

## · 综述 ·

## 儿童闭合性胰腺损伤的诊治进展

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**【摘要】** 儿童闭合性胰腺损伤的发病率较低,且早期临床表现及实验室检查缺乏特异性,导致早期诊断胰腺损伤较为困难;延迟诊断可能加重患儿病情,延长住院时间和增加医疗费用。此外,对高级别闭合性胰腺损伤患儿采取保守治疗还是手术治疗,目前仍存在争议。本文对近年来儿童闭合性胰腺损伤的诊断、治疗和预后等研究进展进行综述。

**【关键词】** 胰腺损伤; 儿童; 治疗

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**Recent advances in the diagnosis and treatment of blunt pancreatic injury in children**

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**【Abstract】** Early diagnosis of blunt pancreatic injury is rather difficult because of its low incidence in children. With sporadic reports, there are non-specific clinical manifestations and laboratory parameters in early injury phase. Delayed diagnosis may lead to disease worsening, prolonged hospitalization and higher expenses. Furthermore, it remains controversial as to whether or not adopting conservative treatment or operation for children with high-grade blunt pancreatic injury. Therefore this review focused upon the latest advances on the diagnosis, treatment and prognosis of blunt pancreatic injury in children.

**【Key words】** Pancreatic Injury; Child; Treatment

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胰腺损伤是指胰腺受外力直接或间接作用后出现的损伤,包括开放性损伤和闭合性损伤。儿童胰腺损伤以闭合性损伤为主,发病率为0.2%~12%,胰腺损伤的直接致死率为4.7%~5.3%,死亡多与合并伤有关<sup>[1-6]</sup>。胰腺损伤若延迟诊断可能导致胰瘘等并发症,延长住院时间,增加医疗费用,危害患者身体健康<sup>[3]</sup>。成人胰腺损伤的治疗已有明确规范,而儿童闭合性胰腺损伤的治疗仍存在争议,尤其是手术指征、手术时机、手术方式等目前还没有明确的指导方案。本文对近年来国内外有关儿童闭合性胰腺损伤的诊断、治疗和预后等研究进展进行综述。

### 一、创伤原因

儿童闭合性胰腺损伤均有上腹部外伤史。最常见于自行车车把撞击,也可见于交通事故或其他意外导致上腹部受到撞击<sup>[4-5,7]</sup>。胰腺近端体部是最常见损伤部位,原因与撞击时突然产生的压缩力将胰腺压向脊柱有关<sup>[8]</sup>。闭合性胰

腺损伤常合并脾脏(21.2%)、肝脏(11.4%)和肾脏(5.6%)等损伤;当临床存在多器官损伤时,需警惕可能同时存在胰腺损伤<sup>[1]</sup>。

### 二、临床诊断

闭合性胰腺损伤患儿常有呕吐、腹痛、腹胀等症状,查体可出现全腹压痛、腹肌紧张、肠鸣音减弱或消失等体征<sup>[4]</sup>。儿童往往不能提供准确的病史,加上症状特异度低,其他合并伤的临床表现亦可能掩盖胰腺损伤,因此对患儿进行病情评估时,需要结合实验室检查、影像学检查综合判断。

#### (一) 血液学检查

血清淀粉酶和脂肪酶升高对于胰腺损伤及其并发症具有提示意义,损伤后期约50%的患者指标升高与胰腺假性囊肿、胰瘘等并发症有关<sup>[9]</sup>。但其升高的程度与损伤程度、手术需求无相关性<sup>[9-13]</sup>。且上述指标在高达40%的胰腺损伤患者中可能正常<sup>[14-15]</sup>。另外其升高也可能是由其他合并伤导致。

急性胰腺炎患者血清淀粉酶水平通常在起病后 6~12 h 内升高,24~48 h 达到峰值;脂肪酶在 4~8 h 内上升,24 h 达到峰值<sup>[16-17]</sup>。所以,早期血淀粉酶、脂肪酶水平正常不能排除胰腺损伤,应给予监测,并进一步行影像学检查帮助诊断。

## (二)影像学检查

闭合性胰腺损伤患儿常用的影像学检查方法包括超声、电子计算机断层扫描(computed tomography, CT)、磁共振胆胰管成像(magnetic resonance cholangiopancreatography, MRCP)、经内镜逆行胆胰管造影(endoscopic retrograde cholangiopancreatography, ERCP)。胰腺损伤早期仅有少量出血、水肿,超声难以发现<sup>[18]</sup>。但超声检查方便快捷,可用于监测胰腺损伤的并发症(如胰瘘、腹腔出血、假性囊肿),并可引导行胰周积液穿刺。腹部 CT 是诊断闭合性胰腺损伤的主要方法,灵敏度为 33%~100%,特异度为 62%~100%,对于判断胰腺损伤部位及严重程度有重要价值<sup>[8,18]</sup>。但需注意 20%~40% 的患儿在损伤后 12 h 内 CT 可能正常<sup>[19-20]</sup>。此外,CT 诊断胰管损伤灵敏度为 43%~75%,当 CT 无法判断是否存在主胰管受损时,建议行 MRCP 或 ERCP<sup>[19,21]</sup>。MRCP 能够无创评估胰管的连续性,且可以更好地显示胰腺实质损伤,对胰头受损具有良好的诊断价值<sup>[8]</sup>。但 MRCP 检查耗时较长,扫描范围较窄,在急诊及危重患者的应用中受到限制。ERCP 可兼顾诊断和治疗,其优势是对血流动力学稳定的患儿可直接进行干预,包括在 ERCP 下行胰管支架植入及并发症治疗(如胰管狭窄、假性囊肿和胰瘘等)<sup>[4,7,22-23]</sup>。但 ERCP 为侵入性检查,儿童 ERCP 操作难度较大,且可能加重胰腺损伤或者导致十二指肠穿孔、胆管炎等并发症<sup>[8]</sup>。另有研究报道,闭合性胰腺损伤患儿早期行 ERCP 治疗并不能明显加快恢复<sup>[22]</sup>。所以目前 ERCP 在儿童闭合性胰腺损伤的应用尚受到限制。因此,对于上腹部闭合性损伤患儿即使早期检查结果未提示胰腺受损,仍要动态监测患儿腹部症状,当出现病情加重或者反复时应及时复查血清淀粉酶、脂肪酶、超声及 CT,从而帮助诊断。

## 三、胰腺损伤分级

胰腺损伤分级方法较多,目前普遍接受的是美国创伤外科协会(American Association for the Surgery of Trauma, AAST)1990 年提出的胰腺损伤评分量表,该量表根据是否存在胰腺导管损伤和损伤部位对严重程度进行分层,具有治疗管理意义<sup>[24]</sup>。具体分级如下:Ⅰ级指胰腺轻微挫伤或表浅撕裂伤;Ⅱ级指胰腺有明显的挫伤或撕裂伤;Ⅲ级指主胰管损伤并伤及肠系膜上静脉左侧的远端胰腺;Ⅳ级指主胰管损伤并伤及肠系膜上静脉右侧的近端胰腺;Ⅴ级指胰头遭到广泛性撕裂性破坏,常有胰十二指肠合并损伤。Ⅰ级和Ⅱ级损伤属于低级别损伤;Ⅲ至Ⅴ级损伤属于高级别损伤。儿童闭合性胰腺损伤最常见为Ⅱ级和Ⅲ级<sup>[8,25]</sup>。

## 四、闭合性胰腺损伤的治疗

成人闭合性胰腺损伤处理指南建议对于低级别损伤行非手术治疗,高级别损伤行胰腺切除术<sup>[26]</sup>。儿童闭合性胰腺损伤的手术与非手术治疗仍存在争议。治疗方式取决于

是否有主胰管损伤、损伤位置和 AAST 损伤分级。同时需要综合考虑患者病情稳定性以及是否合并其他损伤。首先控制活动性出血和对重要器官的治疗,积极进行复苏支持。

## (一)保守治疗

保守治疗包括营养支持、抑制胰酶分泌及抗感染等。生长抑素及其类似物理论上可以通过抑制胰腺外分泌而发挥作用,但在闭合性胰腺损伤的应用中尚无定论,建议根据个体情况选择<sup>[26]</sup>。对于急性胰腺炎患儿,不建议常规使用预防性抗生素。如果出现全身感染性并发症、胆管炎或者感染性胰腺坏死,建议行抗生素治疗<sup>[27]</sup>。如患儿生命体征平稳,无明显腹膜炎体征,排除腹内其他脏器破裂、出血,对低级别和大部分高级别闭合性胰腺损伤患儿可行保守治疗。文献报道低级别闭合性胰腺损伤患儿保守治疗成功率在 96%~100%,高级别闭合性胰腺损伤患儿保守治疗成功率 94.4%~96%<sup>[2,4,8]</sup>。因此大多数闭合性胰腺损伤患儿最初可选择保守治疗。

## (二)手术治疗

手术治疗包括清除坏死组织、止血、处理合并损伤等。手术方式主要取决于胰腺损伤部位和损伤程度,包括剖腹探查加胰周引流、远端胰腺切除术、胰肠 Roux-en-Y 吻合术、胰十二指肠切除术(Whipple 手术)等<sup>[28]</sup>。部分单纯胰腺损伤患儿可选择微创手术<sup>[29]</sup>。如胰头及十二指肠严重受损时可行胰十二指肠切除术。对于 AAST Ⅲ级及Ⅳ级胰腺损伤,损伤在肠系膜左侧胰头部而胰管无损伤者,主张行远端胰体尾切除、胰头置管引流术。对血流动力学不稳定、腹膜炎体征加重,或已经存在感染性休克和多脏器功能衰竭的患儿,应采取手术治疗,并注意探查是否存在血管破裂、肝脾破裂等合并伤,胰腺损伤可先清创、充分引流,待患者一般情况好转,胰腺周围组织条件较好时,再行二期缝合或决定后续手术方案。既往报道高级别胰腺损伤和胰管断裂患儿常需手术治疗<sup>[1-2,30-31]</sup>。但目前高级别闭合性胰腺损伤患儿保守治疗成功率越来越高,且在死亡率和总体并发症方面结果相当甚至更好<sup>[3,9,11,32-33]</sup>。所以,建议高级别闭合性胰腺损伤患儿早期采取保守治疗,但应密切观察病情变化,定期评估手术指征,病情恶化或存在其他重要器官复合伤时采取手术治疗。

## (三)营养支持

目前国内外暂无儿童闭合性胰腺损伤的营养支持规范,已发表的营养管理方案多集中在急性胰腺炎领域,均认为急性胰腺炎患儿肠内营养优于肠外营养,如无肠内营养禁忌,无需等待血淀粉酶、脂肪酶恢复正常或者疼痛停止,如耐受即可早期行肠内营养<sup>[34]</sup>。急性轻症胰腺炎患儿可首先尝试经口进食普通食物,无法耐受时可改为管饲喂养<sup>[35-37]</sup>。急性重症胰腺炎患儿一旦血流动力学稳定,应在入院 72 h 内启动肠内营养,一般推荐管饲营养支持,不建议早期经口进食<sup>[38]</sup>。要素配方、半要素配方和多聚配方都可以用于采用管饲喂养的急性胰腺炎患儿,为提高肠内营养耐受性,儿童鼻空肠喂养时可选择半要素配方或要素配方<sup>[27,34,38]</sup>。儿童

小样本的随机对照临床研究提示急性胰腺炎鼻胃管肠内营养具有良好的耐受性及安全性<sup>[39]</sup>。在鼻胃管肠内营养无法耐受的情况下,可以选择鼻空肠喂养。在胰腺裂伤、断裂或者导管破裂的患儿中,目前尚不清楚在急性期口服或肠内营养是否有害,需要对闭合性胰腺损伤患儿开展更多的前瞻性研究以提供有效建议<sup>[34]</sup>。当患儿不耐受肠内营养,或住院 1 周肠内营养仍未达到目标能量时,需联合肠外营养。一项针对 554 例闭合性胰腺损伤患儿的研究发现,接受肠外营养和住院时间、重症监护室住院时间延长有关,因而建议早期行肠内营养,为长期肠内营养不耐受的患儿提供肠外营养支持<sup>[40]</sup>。

#### (四) 并发症及治疗

胰腺损伤的短期并发症包括创伤性胰腺炎、假性囊肿、胰瘘等,长期并发症包括胰管狭窄、胰腺外分泌和内分泌功能不全等<sup>[3,4,33]</sup>。对胰腺损伤的并发症处理也是外科治疗中的重要环节。

1. 创伤性胰腺炎 创伤性胰腺炎是指胰腺损伤后出现的急性非感染性炎症,诊断主要参照急性胰腺炎,血淀粉酶和(或)脂肪酶水平连续 3 d 及以上超过正常值上限的 3 倍,是诊断创伤性胰腺炎的可靠指标<sup>[41]</sup>。治疗原则类似于急性胰腺炎,包括胃肠减压、抑制胰酶分泌、营养支持等<sup>[42]</sup>。如果保守治疗失败,可行胰腺切除、清创和引流<sup>[14]</sup>。

2. 胰腺假性囊肿 胰腺损伤后渗漏的胰液聚集在胰腺周围,如超过 4 周末被吸收,则被增生的肉芽组织和纤维包裹,形成假性囊肿<sup>[43]</sup>。胰管损伤患者更易形成假性囊肿。行保守治疗的闭合性胰腺损伤患儿假性囊肿发病率(18%~36%)高于手术患儿(1%~7.4%)<sup>[2-3,10]</sup>。胰腺假性囊肿诊断主要根据超声、CT、MRI 等影像学检查。儿童胰腺假性囊肿的治疗尚未达成共识。对于无明显症状、无并发症、无增大趋势的胰腺假性囊肿,可给予观察、营养支持等保守治疗,大多可自行消退,10%~36% 需要引流<sup>[2,9-10]</sup>。当假性囊肿持续 4 周以上,且有囊肿直径>6 cm 或囊肿继发压迫症状或囊肿进行性增大等情况时,则有干预指征<sup>[44]</sup>。外科治疗包括外引流术、内引流术、经皮穿刺置管引流术及胰腺切除术等<sup>[44-45]</sup>。超声或腹腔镜下囊肿外引流术具有较好的疗效,超声引导经皮穿刺囊肿外引流术简单微创,疗效确切,但受囊肿大小及部位限制;腹腔镜下囊肿外引流术可使引流更加充分;对于经皮穿刺引流无反应的患者应检查主胰管<sup>[46]</sup>。当主胰管破裂但无梗阻时,可置入胰管支架。如果存在梗阻,则需要手术切除。

3. 胰瘘 胰瘘是胰腺损伤后常见并发症之一。一项 Meta 分析以所有等级的闭合性胰腺损伤患儿为研究对象,其中手术组胰瘘发病率为 7.6%,高于非手术组的 1%,这与手术组包含更多高级别病例有关<sup>[3]</sup>。胰瘘患儿可先给予非手术治疗,包括引流、控制感染、营养支持和抑制胰液分泌;当非手术治疗无效时应选择内镜介入治疗和手术治疗。远端胰管可行远端胰腺切除术,近端胰管可通过支架置入或胰肠 Roux-en-Y 手术治疗<sup>[47]</sup>。

4. 长期并发症 关于闭合性胰腺损伤患儿长期并发症的病例报告较少,且随访时间有限。胰腺损伤可导致远端胰管狭窄和萎缩,胰管狭窄可导致胰液流出受阻、胰腺实质高压和局部缺血,诱发腹痛和加速胰腺内外分泌功能减退。文献报道胰腺损伤患儿胰腺萎缩发病率差异较大(20%~34%),但胰腺完全横断患儿采取保守治疗后胰腺萎缩发病率达 75%<sup>[4,7,33,48]</sup>。胰管狭窄报道较少,一篇研究中报道其发生率为 25%,这可能和诊断胰管狭窄需要接受 CT、MRI 检查有关<sup>[4]</sup>。胰管狭窄的治疗核心是扩张胰管、通畅引流。随着 ERCP 的不断完善,内镜治疗逐渐成为胰管狭窄的一线治疗方法,常用手段包括胰管括约肌切开术、狭窄扩张术和支架置入术等<sup>[27,49]</sup>。如狭窄位于主胰管头部且只有一处,适宜放置支架,而位于胰腺尾部且多处狭窄时内镜治疗效果较差,需手术干预<sup>[50]</sup>。2020 年的一项研究报道中约 40.6% 的儿童在随访中表现为慢性胰腺炎的影像学特征,但其中仅 46% 有腹痛症状<sup>[4]</sup>。外分泌功能不全的发病率低于 9%,可表现为脂肪吸收不良或者营养不良,可用胰酶替代治疗;内分泌功能不全的发病率低于 6%,可表现为糖耐量异常或者糖尿病<sup>[4,33,48,51]</sup>。胰腺损伤后导致糖尿病可能与切除腺体的数量以及患者年龄、体重指数、损伤前血糖情况有关。但由于病例数较少,随访时间有限,未来的研究需要对闭合性胰腺损伤患儿的胰腺功能进行长期随访。

#### 五、小结

胰腺损伤的诊断主要基于外伤史、临床表现、实验室检查、影像学以及内镜检查。对低级别闭合性胰腺损伤患儿推荐非手术治疗,高级别闭合性胰腺损伤患儿的治疗存在争议,目前建议早期保守治疗,并根据患儿情况进行选择性手术。

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