

腰大池腹腔分流手术治疗继发性交通性脑积水的研究

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【摘要】 目的 探讨腰大池腹腔分流手术(L-P)和脑室腹腔分流手术(V-P)对于L-P分流治疗交通性脑积水的效果及安全性。方法 采用可调压式腰大池腹腔分流管对27例交通性脑积水的患者进行手术治疗,同期应用传统的脑室腹腔分流手术及可调压脑室腹腔分流管对19例脑积水患者进行了手术治疗,对2组患者的年龄、性别、原发病组成、手术前后颅内压、并发症发生率、手术操作时间、手术中出血量、术后调压次数进行了比较,并对腰大池腹腔分流手术组患者手术前后颅内压进行比较。结果 2组患者在年龄、性别、术前颅内压、术后颅内压、手术操作时间、原发病组成、术后感染发生率、术后堵管发生率上无差异;L-P组术后调压1次14人次、调压2次3人次、调压3次2人次;V-P组术后调压1次16人次、调压2次8人次、调压3次3人次,2组间术后调压次数无差异($P=0.374$);L-P组和V-P组术中平均出血量分别为10 mL(四分位间距10)和30 mL(四分位间距10),L-P组术中出血量较少($P<0.001$);L-P分流效果良好、术后颅内压水平明显下降($P<0.001$)。结论 颅脑损伤和脑出血等引起的继发性交通性脑积水采用腰大池腹腔分流术能有效解除颅高压,与传统脑室腹腔分流手术比较效果相似、并发症发生率相仿;但是L-P手术中出血量少,且手术操作更简便、创伤更小。

【关键词】 继发性脑积水;交通性脑积水;脑室腹腔分流术;腰大池腹腔分流术

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Study of lumbar-peritoneal shunt for secondary communicating hydrocephalus

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【Abstract】 **Objective** To evaluate the efficacy and safety of L-P shunt in the treatment of secondary communicating hydrocephalus by retrospectively comparing L-P shunt and V-P shunt from January 2018 to December 2021. **Methods** Totally 27 patients were treated with adjustable L-P shunt, and 19 patients were treated with traditional adjustable V-P shunt. All patients were diagnosed as secondary communicating hydrocephalus. Age, sex, primary disease, intracranial pressure before and after operation, incidence of complications, operation time, The amount of blood loss during surgery, times of postoperative pressure adjustment were compared between the two groups, and intracranial pressure before and after L-P shunt was compared. **Results** There was no difference in age, sex, preoperative intracranial pressure, postoperative intracranial pressure, operation time, composition of primary disease, incidence of postoperative infection and postoperative tube occlusion between the two groups. There were 14 person-times of postoperative pressure regulation, 3 times of pressure regulation and 2 times of pressure regulation in L-P group, while 16 person-times, 8 times and 3 times of pressure regulation in V-P group. There was no significant difference in the number of postoperative pressure regulation between the two groups ($P=0.374$). The average intraoperative blood loss was 10 mL (10 quartile interval) and 30ml (10 quartile

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interval) in Lmurg group and Vmurg group, respectively, while the intraoperative blood loss in Lmurg group was less than that in Vmurg group ($P < 0.001$), and the postoperative intracranial pressure decreased significantly in Lmurg group ($P < 0.001$). **Conclusion** L-P shunt can effectively relieve intracranial hypertension in secondary communicating hydrocephalus caused by cerebral injury and intracerebral hemorrhage. It has similar effect and complication rate with traditional V-P shunt. L-P shunt, however, is relatively simple to operate and minimal invasive.

【Key words】 Secondary hydrocephalus; Communicating hydrocephalus; Ventriculoperitonealshunt; Lumboperitoneal shunt

继发性交通性脑积水是脑血管疾病、颅脑损伤、颅内感染的常见并发症,发生脑积水后患者往往出现颅内压增高症状,且脑室系统也随之扩大,若未得到及时合理的治疗,病情将日趋恶化。目前最常见的治疗方法有脑室腹腔分流术(ventriculoperitoneal shunt, V-P)和腰大池腹腔分流术(lumboperitoneal shunt, L-P),V-P就是把脑室内的脑脊液通过脑室穿刺和皮下分流管植入的方式将脑脊液分流到腹腔内,而L-P是置管于椎管蛛网膜下腔并分流至腹腔内。目前V-P仍为交通性脑积水的主流手术方式,但近年来由于L-P微创、损伤小和更符合脑脊液生理循环等特点在临床中应用越来越多。本研究对近期云浮市人民医院开展的L-P和V-P手术进行回顾性研究,比较两种术式在手术效果、并发症发生率、术后调压次数等方面的差异,初步明确L-P手术的安全性和有效性,为进一步的前瞻性对照研究打下基础。

1 资料与方法

1.1 一般资料 回顾分析云浮市人民医院神经外科在2014-01—2021-12收治的脑积水患者中,完成L-P分流术共27例,完成V-P分流19例,男28例,女18例,年龄中位数60(内四分位间距19),其余详细分组基本临床资料见表1。

1.2 L-P手术操作方法 一般采用右侧卧位,以腰椎2~3、3~4、4~5椎间隙为穿刺点。腰大池内置管5~10 cm;左侧髂嵴及反麦氏点分别行2~3 cm切口,分流阀置于左髂嵴切口内,末端管置入左下腹内约15 cm;按规定方向连接可调压分流阀;术前已将调压分流阀调至适当的压力。

1.3 V-P手术操作方法 一般采用仰卧位,取左或右侧脑室额角穿刺点,通常是Kocher's point,即鼻根向沿头皮正中矢状线上11 cm,旁开2~3 cm;分流泵一般置于耳后,皮肤上另一口并置入;腹部切口一般采用反麦氏点切口,腹腔端分流管置入左下腹约15 cm;同样根据术前腰穿测压结果已将分流阀调整至合适压力。

1.4 统计学方法和随访 对于本组患者数据不符合正态分布的连续数值型变量采用中位数(内四分位间距)来显示,对于符合正态分布的采用均数±标准差显示。本研究中年龄、术前颅内压、术后颅内压、手术操作时间、手术中出血量、手术后调压次数这些变量均不符合正态分布,采用非参数检验的两独立样本检验(Mann-Whitney *U* 检验),对于L-P分流前后颅内压的比较采用非参数检验的两相关样本检验(Wilcoxon 检验),对于性别、原发病、并发症均采用卡方检验。所有患者均随访时间(15.93±5.93)个月

2 结果

2.1 2组患者一般临床资料比较 L-P组和V-P组年龄、男性比例、术前颅内压(mmH₂O)、后颅内压(mmH₂O)、手术操作时间(h)等比较差异均无统计学意义($P > 0.0$);L-P组术中出血量明显少于VP组($P < 0.001$)。见表1。

2.2 2组患者原发病比较 所有患者原发病分为3类,分别是颅脑损伤(脑外伤)、自发性脑出血(脑出血)和其他原因,其他原因包括脑肿瘤术后、感染、特发性脑积水等。L-P组脑外伤、脑出血和其他原因分别是59.3%、25.9%和14.8%,而V-P组分别是58.8%、23.5%和29.4%,2组比较差异无统计学意义($P =$

表1 2组一般资料比较

Table 1 Comparison of general data between the two groups

资料	L-P组	V-P组	<i>P</i> 值
年龄/岁	60(20)	55(13)	0.241
性别(男性/总例数)	15/27	13/19	0.775
术前颅内压/mmH ₂ O	155(75)	180(40)	0.112
术后颅内压/mmH ₂ O	90(40)	90(20)	0.973
手术操作时间/h	3(0.5)	3(0.3)	0.573
手术中出血量/mL	10(10)	30(10)	<0.001
原发病/%	脑外伤	59.3(16/27)	58.8(10/17)
	脑出血	25.9(7/27)	23.5(4/17)
	其他原因	14.8(4/27)	29.4(5/17)
并发症/%	感染	7.4(2/27)	15.8(3/19)
	堵管	7.4(2/27)	10.5(2/19)

0.951)。见表 1。

2.3 2 组患者并发症比较 L-P 组和 V-P 组的术后感染发生率分别为 7.4% 和 15.8%，2 组比较差异无统计学意义 ($P=0.809$)；L-P 组和 V-P 组术后发生分流管堵塞的发生率分别是 7.4% 和 10.5%，差异无统计学意义 ($P=0.137$)。见表 1。

2.4 2 组患者术后调压次数比较 L-P 组术后调压次数：调压 1 次 14 人次，调压 2 次 3 人次，调压 3 次 2

人次；V-P 组术后调压次数：调压 1 次 16 人次，调压 2 次 8 人次，调压 3 次 3 人次；2 组调压次数比较差异无统计学意义 ($P=0.374$)。见图 1。

2.5 L-P 组术前和术后颅内压比较 L-P 组术前和术后颅内压 (mmH₂O) 分别为 155 (75) 和 90 (40)，差异有统计学意义 ($P<0.001$)，L-P 组术后颅内压明显下降。见图 2。

2.6 典型病例 见图 3。

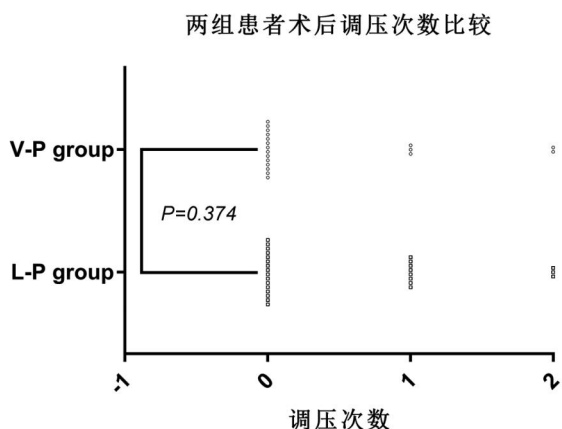


图 1 L-P 组和 V-P 组术后调压次数比较

Figure 1 Comparison of postoperative pressure regulation times between LP group and VP group

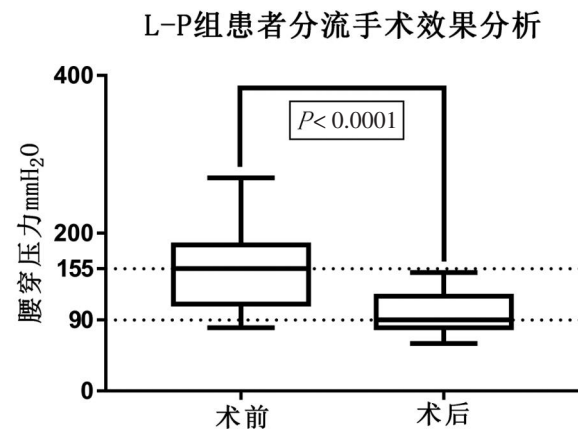


图 2 L-P 组术前及术后颅内压的比较

Figure 2 Comparison of preoperative and postoperative intracranial pressure in L-P group

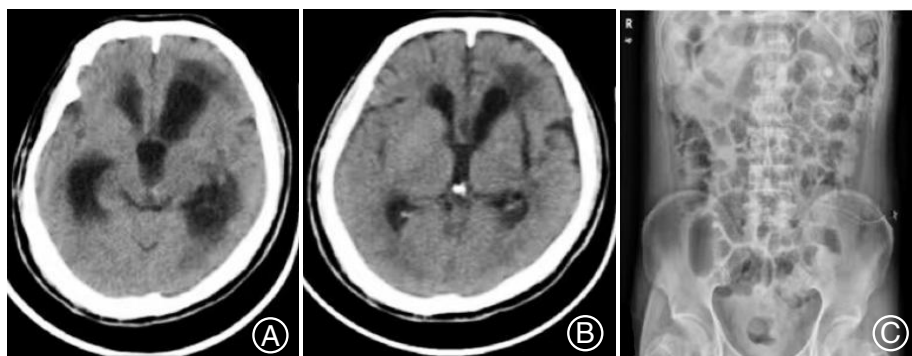


图 3 典型病例, A 为术前 CT, B 为术后 17 d CT, C 为术后腹部 X 线平片

Figure 3 Typical case, A is preoperative CT, B is CT 17 days after surgery, and C is postoperative abdominal X-ray

3 讨论

脑室腹腔分流术 (V-P) 目前仍是治疗交通性脑积水最常采用的手术方法^[1-2]，但其存在的并发症不可忽视。首先穿刺深度难以掌握，V-P 手术在置脑室端分流管时一般采用盲穿；如果置管过深则插入对侧脑组织或插入深部重要结构中引起新的损伤；置管过浅则随着积聚的脑脊液被排出，脑组织回缩后分流管可能被埋入脑组织中，分流管侧孔堵塞失去引流效果。其次可能引发新的损伤，V-P 需穿刺大脑皮层将分流管置入深部的脑室，在穿刺过程中可能损伤血管引起脑内血肿、脑室内积血导致病情恶化，

严重时需开颅行血肿清除术。其次脑室穿刺所致皮层损伤是诱发术后癫痫发作的重要因素，尤其是多次穿刺，其发生率可高达 9.4%~24%^[3-5]。还有分流管堵塞机会多，由于侧脑室脉络丛的包裹、组织碎块或血块进入管腔等原因造成脑室端分流管堵塞。

L-P 分流术主要适用于非梗阻性脑积水，包括正常压力脑积水 (外伤后，脑出血后及不明原因的) 和其他原因所致的交通性脑积水，正常情况下脑室系统与腰大池是保持通畅的，L-P 分流术几乎完全等同于 V-P 分流术的作用；梗阻性脑积水为腰大池-腹腔分流术的禁忌证。本研究 27 例行 L-P 分流手

术患者均为交通性脑积水,而 19 例行 V-P 患者包括交通性和梗阻性脑积水。通过 2 组患者比较发现两种术式在治愈脑积水的疗效是类似的,L-P 术后颅内压均出现明显下降。1990 年 AOKIL 等^[6]报道一项长达 11 a 的临床研究,通过比较 207 例采用 L-P 分流手术与 120 例采用 V-P 分流术患者的手术并发症及一次手术成功率,提出交通性脑积水、脊髓蛛网膜下腔与侧脑室相通而无脊柱畸形患者应首先考虑 L-P 分流。SINGH 等^[7]报道对于感染性脑膜炎术后脑积水的患儿,L-P 手术后的死亡症和堵管等并发症发生率小于 V-P 手术,同时 L-P 手术操作明显简单于 V-P 手术。

本组患者均为脑外伤及脑出血后的继发性交通性脑积水,虽然早期多有报道将 L-P 手术应用于特发性正常颅压脑积水^[8-10],并认为 L-P 手术是治疗特发性正常颅压脑积水首先治疗方式^[11-12],但近年来 L-P 手术的适应证也是逐渐增多。国内近年来 L-P 分流手术在临床中治疗交通性脑积水的应用逐渐增多,取得了良好效果。YADAV 等^[13]认为 L-P 分流是交通性脑积水的最佳治疗方式。对于脑外伤及脑出血引起的继发性脑积水治疗,越来越多研究发现 L-P 手术更具优势。报道将 L-P 分流手术应用于颅脑创伤后脑积水治疗越来越多^[14-17],认为创伤后脑积水患者可调压分流管腰大池腹腔分流术治疗效果显著,术后并发症少,可改善患者术后生活质量^[18-19]。

本文中 2 组术后并发症发生率无明显差异,有报道 L-P 手术相对于 V-P 手术并发症较少,但亦有报道与 V-P 手术类似^[16, 20]。但考虑到 L-P 分流术不需要循环脑组织穿刺,因此无脑内血肿形成或癫痫发作并发症风险;L-P 分流术因皮下引流管潜行途径明显短于 V-P 分流术,因此并发引流管感染的可能性明显降低。JIA 等^[21]认为 L-P 手术较 V-P 手术更加微创,并发症发生率低。另外 L-P 手术操作相对简单,创伤较小,国外甚至有报道在门诊开展此手术^[22-30]。ABUBAKER 等^[31-38]报道对于特发性正常颅压脑积水患者,L-P 和 V-P 分流手术治疗效果类似,但 V-P 分流的长期失效率为 14%,稍高于 L-P 分流 11%。相对于 V-P 手术,L-P 手术亦有少量并发症的报道,如出现双侧硬膜下血肿或脑内血肿,考虑与分流过度有关^[39-40]。

本研究结果显示,L-P 手术在治疗继发性交通性脑积水的疗效上等同于 V-P 手术,并发症发生率亦与 V-P 手术相似,L-P 手术更加微创,可作为多数继发性交通性脑积水的首先手术方式。

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