

急性阑尾炎穿孔的影响因素分析

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摘要

急性阑尾炎是全球最常见的急腹症之一, 治疗方式分为手术治疗和非手术治疗。而阑尾穿孔为阑尾炎发展的终末阶段, 具有很大的风险, 即使经过适当的治疗, 其后果也会导致住院时间延长、发病率和死亡率增加。如果在穿孔发生前及时诊断, 这种情况可以通过简单的手术来预防。穿孔性阑尾炎患者的处理与非穿孔性阑尾炎患者有很大不同, 因此, 术前鉴别穿孔性阑尾炎非常重要。本文回顾了相关文献并描述了白细胞、中性粒细胞、C反应蛋白、胆红素、纤维蛋白原、平均血小板体积。年龄等影响因素有助于判断阑尾穿孔发生的可能, 改善预后。

关键词

急性阑尾炎, 急性阑尾炎穿孔, 预测因素

Analysis of Factors Influencing the Perforation of Acute Appendicitis

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Abstract

Acute appendicitis is one of the most common acute abdominal conditions worldwide, and treatment is divided into surgical and non-surgical options. Appendiceal perforation, however, is the end stage of appendicitis development and carries a high risk of consequences leading to prolonged hospitalization and increased morbidity and mortality, even after appropriate treatment. This condition can be prevented by simple surgery if diagnosed in time before perforation occurs. The management of patients with perforated appendicitis is very different from that of patients

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with nonperforated appendicitis; therefore, it is important to identify perforated appendicitis preoperatively. This article reviews the relevant literature and describes leukocytes, neutrophils, C-reactive protein, bilirubin, fibrinogen, and mean platelet volume. Age and other influencing factors can help to determine the possibility of appendiceal perforation and improve the prognosis.

Keywords

Acute Appendicitis, Perforated Acute Appendicitis, Predicting Factors

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1. 引言

急性阑尾炎是全球最常见的腹部急症之一[1]，目前对于急性阑尾炎的诊断并不十分困难，通过综合评估患者的临床症状、体征、实验室数据和影像学检查等，包括应用一些阑尾炎评分系统如 Alvarado 评分系统，都能有效帮助我们提高急性阑尾炎的诊断率[2]。急性阑尾炎临床症状主要为右下腹的固定压痛或深压痛，实验室检查常用的数据有 WBC、NEUT、CRP 等，影像学检查如 CT、超声等，这些均有助于阑尾炎的诊断。急性阑尾炎的发病机制被认为反映了由于粪石、未消化的食物碎片或淋巴组织增生引起的腔内梗阻对粘膜的初始损害，随后细菌感染逐渐从粘膜扩散到壁上[3]。阑尾壁的炎症导致缺血、坏死和最终穿孔，这可能导致局限性脓肿或弥漫性腹膜炎[4]。阑尾穿孔即阑尾壁存在孔洞样缺损，穿孔性阑尾炎为阑尾炎发展的终末期，但准确的诊断是具有挑战性的，因为没有单一的症状或体征可以准确预测穿孔性阑尾炎。急性阑尾炎穿孔有很大的风险，即使经过适当的治疗，也会导致住院时间、住院费用、发病率和死亡率的增加。如果在穿孔发生前及时诊断，这种情况可以通过简单的手术来预防，穿孔性阑尾炎患者的处理与非穿孔性阑尾炎患者有很大不同，早期手术处理穿孔性阑尾炎也可降低穿孔相关的并发症和死亡率。因此，术前鉴别穿孔性阑尾炎非常重要，本文就穿孔性阑尾炎的影响因素进行综述。

2. 影响因素

2.1. 炎症反应标志物

急性阑尾炎是指阑尾由于多种因素而形成的炎性改变，WBC、中性粒细胞和 CRP 均是判断机体是否感染及感染严重程度的常用指标。研究显示，C 反应蛋白升高，白细胞增多，中性粒细胞百分比升高，增加了阑尾炎的可能性[5]。阑尾炎是一个动态的炎症反应过程，包括阑尾腔扩张之前早期阶段的黏膜溃疡过程，这种溃疡有助于细菌进入阑尾固有肌层从而导致阑尾炎。免疫反应使炎性物质释放，导致阑尾局部水肿、管腔内压力升高、局部缺血，进而引起阑尾坏疽和穿孔。中性粒细胞的生理作用是趋化、吞噬和杀菌，当机体发生感染时其水平可发生反应性升高，以抵抗细菌感染反应。有研究显示[6]，急性阑尾炎的特点是中性粒细胞浸润到黏膜和黏膜下层，因此中性粒细胞百分数可相对比较客观的反映阑尾炎感染的严重程度；C 反应蛋白是一种炎症标志物，在炎症发生后 12 至 24 小时产生，且有报道指出从阑尾炎发作到住院之间延迟 24 小时或更长时间是阑尾穿孔的危险因素[7]，因此，高 C 反应蛋白水平可能与发病和入院之间至少 12 小时的延迟有关。对于阑尾穿孔，C 反应蛋白可能比起病时间更实用，因为发病的实际时间有时并不清楚[8]，类似的研究发现穿孔组阑尾炎中的 CRP 与未穿孔组相比明显增高，且有

差异($P < 0.001$)。经回归处理后得出, CRP 为阑尾炎穿孔的独立危险因素, 且对于怀疑急性阑尾炎患者, C-反应蛋白 $> 3.0 \times 10^4 \mu\text{g/L}$ 的患者应考虑急诊手术[9]。总的来说, 白细胞、中性粒细胞对于阑尾穿孔的诊断缺乏特异性, 而 C 反应蛋白成为预测阑尾穿孔的有用指标, 但在临床上 C 反应蛋白常受其他因素干扰, 在临床怀疑急性阑尾炎时应更关注此指标。

2.2. 年龄

各个年龄段都有可能发生急性阑尾炎, 根据 Buckius 等人研究, 按年龄分析, 阑尾炎的发病率最高的年龄为 10 至 19 岁[10] [11]。但穿孔率却与年龄呈负相关。有研究报道指出, 在成人中, 穿孔状态与患者年龄显著相关, 46 岁以上的患者术中诊断穿孔阑尾炎的几率增加了 4 倍以上, 在 46 岁或 46 岁以上的患者中, 穿孔的风险似乎随着年龄的增加而增加, 65 岁或 65 岁以上的患者穿孔率最高[12]。同样的是, 在儿童中, 各年龄组儿童都可发病, 以 6~12 岁为著, 且年龄越小, 发病率越低, 小于 5 岁患儿明显减少。但穿孔率却与儿童年龄呈负相关。有研究报道, 5 岁以下患儿的穿孔率明显增高, 可高达 52.6%, 可能与儿童的表达能力及生理发育相关[13]。综上所述, 各个年龄段都可能发生急性阑尾炎, 在成人中, 更应警惕高龄患者阑尾穿孔的发生; 在儿童中, 年龄越小, 穿孔发生可能性越高。

2.3. 纤维蛋白原

炎症和凝血系统之间有广泛的相互作用[14], 严重的感染和炎症几乎总是导致止血异常, 从轻微的实验室改变到严重的弥漫性血管内凝血(disseminated intravascular coagulation, DIC), 大量研究证明, 血浆纤维蛋白原是一种急性时相蛋白, 纤维蛋白原水平与受损组织成正比, 继而通过激活组织因子的外在途径消耗凝血因子 VII, 在炎性细胞因子的刺激下由单核细胞和中性粒细胞表达和呈现[15] [16], 因此在炎症或组织坏死时增加[17]。体外研究表明, 纤维蛋白原可以显著改变白细胞功能, 导致细胞迁移、吞噬、产生趋化因子和细胞因子、脱颗粒及其他进程[18]。最近有报道纤维蛋白原是阑尾炎诊断中一个有用的生物标志物[19] [20], 急性阑尾炎多因粪石或淋巴增生等原因导致管腔梗阻, 腔内细菌繁殖, 产生内毒素使血浆中白细胞介素-6、肿瘤坏死因子- α 等炎性因子水平升高, 诱导组织因子增多, 引起凝血级联反应, 导致外源性凝血机制激活, 消耗凝血因子, 使凝血 VII 因子活性明显降低, 最终导致纤维蛋白原升高、凝血时间缩短[21], 根据 Li、Alvarez Mentés Ö 等人研究认为纤维蛋白原对复杂性阑尾炎(阑尾坏疽、穿孔、周围脓肿)诊断是有价值的潜在指标、且根据 Alvarez 对 68 例非复杂性 AA 患者和 47 例复杂性 AA 患者研究发现, 纤维蛋白原临界值为 885 mg/dL 时预测复杂 AA, 敏感度为 86.77%, 特异度为 91.49%, 阳性预测值为 93.65%。

2.4. 胆红素

胆红素可能是一个值得考虑的标记物, 特别是当阑尾穿孔时[5]。随着阑尾穿孔的发生, 可能会导致肠道细菌进入血液, 引起脓毒血症, 感染性休克, 循环衰竭, 甚至死亡。进入门静脉系统和侵入肝实质的细菌增加, 干扰了胆红素的排泄, 这就导致高胆红素血症以及炎性标志物升高。一些研究表明, 当阑尾穿孔发生胆红素是唯一明显升高的指标, Giordano 等人关于血清胆红素升高评估急性阑尾炎穿孔可能性的诊断性 meta 分析里进行了详细的探讨[22]: 穿孔性阑尾炎中高浓度胆红素的特异性为 82%。这与另一个 Akai 等人的研究结果大致相同[23]。然而根据 Emmanuel 等人最近的一项研究, 预测穿孔性阑尾炎的高胆红素血症也可用于非穿孔性阑尾炎的评估, 而且具有 91% 的阳性预测值[24]。综上所述, 多项研究表明了高胆红素水平与阑尾穿孔高度相关[25] [26] [27], 并且具有较高的预测价值, 在临床上具有应用价值。

2.5. 平均血小板体积

平均血小板体积(MPV)是血小板活动和功能的标志, MPV 水平随着血小板产量的增加而升高[28], 血小板(PLT)具有止血和调节炎症的作用, 当炎症介质被释放时, 血小板被高度激活。平均血小板体积(MPV)和血小板分布宽度(PDW)是全血细胞计数的两个 PLT 参数, 在 PLT 产量增加后, MPV 相应地变化。MPV 已被研究为几种疾病的炎症标志物。在许多慢性疾病中, MPV 升高, 而在急性疾病中, MPV 降低, 如溃疡性结肠炎、类风湿性关节炎和强直性脊柱炎患者的 MPV 降低[29] [30], 而家族性地中海热、白塞病和牛皮癣患者的 MPV 增加[31] [32]。各种研究表明, 急性阑尾炎的 MPV 水平较低。Fan 等对 169 名坏疽穿孔性阑尾炎患者和 160 名健康志愿者研究发现, 坏疽穿孔性急性阑尾炎患者的 MPV 值显著低于健康志愿者, 且 MPV 诊断穿孔性阑尾炎的临界值为 9.6 fL, 其灵敏度和特异度分别为 66.25%和 91.19% [33]。而根据 Haghi 等人最新研究结论, MPV 和 RDW 指标有可能被外科医生用来鉴别急性阑尾炎和穿孔阑尾炎, 尤其是成人阑尾炎, 减少不必要的阑尾切除术, 但 MPV 对急性阑尾炎筛查的有效性高于 RDW, 可与其他临床和副临床表现一起考虑作为诊断标志[34]。

3. 讨论

急性阑尾炎阑尾穿孔常伴有许多术后并发症。由于穿孔性阑尾有严重的炎症反应, 导致阑尾正常解剖结构的改变和周围组织的紧密粘连, 增加了手术难度和术后并发症发生率。目前急性阑尾炎仍然是一种以体格检查、实验室检测和影像学检查作为主要诊断方法的疾病。因此能够预测阑尾是否穿孔, 可以使得外科医生在抗生素治疗、开腹或腹腔镜下阑尾切除以及延迟阑尾切除等治疗方式中选择最佳的治疗。炎症反应标志物、年龄、纤维蛋白原、胆红素等与阑尾穿孔相关, 但这些并不是诊断急性阑尾炎的标志物, 而是阑尾穿孔或者未穿孔的一种指标, 只有在诊断为急性阑尾炎时, 这些指标才具有一定的预测价值, 因此, 急诊医师接诊急性阑尾炎患者时, 更应关注这些指标, 通过对不同的临床资料进行系统综合的评估, 有助于判断阑尾穿孔发生的可能, 选择更好的治疗方式, 减少阑尾炎的并发症, 为患者提供最优的治疗。

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