

# 高频彩色多普勒超声在诊断小儿胆道闭锁中的应用

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**【摘要】 目的** 分析儿童胆道闭锁中的超声图像特征,探讨高频彩色多普勒超声在早期诊断胆道闭锁中的应用价值。**方法** 回顾性分析 46 例经手术及病理确诊的胆道闭锁患儿术前超声图像资料,结合术中病理结果,分析高频彩色多普勒超声时提示肝脏大小及内回声情况,胆囊显示率及胆囊大小、形态,肝门区结构,肝动脉内径及血流频谱特征的作用,评估其早期诊断价值。**结果** 术前超声提示肝脏形态增大,肝内回声改变 24 例(52%),胆囊长径 < 15 mm 20 例,胆囊长径 > 15 mm 18 例,胆囊未显示 2 例,胆囊显示欠清(考虑裂隙样胆囊)6 例。超声提示肝门部纤维块 42 例,2 例 MRI 提示胆道闭锁,2 例超声提示肝门部小囊腔。肝动脉内径 2.2 ~ 2.8 mm,均值 2.4 mm。肝动脉频谱为高速高阻血流,PSV:77 ~ 123 cm/s,RI:0.89 ~ 0.96。**结论** 胆囊形态及肝门部纤维块是超声诊断胆道闭锁的重要征象,综合分析肝脏形态及肝动脉内径与频谱特征对早期诊断小儿胆道闭锁具有一定价值。

**【关键词】** 高频彩色多普勒超声;胆道闭锁;胆囊;肝门部纤维块;肝脏形态;肝动脉

## Application of high frequency color Doppler ultrasound in the diagnosis of biliary atresia in children.

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**【Abstract】 Objective** To analyze the ultrasound imaging characteristics of infantile biliary atresia, and to discuss high frequency colour ultrasound imaging in the early diagnosis of biliary atresia. **Methods** 46 cases confirmed by surgery and pathology were retrospectively analyzed biliary atresia with preoperative ultrasound image data, combined with intraoperative and pathological findings, Comprehensive analysis of ultrasound in liver size and inner conditions of the echo, the detection rate of gallbladder and gallbladder size and shape, liver structure, hepatic artery diameter and blood flow spectrum features, and evaluate the early diagnostic value. **Results** Preoperative ultrasound showed increase liver morphology, 24 cases (52%) of the echo change in the liver. There are 2 cases of Gallbladder is not displayed, 6 cases of gallbladder show less clear (with crack sample gallbladder), 20 cases of gallbladder length to diameter < 15 mm with, and 18 cases of gallbladder length to diameter > 15 mm children. Ultrasonic indicated that liver fiber piece of 42 cases of portal vein, 2 cases MRI suggested biliary atresia, 2 cases of ultrasonic hint antrum of hepatic portal vein capsule. Hepatic artery diameter 2.2 ~ 2.8 mm, the average of 2.4 mm. Hepatic arterial spectrum for high-speed, high resistance of blood flow, PSV:77 ~ 123 cm/s, RI: 0.89 to 0.96. **Conclusions** Gallbladder morphology and hepatic portal vein fiber is one of the important signs of ultrasonic diagnosis of biliary atresia, integrated application of the liver and hepatic artery diameter and spectrum characteristics has certain value for early diagnosis of infantile biliary atresia.

**【Key words】** The high frequency exceeds; Biliary atresia; The gallbladder; Hepatic portal vein fiber; The liver form; The hepatic artery

### 胆道闭锁(biliary atresia, BA)的病因和发病机

制不明,是先天性发育障碍所致的胆道梗阻,病变多累及整个胆道,也可仅累及部分胆管<sup>[1]</sup>。是小婴儿阻塞性黄疸的主要病因,早期与婴儿肝炎综合征较难鉴别,晚期可出现胆汁性肝硬化,愈后较差。尽早明确诊断,早期手术对胆道闭锁的愈后至关重要<sup>[2]</sup>。本研究回顾性分析 46 例经手术及病理检查

doi:10.3969/j.issn.1671-6353.2017.01.021

基金项目:广东省卫生厅 A2013519 超声斑点追踪技术评价妊娠糖尿病胎儿心室局部收缩功能

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确诊的胆道闭锁患儿术前超声图像资料,探讨高频超声检查在早期诊断胆道闭锁中的价值。

## 结果

### 材料与方 法

#### 一、研究对象

回顾性分析 2014 年 1 月至 2014 年 12 月由本院诊断并经手术及病理检查确诊的胆道闭锁患儿 46 例,其中男性 26 例,女性 20 例,年龄 30 ~ 121 d,平均年龄 56 d。临床表现为黄疸进行性加重,伴有淡黄色甚至白陶土样大便,疑诊为阻塞性黄疸。均于术前行常规超声检查,图像资料完整。

#### 二、仪器及方法

采用 TOSHIBA SSA-790A 和 SIEMENS ACUSON2000 型彩色多普勒超声诊断仪,高频线阵探头频率 10 ~ 12 MHz。检查方法:检查当日空腹 4 ~ 6 h,哭闹不合作时给予患儿口服 10% 水合氯醛,剂量为 0.7 mL/kg,行术前肝胆常规超声检查,观察肝脏大小及内部回声,胆囊形态及大小,肝动脉内径及频谱测量,重点观察肝门部纤维块情况。

#### 一、肝脏大小及内部回声

24 例提示肝脏增大,内回声增粗,其中 2 例可见少量腹腔积液。22 例超声检查肝脏未见明显异常。术后病理检查结果:16 例提示肝脏早期损害,30 例提示肝脏中期损害。

#### 二、胆囊大小及形态,空腹及餐后半小时变化

2 例未见胆囊(胆囊不显示),6 例胆囊呈裂隙状,20 例小胆囊(胆囊长径 < 1.5 cm),18 例大胆囊(胆囊长径 > 1.5 cm),形态僵硬,不规则,餐后半小时胆囊大小无明显改变。其中 6 例可见肝门区小囊。术后病理检查结果:36 例胆囊发育不良。

#### 三、肝门部纤维块

42 例超声检查可见肝门部纤维块,2 例 MRI 提示 BA,2 例提示肝门区小囊腔。

16 例患儿测量肝动脉内径 2.2 ~ 2.8 mm,均值 2.4 mm。肝动脉频谱为高速高阻血流,PSV77 ~ 123 cm/s,RI:0.89 ~ 0.96。

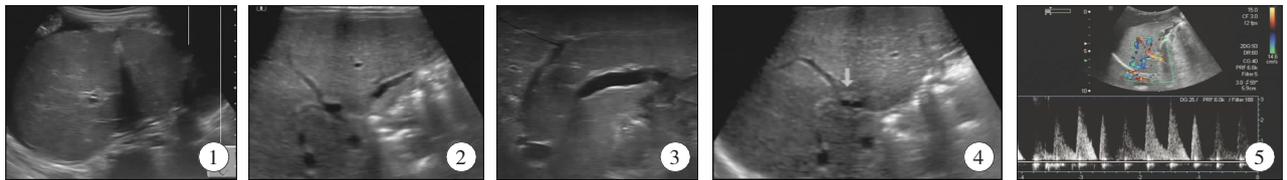


图 1 肝内回声增粗,肝周可见积液暗区; 图 2 胆囊形态小,长径 < 15 mm; 图 3 胆囊长径 > 15 mm,形态僵硬; 图 4 肝门部纤维块; 图 5 肝动脉频谱高速高阻

**Fig. 1** Asperous echogenicity of the liver, and ascites around the liver; **Fig. 2** The morphology of gallbladder is small, and length < 15 mm; **Fig. 3** Gallbladder length > 15 mm, morphological stiffness; **Fig. 4** Hepatic portal fibrosis; **Fig. 5** High speed and high resistance of hepatic artery

## 讨 论

BA 的确切病因至今尚不清楚,单纯依靠超声图像与婴儿肝炎综合征进行鉴别较为困难,这两种疾病在治疗上出入较大,早期诊断,尽早手术,避免出现肝脏严重损害时贻误手术时机。早在 1996 年,Choi SO 等<sup>[3]</sup>报道了 BA 的一个重要超声特征:肝门或左、右肝管汇合部有无团块状或索带状高回声区,即 TC 征。认为 TC 征在诊断 BA 中有很高的敏感性和特异性。随后,这一团队就 TC 征在 BA 诊断中的价值及与胆汁淤积等的鉴别,超声与核素扫描及肝脏针吸活检在诊断 BA 中的作用等进行了一系列对比研究,认为超声是最优的检查方法<sup>[4-6]</sup>。但也发现其他原因引起门静脉周围水肿或增厚而出现假阳

性 TC 征<sup>[4]</sup>。在本组病例的回顾性分析中发现,早期的 TC 征其实较难明确诊断,多于复查或病情发展后发现。

作者结合本组病例的声像图发现,所有病例的胆囊均发育异常,少数病例胆囊先天缺如,多数病例空腹时胆囊形态小,胆囊腔内无回声区未能显示。即使胆囊大小正常,有胆囊腔存在,但胆囊的形态僵硬且不规则,餐后胆囊大小与形态无明显改变。因此,胆囊明显狭小、形态不规则、胆囊壁黏膜线消失,胆囊呈索条状或消失在诊断 BA 上具有很高的敏感性,该结果与 TanKendrick AP 等<sup>[7]</sup>研究一致。王晓曼等<sup>[8]</sup>认为,胆囊形态是超声诊断 BA 的重要征象,合并肝门区小囊肿则可确诊为胆道闭锁。本组病例两例发现肝门部小囊腔,其中 1 例外院诊断胆总管囊肿,本院复查后发现胆囊形态僵硬,后观察到肝门

部斑块继而明确诊断 BA。

BA 患儿除了 TC 征和胆囊异常以外,肝动脉增宽也是其特征。Kim WS 等<sup>[9]</sup>报道 BA 患儿肝动脉增宽,并以在门静脉右支前、后支分叉处测量的肝右动脉内径 >1.5 mm 为阈值诊断 BA 的敏感度、特异度和准确性分别为 92%、87% 和 89%。本组 16 例测量肝动脉内径均增宽,频谱测量显示为高速、高阻。肝门部纤维块、胆囊宽径和肝动脉内径是彩色多普勒超声鉴别囊性胆道闭锁和胆总管囊肿的有效指标,可用于指导术前鉴别诊断<sup>[10]</sup>。肝门部纤维块和胆囊形态异常被认为是超声检查识别胆道闭锁的客观标志,其诊断胆道闭锁的特异性 96%~100%<sup>[11]</sup>。肝动脉扩张诊断胆道闭锁的敏感性和特异性分别为 92% 和 87%<sup>[12]</sup>。

高频彩色多普勒超声对 BA 的诊断有很高的敏感性、特异性,较 MRI 和 CT 检查具有优势,并具有可短期重复检查等便利条件,对肝脏回声的观察提示肝脏损害程度,对手术预后有一定提示作用。综合以上四项特征,并参考患儿总胆红素及直接胆红素指标,可协助临床早期诊断 BA。

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(收稿日期: 2016-08-22)

(本文编辑: 仇君 王爱莲)

本文引用格式: 杜妍妍,符柳江,张向向,等. 高频彩色多普勒超声在诊断小儿胆道闭锁中的应用 [J]. 临床小儿外科杂志, 2017, 16(1): 89-91. DOI: 10.3969/j.issn.1671-6353.2017.01.021.

Cite this article as: Du YY, Fu LJ, Zhang XX, et al. High frequency color doppler ultrasound in the diagnosis of infantile biliary atresia [J]. J Clin Ped Sur, 2017, 16(1): 89-91. DOI: 10.3969/j.issn.1671-6353.2017.01.021.