

doi: 10.13241/j.cnki.pmb.2018.22.012

脾切除及贲门周围血管离断术对肝硬化门静脉高压患者肝脏血流动力学的影响及其术后门静脉血栓形成的因素分析*

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摘要 目的:探讨脾切除及贲门周围血管离断术对肝硬化门静脉高压患者肝脏血流动力学的影响,并分析患者术后门静脉血栓形成的危险因素。**方法:**选择2016年1月-2017年12月在我院进行脾切除及贲门周围血管离断术的96例肝硬化门静脉高压患者,于术前、术后1d、3d、7d采用彩色多普勒超声对患者的肝脏血流动力学指标进行动态监测。统计术后7d内患者门静脉血栓的发生率,并将患者分为血栓组($n=28$)和无血栓组($n=68$),对两组患者的一般资料、手术指标、彩色多普勒超声监测指标等进行单因素分析,并采用Logistic多因素回归分析门静脉血栓形成的危险因素。**结果:**患者在术前、术后1d、3d、7d时的门静脉内径、最大流速、血流量呈逐渐降低的趋势,肝动脉内径、最大流速、血流量呈逐渐升高的趋势,且各时间点间两两比较差异有统计学意义($P<0.05$)。术后7d内有28例患者出现门静脉血栓,发生率为29.17%。血栓组和无血栓组患者在性别、年龄、体质量指数、手术时间、术前门静脉流速比较差异无统计学意义($P>0.05$);血栓组患者Child-Pugh分级为B级比例、术中出血量、脾质量、腹水量、术前门静脉内径均高于无血栓组,术后门静脉内径、术后门静脉流速均低于无血栓组($P<0.05$)。经Logistic多因素回归分析显示,患者术后门静脉内径、术后门静脉流速是门静脉血栓形成的危险因素($P<0.05$)。**结论:**行脾切除及贲门周围血管离断术的肝硬化门静脉高压患者术后进行肝脏血流动力学监测,有助于患者术后的疗效判断,且术后门静脉内径、术后门静脉流速是门静脉血栓形成的危险因素。

关键词:肝硬化门静脉高压;脾切除及贲门周围血管离断术;肝脏血流动力学;门静脉血栓;危险因素

中图分类号:R575.2 **文献标识码:**A **文章编号:**1673-6273(2018)22-4256-05

Influence of Splenectomy and Pericardial Devascularization on Hepatic Hemodynamics in Patients with Cirrhosis and Portal Hypertension and Factors Related to Postoperative Portal Vein Thrombosis*

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ABSTRACT Objective: To investigate the influence of splenectomy and pericardial devascularization on hepatic hemodynamics in patients with cirrhosis and portal hypertension, the risk factors of postoperative portal vein thrombosis were analyzed. **Methods:** 96 patients with cirrhosis and portal hypertension who underwent splenectomy and pericardial devascularization in our hospital from January 2016 to December 2017 were selected. The hemodynamic indexes of the liver were dynamically monitored by color Doppler ultrasound before operation and 1d, 3d and 7d after operation. The incidence of portal vein thrombosis 7d after operation was statistically analyzed, the patients were divided into thrombus group ($n=28$) and non thrombus group ($n=68$), single factor analysis of the general data, operative indicators, color Doppler ultrasound monitoring indicators and so on were made, multivariate Logistic regression analysis was used to analyze the risk factors of portal vein thrombosis. **Results:** The diameter, maximum velocity and blood flow of portal vein were decreasing gradually, the diameter, maximum velocity and blood flow of hepatic artery increased gradually before and 1d, 3d and 7d after operation, the differences between each time point were statistically significant ($P<0.05$). There were 28 cases of portal vein thrombosis at 7d after operation, the incidence was 29.17%. There were no significant difference in gender, age, body mass index, operative time and portal vein flow velocity between thrombus group and non thrombus group ($P>0.05$). The Child-Pugh classification of patients with thrombus group was B grade, intraoperative bleeding, spleen mass, ascites volume, and anterior portal vein diameter were higher than those of non thrombus group. The internal diameter of portal vein and the velocity of portal vein after operation in the thrombus group were all lower than those of the non thrombus group ($P<0.05$). Multivariate Logistic regression analysis showed that postoperative portal vein diameter and postoperative portal vein flow velocity were risk factors of portal vein thrombosis ($P<0.05$). **Conclusion:** Hepatic hemodynamics was monitored after splenectomy and pericardial devascularization in cirrhotic patients with portal hypertension is helpful

* 基金项目:北京市科技计划基金项目(Z131438)

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(收稿日期:2018-04-27 接受日期:2018-05-21)

to judge the curative effect of postoperative patients. Postoperative portal vein diameter and postoperative portal vein flow rate are risk factors of portal vein thrombosis.

Key words: Cirrhosis and portal hypertension; Splenectomy and pericardial vascular disconnection; Liver hemodynamics; Portal vein thrombosis; Risk factors

Chinese Library Classification(CLC): R575.2 **Document code:** A

Article ID: 1673-6273(2018)22-4256-05

前言

肝硬化是临床常见的慢性肝功能疾病,长期患病可导致弥漫性肝损伤、肝功能减退和门静脉高压等临床表现^[1,2]。其中以门静脉高压最为常见,具体表现为门静脉血液未能顺利通过肝脏回流进入下腔静脉,随之导致门静脉压力持续增高,进一步引起患者的脾脏肿大、功能亢进、腹壁、食管静脉曲张、肝功能减退^[3,4],对于部分病情较重的患者还可导致患者的食管胃底静脉曲张,一旦破裂压力进一步升高有可能引起急性上消化道出血,危及患者的生命健康。鉴于肝硬化门静脉高压的巨大危害性,其在临床上的诊断、治疗、疗效评估方面的研究也在不断深入^[5,6]。目前,对于此类患者的治疗主要采用脾切除及贲门周围血管离断术,据相关报道显示,在此类手术的围术期内患者的肝脏血流动力学指标会发生相应的变化,这对于患者术后疗效的评估可能存在着一定的指导意义^[7,8]。门静脉血栓形成是脾切除及贲门周围血管离断术后最易出现的并发症,当前对于门静脉血栓的形成原因尚不完全清楚,可能与患者术中肝脏血流动力学指标改变有关^[9-11]。为此,在本研究中通过对患者的一般资料、手术指标、肝脏血流动力学指标进行监测比较,分析门静脉血栓形成的危险因素,现报道如下。

1 资料与方法

1.1 一般资料

选择 2016 年 1 月 -2017 年 12 月在我院行脾切除及贲门周围血管离断术的 96 例肝硬化门静脉高压患者为研究对象,纳入标准^[12]: ① 所有患者经超声检查确诊为肝硬化门静脉高压; ② 患者表现为肝脾肿大、食管胃底静脉曲张; ③ 患者均进行脾切除及贲门周围血管离断术,能够耐受本研究手术治疗方法; ④ 患者签署知情同意书。排除标准: ① 严重的心、肺、肾功能不全者; ② 合并全身恶性肿瘤疾病者; ③ 术中出现突发事件未完成手术治疗,或术后出现严重并发症转入其他科室治疗者。其中男性 58 例、女性 38 例,年龄 35-68 岁,平均 (50.37 ± 12.39) 岁; 体质指数 $20-26 \text{ kg/m}^2$, 平均 $(23.38 \pm 2.89) \text{ kg/m}^2$; Child-Pugh 分级: A 级 58 例、B 级 38 例,研究方案经我院伦理学委员会批准。

1.2 手术方法

所有患者均进行脾切除及贲门周围血管离断术,患者给予全身静脉麻醉,取仰卧位,在左侧腹部进行手术切口,对患者胃部的胃脾韧带、胃肠韧带进行游离,使患者的胃体、胃底部充分游离,然后切除脾脏。对患者的脾动脉、胃后静脉、胃左静脉、胃右静脉进行结扎离断,然后离断食管下段 6-8 cm 范围内的高位食管支、食管旁静脉侧支、膈下支及周围血管,在离断的创面进行浆膜化处理,放置引流导管,完成手术操作,逐层缝合伤

口,术后进行抗感染治疗。

1.3 评价方法

于术前、术后 1d、3d、7d 采用 EPIQ5 型彩色多普勒超声诊断仪(飞利浦公司)进行肝脏血流动力学指标的动态监测,具体监测指标包括:门静脉内径、门静脉最大流速、门静脉血流量、肝动脉内径、肝动脉最大流速、肝动脉血流量。观察患者在术后 7d 内门静脉血栓的发病例数,计算发生率,将患者分为血栓组和无血栓组。

1.4 统计学方法

采用 SPSS 20.0 进行数据处理与分析,以 $(\bar{x} \pm s)$ 表示计量资料,两组间比较实施 t 检验分析,多组间比较实施 F 检验,以 $[n(\%)]$ 表示计数资料,组间比较实施 χ^2 检验,采用 Logistic 多因素回归分析术后门静脉血栓形成的危险因素,当 $P < 0.05$ 时差异有统计学意义。

2 结果

2.1 患者手术前后肝脏血流动力学指标比较

患者在术前、术后 1d、3d、7d 时的门静脉内径、最大流速、血流量呈逐渐降低的趋势,且各时间点间两两比较差异有统计学意义($P < 0.05$),患者在术前、术后 1d、3d、7d 时的肝动脉内径、最大流速、血流量呈逐渐升高的趋势,且各时间点间两两比较差异有统计学意义($P < 0.05$),见表 1。

2.2 血栓组与无血栓组一般资料、手术指标、血流动力学指标比较

术后 7d 内有 28 例患者出现门静脉血栓,发生率为 29.17%。两组患者在性别、年龄、体质指数、手术时间、术前门静脉流速比较差异无统计学意义($P > 0.05$);血栓组患者 Child-Pugh 分级为 B 级比例、术中出血量、脾质量、腹水量、术前门静脉内径均高于无血栓组,术后门静脉内径、术后门静脉流速均低于无血栓组($P < 0.05$),见表 2。

2.3 门静脉血栓形成的危险因素分析

经 Logistic 多因素回归分析显示,患者术后门静脉内径、术后门静脉流速是门静脉血栓形成的危险因素($P < 0.05$),见表 3。

3 讨论

脾切除及贲门周围血管离断术是治疗肝硬化门静脉高压的有效治疗手段,能够降低门静脉血压水平,改善患者的上消化道出血症状和脾脏功能的亢进情况^[13-15]。降低门静脉压力的主要原因是患者在脾脏切除后,由脾静脉流入肝门静脉的血液消失,导致门静脉的血流量减少,门静脉的高压现象得以降低和缓解;患者在贲门周围血管离断后,门静脉的侧支循环减少,导致门静脉入肝的血流增加,从而降低了患者门静脉的压力

表 1 患者手术前后肝脏血流动力学指标比较($\bar{x} \pm s$)
Table 1 Comparison of liver hemodynamic indexes before and after operation($\bar{x} \pm s$)

Time	n	Portal vein			Hepatic artery		
		Diameter (mm)	Maximum velocity (cm/s)	Blood flow (ml/min)	Diameter (mm)	Maximum velocity (cm/s)	Blood flow (mL/min)
Before operation	96	14.49± 1.48	26.09± 4.76	1290.36± 456.93	3.78± 0.41	46.78± 6.89	120.75± 45.07
1d after operation	96	13.30± 1.30*	22.37± 4.51*	897.67± 264.32*	3.97± 0.30*	53.76± 6.53*	167.46± 44.21*
3d after operation	96	12.01± 1.16*^	17.31± 3.61*^	703.27± 187.12*^	4.21± 0.26*^	63.31± 7.35*^	203.25± 47.12*^
7d after operation	96	11.35± 1.04*^#	14.89± 2.98*^#	560.87± 151.22*^#	4.45± 0.24*^#	72.38± 6.42*^#	261.88± 51.51*^#
F	-	17.008	19.541	14.850	13.815	26.634	20.203
P	-	0.000	0.000	0.000	0.000	0.000	0.000

Note: compared with before operation, * $P<0.05$; compared with 1d after operation, ^ $P<0.05$; compared with 3d after operation, # $P<0.05$.

表 2 血栓组与无血栓组一般资料、手术指标、血流动力学指标比较
Table 2 Comparison of the general data, surgical indexes and hemodynamic indexes of the thrombus group and the non thrombus group

Indexes		Thrombus group(n=28)	Non thrombus group(n=68)	t/χ^2	P
Gender n(%)	Male	18(64.29)	40(58.82)	0.169	0.681
	Female	10(35.71)	28(41.18)		
Age (years)		48.97± 11.45	51.36± 12.03	1.410	0.160
Body mass index(kg/m ²)		23.12± 3.21	23.89± 3.02	1.712	0.089
Child-Pugh n(%)	Class A	10(35.71)	48(70.59)	12.688	0.000
	Class B	18(64.29)	20(29.41)		
Operation time(min)		132.34± 34.21	128.76± 30.44	0.766	0.455
Intraoperative bleeding(mL)		412.85± 102.34	335.74± 86.47	5.640	0.000
Spleen mass(g)		798.09± 246.12	675.93± 213.48	3.764	0.000
Ascites volume(mL)		76.98± 15.72	51.20± 11.34	13.031	0.000
Anterior portal vein diameter before operation(mm)		15.02± 0.89	14.37± 0.64	5.810	0.000
Anterior portal vein diameter after operation(mm)		11.63± 0.38	12.47± 0.54	12.646	0.000
Anterior portal venous flow velocity before operation(cm/s)		25.79± 4.08	25.01± 4.57	1.604	0.110
Anterior portal venous flow velocity after operation(cm/s)		11.73± 2.12	14.28± 1.66	11.557	0.000

表 3 门静脉血栓形成的危险因素分析
Table 3 Risk factors of portal vein thrombosis

Variable	Wald χ^2	β	OR	95%CI	P
Child-Pugh	0.675	0.589	0.869	0.684~1.014	0.231
Intraoperative bleeding	0.893	0.642	1.049	0.851~1.498	0.198
Spleen mass	0.356	0.413	0.972	0.778~1.296	0.423
Ascites volume	1.094	0.675	1.067	0.892~1.451	0.164
Anterior portal vein diameter before operation	0.497	0.539	1.074	0.961~1.493	0.296
Anterior portal vein diameter after operation	12.982	1.325	2.136	1.984~2.475	0.005
Anterior portal venous flow velocity after operation	9.876	1.287	1.049	1.011~1.056	0.011

[16-18]。因此,患者在实施脾切除及贲门周围血管离断术后,患者肝脏的血流动力学指标也会随着脾脏的切除、贲门胃底周围血管的离断而发生显著变化,而这种肝脏动力学指标的改变可以为患者手术效果的评估提供参考依据,当患者门静脉血流动力学指标下降,肝动脉血流动力学指标上升,提示患者的手术效

果良好,患者的门静脉高压得以降低[19-21]。另外,脾切除及贲门周围血管离断术患者术后易出现门静脉血栓形成的并发症,影响手术治疗效果,对于门静脉血栓的发生因素的研究尚不明确,有报道显示与术中患者的肝脏血流动力学指标变化有关[22-24]。

本研究结果显示,患者在术前、术后 1d、3d、7d 时的门静脉

内径、最大流速、血流量呈逐渐降低的趋势,肝动脉内径、最大流速、血流量呈逐渐升高的趋势,这是因为手术过程中切除患者的脾脏,使脾静脉流入肝门静脉的血流完全消失,从源头上减少了门静脉流入的血流量,使得门静脉血压降低,门静脉的内径、最大流速、血流量由此在术后呈下降趋势。患者贲门周围血管离断后,增加了门静脉入肝的血流量,使得肝动脉的内径、最大流速、血流量在术后呈上升趋势^[25-27]。门静脉血栓是患者术后常见的并发症,本研究中有 28 例患者出现门静脉血栓,发生率为 29.17%。经单因素分析显示,血栓组与无血栓组患者 Child-Pugh 分级、术中出血量、脾质量、腹水量、术前门静脉内径、术后门静脉内径、术后门静脉流速比较差异有统计学意义,经 Logistic 多因素回归分析显示,术后门静脉内径、术后门静脉流速是门静脉血栓形成的危险因素,表明术后门静脉血栓形成与患者的肝脏血流动力学指标变化有密切关联。这是因为门静脉血栓的形成与血液的循环异常、出现血凝块、血液沉积物有关。当患者术后门静脉流速较慢,此时在较大的静脉血管中,血液流动缓慢,易导致血液沉积物和血凝块的出现,而术后门静脉内径较小时,这种血凝块、血液沉积物分布更为广泛,从而引发门静脉血栓形成^[28-30]。因此,较小的门静脉内径和较慢的静脉流速是门静脉血栓形成的危险因素,在术后应给予严密的监测和相应的预防。

综上所述,肝硬化门静脉高压患者行脾切除及贲门周围血管离断术后,患者的肝脏血流动力学发生显著变化,其中门静脉的内径、血流量、最大流速均下降,肝动脉的内径、血流量、最大流速均上升,这种指标变化可为患者手术疗效评估提供参考。患者术后门静脉内径、术后门静脉流速是影响患者门静脉血栓形成的危险因素,对于患者门静脉血栓形成具有一定的预测价值。

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