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急性 Stanford A 型主动脉夹层患者的临床特征及术后院内死亡危险因素分析 *

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摘要 目的:研究急性 Stanford A 型主动脉夹层(AAAD)患者的临床特征,并分析影响其术后院内死亡的危险因素。**方法:**选取 2015 年 6 月~2018 年 4 月河北医科大学第四医院心脏血管外科收治的 279 例 AAAD 患者为研究对象,收集患者的基本信息、临床资料,分析 AAAD 患者的临床特征。所有患者均行手术治疗,按照术后院内的死亡情况将患者分为死亡组和存活组,收集两组患者手术相关信息,采用多因素 logistic 回归分析对患者术后死亡的危险因素进行分析。**结果:**279 例 AAAD 患者中,男女比例为 2.88:1;患者平均年龄为(52.11±8.91)岁;合并高血压者占 66.67%,合并冠心病者占 11.47%;患者以胸痛或胸背痛为主要症状(占 69.89%);并发症中以心包积液(占 43.37%)和主动脉瓣反流(占 18.64%)的发生率最高;其平均收缩压、白细胞计数、D-二聚体(DDi)水平均高于正常值上限;心、肾功能不全的发生率分别为 23.30%和 15.77%;院内死亡率为 17.92%。单因素分析结果显示,死亡组和存活组 AAAD 患者在年龄、是否伴有肾功能不全、是否伴有心功能不全、DDi 水平、体外循环时间、手术时间、输血量 and 术后是否开胸止血方面比较,均有统计学差异($P<0.05$)。多因素 logistic 回归分析结果显示,年龄>65 岁、伴有肾功能不全、体外循环时间 ≥ 270 min 和术后开胸止血是 AAAD 患者术后死亡的独立危险因素($P<0.05$)。**结论:**AAAD 患者发病年龄呈年轻化,多数合并有基础疾病,疼痛为其主要症状,且该病患者并发症多、术后死亡率较高。年龄>65 岁、伴有肾功能不全、体外循环时间 ≥ 270 min 和术后开胸止血均可显著增加 AAAD 患者术后死亡风险。

关键词:急性 Stanford A 型主动脉夹层;临床特征;死亡;危险因素

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Clinical Characteristics and Risk Factors of Postoperative Hospital Mortality in Patients with Stanford Type A Acute Aortic Dissection*

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ABSTRACT Objective: To study the clinical characteristics of Stanford type A acute aortic dissection (AAAD) and analyze the risk factors of postoperative hospital mortality. **Methods:** 279 patients with AAAD who were admitted to the Department of Cardiovascular Surgery of the Fourth Hospital of Hebei Medical University from June 2015 to April 2018 were selected as the objects. The basic information and clinical data of patients were collected, and the clinical characteristics of AAAD patients were analyzed. All patients underwent surgical treatment, the patients were divided into death group and survival group according to the death situation in postoperative hospital. And the relevant surgical information was collected from the two groups. The risk factors of postoperative death were analyzed by multivariate logistic regression analysis. **Results:** In the 279 patients with AAAD, the ratio of male to female was 2.88:1. The average age of the patients was (52.11±8.91) years. Combined with hypertension was 66.67%, combined with coronary heart disease was 11.47%. The main symptoms were chest pain and chest back pain (occupying 69.89%). The highest incidence of complications were pericardial effusion (occupying 43.37%) and aortic regurgitation (occupying 18.64%). The mean systolic blood pressure, white blood cell count and D-two polymer(DDi) levels were higher than the upper limit of normal values. The incidence of cardiac and renal insufficiency were 23.30% and 15.77% respectively. Hospital mortality was 17.92%. Single factor analysis showed that there were significant differences in age, renal insufficiency, cardiac insufficiency, DDi level, cardiopulmonary bypass time, operation time, blood transfusion volume and postoperative thoracotomy for hemostasis in the AAAD patients of the death group and the survival group ($P<0.05$). Multivariate logistic regression analysis showed that age>65, with renal insufficiency, cardiopulmonary bypass time ≥ 270 min and postoperative

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thoracotomy for hemostasis were independent risk factors for postoperative mortality in patients with AAAD ($P<0.05$). **Conclusion:** The onset age of AAAD patients is younger, most of them have underlying diseases, and pain is the main symptom. There are many complications and high postoperative mortality. The age >65 years, with renal insufficiency, cardiopulmonary bypass time ≥ 270 min and postoperative open heart hemostasis are significantly increased the risk of postoperative mortality in patients with AAAD.

Key words: Stanford type A acute aortic dissection; Clinical characteristics; Mortality; Risk factors

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前言

急性主动脉夹层(Acute aortic dissection, AAD)是心血管系统的常见急危重症^[1],其主要病理变化为主动脉中层的囊性退行性病变,该病变可进一步导致内膜的局部撕裂,撕裂范围在血流的强力冲击、渗入下而形成血肿,并顺着主动脉长轴方向扩展^[2]。AAD患者常表现为胸背部、腹部等部位的搏动样、撕裂样的剧烈疼痛^[3]。Stanford A型AAD(AAAD)患者是AAD患者的主要类型,其内膜的撕裂范围累及头臂干动脉近端的升主动脉,由于该类型患者撕裂范围广、累及脏器多,故病情往往较Stanford B型更为复杂,且AAAD患者呈现起病急、进展迅速、预后差等特点,严重威胁患者的生命安全^[4,5]。近年来多数学者越来越认同手术治疗方法在提高AAAD患者的存活率、改善其生活质量方面的效果,尤其随着脑保护、麻醉、术后监护等技术的不断改进,孙氏手术已成为治疗AAAD患者的标准术式^[6,7]。然而行孙氏手术的患者术后并发症较多,多数患者预后转归并不理想,因此如何降低其术后死亡率成为目前研究的首要难题^[8,9]。本研究通过分析AAAD患者的临床特征及影响术后院内死亡的危险因素,旨在为提高AAAD患者手术效果及术后预后评估提供指导依据。

1 资料与方法

1.1 研究对象

选取2015年6月~2018年4月间于河北医科大学第四医院心脏血管外科就诊的279例AAAD患者为观察对象,纳入标准为:(1)所有患者均行影像学检查,并依据美国心脏病学会制定的关于AAAD的诊断标准^[10]确诊;(2)均行孙氏手术治疗;(3)临床资料齐全;(4)病程 ≤ 2 周。排除标准:(1)外伤性AAAD患者;(2)具有单纯的真假性动脉瘤者;(3)马凡综合征者;(4)Ehlers-Danlos综合征者;(5)血管炎与结缔组织病者;(6)先天性主动脉畸形者;(7)壁内血肿者。本研究经本院伦理委员会审核,且所有患者对本研究均知情同意。

1.2 方法

1.2.1 手术方法 沿胸骨正中开胸,建立股动脉插管(单纯升主动脉替换)或右腋动脉插管(部分主动脉弓或全主动脉弓替换)以连通体外循环。待膀胱温度低至 $28\sim 32^{\circ}\text{C}$ 时,阻断升主动脉,以近端升主动脉替换,灌注心肌保护液。满足心脏停跳指征后,完成根部病变和升主动脉的替换。对于部分主动脉弓替换患者,切断无名动脉及左颈总动脉,以腋、股动脉顺行脑灌注,以人工血管替换切除的小弯或近端主动脉弓,连通升主动脉。对于全主动脉弓替换患者,于近端处理后降温至鼻咽温 $18\sim 20^{\circ}\text{C}$,顺行脑灌注,设置流量为 $(5\sim 10)\text{mL}/(\text{min}\cdot\text{kg})$;经断

开弓上血管、停循环、切开主动脉弓后,于降主动脉放置支架血管,使之连通主动脉壁、四分支人工血管;等患者恢复全身血流灌注后将人工血管分支分别与左颈总动脉、左锁骨下动脉、无名动脉相连通,同时开始复温并恢复常规血流灌注量,最后接通四分支人工血管近端与升主动脉人工血管远端。

1.2.2 研究方法 收集研究对象的基本信息、临床资料、手术相关信息等进行分析。其中,基本信息包括:(1)人口学资料,如年龄、性别等;(2)既往病史:高血压史、冠心病史。临床资料包括:(1)临床表现:包括症状、并发症(心包积液、主动脉瓣反流、下肢缺血、神经系统症状、低血压或休克、胸腔积液);(2)辅助检查指标:包括血压(收缩压、舒张压)、白细胞数、D-二聚体(D-Dimer, DDi)水平以及心功能不全、肾功能不全发生率。综合基本信息、临床资料,分析AAAD患者的临床特征。手术相关信息包括:体外循环时间、脑缺血时间、手术时间、输血量、术后开胸止血等情况。将患者按照术后院内的死亡情况分为死亡组和存活组,分析影响AAAD患者死亡的危险因素。

1.3 统计学方法

采用SPSS22.0软件进行统计分析,计量资料选择均数 $\pm$ 标准差($\bar{x}\pm s$)表示,采用t检验,计数资料选择率(%)表示,施以 χ^2 检验或Fisher精确概率检验。采用多因素logistic回归方法分析AAAD患者术后院内死亡的危险因素, $P<0.05$ 代表差异有统计学意义。

2 结果

2.1 AAAD患者的临床特征

279例AAAD患者中,男女比例为2.88:1(207/72);患者的年龄在40~72岁之间,平均年龄为 (52.11 ± 8.91) 岁;合并高血压者占66.67%(186/279);合并冠心病者占11.47%(32/279);患者主要以胸痛或胸背痛症状入院,占69.89%(195/279),其次为腹痛和胸闷,分别占16.49%(46/279)和11.47%(32/279);各并发症中,以心包积液和主动脉瓣反流的发生率最高,分别占43.37%(121/279)和18.64%(52/279),其次为胸腔积液、下肢缺血,分别占16.85%(65/279)、12.19%(34/279),神经系统症状、低血压或休克的发生率较低,分别占10.39%(29/279)、5.02%(14/279);各辅助检查指标中,患者的平均收缩压、白细胞计数、DDi水平分别为 $(130.11\pm 25.02)\text{mmHg}$ 、 $(13.82\pm 6.17)\times 10^9/\text{L}$ 、 $(11.06\pm 6.51)\text{mg/L}$,均高于正常值上限,而舒张压为 $(83.44\pm 15.13)\text{mmHg}$,在正常值范围内;患者心、肾功能不全的发生率分别为23.30%(65/279)和15.77%(44/279)。

2.2 AAAD患者术后院内死亡的单因素分析

按照院内术后的死亡情况,将患者分为死亡组和存活组,其中死亡组50例,存活组为229例,院内死亡率为17.92%

(50/279)。单因素分析结果显示,死亡组和存活组 AAAD 患者在年龄、是否伴有肾功能不全、是否伴有心功能不全、DDi 水平、体外循环时间、手术时间、输血量 and 术后是否开胸止血方面比较,差异均有统计学意义($P<0.05$),死亡组和存活组 AAAD

患者在性别、是否合并高血压、是否合并冠心病、有无心包积液、有无主动脉瓣反流、脑缺血时间比较,差异无统计学意义($P>0.05$)。见表 1。

表 1 AAAD 患者术后院内死亡的单因素分析
Table 1 Single factor analysis of postoperative hospital mortality in AAAD patients

Factors	Death group(n=50)	Survival group(n=229)	χ^2	P
Age(years)				
>65	33(66.00)	94(41.05)	10.303	0.001
≤ 65	17(34.00)	135(58.95)		
Sex				
Male	41(82.00)	166(72.49)	1.939	0.164
Female	9(18)	63(27.51)		
Combined with hypertension				
Yes	35(70.00)	151(65.94)	0.305	0.581
No	15(30.00)	78(34.06)		
Combined with coronary heart disease				
Yes	6(12.00)	26(11.35)	0.003	0.995
No	44(88.00)	203(88.65)		
Renal insufficiency				
Yes	14(28.00)	30(13.10)	6.859	0.009
No	36(72.00)	199(86.90)		
Cardiac insufficiency				
Yes	17(34.00)	48(20.96)	3.905	0.048
No	33(66.00)	181(79.04)		
Pericardial effusion				
Yes	19(38.00)	102(44.54)	0.715	0.398
No	31(62.00)	127(55.46)		
Aortic regurgitation				
Yes	13(26.00)	39(17.03)	2.177	0.140
No	37(74.00)	190(82.97)		
DDi level(mg/L)				
≥ 9.00	29(58.00)	90(39.30)	6.103	0.013
<9.00	21(42.00)	139(60.70)		
Cardiopulmonary bypass time(min)				
≥ 270 min	41(82.00)	80(34.93)	37.015	0.000
<270 min	9(18.00)	149(65.07)		
Cerebral ischemia time(min)				
≥ 25.00	20(40.00)	100(43.67)	1.851	0.174
<25.00	30(60.00)	129(56.33)		
Operative time (min)				
≥ 7.50	28(56.00)	93(40.61)	3.957	0.047
<7.50	22(44.00)	136(59.39)		
Blood transfusion volume(mL)				
≥ 14.00	27(54.00)	106(46.29)	9.040	0.003
<14.00	23(46.00)	123(53.71)		
Postoperative thoracotomy for hemostasis				
Yes	12(24.00)	18(7.86)	11.140	0.001
No	38(74.00)	211(92.14)		

2.3 AAAD 患者术后院内死亡的多因素 logistic 回归分析

logistic 回归分析结果显示,AAAD 患者术后死亡的独立

危险因素有年龄 >65 岁、伴有肾功能不全、体外循环时间 ≥ 270 min 和术后开胸止血($P<0.05$)。见表 2。

表 2 AAAD 患者术后院内死亡的多因素 logistic 回归分析

Table 2 Multivariate logistic regression analysis of postoperative hospital mortality in patients with AAAD

Factors	B	S.E	Wald χ^2	P	OR	95%CI
Age>65years	0.053	0.167	4.830	0.040	1.119	1.105~1.221
Cardiac insufficiency	1.354	0.732	2.816	0.062	2.314	0.752~8.314
Renal insufficiency	1.820	0.667	7.935	0.021	6.273	2.958~21.439
DDi level ≥ 9.00 mg/L	1.269	0.759	2.183	0.079	2.056	0.769~9.312
Cardiopulmonary bypass time ≥ 270 min	1.608	0.553	7.611	0.010	5.938	2.511~19.820
Operative time ≥ 7.50 min	1.436	0.826	1.147	0.083	2.894	0.835~9.125
Blood transfusion volume ≥ 14.00 ml	1.398	0.814	2.652	0.067	2.517	0.914~8.956
Postoperative thoracotomy for hemostasis	1.405	1.608	5.724	0.035	3.107	1.328~11.035

3 讨论

随着高血压、冠心病等各类心血管疾病发病率的增长,AAAD 的发生率逐年上升,并呈年轻化趋势,尽管各项手术治疗方式得到不断改进,治疗效果也得到提升,但其术后存活率仍不甚理想^[11-13]。有统计显示,AAAD 患者经手术治疗后,其死亡率在 5%~27.4%之间^[14],本研究对象的死亡率为 17.92%,亦在此范围内,说明 AAAD 患者的手术治疗仍有一定的风险,预后尚有待进一步提升。因此,探索 AAAD 患者的临床特征,并分析影响其术后死亡的危险因素对于判断预后及指导治疗具有极其重要的作用。

本研究发现,AAAD 发病人群的男女比例为 2.88:1,稍低于以往国内研究的(3.50~5.33):1^[15],分析其原因可能与本研究样本量较少有关,而其平均年龄为(50.11 $\pm$ 8.91)岁,与以往的发病年龄相比,具有年轻化的趋势^[16]。目前对于 AAAD 的病因和发病机制尚不明确,普遍认为与高血压、冠心病等因素具有较高相关性^[17]。本研究结果显示,AAAD 患者中合并高血压者占 66.67%,合并冠心病者占 11.47%,略高于国内相关报道^[18]。考虑原因可能与各地区饮食习惯等差异造成高血压、冠心病患病率不同有关,或与当前人群对慢性病的认识和检出率显著提高有关。另外,本研究中,AAAD 患者主要以疼痛入院,而且疼痛部位也有所不同,这与其他研究结果相吻合^[19,20],原因可能与夹层所累及血管及病变的范围不同有关。AAAD 病变将造成患者某些部位发生阻塞、缺血、血肿等变化,进而将引发心包积液、主动脉瓣反流、胸腔积液和下肢缺血等并发症,本研究中,心包积液和主动脉瓣反流的发生率最高,与相关研究报道相一致^[21]。收缩压、白细胞计数、DDi 水平等辅助性指标也可以作为判断 AAAD 的参考指标,本研究结果显示,患者在平均收缩压、白细胞计数、DDi 水平上均升高,这与以往的研究结果略有差异^[22-24]。平均收缩压升高可能与克服 AAAD 患者心肌缺血等失代偿作用有关,而白细胞数增加说明机体在血管内膜撕裂后产生炎症反应,DDi 水平是反映心肌功能的重要指标,其值增加说明患者的心功能下降。本研究还发现,有部分 AAAD 患者伴有肾功能不全和心功能不全,说明 AAAD 患者的病变夹层已累及肾动脉且出现双侧灌注不良现象,同时部分患者主动脉夹层已累及冠状动脉开口处,因而将造成血流动力学变化,进

而影响心功能变化,这与 Pan X 等人的研究结果吻合^[25]。

本研究将 AAD 患者按照术后死亡情况分为死亡组和存活组,进一步对影响 AAD 患者死亡的危险因素进行分析,结果显示,年龄 >65 岁、肾功能不全、体外循环时间 ≥ 270 min 和术后开胸止血均为 AAD 患者术后死亡的独立危险因素($P<0.05$),这与以往的研究结果具有一致性^[26]。AAD 患者年龄增加,其合并症也越多,心肺肾等脏器功能可能越差^[27];肾功能不全者肾动脉已呈现灌注不足,且患者的血流动力学、水电解质代谢和酸碱平衡也受影响,加之手术创伤,患者将更易出现肾功能的持续损害及其他严重并发症^[28];体外循环时间长可激活机体的炎症反应,破坏凝血机制,并对重要脏器造成严重损伤^[29,30];行二次开胸术的患者,手术对其造成的创伤也将增加,同时说明患者本身凝血机制也差,因而也将增加因流血过多造成的死亡风险。

综上所述,AAAD 患者发病年龄较年轻化,多数患者合并有基础疾病,主要以疼痛入院,且该病并发症多,术后院内的死亡率仍有待改善。年龄 >65 岁、肾功能不全、体外循环时间 ≥ 270 min 和术后开胸止血均可使 AAAD 患者术后院内的死亡风险增加,因此,临床医师可通过对相关可控因素进行规避,以有效提高患者术后生存率。

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