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• 临床研究 Clinical research •

不同性质球囊腹主动脉阻断术在凶险性前置胎盘应用中的对比研究

蔡 争, 宋建涛, 甄文瑞, 梁乐乐

【摘要】 目的 对比不同球囊腹主动脉阻断术治疗凶险性前置胎盘的效果。**方法** 回顾性分析 2018 年 2 月至 2021 年 5 月遵义医科大学第二附属医院收治的 102 例凶险性前置胎盘患者临床资料。52 例接受非顺应性球囊腹主动脉阻断术(研究组), 50 例接受顺应性球囊腹主动脉阻断术(对照组)。观察两组腹主动脉球囊阻断术实施情况。记录两组患者腹主动脉阻断术前后血压、心率变化。统计两组球囊阻断时间、X 射线辐射、剖宫产手术及术后并发症情况。**结果** 两组均成功置入球囊, 腹主动脉阻断术成功, 无死亡病例。两组腹主动脉球囊阻断术前后患者心率、收缩压差异无统计学意义(均 $P > 0.05$)。两组 X 线辐射剂量、胎儿射线暴露时间差异无统计学意义(均 $P > 0.05$)。研究组球囊阻断时间低于对照组($P < 0.05$)。研究组剖宫产术中出血量低于对照组($P < 0.05$)。两组输血率、红细胞输注量、子宫切除率差异无统计学意义(均 $P > 0.05$)。两组腹主动脉球囊阻断术相关并发症发生率差异无统计学意义($P > 0.05$)。**结论** 顺应性和非顺应性球囊腹主动脉球囊阻断术治疗凶险性前置胎盘均安全有效, 但使用非顺应性球囊在减少剖宫产术中出血量方面更具优势。

【关键词】 球囊; 腹主动脉球囊阻断术; 凶险性前置胎盘; 效果

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The application of abdominal aortic occlusion using balloon of different properties in treating dangerous placenta previa: a comparative study CAI Zheng, SONG Jiantao, ZHEN Wenrui, LIANG Lele. Department of Interventional Medicine, Second Affiliated Hospital of Zunyi Medical University, Zunyi, Guizhou Province 563000, China

Corresponding author: CAI Zheng, E-mail: caizhen5644@163.com

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作者单位: 563000 贵州 遵义医科大学第二附属医院介入科

通信作者: 蔡 争 E-mail: caizhen5644@163.com

【Abstract】 Objective To compare the curative effect of different types of balloon in performing abdominal aortic occlusion for the treatment of dangerous placenta previa. **Methods** The clinical data of 102 patients with dangerous placenta previa, who were admitted to the Second Affiliated Hospital of Zunyi Medical University of China to receive treatment between February 2018 and May 2021, were retrospectively analyzed. Of the 102 patients, 52 received non-compliant balloon abdominal aortic occlusion(study group) and 50 received compliant balloon abdominal aortic occlusion(control group). The implementation of the abdominal aortic balloon occlusion procedures in the two groups was assessed. Before and after abdominal aortic occlusion, the blood pressure and heart rate in both groups were recorded. The duration of abdominal aortic balloon occlusion, X-ray radiation, the amount of blood loss during cesarean section and postoperative complications in the two groups were calculated. **Results** Successful abdominal aortic occlusion by using balloon implantation was accomplished in all patients of both groups. No death occurred. In both groups, the postoperative heart rate and systolic blood pressure were not significant different from the preoperative ones (all $P>0.05$). No statistically significant differences in X-ray radiation dose and fetal radiation exposure time existed between the two groups(all $P>0.05$). The duration of abdominal aortic balloon occlusion in the study group was obviously shorter than that in the control group($P<0.05$). The amount of blood loss during cesarean section in the study group was remarkably less than that in the control group ($P<0.05$). There were no statistically significant differences in blood transfusion rate, red blood cell transfusion volume and hysterectomy rate between the two groups(all $P>0.05$). No statistically significant difference in the incidence of procedure-related complications existed between the two groups($P>0.05$). **Conclusion** In treating dangerous placenta previa, abdominal aortic balloon occlusion, regardless of using compliant balloon or using non-compliant balloon, is clinically safe and effective, but the use of non-compliant balloon is superior to the use of compliant balloon in reducing the amount of blood loss during cesarean section. (J Intervent Radiol, 2022, 31: 605-608)

【Key words】 balloon; abdominal aortic balloon occlusion; dangerous placenta previa; effect

凶险性前置胎盘植入与子宫瘢痕、高龄、多产、流产史等因素有关^[1-4]。国内外研究证实腹主动脉球囊阻断术等血管内介入治疗,可有效减少凶险性前置胎盘产妇剖宫产出血量^[5-7]。腹主动脉球囊阻断术既可阻断子宫血供而不影响胎儿血供,又可减少剖宫产术中出血量。术中所使用球囊目前主要有顺应性和非顺应性两种,但尚无相应指南、共识明确球囊具体操作规范,国内相关研究较少。国内关于腹主动脉球囊阻断术研究多集中在临床效果和安全性方面^[8-9],何种性质球囊更适宜用于腹主动脉阻断鲜见报道。本研究针对该问题进行探讨,为腹主动脉阻断术合理选用球囊提供依据,为进一步规范操作流程提供参考。

1 材料与方法

1.1 一般资料

选取 2018 年 2 月至 2021 年 5 月遵义医科大学第二附属医院收治的 102 例凶险性前置胎盘患者,其中 52 例接受非顺应性球囊腹主动脉阻断术(研究组),50 例接受顺应性球囊腹主动脉阻断术(对照组)。纳入标准:①有剖宫产史;②中央型前置胎盘;③孕周 >34 周;④单胎妊娠;⑤签署手术知情同意书。排除标准:①有重要脏器功能障碍;②伴发恶

性肿瘤,血液系统、免疫系统疾病及局部/全身感染;③多胎(≥ 2 胎)妊娠;④有吸毒/药物滥用史;⑤有医患交流障碍、认知功能障碍;⑥有不可控的内科疾病;⑦对研究中使用的药物过敏。两组基线特征差异无统计学意义($P>0.05$),见表 1。

表 1 两组基本资料比较 ($\bar{x}\pm s$)

参数	对照组($n=50$)	研究组($n=52$)	t/χ^2 值	P 值
年龄(岁)	28.3 \pm 4.2	29.5 \pm 4.6	1.374	0.172
孕周	36.2 \pm 1.1	36.5 \pm 1.3	1.256	0.212
孕次	2.8 \pm 0.3	2.7 \pm 0.4	1.424	0.158
剖宫产次数	1.6 \pm 0.3	1.7 \pm 0.3	1.683	0.096
胎盘植入(n)	36	32	1.255	0.263

1.2 手术方法

剖宫产术前 1 h 行腹主动脉球囊阻断术,对照组用顺应性球囊,研究组用非顺应性球囊,其余手术操作完全一致。采用改良 Seldinger 法穿刺股动脉,送入导丝行穿刺道扩张,置入 8~12 F 导管鞘;根据术前 MR 诊断图像检测腹主动脉直径并据之选择合适球囊,导丝引导下送入 Cook 主动脉成形球囊导管,透视下将球囊前端送至 L3 椎体上缘水平;对比剂充盈球囊,确保双侧股动脉搏动消失,推注对比剂确保腹主动脉血流阻断。随后抽空球囊,肝素冲洗导管鞘,固定导管鞘与球囊导管,行剖宫

产术;胎儿娩出后充盈球囊,止血后抽空球囊恢复血流,球囊阻断时间每次 ≤ 20 min,两次阻断间隔为 5~10 min;术后退出球囊、导管鞘,穿刺点缝合器缝合后加压包扎穿刺点 4~6 h。

1.3 手术效果和安全性评价

统计两组球囊阻断时间(置入球囊导管至拔除导管时间)、X 线辐射剂量、胎儿射线暴露时间,以及剖宫产术中出血量、输血率、红细胞输注量、子宫切除率。子宫切除需满足以下条件:胎盘穿透子宫全层;侵犯附近组织,剥离十分困难;术中出血量 $> 1\,000$ mL;无再生育需求。

1.4 统计学分析

采用 SPSS 19.0 软件进行数据分析。正态分布的计量资料以 $\bar{x} \pm s$ 表示,组间比较用两独立样本 t 检验;计数资料以例(%)表示,组间比较用 χ^2 检验。 $P < 0.05$ 为差异有统计学意义。

2 结果

两组均成功置入球囊,腹主动脉阻断术成功。对照组中 1 例因术中血压过高发生导管打折情况,无死亡病例。两组患者腹主动脉球囊阻断术前后心率、收缩压对比,差异无统计学意义(均 $P > 0.05$),术后收缩压、心率低于术前(均 $P < 0.05$),见表 2。两组 X 线辐射剂量、胎儿射线暴露时间对比,差异无统计学意义(均 $P > 0.05$),研究组球囊阻断时间低于对照组($P < 0.05$),见表 3。研究组剖宫产术中出血量低于对照组($P < 0.05$),两组输血率、红细胞输注量、子宫切除率对比,差异无统计学意义(均 $P > 0.05$),见表 4。两组腹主动脉球囊阻断术相关并发症发生率对比,差异无统计学意义($P > 0.05$),见表 5。

3 讨论

凶险性前置胎盘患者病情通常十分凶险,面临

表 2 两组球囊阻断术前后收缩压、心率变化 ($\bar{x} \pm s$)

参数	对照组($n=50$)	研究组($n=52$)	t 值	P 值
收缩压(mmHg*)				
术前	124.9 \pm 15.3	122.3 \pm 14.9	0.869	0.387
术后	116.6 \pm 13.1	114.2 \pm 12.6	0.943	0.348
t 值	2.914	2.993		
P 值	0.004	0.003		
心率(次/min)				
术前	80.9 \pm 11.4	81.2 \pm 11.8	0.131	0.896
术后	73.6 \pm 10.5	74.9 \pm 10.9	0.613	0.541
t 值	3.331	2.828		
P 值	0.001	0.006		

*1 mmHg=0.133 kPa

表 3 两组球囊阻断时间、X 线辐射情况 ($\bar{x} \pm s$)

参数	对照组($n=50$)	研究组($n=52$)	t 值	P 值
球囊阻断时间(min)	26.8 \pm 4.1	25.1 \pm 3.9	2.146	0.034
X 射线辐射剂量(mGy)	24.1 \pm 3.6	23.2 \pm 3.4	1.298	0.197
胎儿射线暴露时间(min)	1.6 \pm 0.3	1.5 \pm 0.3	1.683	0.096

表 4 两组剖宫产手术情况

参数	对照组($n=50$)	研究组($n=52$)	t/χ^2 值	P 值
术中出血量(mL)	1 148.2 \pm 90.5	1 103.4 \pm 86.2	2.561	0.012
输血率[n(%)]	9(18.00)	6(11.54)	0.848	0.357
红细胞输注量(U)	2.5 \pm 0.4	2.4 \pm 0.3	1.432	0.155
子宫切除率[n(%)]	6(12.00)	1(1.92)	2.626	0.105

表 5 两组球囊阻断术相关并发症情况 [n(%)]

参数	对照组($n=50$)	研究组($n=52$)	χ^2 值	P 值
股动脉血栓	1(2.0)	1(1.9)	0.471	0.493
穿刺侧下肢疼痛	3(6.0)	1(1.9)	0.303	0.582
穿刺侧下肢感觉异常	1(2.0)	1(1.9)	0.471	0.493
总并发症发生率	5(10.0)	3(5.8)	0.182	0.670

来自髂内动脉区域外血管大出血风险,主要出血来源为髂外动脉。针对该类疾病,临床通常行宫腔填塞纱条、髂内动脉结扎、注射缩宫素等措施减少术中出血量,但仍有部分患者止血效果不佳,不得不行子宫切除以控制病情^[10]。盆腔血管栓塞多应用于凶险性前置胎盘患者大出血后的补救,而球囊临时阻断术可用于剖宫产术前和术中,以降低剖宫产术中大出血风险。球囊临时阻断术可分为双侧髂内动脉阻断术、腹主动脉阻断术。双侧髂内动脉球囊阻断术可暂时阻断由髂内动脉分出的子宫动脉,但由于子宫同时接收来自腹主动脉、髂外动脉和股动脉吻合支的血液,部分患者双侧髂内动脉单纯阻断并不能有效减小术中出血量^[11]。腹主动脉球囊阻断术可将盆腔所有血供全部阻断,球囊置于主动脉充盈时可明显降低动脉压力,减少出血速度,有助于创面凝血、抑制子宫出血,而出血速度降低、出血量少便于暴露胎盘剥离面出血点,利于缝合创面,且出血量减少还可减少因血制品输注所致凝血功能恶化引起的出血^[12]。目前尚无统一的指南、共识明确推荐选择何种性质球囊行腹主动脉阻断术,也鲜见相关对照研究文献探讨此类问题,因此对腹主动脉阻断术中球囊选择进行临床研究可进一步明确球囊阻断效果、并发症发生等情况。本研究期望为该技术的规范使用提供参考。

本研究结果发现,两组均成功置入球囊,无死亡病例,腹主动脉球囊阻断术前和术后收缩压、心率差异均无统计学意义,X 线辐射剂量、胎儿射线暴

露时间差异均无统计学意义,说明顺应性和非顺应性两种性质球囊阻断术均可安全、顺利开展。有文献报道显示球囊阻断 30 min 内较安全,出现下肢缺血坏死的风险极低^[13]。本研究中球囊阻断时间均不超过 20 min,安全性良好。研究组球囊阻断时间、剖宫产术中出血量均低于对照组,说明非顺应性球囊阻断术在减小剖宫产出血方面更具优势,更利于术者操作,进而减少球囊阻断时间。推测这可能与非顺应性球囊直径不会随着腹主动脉舒张、收缩而变化有关,腹主动脉舒张时同样有部分血流通过球囊和动脉壁间歇流入盆腔、下肢,既可保障下肢与盆腔脏器不会出现完全缺血情况,降低术后严重并发症发生风险,也因为少量血流通过可让术者在剖宫产术中及时发现出血部位,及时对症止血,从而减少剖宫产术中出血量。顺应性球囊在弯曲血管中具优势,可降低血管床牵拉影响;非顺应性球囊顺应性弱,但其支撑性、耐高压性及精确扩张力更强。由于腹主动脉血管条件相对较直,使用非顺应性球囊打开通路可避免球囊扩张不到位、球囊未充分充盈情况发生。然而相关研究发现,大气压<6 kPa 可充分充盈球囊,但仍有个别患者出现血液从球囊周边流出情况,大气压>8 kPa 又可增加血管壁损伤、球囊破裂风险^[14-15]。本研究中研究组、对照组分别有 1 例、6 例患者子宫切除,后期仍需增加样本量对此进一步探讨验证;相关并发症发生率差异无统计学意义,均无严重并发症发生,说明两种性质球囊阻断术应用于凶险性前置胎盘患者安全可靠。Huo 等^[16]研究显示,腹主动脉球囊阻断术可有效降低前置胎盘患者术后子宫动脉栓塞发生率和输血量,从而降低术中血管药物使用率、输血量及术后入住重症监护室风险,安全性良好。本研究结果与之类似。

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