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全麻联合椎旁神经阻滞在胸腔镜下肺叶切除术中的麻醉效果 及对术后认知功能和炎症反应的影响*

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摘要 目的:研究全身麻醉联合椎旁神经阻滞在胸腔镜下肺叶切除术患者的应用效果,探讨其对患者术后认知功能和炎症反应的影响。**方法:**选取 2017 年-2021 年在我院接受胸腔镜下肺叶切除术治疗的患者 100 例,根据其麻醉方式的不同分为对照组(50 例)和研究组(50 例),对照组给予全身麻醉,研究组给予全身麻醉联合椎旁神经阻滞。比较两组患者手术时间、麻醉时间、术中出血量、舒芬太尼和瑞芬太尼用量、术后疼痛情况、简易智力状态检查量表(MMSE)评分和血清 C-反应蛋白(CRP)、白介素-6(IL-6)水平。**结果:**两组患者手术时间、麻醉时间和术中出血量比较无显著差异($P>0.05$),而研究组患者舒芬太尼用量和瑞芬太尼用量均低于对照组($P<0.05$);研究组患者术后 6、12、24 和 48 小时疼痛评分均较对照组患者低($P<0.05$);两组患者术前 MMSE 评分无差异($P>0.05$),研究组患者术后 6、12、24 和 48 小时 MMSE 评分均较对照组高($P<0.05$);两组患者术前血清 CRP 和 IL-6 水平无显著差异,但研究组患者术后 24 小时血清 CRP 和 IL-6 水平均显著低于对照组($P<0.05$)。**结论:**全身麻醉联合椎旁神经阻滞用于胸腔镜下肺叶切除术患者可有效减少手术中麻醉药物用量,术后镇痛效果更好,对患者认知功能损伤更低,并且术后炎症更低。

关键词:全身麻醉;椎旁神经阻滞;认知功能;炎症

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Anesthesia Effect of General Anesthesia Combined with Paravertebral Nerve Block in Thoracoscopic Lobectomy and Its Effect on Postoperative Cognitive Function and Inflammatory Response*

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ABSTRACT Objective: To study the application effect of general anesthesia combined with paravertebral nerve block in patients undergoing thoracoscopic lobectomy, and to explore its effect on postoperative cognitive function and inflammatory response in patients.

Methods: A total of 100 patients who received thoracoscopic lobectomy in our hospital from 2017 to 2021 were selected. According to the different anesthesia methods, they were divided into matched group (50 cases) and research group (50 cases). Patients in matched group were given general anesthesia, and patients in research group were given general anesthesia combined with paravertebral nerve block. We compared the operation time, anesthesia time, intraoperative blood loss, sufentanil and remifentanyl dosage, postoperative pain, Mini-Mental State Examination (MMSE) score, and serum C-reactive protein (CRP) and interleukin-6 (IL-6) levels between the two groups. **Results:** There was no difference in operation time, anesthesia time and intraoperative blood loss between the two groups ($P>0.05$), while the dosages of sufentanil and remifentanyl in the research group were lower than those in the matched group ($P<0.05$); the pain scores of the patients in the research group were significantly lower than those in the matched group at 6, 12, 24 and 48 hours after surgery ($P<0.05$); there was no difference in the preoperative MMSE scores between the two groups ($P>0.05$), the MMSE scores of patients in the research group were significantly higher than those in the matched group at 6, 12, 24 and 48 hours after surgery ($P<0.05$); There was no difference in serum CRP and IL-6 levels between the two groups before surgery, but the levels of serum CRP and IL-6 in the research group were lower than those in the matched group at 24 hours after operation ($P<0.05$). **Conclusion:** General anesthesia combined with paravertebral nerve block for patients undergoing thoracoscopic lobectomy can effectively reduce the amount of anesthesia drugs during surgery, have better postoperative analgesia, lower cognitive impairment and lower postoperative inflammation.

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前言

胸腔镜手术,即电视辅助胸腔镜手术(Video-Assisted Thoracic Surgery, VATS),是一种微创胸外科新技术^[1]。胸腔镜手术是 20 世纪末期胸外科革命性的突破,经近 20 年的发展使得 VATS 成为目前微创胸外科应用最广泛的手术。目前,胸腔镜手术被各级别医院广泛开展,约占整个胸科手术的比重超 70 %,可被用于各类疾病治疗,比如肺大疱切除、肺部肿瘤和下肺叶切除^[2-4]。与传统开胸手术相比,胸腔镜手术不仅切口小、创伤小,而且还具有术后疼痛低和恢复快等多种优点^[5-6]。但在临床实际中仍然不能忽略胸腔镜手术因手术切口牵拉、引流管留置和神经缝合等可能产生的神经痛,并可能由此引起血肿和气胸等并发症^[7]。如何缓解和快速消除胸腔镜手术带来的不良反应是目前研究热点。胸椎旁神经阻滞主要针对严重肋间神经痛患者,可缓解交感神经痛、胸椎痛等,因此在传统开胸手术中常联合全麻用于患者麻醉^[8-9]。然而,在 VATS 中椎旁神经阻滞复合全身麻醉的效果相比于单独全身麻醉是否具有优势目前鲜有报道,本研究通过设置对照组的方式比较椎旁神经阻滞复合全身麻醉和单独全身麻醉在胸腔镜下肺叶切除术的麻醉效果,并探讨其对患者术后认知功能和炎症反应的影响。

1 资料与方法

1.1 一般资料

选择 2017 年 1 月至 2021 年 12 月于接受胸腔镜下肺叶切除术治疗的患者 100 例,根据其麻醉方式的不同分为对照组(50 例)和研究组(50 例)。

纳入标准:(1)具有手术指征需实施肺叶切除术;(2)年龄 18-60 周岁;(3)美国麻醉医师协会(American Society of Anesthesiologists, ASA)分级为 I 和 II 级;(4)可正常沟通,病知情且签订同意书。

排除标准:(1)凝血功能障碍;(2)药物、酒精依赖史;(3)伴有肝肾功能障碍;(4)智力障碍、沟通障碍、精神异常或伴有神经系统疾病;(5)正在参与其他临床研究的患者。

1.2 麻醉方法

所有患者进入手术室后,经手术医师、麻醉医师和手术

室护士三方确认后,建立麻醉静脉用药通道,首先静脉滴注 500 mL 电解质溶液,密切监测生命体征。对照组患者经咪达唑仑、丙泊酚、舒芬太尼和顺阿曲库铵进行麻醉诱导,选择瑞芬太尼和丙泊酚作为麻醉维持药物,手术结束前停止麻醉维持药物注入,静脉注射舒芬太尼、酮咯酸丁二醇注射液和昂丹司琼。研究组患者在超声指导下,选择 T4-T7 作为穿刺点,穿刺位置到达椎体横突下缘肋横突韧带,穿刺成功后注入利多卡因麻醉药物。研究组患者在椎旁神经阻滞给予同对照组一致的全身麻醉。

1.3 观察指标

1.3.1 两组一般手术指标比较 记录手术时间、麻醉时间、术中出血量以及手术过程中舒芬太尼和瑞芬太尼用量。

1.3.2 两组术后疼痛比较 分别在手术 6、12、24 和 48 小时通过视觉模拟量表(Visual analogue scale, VAS)评估疼痛。VAS 量表评分由 0-10 分为 11 个级别,0 表示不痛,10 分表示无法忍受的剧痛,VAS 评分越高表示疼痛程度越高^[10,11]。

1.3.3 两组认知功能比较 分别在手术前和手术后 6、12、24 和 48 小时通过简易精神状态检查表(Mini-Mental State Examination, MMSE)评估患者认知功能状态。MMSE 量表包括 7 个维度,共 30 项题目,1 分:每项回答正确,0 分:回答错误或答不知道,量表总分范围为 0-30 分。MMSE 评分越低表示受试者认知功能越差^[12,13]。

1.3.4 血清 CRP 和 IL-6 水平 分别在术前和术后 24 小时采集患者外周血,离心分离血清,通过酶联免疫吸附法对血清 C-反应蛋白(C-reactive protein, CRP)和白介素-6(Interleukin-6, IL-6)进行检测。

1.4 统计学方法

采用 SPSS22.0 分析,计量资料表示为($\bar{x} \pm s$),采用 t 检验;以 n%表示计数资料,采用卡方检验。 $P < 0.05$ 表示有统计学意义^[14]。

2 结果

2.1 一般临床资料比较

两组患者一般临床资料无差异($P > 0.05$)。见表 1。

表 1 一般临床资料对比
Table 1 Comparison of general clinical data

Index/Groups	Matched group (n=50)	Research group (n=50)
Ages (years)	47.26±6.70	47.29±5.18
Gender (male/female)	28/22	27/23
Height (m)	168.02±5.17	168.10±5.42
Weight (kg)	65.21±5.99	65.79±5.48
BMI (kg/m ²)	23.42±1.81	23.47±1.79
ASA grade (I/II)	18/32	21/29

2.2 一般手术指标比较 ($P>0.05$),但研究组舒芬太尼用量和瑞芬太尼用量均较对照组两组患者手术时间、麻醉时间和术中出血量比较无差异 低($P<0.05$)。见表 2。

表 2 一般手术和麻醉指标比较($\bar{x}\pm s$)
Table 2 Comparison of general surgical indicators ($\bar{x}\pm s$)

Index/Group	Matched group (n=50)	Research group (n=50)
Operation time (min)	51.57±6.24	52.54±6.52
Anesthesia time (min)	62.58±7.45	65.32±8.21
Intraoperative blood loss (ml)	154.38±27.02	152.41±20.62
Sufentanil (ug)	69.52±9.56	59.62±10.22*
Remifentanil (mg)	1.68±0.52	1.25±0.48*

Note: compared with the matched group, * $P<0.05$, the same below.

2.3 术后疼痛比较 评分,结果显示:研究组患者术后 6、12、24 和 48 小时 VAS 评分均较对照组患者低($P<0.05$)。见表 3。

表 3 术后各时间点 VAS 评分比较($\bar{x}\pm s$)
Table 3 Comparison of VAS scores at different time points postoperative ($\bar{x}\pm s$)

Groups	n	Postoperative (hours)			
		6	12	24	48
Matched group	50	3.32±0.56	4.57±0.42	3.82±0.84	2.55±0.62
Research group	50	2.35±0.42*	3.63±0.31*	2.77±0.74*	1.58±0.54*

2.4 围手术期认知功能比较 评分比较无差异 ($P>0.05$), 研究组患者术后 6、12 和 24 小时 MMSE 评分较对照组患者高($P<0.05$)。见表 4。

MMSE 评分,结果显示:两组患者术前和术后 48 小时 MMSE

表 4 围手术期 MMSE 评分比较($\bar{x}\pm s$)
Table 4 Comparison of perioperative MMSE scores ($\bar{x}\pm s$)

Groups	n	Pre-operation	Postoperative (hours)			
			6	12	24	48
Matched group	50	29.35±2.65	23.08±2.69	23.48±2.65	24.15±2.12	27.56±1.12
Research group	50	29.58±2.56	26.85±2.52*	26.35±2.75*	26.93±2.15*	27.98±1.42

2.5 术后炎症反应比较 比较无差异($P>0.05$),而研究组患者术后 24 小时血清 CRP 和 IL-6 均较对照组患者低($P<0.05$)。见表 5。

在术前和术后 24 小时采集患者外周血以检测血清 IL-6 和 CRP 水平,结果显示:两组患者术前血清 CRP 和 IL-6 水平

表 5 围手术期 IL-6 和 CRP 水平比较($\bar{x}\pm s$)
Table 5 Comparison of perioperative serum IL-6 and CRP levels ($\bar{x}\pm s$)

Groups	n	CRP (mg/L)		IL-6 (ng/L)	
		Preoperative	Postoperative	Preoperative	Postoperative
Matched group	50	7.92±1.25	13.58±3.12	50.68±8.93	100.35±9.65
Research group	50	7.89±1.34	10.25±2.38*	51.62±9.74	90.68±8.75*

3 讨论

肺叶切除术是一种适用于周围型肺癌,局限肺叶内的不可逆病变的手术,如肿瘤包括良性肿瘤和肺癌,还有结核或毁损

肺的症状,经外科解剖性手术进行切除以达到治疗的目的^[15-17]。近年来,随着腔镜技术的不断发展,肺癌胸腔镜肺叶切除术以创伤小、胸壁肌肉损伤小、手术时间短、手术切口小、出血量少

癌早期手术治疗的主要方式^[18,19]。但该手术的围术期麻醉管理十分重要,不仅会影响患者手术治疗疗效,而且对术后恢复产生影响^[20]。

本研究通过设立对照组的方式研究不同麻醉方式对胸腔镜下肺叶切除术的影响,结果显示:与单独全身麻醉相比,椎旁神经阻滞联合全身麻醉的患者在接受胸腔镜下肺叶切除术治疗时手术时间、麻醉时间、术中出血量均未出现显著差异,但围术期舒芬太尼和瑞芬太尼用量却显著降低,这与张博等人^[21]的研究结果一致。张博等人比较单纯静吸全麻和预先胸椎旁神经阻滞联合静吸全麻在胸腔镜下肺叶切除术围术期舒芬太尼和瑞芬太尼用量时发现,接受预先胸椎旁神经阻滞联合静吸全麻的患者在胸腔镜下肺叶切除术围术期使用的舒芬太尼和瑞芬太尼剂量均显著低于单纯静吸全麻。进一步分析可知^[22,23]:椎旁神经阻滞是在全麻前将麻醉药物注射到胸椎旁间隙以发挥椎旁神经阻滞的效果,其镇痛效果确切,因此可显著降低围术期其他镇痛镇静药物的用量。

此外,研究组患者术后 6-48 小时内不同时间点 VAS 评分均显著低于对照组,这表明研究组患者术后疼痛程度低于对照组,这与陈静等人^[24]的研究结果一致。陈静等人在比较单纯全麻与椎旁神经阻滞联合全麻对胸腔镜下肺癌根治术患者术后疼痛的影响时发现,接受椎旁神经阻滞联合全身麻醉的患者术后 6、12、24 和 48 小时 VAS 评分均显著低于接受单独全身麻醉的患者。进一步分析可知^[25,26]:胸腔镜下肺叶切除术虽然手术创伤小,但由于手术切口的牵拉和导流管的留置会引起肋间神经痛,这是引起胸腔镜下肺叶切除术患者术后疼痛的主要原因。椎旁阻滞是指将局麻药注射到胸椎旁间隙,产生注射部位同侧邻近多个节段的躯体和交感神经的阻滞,从而达到镇痛的目的。全麻联合胸椎旁镇痛肌松完善,降低应激反应,改善心肌供血,全麻用药量少,苏醒迅速,有利于术后恢复等,因此其术后镇痛效果明显优于单独全身麻醉。

本研究通过分析术后患者认知功能损伤程度和血清炎症因子含量,就不同麻醉方式对患者创伤进行研究,结果显示:两组患者术前 MMSE 评分和炎症因子含量(CRP 和 IL-6)具有可比性,但研究组患者术后 6、12 和 24 小时 MMSE 评分显著高于对照组患者,并且研究组患者术后 24 小时血清 CRP 和 IL-6 均显著低于对照组患者,表明椎旁神经阻滞联合全身麻醉对胸腔镜下肺叶切除术患者认知功能和身体创伤更低。进一步分析可知:术后认知功能的损伤与围术期麻醉药物的用量密切相关,同等条件下围术期麻醉药物用量越大,术后认知功能损伤越严重,而研究组患者围术期舒芬太尼和瑞芬太尼用量低于对照组,所以其术后认知功能损伤程度也低于对照组^[27,28]。引起机体炎症反应的主要原因包括精神紧张、手术创伤、血容量的改变及术后疼痛,而激发炎症反应的因素为神经冲动的穿入及创伤引起的局部炎症反应及细胞因子的释放,所以研究组患者术后镇痛效果优于对照组,术后炎症程度低于对照组^[29,30]。本研究的不足之处在于纳入临床样本较小,研究结果尚需后期多中心大样本量研究证实。

综上所述,全身麻醉联合椎旁神经阻滞用于胸腔镜下肺叶切除术患者可有效减少手术中麻醉药物用量,术后镇痛效果更

好,对患者认知功能损伤更低,并且术后炎症反应更低。

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