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医学影像物理

彩色多普勒超声联合磁共振胆胰管成像诊断老年胆总管结石270例临床分析

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【摘 要】**目的:**分析彩色多普勒超声(CDU)联合磁共振胆胰管成像(MRCP)诊断老年胆总管结石的价值并讨论其意义。**方法:**选择2014年1月~2015年12月拟诊断胆总管结石患者270例,男性116例,女性154例,年龄60~85岁。患者均行CDU和MRCP检查,同时以手术或内镜下逆行胰胆管造影术作为金标准,用统计学方法比较单独用CDU或MRCP,以及CDU联合MRCP对诊断老年胆总管结石的价值,同时计算敏感性、特异性和准确性。**结果:**老年患者270例经手术或ERCP确诊胆总管结石218例,CDU联合MRCP诊断老年胆总管结石的敏感性、特异性和准确性均较单纯CDU检测或MRCP检测高,差异具有统计学意义(P<0.05)。**结论:**CDU联合MRCP检查可提高老年胆总管结石诊断准确率,且简便安全,可在临床推广应用。

【关键词】胆总管结石;老年患者;彩色多普勒超声;磁共振胆胰管成像;内镜下逆行胰胆管造影术
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Clinical diagnostic value of color Doppler ultrasound combined with magnetic resonance cholangiopancreatography in elderly patients with choledocholithiasis: analysis of 270 cases

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Abstract: Objective To evaluate the diagnostic value of color Doppler ultrasound (CDU) combined with magnetic resonance cholangiopancreatography (MRCP) in elderly patients with suspected choledocholithiasis, and discuss on its clinical significance. **Methods** Admitted from Jan. 2014 to Dec. 2015, 270 elderly patients with suspected choledocholithiasis were selected, including 116 male, 154 female, aged 60-85 years old. All patients underwent CDU and MRCP examination, and the value of CDU, MRCP, and CDU combined with MRCP in the diagnosis of elderly patients with common bile duct stones were compared with the gold standard of surgery or endoscopic retrograde choangiopancreatography (ERCP). The diagnostic accuracy, sensitivity and specificity of choledocholithiasis of CDU or MRCP alone, and CDU combined with MRCP were calculated. **Results** In 270 elderly patients, 218 patients were diagnosed as common bile duct stones by surgery or ERCP. The sensitivity, specificity and accuracy of CDU combined with MRCP in the diagnosis of common bile duct stones were significantly higher than those of CDU or MRCP, with statistical significance (P<0.05). **Conclusion** The CDU combined with MRCP examination can be used in clinical application because the examination can improve the diagnosis accuracy rate of common bile duct stones in elderly patients, and is simple and safe.

Key words: choledocholithiasis; elderly patient; color Doppler ultrasound; magnetic resonance cholangiopancreatography; endoscopic retrograde choangiopancreatography

前 言

胆总管结石作为胆道疾病中最常见疾病,中老年人易发,胆总管阻塞可引起梗阻性黄疸,当伴发感染时可发生急性化脓性胆管炎和胆源性胰腺炎,特别是老年人可能发生休克,甚至危及生命。因此,对胆总管结石的早期诊断和有效处理具有重要的临床意义[1-3]。我们对拟诊的老年胆总管结石在进行临床资料分析的同时进行彩色多普勒超声(CDU)联合磁

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共振胆胰管成像(MRCP),并以手术或内镜下逆行胰胆管造影术(ERCP)作为金标准评价它们在诊断胆总管结石中的价值,并讨论其临床意义。

1 对象和方法

1.1 对象

1.1.1 病例选择 选择2014年1月~2015年12月在第四军医大学唐都医院和西京医院拟诊断胆总管结石患者270例,男性116例,女性154例,年龄60~85(69.2±8.9)岁。主要临床表现包括上腹部疼痛176例,发热94例,腰背部疼痛40例,黄疸91例,胆石性胰腺炎26例,血清总胆红素和直接胆红素增高128例。全部患者均在拟诊断胆总管结石的2~14(6.5±4.1)d完成超声和MRCP检查。

1.1.2 主要设备 彩色多普勒超声诊断仪为PhilipsiU22或东芝Nemio 30,MRCP检查用荷兰飞利浦Achieva 1.5T磁共振成像系统。

1.2 方法

1.2.1 CDU检查 患者检查前禁食10~12 h。在卧位或左侧卧位下,设定CDU探头频率为3.5 MHz,对胆总管扩张状况进行仔细观察,如见胆管扩张时即沿其扩张方向仔细查找是否存在结石,特别注意管腔内出现的高回声团块,如果其后方出现声影即是胆总管结石的重要依据[1,3]。检查过程应详细记录胆总管宽度,结石的部位、大小和数量等。

1.2.2 MRCP检查 MRCP检查前禁食10 h。患者仰卧位下用腹部线圈行三维高分辨单次激发快速自旋回波MRCP扫描,用不屏气的呼吸触发技术。MRI主要参数:回波时间=1 053 ms,重复时间=3 333 ms,矩阵=256×205,扫描视野=360 mm×360 mm,扫描层数=96层。薄层图像按要求用特定软件进行三维重建处理。参考诊断标准依据《胆总管结石临床路径(2009年版)》,胆总管内结石为低信号影,表现为类圆形、圆形或形状不规则,周围胆汁为高信号。胆总管下端有结石嵌顿时,可在梗阻端出现倒"杯口"状的充盈缺损,上端胆道可出现程度不同的扩张。

1.2.3 CDU联合MRCP诊断分析 CDU检查对有胆总管扩张,但未见团状强回声或条状强回声,或胆总管伴呈团状强回声或条状强回声,同时有不同程度胆管扩张均可作为诊断依据;对CDU检测结果难以下结论的个别病例则结合MRCP检查进行分析[2-3],最后确定胆总管结石的影像学诊断。

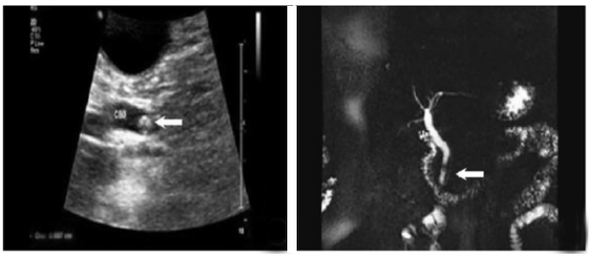
1.3 统计学处理

应用SPSS 16.0统计软件,各组间比较行χ^2检验,P<0.05为差异有统计学意义。

2 结 果

2.1 病例诊断

所有检查患者均未出现不良反应,顺利完成既定检查。拟诊断的老年胆总管结石270例患者经手术探查或ERCP确诊为胆总管结石218例(80.74%),胆总管结石部分包括上段58例、中段24例、下段56例。典型病例影像学见图1~3。

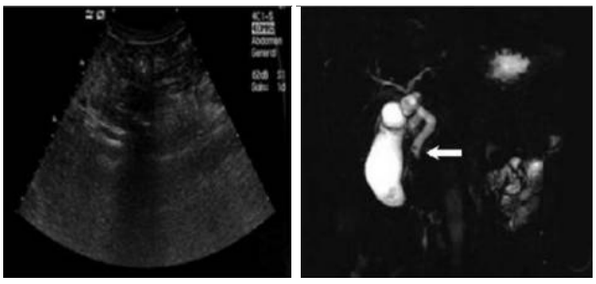


a: Common bile duct mass echo shadow in CDU　**b: Lower end of the common bile duct stones in MRCP**

CDU: Color Doppler ultrasound; MRCP: Magnetic resonance cholangiopancreatography

图1 男性,62岁,胆总管下端结石

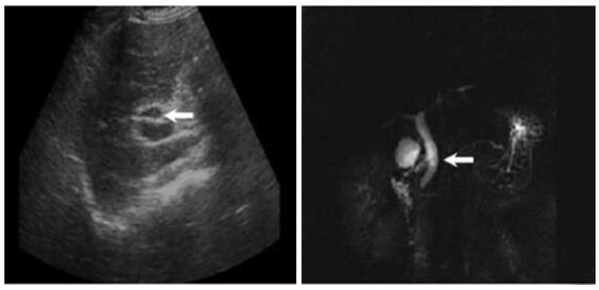
Fig.1 Male, 62 years old, lower common bile duct stones



a: No stones in CDU　**b: Lower part of common bile duct stones in MRCP**

图2 女性,66岁,CDU下未见胆管结石而MRCP下可见

Fig.2 Female, 66 years old, bile duct stones which were not seen in CDU, but in MRCP



a: Stone shadow in CDU　**b: Bile duct end of the expansion and no stone shadow in MRCP**

图3 女性,73岁,胆管结石CDU可见而MRCP未见

Fig.3 Female, 73 years old, bile duct stones which were not seen in MRCP, but in CDU

2.2 CDU和MRCP诊断比较

用CDU诊断结果的真阳性162例，假阳性30例，真阴性22例，假阴性56例。用MRCP检查诊断，结果真阳性204例，假阳性10例，真阴性42例，假阴性14例。CDU联合MRCP诊断结果，真阳性214例，假阳性2例，真阴性50例和假阴性4例。与MRCP比较，CDU诊断老年胆总管结石的敏感性、特异性、阳性预测值、阴性预测值和准确率均比较低（P<0.05），两者联合检查，可以明显提高上述各指标（P<0.05，表1）。

表1 CDU联合MRCP诊断老年胆总管结石的效能评价（%）

Tab.1 Efficacy evaluation of CDU combined with MRCP in the diagnosis of common bile duct stones in elderly patients(%)

Method	Sensitivity	Specificity	Positive predictive	Negative predictive	Accuracy
CDU	74.31(162/218)	42.31(22/52)	84.36(162/192)	71.79(56/78)	68.15(184/270)
MRCP	93.58(204/218)[a]	80.77(42/52)[a]	95.33(204/214)[a]	75.00(42/56)[a]	91.11(246/270)[a]
CDU and MRCP	98.17(214/218)[ab]	96.15(50/52)[ab]	99.07(214/216)[ab]	92.59(50/54)[ab]	97.78(264/270)[ab]

[a]P<0.05 *vs* CDU, [b]P<0.05 *vs* MRCP

3 讨 论

胆总管结石和临床表现各式各样，其自然病程复杂多变，较小结石可自行通过十二指肠排出，较大结石则可滞留于胆总管内并逐渐变大，甚至诱发急性梗阻性化脓性胆管炎、胆源性胰腺炎而发生感染性休克，特别是老年人常可引起生命危险[4-6]。因此，早期诊断和处理胆总管结石对改善患者生存质量非常重要。我们研究认为对于老年胆总管结石诊断用CDU检查，必要时联合MRCP可提高诊断的准确性，同时具有简便安全的特点，可依据临床需要进行应用。

3.1 ERCP和MRCP诊治胆总管结石

ERCP是诊治胆总管结石的重要手段也是诊断胆管病变的金标准。随着科技发展，ERCP已不再是单纯诊断性技术，现已成为诊断和治疗为一体的综合性技术应用于现代胆胰病学临床[7-10]。MRCP作为一种用重T_2加权脉冲序列以显示非常长T_2弛豫时间组织结构技术。这一技术对T_2弛豫时间比较短的肝脾胰等实质性器官可在重T_2加权序列呈现出低信号，并可通过频率选择或反转抑制脂肪信号技术对人体脂肪组织产生的信号进行抑制；同时在影像上，对快速流动液体表现为信号缺失，而静止或相对静止液体则高信号。胆汁在胆管系统内是作为相对静止液体，胆管系统形态结构在MRCP下可以清晰显示，因此，MRCP对胆胰管扩张程度，结石大小、数目、形态和部位等都能清晰地进行观察。临床上，MRCP检查是一种无创伤、无放射性检查，对胆总管结石显示清晰，具有较高确诊率[11-14]。但对较小胆总管结石可能漏诊，且由于费用高目前作为常规检查仍受限制。MRCP作为容积重建后的三维成像，在数据采集、图像处理必须严格掌握，同时还应尽可能减少运动伪影形成。MRCP由于容积效应存在一定的假阴性，对于一些微小病灶难以发现可能出现漏诊或误诊，临床上务必特别重视对原始薄层模片的观察。本文中，为提高诊断的准确性，我们对MRCP诊断胆总管结石的原始图像也进行了反复观察和对比，其结果与已有报道相近[14-16]。

3.2 CDU诊断胆道疾病

CDU是一种方法安全、简便、廉价和可重复性的检测方法，是胆道疾病诊断首选和重要检查方法，对胆道系统结石的准确诊断率在95%以上，特别是老年患者更为适用[2-4]。但这一方法在胆总管结石诊断中假阴性比较多见，特别是胆总管下端结石更容易误诊，其真阳性率在25%~63%[5-6,15-18]。因此，对胆道系统结石患者，必要时在行CDU检查时还需要进行ERCP或MRCP等影像学检查来进一步明确是否存在胆总管下段结石。我们分析表明，超声对胆总管结石诊断的敏感性为74.31%，明显低于MRCP的93.58%（P<0.05），而CDU联合MRCP检查，其敏感性可提高到98.17%。

CDU检查对胆总管下端结石诊断较困难有其解剖生理学特点。胃及十二指肠等空腔脏器内的气体常常干扰CDU对胆总管末端的检查，同时由于结石较小或阻塞早期无胆总管无扩张或反常扩张，或胆总管细小并弯曲，胆汁在胆管内又充盈不佳，这些情况都可能影响CDU的超声束投影，图像中的胆总管下段无法清晰显示，同时也可能CDU检查医师的技术水平或经验不足等，均容易造成漏诊[19-21]。而MRCP造影可以清晰发现胆胰管扩张程度和结石的

特点等，胆总管炎性狭窄、胆总管内径和走向的改变均能定位诊断[22-24]，同时MRCP具有无损伤、安全、不需对比剂和不受胃肠道气体干扰等优点，这些都可以克服CDU声的不足缺点[25-27]。在本研究中，我们把CDU和MRCP二者联合检查，其诊断胆总管结石的敏感性、特异性和准确率均优于单一CDU检查（$P<0.05$），也较单一用MRCP诊断准确率高（$P<0.05$）。

我们用CDU和MRCP检查胆总管结石漏诊病例分别为10例和2例，经ERCP诊断为胆总管微小结石，其直径均为0.5 cm左右，其可能原因是这种细小结石被胆总管胆汁性液体信号所衍射未能做出诊断[13-15,24]。我们认为对于细小的胆总管结石进行MRCP检查时应进行综合对比分析，并结合临床表现，这样才能提高胆总管细小结石或泥沙样结石的诊断。

综上所述，CDU操作简便、经济安全，对胆囊结石诊断有很高的准确率，在诊断胆总管结石虽然有一定局限性，但作为筛查胆总管结石仍然是首选的检查方法。对一些高度可疑患者，在术前行MRCP检查有利于明确诊断和指导手术。临床上为提高胆总管结石诊断准确率多采用DUB和MRCP联合检查，必要时进行ERCP。

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