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胸腔镜辅助小切口与传统开胸手术对胸外伤患者凝血功能及预后的影响*

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摘要 目的:探讨胸腔镜辅助小切口(VTAMS)与传统开胸手术对胸外伤患者凝血功能及预后的影响。**方法:**回顾性选取 2017 年 7 月~2019 年 2 月期间我院收治的胸外伤患者 91 例,根据手术方式的不同分为 A 组(n=44,行传统开胸手术)和 B 组(n=47,行 VTAMS 手术),比较两组患者围术期指标、术前及术后 7d 的凝血功能指标、术后并发症发生情况及病死率。**结果:**B 组术中出血量、术中输血量少于 A 组,手术时间、住院时间短于 A 组($P<0.05$)。两组患者术后 7d 活化部分凝血酶原时间(APTT)、血小板(PLT)较术前降低,D-二聚体(DD)、凝血酶原时间(PT)较术前升高($P<0.05$);B 组术后 7d 的 APTT、PLT 高于 A 组,DD、PT 则低于 A 组($P<0.05$)。B 组术后并发症发生率为 10.64%(5/47),低于 A 组的 27.27%(12/44)($P<0.05$)。B 组病死率为 2.13%(1/47),低于 A 组的 15.91%(7/44)($P<0.05$)。**结论:**与传统开胸手术相比,胸外伤患者应用 VTAMS 手术治疗,可改善围术期指标,对凝血功能影响较轻,减少术后并发症的同时还可降低病死率。

关键词:胸腔镜辅助小切口;传统开胸手术;胸外伤;凝血功能;预后

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Influence of Thoracoscopic Assisted Small Incision and Traditional Thoracotomy on Coagulation Function and Prognosis in Patients with Thoracic Trauma*

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ABSTRACT Objective: To investigate the effect of thoracoscopic assisted small incision (VTAMS) and traditional thoracotomy on coagulation function and prognosis in patients with thoracic trauma. **Methods:** The clinical data of 91 patients with thoracic trauma who were admitted to our hospital from July 2017 to February 2019 were analyzed retrospectively. According to the different operation methods, they were divided into group A (n=44, traditional thoracotomy) and group B (n=47, VTAMS). The perioperative indexes, preoperative and postoperative coagulation function indicators, postoperative complications and mortality of the two groups were compared. **Results:** The intraoperative blood loss volume and intraoperative blood transfusion volume in group B were less than those in group A, and the operation time and hospitalization time were shorter than those in group A ($P<0.05$). The activated partial thrombin time (APTT) and platelets (PLT) of the patients in the two groups were decreased at 7d after operation compared with that before operation, D-dimer (DD) and prothrombin time (PT) were higher than those before operation ($P<0.05$). APTT and PLT in group B were higher than those in group A, while DD and PT were lower than those in group A ($P<0.05$). The incidence of postoperative complications in group B was 10.64% (5/47), which was lower than 27.27% (12/44) in group A ($P<0.05$). The fatality rate of group B was 2.13% (1/47), which was lower than 15.91% (7/44) of group A ($P<0.05$). **Conclusion:** Compared with the traditional thoracotomy, the application of VTAMS in the surgical treatment of chest trauma patients can improve the perioperative indicators, have less impact on coagulation function, reduce postoperative complications and reduce mortality.

Key words: Thoracoscopic assisted small incision; Traditional thoracotomy; Thoracic trauma; Coagulation function; Prognosis

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前言

胸外伤是胸外科常见的多发疾病,主要包括挫伤、胸骨骨折、气胸、创伤性窒息、血胸、肺挫伤等,部分患者还伴有腹部损伤,若未能及时予以治疗,可危及患者的生命,致死率高^[1-3]。开胸手术是胸外伤患者常用的治疗方式,然而该术式创伤较大、术后并发症多,临床治疗效果不够理想^[4,5]。随着微创技术的不断发展,胸腔镜辅助小切口(Video assisted thoracic muscle spare surgery, VTAMS)治疗胸外伤取得了较大的进展,其具有安全性高、创伤性小的特点,但 VTAMS 术式学习曲线长,对施术者要求较高^[6,7]。现临床有关 VTAMS 与传统开胸手术应用于胸外伤的疗效尚存在一定争议。鉴于此,本研究对比了 VTAMS 与传统开胸手术对胸外伤患者凝血功能、术后并发症及病死率的影响,以期临床胸外伤患者治疗术式的选择提供参考。

1 资料与方法

1.1 一般资料

回顾性选取 2017 年 7 月~2019 年 2 月期间我院收治的胸外伤患者 91 例,纳入标准:(1)经胸部 X 线及 CT 证实有胸外伤者;(2)临床资料完整者;(3)具备手术指征且完成了相关手术。排除标准:(1)妊娠及哺乳期妇女;(2)合并心肝肾等重要脏器衰竭者;(3)合并恶性肿瘤者;(4)合并血小板或凝血功能障碍者;(5)随访过程中患者失访;(6)胸部二次手术者。根据手术方式的不同分为 A 组(n=44, 开胸手术)和 B 组(n=47, VTAMS),其中 A 组男 24 例,女 20 例,年龄 21~56 岁,平均(43.68±4.29)岁;致伤原因:高空坠落伤 12 例,摔倒伤 10 例,车祸伤 15 例,锐器伤 7 例;受伤部位:左胸、左背 23 例,右胸、右背 21 例;临床诊断结果:挫伤 6 例,胸壁裂伤 8 例,气胸 5 例,心脏损伤 7 例,血胸 5 例,肺挫伤 4 例,胸骨骨折 5 例,创伤性窒息 4 例。B 组男 26 例,女 21 例,年龄 23~60 岁,平均(44.06±5.38)岁;致伤原因:高空坠落伤 14 例,摔倒伤 9 例,车祸伤 14 例,锐器伤 10 例;受伤部位:左胸、左背 25 例,右胸、右背 22 例;临床诊断结果:挫伤 7 例,胸壁裂伤 6 例,气胸 6 例,心脏损

伤 7 例,血胸 5 例,肺挫伤 5 例,胸骨骨折 4 例,创伤性窒息 7 例。两组一般资料对比无差异($P>0.05$)。

1.2 手术方法

两组均采用静吸复合麻醉。A 组给予开胸手术治疗,于前外侧作一切口,经伤口或者第 4~6 肋间进入胸腔,为保证视野清晰,可采用吸引器快速吸净积血、凝血块,利用褥式进行膈肌裂口、肺裂伤的修复,手术结束后常规放置引流管。B 组患者给予 VTAMS 治疗,具体操作如下:患者平卧,将手术侧垫高 45°,取第 7 或 8 肋间腋中线作一切口作为胸腔镜孔,若术前接受胸腔引流者,则从原切口将胸腔镜置入,随后取腋前线第 4 肋间或者胸部伤口处作一切口为操作孔,利用褥式进行膈肌裂口、肺裂伤的修复,手术结束后常规放置引流管。

1.3 观察指标

(1)记录两组术中出血量、手术时间、住院时间、术中输血量。(2)记录两组患者术后并发症发生情况,包括漏气、胸腔积液、切口慢性疼痛、静脉血栓栓塞症等,两组患者均住院观察,记录两组患者死亡情况。(3)于术前、术后 7d 后抽取患者肘静脉血 4 mL,经 3600 r/min 离心 15 min,离心半径 8 cm,取上清液置于冰箱中(-30℃)待测。采用 ACL-TOP 型全自动凝血分析仪(购自美国 Beckman-Coulter 公司)检测凝血功能指标:活化部分凝血酶原时间(Activated partial thrombin time, APTT)、血小板(Platelet, PLT)、D-二聚体(D-Dimer, DD)及凝血酶原时间(Prothrombin time, PT)。

1.4 统计学方法

数据处理采用 SPSS23.0 统计学软件。计数资料以[n(%)]表示,行 χ^2 检验。计量资料以($\bar{x} \pm s$)表示,行 t 检验。检验水准为 $\alpha=0.05$ 。

2 结果

2.1 两组围术期指标比较

B 组术中出血量、术中输血量少于 A 组,手术时间、住院时间短于 A 组($P<0.05$);详见表 1。

表 1 两组围术期指标比较($\bar{x} \pm s$)

Table 1 Comparison of perioperative indexes between the two groups($\bar{x} \pm s$)

Groups	Intraoperative hemorrhage (mL)	Operative time (min)	Length of stay (d)	Intraoperative blood transfusion volume (mL)
Group A (n=44)	169.09±17.35	83.56±3.26	14.23±1.25	490.31±37.69
Group B (n=47)	102.06±16.42	74.81±4.29	8.91±1.36	356.86±29.74
t	18.935	10.899	19.389	18.813
P	0.000	0.000	0.000	0.000

2.2 两组凝血功能指标比较

两组患者术前 APTT、PLT、DD、PT 比较差异无统计学意义($P>0.05$);两组患者术后 7d APTT、PLT 较术前降低,DD、PT 较术前升高($P<0.05$);B 组术后 7d APTT、PLT 高于 A 组,DD、PT 则低于 A 组($P<0.05$);详见表 2。

2.3 两组并发症发生情况比较

B 组术后并发症发生率 10.64%(5/47) 低于 A 组 27.27%(12/44)($P<0.05$);详见表 3。

2.4 两组预后情况比较

A 组 44 例患者中,治愈出院 37 例,死亡 7 例,病死率为 15.91%(7/44),B 组 47 例患者中,治愈出院 46 例,死亡 1 例,病死率为 2.13%(1/47),B 组病死率低于 A 组($\chi^2=5.389$, $P=0.020$)。

3 讨论

近年来,挤压、车祸、摔伤、坠落等各种意外导致的胸部外

表 2 两组凝血功能指标比较($\bar{x} \pm s$)Table 2 Comparison of coagulation indexes between the two groups($\bar{x} \pm s$)

Groups	APTT(s)		PLT($\times 10^9/L$)		DD($\mu g/L$)		PT(s)	
	Before operation	7d after operation	Before operation	7d after operation	Before operation	7d after operation	Before operation	7d after operation
Group A (n=44)	35.32 $\pm$ 2.31	28.66 $\pm$ 2.23*	231.28 $\pm$ 20.13	97.81 $\pm$ 15.14*	201.67 $\pm$ 32.45	277.98 $\pm$ 25.43*	12.54 $\pm$ 2.35	19.64 $\pm$ 2.29*
Group B (n=47)	35.14 $\pm$ 2.29	32.21 $\pm$ 2.57*	229.31 $\pm$ 18.14	158.05 $\pm$ 23.16*	202.63 $\pm$ 29.58	239.23 $\pm$ 21.59*	12.58 $\pm$ 2.36	15.13 $\pm$ 3.24*
t	0.373	7.017	0.491	14.579	0.148	7.853	0.081	7.621
P	0.710	0.000	0.625	0.000	0.883	0.000	0.936	0.000

Note: Compared with before operation, * $P < 0.05$.

表 3 两组患者并发症发生情况比较 [例(%)]

Table 3 Comparison of complications between the two groups [n(%)]

Groups	Pleural effusion	Leak	Chronic pain of incision	Venous thromboembolism	Total incidence rate
Group A (n=44)	3(6.82)	2(4.55)	5(11.36)	2(4.55)	12(27.27)
Group B (n=47)	1(2.13)	1(2.13)	2(4.26)	1(2.13)	5(10.64)
χ^2					4.143
P					0.042

伤的发生率呈逐年上升趋势,因胸外伤患者病情危急,且多合并其他脏器损伤,导致胸外伤术后的病死率较高^[8-10]。胸外伤死亡的患者约占所有创伤患者的 25%^[11],手术治疗是治疗胸外伤的常用方法,因而手术方案的选择直接关系到胸外伤患者的治疗效果及预后。既往受医疗器械、技术的限制,开胸手术一直是胸外伤患者的主流术式,因该术式创伤较大,术后极易受到感染而增加并发症发生风险,给患者带来二次损伤,病死率较高,无法取得令人满意的预后^[12-14]。近年来随着胸腔镜器械的更新和操作技术的提高,胸腔镜技术已经是治疗胸外伤不可或缺的手段之一^[15]。VTAMS 是指通过直视和胸腔镜定向暴露结合,术中凭借电钩、钛夹等器械,减少或尽量不使用一次性器械的术式,其具有手术视野清晰,对患者机体创伤较为轻微的优点^[16,17]。

本次研究结果显示,B 组术中出血量、术中输血量、手术时间、住院时间均优于 A 组,表明与传统开胸手术相比,VTAMS 手术治疗可缩短手术时间,减少术中输血量 and 出血量,可促进患者早日恢复,这主要是因为 VTAMS 为小切口伤口,其创伤较小,因而术中出血量少,且术中作出的小切口位置,可避免切断胸壁大的肌肉束,从而有利于患者术后的恢复^[18]。既往研究报道显示,胸外伤患者常常由于医源性操作导致机体处于高凝状态,而高凝状态、术后制动血流淤滞及血管损伤等多项原因又可导致静脉血栓的形成,不利于患者恢复^[19,21]。当胸外伤患者处于高凝状态时,凝血系统被激活,大量微血栓形成,其中 PLT 具有聚集、黏附和释放的功能,可在血栓的形成过程中起关键性作用,而血栓的纤溶亢进过程又可产生大量 DD,使血液凝固性大大增强,导致微小血栓或血栓性疾病的发生率增加^[22,23]。APTT、PT 是反映凝血系统各凝血因子的含量与活性的主要指标^[24]。本研究中,两组患者术后 7d 的 APTT、PLT 较术前降低,DD、PT 较术前升高,B 组术后 7d 的 APTT、PLT 高于 A 组,DD、PT 低于 A 组,说明胸外伤患者术后均存在不同程度凝血障碍,但 B 组凝血障碍程度更轻,说明 VTAMS 术式对患者

的凝血功能影响较小,这可能是因为 VTAMS 术式为微创术式,患者术后应激反应较小,凝血系统的激活相对受到抑制,患者机体内凝血因子的异常消耗和产生情况较为轻微^[25-27]。本次研究结果还显示,B 组术后并发症发生率、病死率均低于 A 组,可见与传统开胸手术相比,VTAMS 治疗不仅可减少并发症发生情况,还可有效改善患者预后,这可能是因为 VTAMS 手术使用的胸腔镜具有影像放大和深部照明功能,可准确判断患者胸内损伤及出血情况,对于心包裂伤、膈肌裂伤不会漏诊,可通过小切口进行及时的修补缝合^[28-30]。同时,胸腔镜可为术者提供清晰的视野,及时有效的清除胸腔内凝血块并止血,有效改善患者预后。值得注意的是,由于 VTAMS 术中需行双腔气管插管,若患者术侧存在肺萎缩,合并胸腹联合伤者,或单肺通气的耐受不良者,较难进行内镜操作者,均不宜采用 VTAMS 手术治疗。

综上所述,与传统开胸手术相比,VTAMS 手术对胸外伤患者术后的凝血功能影响较轻,可有效改善围术期指标,同时还具有降低术后并发症发生率和病死率的优点。

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