

儿童美克尔憩室诊治进展

张宇, 詹学*

重庆医科大学附属儿童医院消化科, 国家儿童健康与疾病临床研究中心, 儿童发育疾病研究教育部重点实验室, 结构性出生缺陷与器官修复重建重庆市重点实验室, 重庆

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摘要

美克尔憩室(MD)是儿童最常见的消化道畸形之一, 在各年龄段均可出现临床症状, 婴幼儿期较为常见。MD多因发生并发症而出现无特异性症状, 导致该病患者被延误诊治, 甚至发生严重失血性贫血或肠坏死等, 从而危及患儿生命。本文通过总结MD诊治进展, 为临床医生选择恰当的检查及治疗方法提供参考, 以便及早对疑似MD患儿进行诊断及治疗, 避免临床危急重症的发生。

关键词

美克尔憩室, 检查, 治疗, 儿童

Advances in the Diagnosis and Treatment of Meckel's Diverticulum in Children

Yu Zhang, Xue Zhan*

Department of Gastroenterology Children's Hospital of Chongqing Medical University, National Clinical Research Center for Child Health and Disorders, Ministry of Education Key Laboratory of Child Development and Disorders, Chongqing Key Laboratory of Structural Birth Defect and Reconstruction, Chongqing

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Abstract

Meckel's Diverticulum (MD) is one of the most common gastrointestinal malformations in children, of which clinical symptoms can be seen at all ages, with infancy and childhood being the most common. MD often presents with non-specific symptoms due to complications, resulting in delayed diagnosis and treatment of children with the disease, and even severe hemorrhagic anemia or intestinal necrosis, thus endangering the lives of children. This article summarizes the progress in the diagnosis and treatment of MD and provides a reference for clinicians to choose appropriate

*通讯作者。

examination and treatment methods, so as to diagnose and treat children with suspected MD as early as possible and avoid the occurrence of clinical critical illness.

Keywords

Meckel's Diverticulum, Examination, Treatment, Children

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1. 引言

美克尔憩室(Meckel's Diverticulum, MD)是最常见的小肠憩室[1] [2], MD 多因发生并发症而出现无特异性症状(如便血、腹痛、呕吐等), 导致该患儿易被延误诊治[3], 可发生严重失血性贫血, 或肠坏死等, 甚至危及患儿生命[4]。有研究称, 儿童 MD 所致的患儿死亡率为 0.4%~1.5% [5]。因此, 提高临床医生对儿童 MD 及其并发症的认识, 有助于临床早诊断、早治疗及改善患儿预后[2] [6]。本文对 MD 的诊治进展进行总结, 为临床医生对 MD 的诊断及治疗提供参考。

2. 流行病学

MD 最早于 1650 年由 Fabricus Heldanus 进行描述, 后来 Johann Friedrich Meckel 在 1808 年进行了更详细描述, 于 1809 年确定了其胚胎学起源, 并最终以后者姓氏命名[3] [7]。MD 存在于 2%~4%人群中, 男女比例为 1.5:1~4:1 [2] [8] [9]。大多数人无任何症状, 仅 4%~6%因出现并发症如消化道出血、憩室炎、肠梗阻等[10]。MD 并发症在各年龄段均可发生, 但在婴幼儿期更为常见, 有报道称[11] [12] 48%~60% MD 的并发症发生于 4 岁以内。MD 的并发症的发病率随着年龄的增长而逐渐趋近于零[13] [14] [15]。

3. 胚胎学及病理特征

MD 是末端回肠壁上的指状突出物, 为卵黄囊近端退化不全所致, 位于回肠肠系膜对侧缘, 长度可达 5 cm, 距离回盲瓣多在 100 cm 内。MD 为真性憩室, 憩室腔与回肠相通, 憩室壁含有完整的小肠组织的 3 层结构[14]。据报道, 50%有症状患者的憩室中存在异位组织(包括异位胃黏膜、胰腺黏膜十二指肠黏膜[3] [7] [9])。

4. 临床表现

儿童 MD 通常无临床症状, 多因憩室并发症出现相关临床症状[5]。儿童 MD 并发症以急性消化道出血、小肠梗阻和急性憩室炎为主[10] [16] [17]。

5. 辅助检查

5.1. 病理检查

手术切除组织病理检查目前仍是诊断 MD 的金标准[18], 但在术前仍需辅助检查以协助诊断。

5.2. 实验室检查

根据 MD 患儿临床表现。常规检查为: 血生化和血常规, 可评估电解质和血红蛋白水平。在憩室炎

和/或穿孔的情况下, WBC 计数具有重要参考价值[19]。与急性阑尾炎血象类似, 此时白细胞可显著增高, 早期多在 $(15\sim 20) \times 10^9/L$, 中性粒细胞可高达 80%~90%。少数有严重休克或中毒症状的患儿, 白细胞可正常或偏低[20]。

5.3. 影像学检查

1) 腹部平片在诊断 MD 方面用途有限, 但可用于发生并发症时的腹腔积气和梗阻鉴别。

2) 钡剂造影在 MD 有症状的情况下, 憩室入口常因水肿而被阻塞, 因此常无法在射线下发现憩室, 另因摄片时憩室与正常消化道组织可能出现影像重叠造成憩室无法显像, 且因消化道钡剂造影放射性大及操作复杂的特点, 一般不推荐钡剂造影用于 MD 术前诊断。

3) 超声检查高频超声[21]可清晰显示包括憩室盲端、憩室开口及憩室壁等细微结构。刘浩、李姝等人[21]研究发现高频超声诊断正确率 68.9%, 单纯型 MD (表现为右下腹不规则囊状无回声区或指状肠管样回声, 可清晰显示憩室结构)超声诊断正确率 100%, 复杂型 MD (表现为右下腹不均质低回声包块或伴发其他消化道畸形)超声诊断正确率 55.8%, 但该研究样本量较小, 证据尚不充足。李治熹、蒋文军等[22]人研究显示高频超声对小儿 MD 或并发症的诊断符合率为 85.0%、89.8%。另一项研究[23]显示对以便血为主要症状的疑似 MD 患儿(833 名)高频超声诊断的敏感性为 93.6%, 特异性为 98.1%, 诊断符合率为 95.4%, 假阳性率为 6.4%, 假阴性率为 1.9%, 显示高频超声对儿童 MD 出血的诊断具有较高的敏感性和特异性, 因此高频超是最方便有效的诊断方法。超声因无辐射、方便、费用少等优势, 已成为筛查临床疑似 MD 的患儿的首选方法[6]。

4) 放射性核素显像(Radionuclide Imaging, RNI)是利用核素显像剂可被胃黏膜摄取并显影的原理作为非侵入性影像学方法, 用于诊断含有异位胃黏膜或处于出血期的 MD。

有研究[24][25]显示以下情况可导致 RNI 结果假阴性: ① 当 MD 存在的胃黏膜细胞数量不足; ② 胃黏膜侵蚀面积 $> 1.8 \text{ cm}^2$; ③ 憩室炎导致组织水肿或坏死; ④ 或憩室出口梗阻导致压力增加; ⑤ 血红蛋白水平较低时; ⑥ 异位组织核素显像剂摄取减少(如: 出血量少、出血停止、处于出血间歇期)或被稀释(如: 突然出血、或肠道分泌过多)。

也有研究报道[26], 因技术问题或膀胱、肾、或尿道与憩室区域重叠时, 也可出现假阴性和假阳性结果。据报道, 放射性核素显像在儿童中的特异度为 95%, 敏感度为 85%, 准确度为 90% [27]; 在成人中, RNI 诊断准确率较低, 在 20%~60%之间[28], 故 RNI 多用于儿童 MD 诊断[29]。对于间歇性不明原因下消化道出血, 且临床疑诊复杂 MD (尤其含有异位胃黏膜)的患儿, 首选 RNI 检查[26]。有数据[30]表明使用 H_2 受体拮抗剂、五肽胃泌素和胰高血糖素可以提高 RIN 的敏感性。

有研究认为[10]联合应用单光子发射计算机断层成像术(Single-Photon Emission Computed Tomography, SPECT) SPECT-/CT 可提高 RNI 在 MD 诊断中的灵敏度和特异性, 但由于辐射负荷的增加, SPECT-/CT 仅被建议用于诊断难度较高的病例。

5) CT/MRI 及其造影 CT 和 MRI 对 MD 诊断价值有限[31]。对于无症状 MD, CT 难以区别憩室与正常的肠襻, 然而当存在合并症时, 憩室及其周边出现异常征象(如: 炎症、钙化、阻塞、气腹和游离液体等)常有间接诊断价值[32]。CT 肠造影术(CTE)不仅能显示肠道黏膜和结构, 还能发现肠周的异常。核磁共振小肠造影术(Magnetic Resonance Enterography, MRE)可同时分析小肠的形态和功能。对于 MD 患儿, MRE 对比 CTE 具有可视化的软组织影及无电离辐射的优势, 但由于肠蠕动造成的伪影等原因, MRE 较少用于诊断儿童 MD [33], 但随着图像信号、空间分辨率、以及成像速度的提高, 未来 MRE 在儿童 MD 诊断中将发挥越来越重要的作用[34]。

6) 肠系膜上动脉血管造影可直接利用造影剂外溢来确定出血部位, 也可利用起源于肠系膜上动脉的

异常动脉间接确定出血部位[7] [35]。有研究[7]报道儿童消化道出血造影检测需要高于 2 mL~3 mL/min 的出血速度。

7) 内镜检查。双气囊小肠镜(Double-Balloon Enteroscopy, DBE) Gasbarrini 等[36]首次使用 DBE 检查 MD。DBE 不仅可对整个小肠进行可视化检查, 也可行活检或治疗, 但操作较为复杂、耗时长, 需较多人员配置[25] [36]。DBE 检查最常用于寻找不明原因的消化道出血的病因, 因 DBE 介入治疗可能导致胰腺炎、肺炎、肠梗阻和穿孔等并发症, 且费用高、耗时长, 故儿科临床应用受限[37]。

胶囊内镜(Capsule Endoscopy, CE) CE 无创、简便, 是胃镜及结肠镜检查无果的补充检查手段[38]。胶囊内镜不但能发现小肠憩室, 还能发现小肠其他病变(包括溃疡性结肠炎、克罗恩病以及肿瘤等) [39]。但 CE 检查也可能会因胶囊快速经过 MD 开口, 而无法获得瞬时图像; 或因 MD 开口附着血凝块, 可能无法准确判读, 同时, 也可能受胶囊内镜图像判读者经验的影响。因胶囊大小和肠道情况的影响, 可能出现吞咽胶囊困难及胶囊嵌顿。目前有报道的[40] [41]胶囊内镜检查的患者的最小年龄为 8 个月, 最小体重为 8 kg。Slobodan 等[42]报道, CE 的阳性预测值为 84.6%, 是诊断 MD 胃肠道隐性出血的一种有效且有前景的方法。Sung Noh Hong 等[28]认为小肠出血的复杂, CE 检查应被视为调查的一线方法。吴婕等[43]研究认为 CE 有助于儿童 MD 的诊断, 侵入性较小, 应作为有确诊价值的检查。

腹腔镜检查是诊断 MD 可疑病例和切除 MD 病灶安全有效的方法[44], 但因其与传统的影像学方法相比更具侵入性, 故常不作为首选检查方法[1]。

智能机器人内镜技术包括十二足胶囊[45] (Valdastri 等开发的一种胶囊, 包括两个电机、一个双向通信平台和一个能够半自主内在电磁驱动的人机界面)、蠕虫样胶囊[46] (Wang 等发明的类似蚯蚓的机器人内窥镜)及鳍样囊状装置[47] (日本的一个团队开发的一种长 170 毫米, 直径 30 毫米的新型囊状装置, 由带有顺时针螺旋鳍的前体和带有逆时针螺旋鳍的后体组成)等针对传统光学结肠镜存在的固有局限性(患者不适感、内镜医生疲劳、视野狭窄和结肠褶皱致使漏诊等)发展出的新一代内镜技术。机器人技术有可能使得下消化道检查更快、更安全、更可靠、更无痛。Harpreet 在其系统综述中纳入了包括不同驱动方式(电动驱动、电动气动驱动、液压驱动、磁力驱动和混合驱动)的 37 项研究, 其中前述五种驱动方式的设备已获得美国食品和药物管理局的批准, 但大多数仍处于测试和开发早期阶段, 迄今为止没有报告显示其诊断或治疗优于传统下消化道内窥镜检查。但 Harpreet 认为, 未来十年的设计改进以及半自动和自动系统的整合可能会导致机器人结肠镜检查变得更加普遍[48]。

6. 治疗

有症状的 MD 应通过开腹手术、腹腔镜或腹腔镜辅助手术治疗[1]。目前对于如何处理意外发现的无症状 MD 尚无定论[11]。Cullen 等[49]的研究表明, MD 并发症的终生风险为 6.4%, 而手术的终生风险为 1%, 死亡率和发病率为 2%。因此, 就发病率和死亡率而言, 获益大于风险, 应切除无症状 MD。Andrzej 建议[1] [11]儿童偶然发现的无症状 MD 都应进行预防性切除。Park 等[50]在其设计 1476 名患者的研究中将 11 岁以下的患者定义为儿科人群, 并建议切除儿科人群中偶然发现的 MD。不过切除憩室的适应症和禁忌症是相对的, 外科医生应根据患者的具体情况做出决定。

7. 结语

MD 是最常见的先天性胃肠道畸形, 易并发包括消化道出血、憩室炎、肠梗阻等并发症。因临床症状和影像学特征与其他临床急腹症高度重叠, 因此目前术前诊断 MD 尚存在较大难度[1] [51]。上消化道的腹部平片、CT 和钡剂造影通常由于敏感性低而无法对 MD 作出诊断。临床上以腹痛或反复消化道出血为主要症状的就诊患儿, 超声检查应为首选筛查方法, 当出现出血症状并高度怀疑 MD 时, RNI 是首选

诊断检查方法。建议同时结合超声及 RNI 两种检查以进一步提高 MD 的检出率。如果 RNI 未显示 MD, 但临床症状高度提示 MD 出血, 则有必要行 DBE 检查以及 CE 检查以明确诊断, 鉴于 DBE 易导致胰腺炎、肺炎、肠梗阻和穿孔等并发症, 因此建议在完善 RNI 后仍不能明确诊断者优先选择 CE 检查。未来十年机器人内镜技术的应用可能使 MD 诊断和治疗步入新的阶段。

现阶段由于 MD 的非特异性临床表现, 术前诊断仍较为困难[1] [51]。如果术前根据辅助检查仍难以明确诊断, 而临床上又高度怀疑患儿罹患 MD 时, 必要时可行诊断性腹腔镜检查。良好了解与应用相关辅助检查将使临床医生能够快速和正确地诊断 MD, 从而及时地进行手术干预[1], 这对减少临床不良预后的发生有重大意义。

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