

左回旋支急性完全闭塞的非 ST 段抬高心肌梗死患者的临床及心电图特征综述

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【摘要】 冠状动脉急性完全闭塞患者的心电图常表现为 ST 段抬高, 容易早期发现和及时行血运重建治疗。在临床实践中发现, 部分急性心肌梗死患者罪犯血管完全闭塞, 常规心电图上却无典型的 ST 段抬高, 即表现为非 ST 段抬高心肌梗死。这种现象在左回旋支急性完全闭塞的患者中更为常见, 延迟了再灌注治疗时间, 具有较高的心血管事件发生率和死亡率。因此, 总结左回旋支急性完全闭塞的非 ST 段抬高心肌梗死患者的临床及心电图特点, 对早期识别、尽早行血运重建、改善预后具有重要意义。

【关键词】 左回旋支; 急性完全闭塞; 非 ST 段抬高心肌梗死; 临床特点; 心电图特征

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Clinical and Electrocardiogram Characteristics in Patients with NSTEMI Related to Acute Completely Occluded Left Circumflex Artery

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【Abstract】 The electrocardiogram (ECG) of patients with acute total occlusion of coronary artery usually presents ST segment elevation, which is easy to be detected for performing prompt revascularization. It has been found in clinical practice that some patients with acute myocardial infarction have completely occluded coronary artery, but there is no typical ECG ST segment elevation. That is non-ST segment elevation myocardial infarction. This is more common in patients with acute complete occlusion of the left circumflex artery. It delayed reperfusion treatment time and had a higher incidence of major adverse cardiac event and higher mortality. Therefore, to summarize the clinical and ECG features in this sub-group patients is of great significance for early identification, prompt reperfusion therapy and improved prognosis.

【Key words】 Left circumflex artery; Acute total occlusion; Non-ST segment elevation myocardial infarction; Clinical features; ECG characteristics

急性非 ST 段抬高心肌梗死 (non-ST segment elevation myocardial infarction, NSTEMI) 的病理基础主要是冠状动脉粥样斑块破裂导致非闭塞性冠状动脉血栓形成^[1], 其梗死相关动脉 (infarct-related artery, IRA), 又称罪犯血管, 并未完全闭塞^[2], 心电图 (electrocardiogram, ECG) 多以 ST 段压低或 T 波倒置为主要表现^[3]。近年来, NSTEMI 的发病率呈上升趋势, 在欧美国家急性冠脉综合征患者中约占 70%^[4]; 在亚洲, 虽然 60% ~ 80% 的患者表现为 ST 段抬高心肌梗死 (ST segment elevation myocardial infarction, STEMI), 但有研究表明 NSTEMI 的比例正在增加^[5], 且发病人群逐渐趋于年轻化^[6], 长期随访的死亡风险较 STEMI 更

大^[7]。尽管急性心肌梗死 (acute myocardial infarction, AMI) 的定义是基于心肌损伤标志物的升高^[3], 但 ECG 仍是识别急性冠状动脉闭塞患者最快、最容易获得的检测手段, 临床上早期的治疗决策也很大程度地依赖于 ECG。在临床实践中, 冠状动脉造影显示 IRA 已完全闭塞, 但 ECG 未见 ST 段抬高的病例并不少见^[8], 左前降支 (left anterior descending, LAD)、右冠状动脉 (right coronary artery, RCA) 及左回旋支 (left circumflex artery, LCX) 均可出现这种表现, 其中 LCX 的发生率更高。初步研究发现, 与 IRA 无完全闭塞的 NSTEMI 患者相比, 这类患者有着更高的不良心血管事件发生率及死亡率^[9]。关注并总结这类患者的临床及 ECG 特点, 有助

于早期诊断、及时进行再灌注治疗,从而改善患者预后。

1 LCX 急性完全闭塞的 NSTEMI 患者的临床及冠状动脉造影特征

已有研究^[10]证实,诊断为非 ST 段抬高型急性冠脉综合征的患者在诊断性血管造影中,约 25% 存在闭塞的罪犯血管,其中以 LCX 或 RCA 病变多见,这一结论也同 Dixon 等^[11]的研究结果一致。From 等^[12]的一项纳入 1 500 例 AMI 患者(均存在闭塞的罪犯血管)的研究显示,28% 的患者表现为 NSTEMI,进一步统计其 IRA 的发生频率,LCX-IRA 所占比例约为 60%,明显高于 LAD 及 RCA 的闭塞发生率。TRITON-TIMI 38 研究^[13]同样发现,在 314 例罪犯血管完全闭塞的 NSTEMI 患者中,LCX 为最常见的 IRA (48.4%),其次是 LAD (33.8%) 和 RCA (17.8%)。进一步分析发现,LCX-STEMI 常见于冠状动脉左优势型,而 LCX-NSTEMI 则普遍存在于冠状动脉右优势型的患者^[14]。在伴有 LCX 闭塞性病变的 AMI 患者中^[15],STEMI 患者的病变部位多在血管近端,更易累及钝缘支;而 NSTEMI 患者更易表现为多血管病变,LCX 的血管直径明显小于 RCA,且侧支代偿不良^[16]。

相比于 STEMI,虽然性别和吸烟史无显著差异,但 LCX 急性完全闭塞的 NSTEMI 患者年龄更大,合并更多的心血管危险因素(糖尿病、高血压、血脂异常和脑血管意外等)^[14],且左室射血分数较低,行急诊经皮冠脉介入术的比例降低,其门-球囊扩张时间延长,门-球囊扩张时间 < 90 min 的比例低于 LAD 或 RCA 急性闭塞的患者^[17]。

LCX 急性完全闭塞的 NSTEMI 患者,不论是住院期间出现心源性休克或再发心肌梗死的风险,还是远期死亡率,均明显高于 STEMI 患者^[18]。在 NSTEMI 患者的单支罪犯血管分类中,与 LAD 或 RCA 闭塞性病变的患者相比,LCX 急性完全闭塞的患者经皮冠脉介入术后急性血栓事件发生率最高,常需进一步强化抗血栓治疗^[19]。同时 Sohrabi 等^[20]的研究也发现,相比于 RCA 为罪犯血管的患者,LCX-IRA 的 AMI 患者心肌梗死的面积明显增大,心肌梗死后出现二尖瓣反流及左室功能不全更为常见,随访 30 d 和 1 年的全因死亡率和心源性死亡率均显著高于 RCA-IRA。另有研究^[17]显示,虽然三支主要冠状动脉急性完全闭塞患者之间的院内死亡率无显著性差异,但经多变量分析后发现,早期行冠状动脉介入治疗可降低冠状动脉闭塞患者的住院死亡率,由于 LCX-IRA 的患者未表现出明显的 ST 段抬高,标准 12 导联 ECG 对 LCX-IRA 诊断的敏感性相对较低,导致介入治疗的不及时,可能会造成住院死亡率的相对增加。

2 LCX 急性完全闭塞的 NSTEMI 患者的 ECG 研究进展

欧洲心脏病学会/美国心脏病学会/美国心脏协会推荐的 ST 段抬高标准对 AMI 的检测灵敏度只有 50%^[21]。在 LAD 和 RCA 急性闭塞的患者中,ECG 的检出率为 70% ~ 92%,而对回旋支急性闭塞的敏感性为 32% ~ 48%^[14-15]。供应下外侧心肌的 LCX 急性闭塞多表现为 NSTEMI^[22],其治疗以风险分层为指导^[23],中高危患者尤其是心肌损伤标志物阳性的患者更倾向于早期介入治疗,这已成为改善 NSTEMI 患者预后的重要手段之一^[4]。因此,若能发现 LCX-IRA 完全闭塞的 NSTEMI 患者敏感性和特异性相对较高的 ECG 特征,对更好地识别那些可能受益于早期血运重建的患者具有重要临床意义。国内外学者也进行了相关研究,提出了以下有别于传统的 ECG 诊断标准。

2.1 孤立性 ST 段压低

即在标准 12 导联 ECG 中,至少 1 个导联 ST 段压低 ≥ 0.1 mV,其余任何导联无 ST 段抬高 ≥ 0.1 mV 的表现^[24]。当 V_2 或 V_3 导联出现最大程度 ST 段压低时,可用于区分 LCX 急性闭塞与非闭塞性缺血病变,其特异性为 96%,敏感性为 70%。

2.2 Kanemoto 标准

Kanemoto 标准^[25]:(1)连续 2 个胸导联 ST 段压低 ≥ 0.1 mV;(2) V_2 、 V_3 导联 U 波 ≥ 0.1 mV;(3) V_2 、 V_3 导联 T/U 比值 ≤ 4 。满足以上 2 条标准即可,仅适用于发病时间 ≤ 24 h 的 NSTEMI 患者,其敏感性为 71.9%,特异性为 97.0%,诊断正确率为 88.8%。

2.3 I 导联和 V_6 导联 T 波振幅之和

Rovai 等^[26]研究发现,I 导联 T 波振幅加 V_6 导联 T 波振幅($T_1 + T_{V_6} \leq 0$ mV)是 LCX 闭塞的唯一独立预测因子,其敏感性为 47%,特异性为 83%。

2.4 “N”波

“N”波即 NSTEMI 急性 LCX 闭塞患者 ECG 的 II、III 和 aVF 或 I、aVL 导联的 QRS 波群末端的切迹或缺损^[27]。II、III 和 aVF 导联的“N”波诊断敏感性为 77%、特异性为 89%;I 和 aVL 导联的“N”波诊断敏感性为 64%、特异性为 96%。这被认为是 ECG 中一种新的缺血模式,具有“N”波表现的 NSTEMI 患者 LCX 急性闭塞和主要不良心血管事件的发生率明显高于无“N”波的患者,其临床预后同 STEMI 患者相当,可视为“STEMI 等价物”^[28]。

3 ECG 表现为非 ST 段抬高的可能机制

LCX 急性闭塞但 ECG 表现为非 ST 段抬高的机制目前还不明确,可能与以下因素有关。

3.1 解剖结构

LCX 在左主干发出后沿左房室沟向左后方向行走至后室间沟,主要供应左心室侧壁、后壁,由于缺乏面向左心室后壁的标准导联^[29],故易成为标准 12 导联 ECG 检测的“盲区”。同时,心肌供血面积与 LCX 管腔直径有关,若 LCX 细小,梗死后心肌丢失总量<其他冠状动脉闭塞^[17],ST 段抬高不明显。

3.2 冠状动脉优势

约 80% 中国人群冠状动脉的供血系统是冠状动脉右优势型,即供血到下壁的后降支主要来自 RCA,少部分人群为冠状动脉左优势型,后降支来自 LCX。LCX 相对于 LAD 和 RCA,其供血范围相对较小,发生闭塞时梗死面积也较少,这也可能是 ECG 表现为非 ST 段抬高的原因^[14]。

3.3 梗死部位及侧支循环

ST 段抬高与否与 LCX 闭塞部位相关,研究^[15]显示,LCX 近段闭塞患者多表现为 STEMI,LCX 远段闭塞多表现为 ST 段压低,而在 ST 段无变化患者中钝缘支闭塞所占比例较高^[30]。造成此差异的主要原因为侧支循环代偿不同,位于 LCX 血管近、中段闭塞部位的侧支循环不良比例多^[31],急性缺血时代偿不足,ECG 表现更为明显;而 LCX 远段或钝缘支闭塞时,侧支循环较为丰富^[32],梗死面积较小,从而降低 ECG ST 段抬高的可能性。

由此可见,受多因素影响,LCX 急性完全闭塞的 NSTEMI 患者 ECG 常不伴典型 ST 段抬高表现,为早期识别出这类患者带来较大困难。

4 总结

在临床实践中,LCX 急性完全闭塞的 NSTEMI 患者并不少见,但由于缺乏特征性的临床表现及 ECG 特点,易被临床医师忽视,延误了最佳的再灌注治疗时机。ECG 对于早期判断罪犯血管及其梗死部位的作用尤为重要,而 LCX 因其本身的解剖变异度大、供血范围不定,且受冠状动脉优势类型、侧支循环等因素的影响,常规 ECG 诊断标准的灵敏性及特异性不高。新提出的标准由于灵敏度或特异度的问题,还未得到临床广泛应用。因此,还需总结更多的临床经验,以期发现较高敏感性和特异性的 ECG 指标,早期识别 LCX 急性完全闭塞的 NSTEMI 患者,以便及时进行血运重建治疗,挽救缺血心肌,改善患者预后。

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