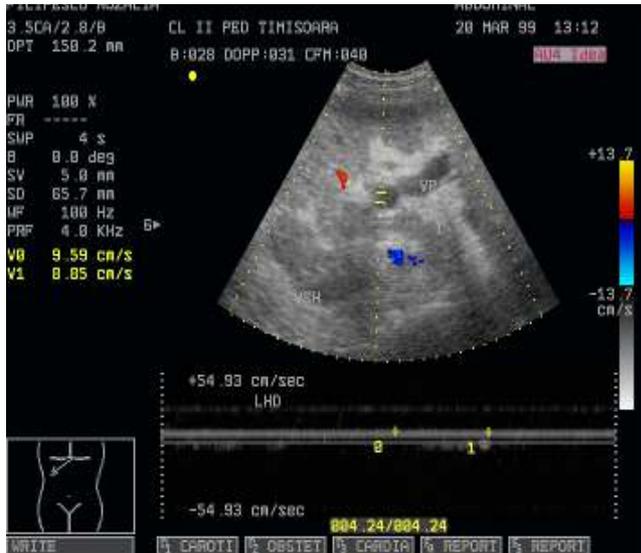


Fig.11 Cholangitis

Conclusions

1. Ultrasonography became the main method to evaluate children's liver disease, permitting a dynamic surveillance of the existing pathological elements.

2. Echography is as efficient as the new imagistic techniques to evaluate the children's cholestatic syndrome. It is preferred because has no invasiveness, can be repeated and has a low cost.

3. It also permit echographic guided biopsy of the liver formations and the histopathological examination confirms the diagnosis.

4. Using ultrasonography for the cholecyst pathology we can describe: position, shape and volume anomalies, focal or diffuse modifications of cholecyst content or wall, the biliary obstruction site: intrahepatic or extra hepatic cholestasis.

5. Doppler techniques are more accurate to describe biliary tract dilatations of venous or arterial dilatations.

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