

减重手术后出血特征及影响因素分析

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【摘要】 目的 探讨减重手术后出血特征及影响因素。**方法** 采用回顾性病例对照研究方法。收集 2010 年 5 月至 2021 年 8 月南京医科大学第一附属医院收治的 3 371 例肥胖症行减重手术患者的临床资料;男 903 例,女 2 468 例;年龄为 31(16~65)岁。观察指标:(1)减重手术后出血发生情况及诊断与治疗。(2)减重手术后出血的影响因素分析。(3)随访情况。采用门诊、电话或微信方式进行随访,了解减重手术后出血患者总体质量减少率、高血压和 2 型糖尿病缓解情况。随访时间截至 2021 年 8 月。正态分布的计量资料以 $\bar{x} \pm s$ 表示。偏态分布的计量资料以 M (范围)表示。计数资料以绝对数或百分比表示,组间比较采用 χ^2 检验。等级资料比较采用非参数秩和检验。单因素分析根据资料类型选择对应的统计学方法。多因素分析采用二元 Logistic 回归模型。**结果** (1)减重手术后出血发生情况及诊断与治疗。3 371 例患者中,27 例确诊术后出血,其中男 13 例,女 14 例;腹腔出血 18 例,消化道出血 9 例;8 例手术当天确诊,13 例术后第 1 天确诊,4 例术后第 2 天确诊,2 例术后第 3 天及以后确诊。27 例术后出血患者中,24 例主要表现为心动过速;11 例为腹腔引流异常,引流量为 300(100~600)mL;6 例为便血,便血量为 500(120~1 000)mL;5 例低血压;3 例呕血,呕血量为 300(50~800)mL;2 例术后第 1 天血红蛋白显著降低。同一患者可合并多种临床表现。27 例术后出血患者中,6 例腹腔出血患者因腹腔引流液持续增多或失血性休克再次急诊手术探查,术后心力衰竭死亡 1 例;再次手术距首次手术结束时间为 13.5(2.0~45.0)h,腹腔积血量为 1 000(600~7 000)mL。6 例患者中,5 例术中明确出血部位,分别为袖状胃切缘出血 2 例,胃旁路小网膜囊出血、胃短血管及穿刺孔出血各 1 例;1 例探查未见明显活动性出血。其余 12 例腹腔出血及 9 例消化道出血患者均经保守治疗治愈,患者出血持续时间为 (2.1 ± 0.7) d。(2)减重手术后出血的影响因素分析。单因素分析结果显示:性别、高血压、2 型糖尿病、手术方式是影响减重手术后出血的相关因素($\chi^2=6.33, 42.16, 4.49, 14.09, P<0.05$)。多因素分析结果显示:手术方式是减重手术后出血的独立影响因素(优势比=1.69,95%可信区间为 1.18~2.41, $P<0.05$)。(3)随访情况。27 例患者均获得随访,随访时间为 16(1~62)个月。18 例患者随访时间 ≥ 12 个月,1 年总体质量减少率为 $36\% \pm 12\%$,高血压缓解比例为 8/11,2 型糖尿病完全缓解比例为 6/7。6 例患者随访时间 ≥ 36 个月,3 年总体质量减少率为 $35\% \pm 12\%$,高血压缓解比例为 4/5,2 型糖尿病完全缓解比例为 1/1。**结论** 减重手术后出血发生率较低,心动过速、腹腔引流液异常及低血压具有前哨提示作用。手术方式是减重手术后出血的独立影响因素。

【关键词】 肥胖症; 减重手术; 出血; 危险因素; 诊断; 治疗

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Analysis of bleeding characteristics and influencing factors after bariatric surgery

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【Abstract】 Objective To investigate the bleeding characteristic and influencing factors after

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bariatric surgery. **Methods** The retrospective case-control study was conducted. The clinical data of 3 371 patients with obesity who underwent bariatric surgery in the First Affiliated Hospital of Nanjing Medical University from May 2010 to August 2021 were collected. There were 903 males and 2 468 females, aged 31(16–65)years. Observation indicators: (1) occurrence, diagnosis and treatment of bleeding after bariatric surgery; (2) analysis of influencing factors for bleeding after bariatric surgery. (3) Follow-up. Follow-up was conducted through outpatient examinations, telephone interview or WeChat to detect total weight loss rate, resolution of hypertension and remission of type 2 diabetes of the patients with bleeding after bariatric surgery. The follow-up was up to August 2021. Measurement data with normal distribution were represented as $Mean \pm SD$. Measurement data with skewed distribution were represented as $M(\text{range})$. Count data were represented as absolute numbers or percentages, and comparison between groups was analyzed by the chi-square test. Ordinal data were analyzed by the non-parametric rank sum test. Univariate analysis was conducted using the corresponding statistical methods based on data type. The binary Logistic regression was used for multivariate analysis. **Results** (1) Occurrence, diagnosis and treatment of bleeding after bariatric surgery. There were 27 of 3 371 patients diagnosed with postoperative bleeding, including 13 males and 14 females. There were 18 cases of abdominal bleeding and 9 cases of gastrointestinal bleeding. Among the 27 patients with postoperative bleeding, 8 cases were diagnosed with bleeding on the day after operation, 13 cases were diagnosed on the first day after operation, 4 cases were diagnosed on the second day, and 2 cases were diagnosed on the third day or later. Among the 27 patients with postoperative bleeding, 24 cases had tachycardia as the main clinical manifestation, 11 patients had abnormal abdominal drainage with the drainage volume as 300(range, 100–600)mL, 6 cases had hematochezia with the volume as 500(range, 120–1 000)mL, 5 cases were manifested as hypotension, 3 cases had hematemesis with the volume as 300(range, 50–800)mL, 2 cases had a significant decrease in hemoglobin on the first day after operation. One patient may have multiple clinical manifestations. Among the 27 patients with postoperative bleeding, 6 cases with abdominal bleeding received emergency laparotomy due to continuous increase of abdominal drainage or hemorrhagic shock, of which one patient died of heart failure after emergency reoperation. The time between primary and secondary operation was 13.5(range, 2.0–45.0)hours, and the volume of blood accumulation was 1 000(range, 600–7 000)mL. The bleeding sites were identified in 5 patients during reoperation, including 2 cases of staple line bleeding after sleeve gastrectomy, 1 case of lesser sac bleeding after Roux-en-Y gastric bypass, 1 case of short gastric vessel bleeding and 1 case of trocar site bleeding. One patient had no obvious active bleeding during reoperation. The remaining 12 cases of abdominal bleeding and 9 cases of gastrointestinal bleeding were treated by conservative therapy. The duration of bleeding lasted for (2.1 ± 0.7) days. (2) Analysis of influencing factors for bleeding after bariatric surgery. Results of univariate analysis showed that gender, hypertension, type 2 diabetes, surgical type were the related factors that affected the bleeding after bariatric surgery ($\chi^2=6.33, 42.16, 4.49, 14.09, P<0.05$). Results of multivariate analysis indicated that surgical type was an independent factor affecting postoperative bleeding in patients undergoing bariatric surgery (odds ratio=1.69, 95% confidence interval as 1.18–2.41, $P<0.05$). (3) Follow-up. All the 27 patients were followed up for 16(1–62)months. Eighteen patients reached or exceeded the 12 months follow-up time point. The 1-year total weight loss rate was $36\% \pm 12\%$, the resolution proportion of hypertension was 8/11, and the complete remission proportion of type 2 diabetes was 6/7. Six patients reached or exceeded the 36 months follow-up time point. The 3-year total weight loss rate was $35\% \pm 12\%$, the resolution proportion of hypertension was 4/5, and the complete remission proportion of type 2 diabetes was 1/1. **Conclusions** The incidence of postoperative bleeding after bariatric surgery is low. Tachycardia, abnormal abdominal drainage and hypotension have sentinel functions. Surgical type is an independent factor affecting bleeding after bariatric surgery.

【Key words】 Obesity; Bariatric surgery; Bleeding; Risk factors; Diagnosis; Treatment

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我国肥胖症发病率逐年升高,目前已达 16.8%,其各种并发症给患者增加健康负担^[1]。减重手术对肥胖症的疗效显著优于生活方式干预及内科治

疗,不仅显著降低体质量,还能缓解肥胖症带来的各种并发症,改善患者生命质量并延长患者生存时间^[2-3]。随着外科技术的进步,减重手术的安全性

逐渐得到认可,围手术期严重并发症发生率为0~1.55%,病死率为0~0.64%^[4]。出血仍为减重手术后发生率最高的早期并发症^[5-6]。我国减重手术开展快速增长,至2020年已突破万例^[7]。本研究回顾性分析2010年5月至2021年8月我科收治的3 371例肥胖症行减重手术患者的临床资料,探讨减重手术后出血特征及影响因素。

资料与方法

一、一般资料

采用回顾性病例对照研究方法。收集3 371例肥胖症行减重手术患者的临床资料;男903例,女2 468例;年龄为31(16~65)岁。3 371例患者中,1 799例行袖状胃切除术(sleeve gastrectomy, SG)、825例行袖状胃切除联合空肠旁路术(sleeve gastrectomy+jejunojunal bypass, SG+JJB)、461例行Roux-en-Y胃旁路术(Roux-en-Y gastric bypass, RYGB)、286例行单吻合口十二指肠转流术(single anastomosis duodenal switch, SADS)。本研究通过我院医学伦理委员会审批,批号为2018-SR-054。患者及家属均签署知情同意书。

二、纳入标准和排除标准

纳入标准:(1)患者符合《中国肥胖及2型糖尿病外科治疗指南(2019版)》手术入选标准。(2)手术方式为SG、RYGB、SG+JJB或SADS。(3)临床资料完整。

排除标准:(1)行修正手术。(2)同期行其他手术(胆囊切除术、卵巢囊肿剥除术等)。(3)临床资料缺失。

三、手术方式

SG:以超声刀或Ligasure游离胃大弯至食管左侧His角及幽门下。置入38 Fr支撑管,紧贴胃小弯侧,自幽门上方2 cm处以直线切割闭合器沿支撑管切除胃大弯,直至His角。连续全层缝合或杂交缝合加强切缘。SG+JJB:完成SG(同上)后,距离Treitz韧带20~30 cm离断空肠。测量远端空肠200~300 cm,以直线切割闭合器行近远端空肠侧侧吻合。共同开口连续缝合关闭并加强,关闭肠系膜裂孔。SADS:完成SG后,游离十二指肠球部,于幽门下方3 cm离断十二指肠。自Treitz韧带测量200 cm空肠,将肠管上提行十二指肠球部与空肠端侧手工吻合并加强。RYGB:在胃左动脉第一、二分支间紧贴胃壁进行游离,建立胃后隧道直至His角下

方,以直线切割闭合器离断胃壁建立胃小囊,容积20~30 mL。距离Treitz韧带100 cm提起空肠,行胃肠吻合,连续缝合关闭共同开口并加强。靠近胃肠吻合口旁离断近端空肠,并与吻合口远端100 cm空肠行侧侧吻合,连续缝合关闭共同开口并加强。关闭肠系膜裂孔及Petersen间隙。放置腹腔引流管及切缘加强缝合:2016年8月之前不常规放置腹腔引流管,SG切缘均为连续全层缝合加强,2016年9月之后均常规放置腹腔引流管,SG切缘均为杂交缝合。

四、观察指标和评价标准

观察指标:(1)减重手术后出血发生情况及诊断与治疗包括出血发生例数、出血部位、确诊出血时间、出血临床表现、出血量、治疗。(2)减重手术后出血的影响因素分析:性别、年龄、BMI、高血压、2型糖尿病、使用抗凝药物、手术时间、手术方式。(3)随访情况:获得随访例数、随访时间、总体质量减少率、高血压和2型糖尿病缓解情况。

评价标准:术后出血定义为术后30 d内确诊出血。术后出血诊断标准:术后Hb较术前下降 >2 g/L,伴或不伴呕血、黑便、腹部切口出血或腹腔引流出血性液体^[8]。糖尿病完全缓解:空腹血糖 <5.6 mmol/L,糖化血红蛋白 $<6.0\%$,持续1年,且无需药物干预^[9]。高血压缓解:晨起血压 $<140/90$ mmHg(1 mmHg=0.133 kPa),持续1年,且无需药物干预^[10]。

五、随访

采用门诊、电话或微信方式进行随访,了解减重手术后出血患者总体质量减少率、高血压和2型糖尿病缓解情况。随访时间截至2021年8月。

六、统计学分析

应用SPSS 22.0统计软件进行分析。正态分布的计量资料以 $\bar{x} \pm s$ 表示。偏态分布的计量资料以M(范围)表示。计数资料以绝对数或百分比表示,组间比较采用 χ^2 检验。等级资料比较采用非参数秩和检验。单因素分析根据资料类型选择对应的统计学方法。多因素分析采用二元Logistic回归模型。 $P < 0.05$ 为差异有统计学意义。

结 果

一、减重手术后出血发生情况及诊断与治疗

3 371例患者中,27例确诊术后出血,其中男13例,女14例;腹腔出血18例,消化道出血9例;8例手术当天确诊,13例术后第1天确诊,4例术后

第2天确诊,2例术后第3天及以后确诊。27例术后出血患者中,24例主要表现为心动过速;11例为腹腔引流异常,引流量为300(100~600)mL;6例为便血,便血量为500(120~1 000)mL;5例低血压;3例呕血,呕血量为300(50~800)mL;2例术后第1天Hb显著降低。同一患者可合并多种临床表现。

27例术后出血患者中,6例腹腔出血患者因腹腔引流液持续增多或失血性休克再次急诊手术探查,术后心力衰竭死亡1例;再次手术距首次手术结束时间为13.5(2.0~45.0)h,腹腔积血量为1 000(600~7 000)mL。6例患者中,5例术中明确出血部位,分别为袖状胃切缘出血2例,胃旁路小网膜囊、胃短血管及穿刺孔出血各1例;1例探查未见明显活动性出血。其余12例腹腔出血及9例消化道出血患者均经保守治疗治愈,患者出血持续时间为(2.1±0.7)d。

二、减重手术后出血的影响因素分析

单因素分析结果显示:性别、高血压、2型糖尿病、手术方式是影响减重手术后出血的相关因素($P<0.05$)。年龄、BMI、抗凝药物使用、手术时间不是影响减重手术后出血的相关因素($P>0.05$)。见表1。多因素分析结果显示:手术方式是减重手术后出血的独立影响因素($P<0.05$)。见表2。

三、随访

27例患者均获得随访,随访时间为16(1~62)个月。18例患者随访时间≥12个月,1年总体质量减少率为36%±12%,高血压缓解比例为8/11,2型糖尿病完全缓解比例为6/7。6例患者随访时间≥36个月,3年总体质量减少率为35%±12%,高血压缓解比例为4/5,2型糖尿病完全缓解比例为1/1。

讨 论

随着外科技术的不断进步,减重手术的安全性逐步提升,其并发症发生率与LC相当^[11]。出血仍为减重手术后早期最常见的并发症^[12-13]。本研究结果显示:减重手术后出血发生率为0.80%(27/3 371),其中经典SG及RYGB后出血发生率较低,而新兴手术方式如SG+JJB及SADS后出血发生率较高。主要原因可能为经典手术方式已形成固定手术流程,外科医师已度过学习曲线,而新兴手术开展时间短、手术复杂性高^[14-18]。

随着加速康复理念的广泛应用,“无管化”正逐步被外科医师接受^[19]。有研究结果显示:引流管增

表1 影响3 371例减重手术患者术后出血的单因素分析(例)

Table 1 Univariate analysis of bleeding after bariatric surgery of 3 371 patients (case)

临床因素	赋值	例数	出血	未出血	统计值	P值
性别						
男	1	903	13	890	$\chi^2=6.33$	0.012
女	0	2 468	14	2 454		
年龄(岁)						
<31	0	1 685	9	1 676	$\chi^2=3.02$	0.082
≥31	1	1 686	18	1 668		
体质量指数(kg/m ²)						
<30	1	316	4	312	$Z=-1.31$	0.189
≥30且<40	2	2 027	10	2 017		
≥40且≤50	3	826	10	816		
>50	4	202	3	199		
高血压						
是	1	621	18	603	$\chi^2=42.16$	<0.001
否	0	2 750	9	2 741		
2型糖尿病						
是	1	600	9	591	$\chi^2=4.49$	0.034
否	0	2 771	18	2 753		
使用抗凝药物						
是	0	183	2	181	$\chi^2=0.00$	0.977
否	1	3 188	25	3 163		
手术时间(h)						
>1.5	1	1 190	11	1 179	$\chi^2=0.35$	0.553
≤1.5	0	2 181	16	2 165		
手术方式						
SG	1	1 799	7	1 792	$\chi^2=14.09$	0.003
SG+JJB	2	825	13	812		
RYGB	3	461	2	459		
SADS	4	286	5	281		

注:SG为袖状胃切除术,SG+JJB为袖状胃切除联合空肠旁路术,RYGB为Roux-en-Y胃旁路术,SADS为单吻合口十二指肠转流术

表2 影响3 371例减重手术患者术后出血的多因素分析

Table 2 Multivariate analysis of bleeding after bariatric surgery of 3 371 patients

临床因素	b值	标准误	Wald值	优势比	95%可信区间	P值
性别	0.70	0.39	3.17	2.02	0.93~4.37	0.075
高血压	0.48	0.43	1.27	1.62	0.70~3.76	0.261
2型糖尿病	0.56	0.43	1.70	1.74	0.76~4.03	0.193
手术方式	0.52	0.18	8.28	1.69	1.18~2.41	0.004

加患者不适,限制早期活动,对预防出血等并发症并无意义,但大样本回顾性研究结果显示:美国约20%患者放置腹腔引流管^[20-22]。本研究18例腹腔出

血患者中,11 例因引流液性质及量的改变及时诊断并处理,多数患者发生在手术当天或术后第 1 天。因此,笔者认为:减重手术应常规留置腹腔引流管,待术后第 1 天排除出血后早期拔除更安全、稳妥。此外,持续低血压及心动过速对诊断出血亦有提示作用,出现上述表现应及时复查 Hb,并与术前比较,避免延误诊断。

本研究中腹腔出血患者再手术比例为 6/18,常见出血部位为胃切缘、穿刺孔及网膜离断面。因此,术毕需仔细检查手术部位并处理可疑出血点。腹腔积血与腹腔引流量并不一致,腹腔引流主要作用为早期提示出血,判断出血量与速度仍需依据患者临床表现及 Hb 动态变化。针对腹腔出血是否需要再次手术及再次手术时间应根据患者具体情况,如生命体征、Hb 下降速度、腹腔引流量及速度等综合决定。本研究中腹腔出血及消化道出血发生比例为 2:1,消化道出血患者均经保守治疗痊愈,而 8% 冰去甲肾上腺素溶液治疗上消化道出血安全、有效,可尝试使用,而保守治疗效果欠佳,可考虑内镜下治疗^[23-26]。

本研究中减重手术后出血患者术前合并高血压比例较高,术后由于疼痛、紧张等,85.2% 患者血压高于正常值上限,提示血压控制不良可能增加术后出血发生率,与 Mocanu 等^[27]报道一致。有文献报道减重手术后出血与 2 型糖尿病直接相关^[28]。本研究 27 例减重手术后出血患者中 9 例术前合并 2 型糖尿病。因此,针对减重手术,加强围手术期血糖和血压控制,对降低出血发生率有积极作用。

本研究结果显示:手术方式是减重手术后出血的独立影响因素。手术技巧的提升及改进对降低术后并发症也有积极作用,有研究分级评估外科医师的手术技巧,结果显示:高水平减重代谢外科医师的患者术后各种并发症均较低^[29]。另有研究结果显示:改进袖状胃切缘加强方式亦可显著降低术后出血发生率^[5,30]。因此,对于减重代谢外科医师,制订标准化手术流程、改进手术方式并不断提升手术技巧对降低减重手术后并发症发生率为重要^[31-32]。

综上,减重手术后出血发生率较低,心动过速、腹腔引流异常及低血压具有前哨提示作用。手术方式是减重手术后出血的独立影响因素。

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