

doi: 10.13241/j.cnki.pmb.2017.32.028

腰丛 - 坐骨神经阻滞与腰硬联合麻醉用于老年患者下肢手术中的效果比较

廖华山¹ 姚喆^{2Δ} 霍红艳¹ 何平³ 童华³

(1 西安高新医院麻醉科 陕西 西安 710075;

2 长安医院麻醉科 陕西 西安 710016; 3 西安交通大学第一附属医院麻醉科 陕西 西安 710061)

摘要 目的:分析和比较两种不同麻醉方式(腰丛 - 坐骨神经阻滞麻醉与腰硬联合麻醉)对老年患者下肢骨折手术中的效果。**方法:**以我院收治的下肢骨折拟行手术治疗的老年患者 158 例作为研究对象,将其随机分为腰硬联合麻醉组(CSEA)和腰丛 - 坐骨神经阻滞组(LPSB),每组各 79 例。CSEA 组采用腰硬联合麻醉,LPSB 组采用腰丛 - 坐骨神经阻滞,比较两组患者感觉阻滞起效时间、运动阻滞起效时间、运动恢复时间、维持时间、疼痛感觉评分和并发症的发生状况。**结果:**CSEA 组和 LPSB 分别有 1 例和 3 例患者因局部麻醉失效而需全身麻醉;LPSB 组的感觉阻滞起效时间、运动阻滞起效时间、运动恢复时间均显著晚于 CSEA 组,但其维持时间显著长于 CSEA 组,患者疼痛感觉评分低于 CSEA 组($P < 0.05$)。**结论:**与腰硬联合麻醉相比,腰丛 - 坐骨神经阻滞能为老年下肢骨折手术患者提供有效的单侧麻醉,且安全性高,可作为下肢骨科手术患者的首选麻醉方案。

关键词:腰丛 - 坐骨神经阻滞;腰硬联合麻醉;下肢骨折;老年患者

中图分类号:R683;R614 **文献标识码:**A **文章编号:**1673-6273(2017)32-6328-04

A Comparison of the Anesthesia Effect of Combined Spinal Epidural Anesthesia and Lumbar Plexus-Sciatic Nerve Blocks on the Patients with Lower Limb Orthopedic Surgery

LIAO Hua-shan¹, YAO Zhe^{2Δ}, HUO Hong-yan¹, HE Ping³, TONG Hua³

(1 Department of Anesthesiology, Xi'an High-tech Hospital, Xi'an, Shaanxi, 710075, China;

2 Department of Anesthesiology, Changan Hospital, Xi'an, Shaanxi, 710016, China;

3 Department of Anesthesiology, The First Affiliated Hospital of Xi'an Jiaotong University, Xi'an, Shaanxi, 710061, China)

ABSTRACT Objective: To analyze the analgesic effect of combined spinal epidural anesthesia (CSEA) and lumbar plexus-sciatic nerve blocks (LPSB) on the elderly patients with lower limb orthopedic surgery. **Methods:** 158 cases of elderly patients with surgical treatment of lower limb fracture in our hospital were chosen. The patients were randomly divided into two groups (combined spinal epidural anesthesia was performed in the combined spinal epidural anesthesia (CSEA) group and the lumbar plexus and sciatic nerves were blocked in the lumbar plexus-sciatic nerve blocks (LPSB) group. The onset of sensory-motor block, success in providing adequate anesthesia, hemodynamic changes, first analgesic request time and VAS score were recorded. **Results:** One patient in the CSEA group and three patients in the LPSB group required general anesthesia due to failed block of each patient were observed. There was no significant differences in the success of providing adequate anesthesia between two groups. The onset of sensory-motor block and the first analgesic request time were significantly later in the LPSB group than CSEA group. However, the duration of analgesia in the LPSB group were longer than CSEA group, the VAS score in LPSB group was significantly lower than CSEA group. **Conclusions:** The lumbar plexus-sciatic nerve blocks could provide effective unilateral anesthesia and offer a beneficial alternative to combined spinal epidural anesthesia in patients undergoing lower limb orthopedic surgery.

Key words: CSEA; LPSB; Lower limb fracture; Elderly patients

Chinese Library Classification(CLC): R683; R614 **Document code:** A

Article ID: 1673-6273(2017)32-6328-04

前言

作者简介:廖华山(1978-),男,本科,主治医师,研究方向:临床麻醉, E-mail: liaohuashan_1978@medicinesp.com

Δ 通讯作者:姚喆(1979-),男,本科,主治医师,研究方向:临床麻醉, E-mail: yaozhe_1979@papedhos.com

(收稿日期:2017-05-05 接受日期:2017-05-23)

老年人会出现一定程度的骨质疏松症状,临床症状表现为骨折损伤及劳损。髋部骨折等下肢骨折为老年人常见骨折^[1-3],目前治疗多采用手术治疗。由于老年人由于衰老,会出现全身性蜕变,且重要器官的储备功能会明显降低,与年轻人相比,老年人在麻醉 - 手术期间会发生重要功能的失代偿状态,麻醉耐受力降低,增加了手术的风险^[4-6],术中的麻醉方式也成为医学界所关注的重点。临床上下肢手术多用椎管内麻醉或全麻完

成,但老年患者多伴有严重的呼吸系统疾病、心脑血管疾病、脊柱强直、长期抗凝治疗或侧弯,导致凝血异常的情况,椎管内麻醉虽然镇痛完善,但由于节段性阻滞交感神经,容易出现血流动力学紊乱,尤其是对于心血管疾病或合并呼吸的患者,增加了麻醉手术的风险,而腰丛坐骨神经麻醉用于下肢手术麻醉,起效快、效果确切,对血流影响较小,且副作用较少。因此,本研究主要分析和比较了两种不同麻醉方式(腰丛-坐骨神经阻滞麻醉及腰硬联合麻醉)对老年患者下肢手术中的麻醉效果,具体报道如下。

1 资料与方法

表 1 两组一般资料的比较($\bar{x} \pm s$)

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

	CSEA n=78	LPSB n=76	P
Age(Year)	71.3 $\pm$ 14.6	74.0 $\pm$ 16.9	0.14
Sex(Male/Female)	45/33	40/36	0.41
Weight(kg)	78.5 $\pm$ 11.5	77.8 $\pm$ 12.3	0.36
ASA grade(I / II / III)	32 / 46	28 / 48	0.74
Operation time(min)	71.1 $\pm$ 34.1	75.9 $\pm$ 39.4	0.21

1.2 纳入及排除标准

纳入标准:(1)美国麻醉医师协会(ASA)分级 I -III 级者;(2)符合腰硬联合麻醉及腰丛-坐骨神经阻滞的适应证;(3)患者及患者家属均了解麻醉和手术治疗风险,要求治疗并愿意配合调查研究。排除标准:(1)具有硬膜外麻醉、外周神经阻滞或使用麻醉剂的禁忌证者;(2)患有心肺功能不全、肝肾功能障碍等严重疾病;(3)有神经或精神疾病既往史,智力缺陷者;(4)慢性疼痛综合征。

1.3 麻醉方法

进入手术室后,对患者即刻建立静脉通道,并对其无创动脉血压、心电图及脉搏血氧饱和度进行监测,并给予持续的鼻导管吸氧。试验组患者均采用外周神经阻滞麻醉(LPSB),股骨大转子与骶裂孔连线及髂后上棘与股骨大转子连线中点垂直线的交点为神经穿刺点;中线交点及髂嵴最高点连线为腰丛穿刺点,在腰椎棘突旁开 4.5 cm 至 5.0 cm。在外周神经刺激仪引导下实行穿刺并辅以 B 超定位。腰丛与坐骨神经注入盐酸罗哌卡因注射液,坐骨神经以足背伸屈为准,腰丛以股四头肌为准,将刺激电流强度逐渐降低至不高于 0.3 mA,若仍存在肌肉收缩,分别注入 25-35、15-25 mL 的 0.375%罗哌卡因;对照组患者给予 CSEA 麻醉方式,使患者维持左侧卧位,在腰椎 L3-L4 间

1.1 一般资料

纳入 2011 年 4 月—2016 年 12 月我院骨科收治的拟行下肢手术的老年患者 158 例,随机分为试验组(腰丛-坐骨神经阻滞麻醉,LPSB)和对照组(腰硬联合麻醉,CSEA)。每组 79 例。本研究经医院伦理学委员会批准同意,所有患者知情同意。CSEA 组的 1 名患者和 LPSB 组有 3 名患者因局部麻醉失效而需全身麻醉,本研究排除了这四名患者。因此,两种麻醉方式的成功率分别为 98.7% (CSEA 组,78 例)和 96.2%(LPSB 组,76 例)。两组患者年龄、性别构成比、身高、ASA 分级及手术时间对比差异均无统计学意义($P>0.05$),具有可比性,见表 1。

隙,给予蛛网膜下腔阻滞,待患者穿刺成功后,注入 2.5-3.0 mL 的 0.5%盐酸布比卡因注射液,并控制麻醉平面于胸椎 T8 以下。两组患者均由麻醉操作熟练的麻醉师进行,之后视患者情况分次静注 1-2 mg 咪唑安定及 0.03-0.05 mg 芬太尼。

1.4 观察指标

治疗时密切关注两组患者的各体征指数(运动阻滞起效时间、感觉阻滞起效时间及运动阻滞恢复时间等),记录两组患者的术后不良反应情况,用 VAS 评分判定两组患者的疼痛状况,分值范围为 0 至 10 分,分数越低,疼痛程度越低^[7]。

1.5 统计学方法

采用 SPSS19.0 软件进行统计,计量资料以 $\bar{x} \pm s$ 表示,采用 t 检验对比分析;计数资料以率或百分比表示,采用卡方检验对比分析,以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组麻醉指标的比较

LPSB 组的感觉阻滞起效时间、运动阻滞起效时间、运动恢复时间均显著晚于 CSEA 组 ($P<0.05$),但维持时间显著长于 CSEA 组,患者疼痛感觉评分也低于 CSEA 组($P<0.05$)。

表 2 两组患者麻醉指标比较($\bar{x} \pm s$)

Table 2 Comparison of the anesthesia indicators between two groups($\bar{x} \pm s$)

Groups	Sensory blockade working time(min)	Motion block work time(min)	Motion block recovery time(min)	Maintain time(min)	Pain Scores (scoer)
CSEA	10.5 $\pm$ 3.1	14.5 $\pm$ 3.6	106.8 $\pm$ 83.4	236.6 $\pm$ 17.7	5.3 $\pm$ 0.5
LPSB	13.5 $\pm$ 4.6	18.8 $\pm$ 4.3	158.6 $\pm$ 55.7	410.7 $\pm$ 20.2	3.2 $\pm$ 0.9
P	0.000	0.000	0.001	0.003	0.001

2.2 两组不良反应发生情况的比较

两组发生低血压 28 例 (CSEA 组, 18 例; LPSB 组, 10 例), 心动过缓 12 例 (CSEA 组, 8 例; LPSB 组, 4 例), 分别给予静脉

注射 10 mg 麻黄碱、静注 0.5 mg 阿托品。CSEA 组发生 1 例血管迷走反射。CSEA 组不良反应的总发生率显著高于 LPSB 组 ($P < 0.05$)。

表 3 两组患者不良反应发生状况的比较(n, %)

Table 3 Comparison of with the incidence of adverse reactions between two groups

Groups	Hypotension	Bradycardia	Nausea and Vomiting	Vasovagal Reflex	Total
CSEA	18(23.08%)	8(10.13%)	8(10.52%)	2(2.63%)	36(47.37%)
LPSB	10(12.66%)	4(5.06%)	2(2.53%)	0	16(20.25%)
P					0.000

3 讨论

L2-3 穿刺比 L4-5 更可取, 因为 L2-3 间隙较宽, 可减少并发症的可能性。然而, 这一平面腰大肌的内侧和外侧面距离较窄^[8-10]。因此, 本研究我们在 L3 椎体高度后路椎旁进行穿刺, 为防止腰丛联合坐骨神经阻滞效果不佳, 并在神经刺激仪的引导下定位腰丛和坐骨神经, 实现针对性麻醉阻滞, 成功率为 96.2%, 与文献的结果一致^[11]。本研究中, LPSB 组的感觉阻滞起效时间、运动阻滞起效时间均显著晚于 CSEA 组, 可能因为局部麻醉药液必须通过纤维组织和神经鞘等不同解剖屏障, 才能到达外周神经的作用区域^[12-15]。在硬膜外麻醉中, 局部麻醉向硬脑膜区域快速扩散, 从而导致感觉和运动神经阻滞的起效快。此外, LPSB 组的维持时间显著长于 CSEA 组, 患者疼痛感觉评分和不良反应发生率均显著低于 CSEA 组, 表明 LPSB 为行下肢手术的老年患者提供了有效的单侧麻醉。

老年患者的机体代偿能力减弱, 心血管系统对麻醉药物的敏感性增加, 全身麻醉存在巨大的心血管疾病治疗意外和风险^[16-19]。因此, 出于对老年患者的保护, 推荐在能够满足外科麻醉水平的条件下, 优选使用神经阻滞技术, 包括椎管内麻醉, 外周神经阻滞麻醉等方式^[20-22]。椎管内麻醉代表性麻醉方式即腰硬联合麻醉。腰硬联合麻醉通过局麻药短时间内阻断患者脊神经、交感神经、运动神经甚至本体感觉神经发挥止痛、肌松作用, 有助于手术的顺利进行; 但交感神经受到抑制后, 迷走则呈相对亢进, 临床表现为心率减慢, 血压下降甚至低血压, 为手术治疗的安全顺利进行带来不可控因素^[23-26]。老年患者常需口服阿司匹林、氯吡格雷等抗凝药且术后常需抗凝治疗影响腰硬联合麻醉的使用。根据文献报道, 大多数单侧下肢手术可在腰丛-坐骨神经阻滞麻醉下完成^[28-30], 与腰硬联合麻醉相比, 其具有对全身影响小, 禁忌证和并发症较少等特点, 在高龄合并有慢性病患者的手术麻醉中, 可稳定维持全身循环系统稳定。

综上所述, 与腰硬联合麻醉相比, 腰丛-坐骨神经阻滞能为老年下肢骨折手术患者提供有效的单侧麻醉, 且安全性高, 可作为下肢骨科手术患者的首选麻醉方案。

参考文献(References)

- [1] Brox W T, Chan P H, Cafri G, et al. Similar mortality with general or regional anesthesia in elderly hip fracture patients [J]. Acta Orthopaedica, 2016, 87(2): 152
- [2] Neuman M D, Ellenberg S S, Sieber F E, et al. Regional versus General Anesthesia for Promoting Independence after Hip Fracture

(REGAIN): protocol for a pragmatic, international multicentre trial [J]. Bmj Open, 2016, 6(11): e013473

- [3] Leblanc P, Boucher V, Émond M, et al. P076: Delirium prevention in the emergency department using regional anesthesia with ultrasound guidance in the elderly population with hip fracture: a pilot study[J]. Canadian Journal of Emergency Medicine, 2016, 18(S1): S103-S104
- [4] Chua S Y I, Ong Y K G. 6 Intravenous Regional Anesthesia for Pediatric Forearm Fractures in a Pediatric Emergency Department: Experience in the Last 12 Years 2003-2014 [J]. Annals of Emergency Medicine, 2016, 68(4): S3-S3
- [5] Johnston D F, Stafford M, McKinney M, et al. Peripheral nerve blocks with sedation using propofol and alfentanil target-controlled infusion for hip fracture surgery: a review of 6 years in use [J]. Journal of Clinical Anesthesia, 2016, 29(1):33
- [6] Madabushi R, Rajappa G C, Thammanna P P, et al. Fascia iliaca block vs intravenous fentanyl as an analgesic technique before positioning for spinal anesthesia in patients undergoing surgery for femur fractures-a randomized trial [J]. Journal of Clinical Anesthesia, 2016, 35: 398-403
- [7] Oh C S, Rhee K Y, Yoon T G, et al. Postoperative Delirium in Elderly Patients Undergoing Hip Fracture Surgery in the Sugammadex Era: A Retrospective Study[J]. Biomed Research International, 2016, 2016, 12 (4): 1054597
- [8] Ikram S, Saleem N, Latif R K. Acute left ventricle failure on induction of anesthesia: a case report of reverse stress cardiomyopathy-presentation, diagnosis and treatment[J]. Journal of Anesthesia, 2016, 25(6): 1-4
- [9] Conversely. Increased Fracture Collapse after Intertrochanteric Fractures Treated by the Dynamic Hip Screw Adversely Affects Walking Ability but Not Survival [J]. Biomed Research International, 2016, 31(8): 8
- [10] Xu M, Shi C M, Li J, et al. Massive Pulmonary Embolism in Recovery Period of General Anesthesia: Rapid Diagnosis and Successful Rescue by the Guidance of Transthoracic Echocardiography[J]. Chinese Medical Journal, 2017, 130(2): 245
- [11] Vargo J J, Niklewski P J, Williams J L, et al. Patient safety during sedation by anesthesia professionals during routine upper endoscopy and colonoscopy: an analysis of 1.38 million procedures [J]. Gastrointestinal Endoscopy, 2016, 33(6): 660-661
- [12] Singh S K, Yahya N, Misiran K, et al. Combined spinal-epidural analgesia in labour: its effects on delivery outcome [J]. Revista

- Brasileira De Anestesiologia, 2016, 66(3): 259-264
- [13] Beecher H K, Todd D P. A study of the deaths associated with anesthesia and surgery: based on a study of 599, 548 anesthetics in ten institutions 1948-1952, inclusive[J]. *Annals of Surgery*, 2017, 140(1): 2-35
- [14] Chaki T, Sugino S, Janicki P K, et al. Efficacy and Safety of a Lidocaine and Ropivacaine Mixture for Scalp Nerve Block and Local Infiltration Anesthesia in Patients Undergoing Awake Craniotomy[J]. *Journal of Neurosurgical Anesthesiology*, 2016, 28(2): 131
- [15] Pignaton W, Braz J R, Kusano P S, et al. Perioperative and Anesthesia-Related Mortality: An 8-Year Observational Survey From a Tertiary Teaching Hospital[J]. *Medicine*, 2016, 95(2): e2208
- [16] Weng M, Chen W, Hou W, et al. The effect of neuraxial anesthesia on cancer recurrence and survival after cancer surgery: an updated meta-analysis[J]. *Oncotarget*, 2016, 7(12): 15262-15273
- [17] Lee T W R, Kowalski S, Falk K, et al. High Spinal Anesthesia Enhances Anti-Inflammatory Responses in Patients Undergoing Coronary Artery Bypass Graft Surgery and Aortic Valve Replacement: Randomized Pilot Study[J]. *Plos One*, 2016, 11(3): e0149942
- [18] Cheng X Y, Lun X Q, Li H B, et al. Butorphanol suppresses fentanyl-induced cough during general anesthesia induction: A randomized, double-blinded, placebo-controlled clinical trial [J]. *Medicine*, 2016, 95(26): e3911
- [19] Munro M G. Hysteroscopic Myomectomy of FIGO Type 2 Leiomyomas Under Local Anesthesia: Bipolar Radiofrequency Needle-Based Release Followed By Electromechanical Morcellation [J]. *Journal of Minimally Invasive Gynecology*, 2016, 23(1): 12
- [20] Pagel P S, Hudetz J A. Scholarly productivity and national institutes of health funding of foundation for anesthesia education and research grant recipients: insights from a bibliometric analysis [J]. *Anesthesiology*, 2016, 123(3): 683
- [21] Luedi M M, Kauf P, Evers T, et al. Impact of spinal versus general anesthesia on postoperative pain and long term recurrence after surgery for pilonidal disease[J]. *Journal of Clinical Anesthesia*, 2016, 33(4): 236-242
- [22] Sarakatsianou C, Georgopoulou S, Baloyiannis I, et al. Spinal versus general anesthesia for transabdominal preperitoneal (TAPP) repair of inguinal hernia: Interim analysis of a controlled randomized trial[J]. *American Journal of Surgery*, 2017, 11(2): 31
- [23] Yamamoto H, Shido A, Sakura S, et al. Monitored anesthesia care based on ultrasound-guided subcostal transversus abdominis plane block for continuous ambulatory peritoneal dialysis catheter surgery: case series[J]. *Journal of Anesthesia*, 2016, 30(1): 1-5
- [24] Dalla M L, Osuru H P, Oklopic A, et al. General Anesthesia Causes Epigenetic Histone Modulation of c-Fos and Brain-derived Neurotrophic Factor, Target Genes Important for Neuronal Development in the Immature Rat Hippocampus [J]. *Anesthesiology*, 2016, 35(7): 12-16
- [25] Zhang D, Chen L X, Chen X Y, et al. Lower incidence of postdural puncture headache using whitacre spinal needles after spinal anesthesia: A meta analysis[J]. *Headache*, 2016, 56(3): 501-510
- [26] Ledwoch J, Matić P, Franke J, et al. Transcatheter mitral valve repair with the MitraClip[®], can be performed without general anesthesia and without conscious sedation [J]. *Clinical Research in Cardiology*, 2016, 105(4): 1-10
- [27] Wang W, Feng L, Bai F, et al. The Safety and Efficacy of Dexmedetomidine vs. Sufentanil in Monitored Anesthesia Care during Burr-Hole Surgery for Chronic Subdural Hematoma: A Retrospective Clinical Trial [J]. *Frontiers in Pharmacology*, 2016, 7(3): 41
- [28] Westin, Wollert, Staffan, et al. Less Pain 1 Year After Total Extraperitoneal Repair Compared With Lichtenstein Using Local Anesthesia: Data From a Randomized Controlled Clinical Trial [J]. *Annals of Surgery*, 2016, 16(4): 263
- [29] Warnaby C E, Seretny M, Mhuircheartaigh R N, et al. Anesthesia-induced Suppression of Human Dorsal Anterior Insula Responsivity at Loss of Volitional Behavioral Response [J]. *Anesthesiology*, 2016, 124(4): 1
- [30] Park M, Jeon Y. Preoperative pregabalin prolongs duration of spinal anesthesia and reduces early postoperative pain: A double-blind, randomized clinical CONSORT study [J]. *Medicine*, 2016, 95(36): e4828

(上接第 6282 页)

- Zhang Xing-kai, Feng Jing, Song Rong, et al. Risk factors in elderly patients with hypertension complicating lower extremity atherosclerosis in varying degrees [J]. *Chinese Journal of Evidence-Based Cardiovascular Medicine*, 2013, 5(3): 278-280
- [24] Rustempasic N, Totic D, Djedovic M, et al. Epidemiological aspects of atherosclerosis in patients treated for acute atherothrombosis of extremity arteries[J]. *Med Arch*, 2014, 68(5): 329-331
- [25] Gracheva SA, Biragova MS, Glazunova AM, et al. Risk factors for and prognostic value of multifocal atherosclerosis in patients with diabetes mellitus[J]. *Ter Arkh*, 2014, 86(10): 20-26
- [26] Mi Y, Yan S, Lu Y, et al. Venous thromboembolism has the same risk factors as atherosclerosis: A PRISMA-compliant systemic review and meta-analysis[J]. *Medicine(Baltimore)*, 2016, 95(32): e4495
- [27] Capuano V, Marchese F, Capuano R, et al. Hyperuricemia as an independent risk factor for major cardiovascular events: a 10-year cohort study from Southern Italy[J]. *J Cardiovasc Med (Hagerstown)*, 2017, 18(3): 159-164
- [28] Barbarash OL, Usoltseva EN, Kashtalov VV, et al. Factors determining progression of atherosclerosis in extracoronary arteries after myocardial infarction[J]. *Kardiologiia*, 2013, 53(11): 55-61
- [29] 伊继峰, 许聿新, 岳建美, 等. 尿酸与 2 型糖尿病患者大血管病变的相关性[J]. *中国综合临床*, 2014, 30(12): 1278-1280
- Yi Ji-feng, Xu Yu-xin, Yue Jian-mei, et al. Relationship between vascular disease and uric acid of type 2 diabetic patients [J]. *Clinical Medicine of China*, 2014, 30(12): 1278-1280
- [30] Bagheri B, Zargari M, Meshkini F, et al. Uric Acid and Coronary Artery Disease, Two Sides of a Single Coin: A Determinant of Antioxidant System or a Factor in Metabolic Syndrome [J]. *J Clin Diagn Res*, 2016, 10(2): OC27-OC31