

鞘膜积液对小儿睾丸发育影响研究进展

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摘 要

鞘膜积液是婴幼儿阴囊无痛性肿胀最常见的原因, 也是发病率较高的先天性疾病之一。现鞘膜积液手术大多在2岁前进行, 但手术时机的选择一直存在争议。鞘膜积液对于睾丸发育的影响因素较多, 既有压力对血流的影响, 也有温度所带来的间接影响。目前的研究显示, 鞘膜积液是否对睾丸发育有严重影响尚无定论, 手术时机的选择由鞘状突自行闭合的时间划定。现仍考虑鞘膜积液对小儿睾丸发育存在负面影响, 病情较重的儿童需及时就医。

关键词

儿童, 鞘膜积液, 睾丸体积, 睾丸, 小儿外科

Advances in Research on the Effects of Hydrocele on Pediatric Testicular Development

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Abstract

Hydrocele is the most common cause of painless scrotal swelling in infants and children and is one of the more prevalent congenital disorders. Most surgery for hydrocele is now performed before the age of 2 years, but the timing of surgery has been controversial. Hydrocele has a number of factors that affect testicular development, both in terms of pressure on blood flow and indirectly due to temperature. Current research shows that it is inconclusive whether hydrocele has a serious effect on testicular development. The timing of surgery is determined by the timing of pro-

cessus vaginalis closure. It is still considered that hydrocele has a negative impact on the development of the testicles in children and that children with more severe cases need to seek medical attention.

Keywords

Children, Hydrocele, Testicular Volume, Testis, Pediatric Surgery

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1. 引言

鞘膜积液是小儿常见疾病, 新生儿和小婴儿鞘膜积液有自愈可能, 常随诊观察至 2 岁以后决定。治疗方法以手术为主, 常见治疗方法为鞘状突高位结扎术。Stanle 等通过回顾目前管理腹股沟疝和鞘膜积液的经验, 提出复发性鞘膜积液的患者, 可以进行超声检查以排除复发性疝, 并继续观察鞘膜积液长达 1 年, 若仍有积液, 建议穿刺抽吸[1]。现鞘膜积液的手术指征尚不确切。鞘膜积液对睾丸发育的影响相关文献较少, 且年代久远。近年来超声发展迅速, 临床上常用于鞘膜积液的诊断与病情评估, 鞘膜积液术前术后的超声检查对比显示出睾丸受累情况[2]-[7]。本文将通过文献复习、分析鞘膜积液对小儿睾丸发育的各种影响因素, 探讨鞘膜积液的治疗时机和病情评估办法。

2. 鞘膜积液的发生机制及体征

鞘膜积液主要是由鞘状突不完全闭塞, 囊内液体分泌和再吸收不平衡所致[8]。但有研究表明鞘膜囊壁内膜主要由单层扁平间皮细胞构成, 分泌功能非常弱。囊内积液不是囊壁自身分泌, 而是来源于腹腔的正常腹水[9]。

鞘膜积液患者主要表现为一侧或两侧阴囊肿胀。在绝大多数情况下, 肿胀是不伴有其他症状的。患者可能会有一种模糊的沉重感。有伴随症状的鞘膜积液通常继发于外伤、睾丸感染或睾丸扭转。鞘膜积液常通过临床表现来诊断, 主要为触诊[8]。阴囊的透光试验可以帮助证实诊断, 但有些鞘膜积液由于鞘膜增厚会无法透光, 因此如果不能确定诊断或怀疑睾丸异常, 则需要超声来完成评估[10]。

3. 鞘膜积液患儿手术时机选择

目前, 儿童鞘膜积液的手术时间安排尚无明确标准。由于大多数患儿鞘状突在出生后的前 24 至 36 个月关闭[11], 89% 的婴儿鞘膜积液患者会自发消退[12], 故大多数小儿鞘膜积液手术于 2 岁后进行[13][14]。手术方式主要为鞘状突高位结扎, 并将收集到的远端积液引流[1]。然而, 在某些情况下手术可能需要更早。例如: 较大和紧张的鞘膜积液[8]; 腹腔-阴囊鞘膜积液自发消退少见, 且此类病变体积较大, 可导致睾丸畸形、肾积水、睾丸扭转[15][16]; 张力性鞘膜积液常引起睾丸形态和循环的改变, 实质内血管阻力的增加, 以及强烈、持续的疼痛[17]; 同时伴有病理相关疾病[12]。另一方面, 在成人及青少年, 鞘膜积液对患者、其家人和社区的生活质量有相当大的负面影响, 手术治疗亦有助于患者的工作能力和性功能改善, 自尊心恢复[18]。因此鞘膜积液的治疗时间往往并不统一, 临床医生难以明确指导患者手术时间。

4. 鞘膜积液患儿睾丸术前术后改变

近年来超声发展迅速, 现已能通过超声能检测到出生后一年确定的生理变化相关的睾丸体积微小变化[19], 且能检测睾丸发育不良的征象或睾丸癌变[20]。

研究者通过术前和术后阴囊超声检查和扩散加权 MRI, 发现鞘膜积液患者睾丸的一些观测值存在差异, 包括表观扩散系数(apparent diffusion coefficient, ADC)、囊下动脉电阻率(resistivity index of the subcapsular artery, RIsc)、血流、体积、电阻率(resistivity, RI)和搏动率(pulsatility, PI)等[3] [6] [7] [21]。

正常儿童的超声结果显示, 双侧睾丸体积无明显差异, 且前 5 个月体积显著增加, 此后几年保持稳定[19]。在术前对单侧发病鞘膜积液患儿双侧睾丸体积的测定中, 部分研究者检测出双侧体积存在差异, 且为患侧体积大于健侧[5] [6], 而另有研究者提出患侧与健侧体积相同, 进一步解读超声结果显示: 右侧病变睾丸血流低于左侧, 患侧形态变圆, RISC 值增高[3] [21]。既往病理研究中发现, 患侧睾丸 20% 变平、8% 萎缩、10% 精子发生部分停止, 8% 完全停止[22], 但除去同时存在的病理相关疾病, 患侧与健侧无明显差异[23]。Jong 等在基于人群的研究中, 得出结论睾丸体积与增加的精子数量和精子活力之间存在显著的正相关关系[24], 体积的减小提示生殖功能受到一定影响。

术后检查结果显示, 研究者对 17 例单侧通讯性先天性鞘膜积液患者行鞘膜积液切除术后的睾丸体积进行了测量, 发现患侧睾丸体积减少了 15%。提出这有助于鉴别术后睾丸萎缩[5]。Mihmanli 等对 23 例平均年龄 42.8 岁的单侧特发性鞘膜积液患者进行了测量, 发现术后患侧睾丸体积下降 21%, RI 下降 21%, PI 下降 31% [6]。采用磁共振扩散加权成像法评估 49 例患者, 提示 ADC 值术前术后存在差异[7]。

在鞘膜积液患者的超声随访中发现, 随年龄增长鞘膜积液发生率增加, 没有发现睾丸癌或阴囊恶性肿瘤[25]。鉴于目前尚无文章报道鞘膜积液对成年人的睾丸功能有明确影响, 且临床研究提示鞘膜积液无明显恶变倾向, 对于成年鞘膜积液患者来说, 术前行超声检查并不一定合理。

综上, 鞘膜积液对于患侧睾丸的血供、形态等存在一定影响, 亟需进一步研究明确影响程度, 指导随访治疗。

5. 鞘膜积液对睾丸发育影响因素相关研究

鞘膜积液对睾丸发育的影响机制现尚无定论。研究者通过对发病机制的病理研究指出, 囊内膜主要由单层扁平上皮细胞组成, 具有非常微弱的分泌功能。推断囊内积液来自腹腔而非囊壁分泌[9]。尽管如此, 鞘膜积液的囊内压力与腹内压力并不相同, 有相当比例的腹内压高于腹内压, 并不能将腹腔与鞘膜积液囊之间视为自由流通[26]。而这种压力是否达到对睾丸有潜在损害的水平, 在其他研究中发现, 鞘膜积液的睾丸 ADC 值与鞘膜积液切除术时吸入液体量呈显著负相关, 考虑这种流体压力可能与睾丸功能障碍有关[7]。

液体引起的压力对睾丸的血液流动和功能造成影响, 通过超声可以检测到睾丸静脉和淋巴阻抗的增加[6]。大量的鞘膜积液将压迫睾丸及其周围血管网, 造成生殖系统发育不良[2]。在改良 Ferguson 技术术前术后改变中, 右侧腹股沟病变患者右侧睾丸血流量明显低于左侧, 也从侧面印证了这一点[3]。

此外, 睾丸细胞对高压、高蛋白含量液体的应激反应, 使睾丸的温度升高, 导致睾丸几何形状改变、囊下动脉电阻率指数升高、睾丸舒张期血流缺失, 从而影响精子发育, 损害睾丸功能[8]。

6. 结论及展望

根据以上研究结果, 临床工作者需考虑鞘膜积液对睾丸发育存在负面影响。尽管小儿鞘膜积液大部分于 2 岁后进行手术治疗, 但对于积液体积较大, 临床症状较重的患儿有及时治疗的必要。在未来我们将进一步收集临床数据用以量化影响程度, 帮助临床医生制定手术指征, 指导患儿随访治疗。

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