

doi: 10.13241/j.cnki.pmb.2022.05.013

超声引导下腹横肌平面阻滞与静脉镇痛在腹股沟疝气手术中的应用价值*

宿明艳 刘晓杰 张晓坤 彭余楠 周 瑜

(南京大学医学院附属鼓楼医院麻醉科 江苏 南京 210008)

摘要 目的:分析超声引导下腹横肌平面阻滞与静脉镇痛在腹股沟疝气手术中的应用价值。**方法:**选择2019年1月~2020年12月我院的120例腹股沟疝气手术患者为研究对象,按照麻醉镇痛方法的差异分为两组,对照组采用静脉镇痛,观察组采用腹横肌平面阻滞。记录两组患者术中丙泊酚、麻黄碱以及芬太尼的使用剂量以及手术后不同时间的VAS评分和芬太尼追加次数;比较两组术后恶心呕吐的发生率,并比较进食时间、肠道功能恢复时间以及下床活动时间。**结果:**观察组患者丙泊酚、麻黄碱以及芬太尼的使用剂量均显著少于对照组($P<0.05$);观察组疝气手术后1 h(T0)、5 h(T1)、10 h(T2)、1 d(T3)、2 d(T4)的VAS评分均明显低于对照组($P<0.05$);观察组的芬太尼追加次数为4次/人,明显低于对照组的11次($P<0.05$);观察组疝气手术后恶心呕吐的发生率(6.67%)、进食时间、肠道功能恢复时间以及下床活动时间均明显低于对照组($P<0.05$)。**结论:**腹横肌平面阻滞对腹股沟疝气手术后患者的镇痛效果明显优于静脉镇痛,且更有助于促进术后恢复。

关键词:腹横肌平面阻滞;静脉镇痛;腹股沟疝气手术;术后恢复

中图分类号:R656.21;R445.2;R614 文献标识码:A 文章编号:1673-6273(2022)05-863-04

Application Value of Ultrasound-guided Transversus Abdominis Plane Block and Intravenous Analgesia in Inguinal Hernia Surgery*

SU Ming-yan, LIU Xiao-jie, ZHANG Xiao-kun, PENG Yu-nan, ZHOU Yu

(Department of Anesthesiology, Drum Tower Hospital, Nanjing University School of Medicine, Nanjing, Jiangsu, 210008, China)

ABSTRACT Objective: To explore the value of transverse abdominal plane block and intravenous analgesia in hernia surgery. **Methods:** From January 2019 to December 2020, 120 patients undergoing inguinal hernia surgery in our hospital were selected as research subjects. According to the difference of anesthesia methods, they were divided into two groups. The control group was given intravenous analgesia, while the observation group was given transverse abdominal plane block. The intraoperative doses of propofol, ephedrine and fentanyl in the two groups of patients, as well as the VAS score and the number of fentanyl supplements at different times after the operation were recorded; the incidence of postoperative nausea and vomiting between the two groups was compared, and Compare eating time, intestinal function recovery time, and time to get out of bed. **Results:** The dosages of propofol, ephedrine and fentanyl in the observation group were significantly less than those in the control group ($P<0.05$). The VAS scores of 1 h (T0), 5 h (T1), 10 h (T2), 1 d (T3), 2 d (T4) in the observation group were significantly lower than those in the control group ($P<0.05$). The number of additional fentanyl in the observation group was 4 times per person($P<0.05$). The incidence of nausea and vomiting (6.67%), eating time, intestinal function recovery time, and time to get out of bed in the observation group after hernia surgery were significantly lower than those in the control group ($P<0.05$). **Conclusion:** Transverse abdominis plane block is significantly better than intravenous analgesia for patients with inguinal hernia after surgery, and it is more helpful to promote postoperative recovery.

Key words: Transversus abdominis plane block; Intravenous analgesia; Inguinal hernia surgery; Postoperative recovery

Chinese Library Classification(CLC): R656.21; R445.2; R614 **Document code:** A

Article ID: 1673-6273(2022)05-863-04

前言

疝气指的是机体中的某个脏器或者组织与正常的解剖位置之间发生的偏离,通常可借助患者机体中后天或先天形成的缺损、孔隙和薄弱点等进入到机体的另一部位^[1-4]。临床上对于疝气患者的治疗以手术疗法为主。由于腹腔镜根治术具有术后疼痛反应轻、恢复快、切口比较小、肿瘤根治性以及肠梗阻发生

率低等优点而在疝气患者的治疗领域获得日益广泛的应用^[5]。但腹腔镜根治术的手术时间比较长,且会对患者的神经系统造成比较复杂的影响,因此对术后镇痛以及麻醉均提出了更高的要求,而不同的术后麻醉镇痛方式对结直肠癌患者术后的转归情况产生较大的影响^[6,7]。患者在全麻成功后,常借助静脉镇痛、腹横肌平面阻滞或硬膜外镇痛,以协同提高镇痛效果^[8]。腹横肌平面阻滞由于目标平面中分布的血管分布比较少,药物经血管

* 基金项目:国家自然科学基金项目(H0903)

作者简介:宿明艳(1986-),女,硕士,研究方向:普外、妇产、泌尿科、机器人等,电话:15195860663,E-mail:sumingyan19860120@163.com

(收稿日期:2021-07-04 接受日期:2021-07-28)

吸收慢且少,可以维持较长时间的镇痛效果,作用确切,且安全性高^[9]。本研究对腹横肌平面阻滞与静脉镇痛两种麻醉镇痛手段的效果进行了比较,现报道如下。

1 资料与方法

1.1 一般资料

选择 2019 年 1 月~2020 年 12 月我院的 120 例腹股沟疝气手术患者为研究对象,所有患者均符合疝气手术指征,心、肺、肾、肝以及凝血功能均正常,且均对本研究知情同意,排除术前使用过会对神经系统造成影响的药物者,有精神障碍性疾病者。按照麻醉镇痛方法的差异分为两组。观察组 60 例,男 37 例,女 23 例;年龄 43~72 岁,平均 (57.42 ± 4.39) 岁;失血量 (23.75 ± 2.49) mL;手术时间 (61.76 ± 9.45) min。对照组 60 例,男 38 例,女 22 例;年龄 44~73 岁,平均 (57.63 ± 5.39) 岁;失血量 (23.36 ± 2.28) mL;手术时间 (63.41 ± 10.17) min。两组的基线资料具有可比性。

1.2 方法

观察组腹股沟疝气手术患者在超声引导下开展双侧腹横肌平面阻滞,然后实施喉罩全麻。具体方法如下:取仰卧位,进针区域位于腹外斜肌后缘、背阔肌前缘以及髂嵴组成的三角部位。得到比较清晰的超声影像后,采用神经丛刺激针,于机体的长轴平面内进针,当回抽无气无血后,注入 20 mL 的 0.25% 盐酸罗哌卡因注射液(批准文号:进 H20140764,厂家:瑞典 Astra

Zeneca AB 公司,规格:75 mg/10 mL×5 支),采用超声实时观察罗哌卡因的扩散以及渗透情况。然后采取上述同样的方法对侧进行阻滞麻醉,阻滞实施喉罩全麻,即可开展手术,术后不进行静脉镇痛。

对照组腹股沟疝气手术患者常规实施喉罩全麻后开展手术,手术结束时给予地佐辛辅合氟比洛芬酯进行静脉镇痛。

1.3 观察指标

① 记录两组患者术中丙泊酚、麻黄碱以及芬太尼的使用剂量。

② 分别于术后 1 h(T_0)、5 h(T_1)、10 h(T_2)、1 d(T_3)、2 d(T_4)记录两组的 VAS 评分,评分值越低即疼痛程度越轻;并比较两组患者苏醒期芬太尼的追加次数。

③ 记录两组术后恶心呕吐的发生率,并比较进食时间、肠道功能恢复时间以及下床活动时间。

1.4 统计学分析

采用 SPSS22.0,两组间计量资料对比用 t 检验,计数资料用 χ^2 检验, $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 两组丙泊酚、麻黄碱以及芬太尼的使用剂量比较

观察组患者丙泊酚、麻黄碱以及芬太尼的使用剂量均显著少于对照组($P < 0.05$),见表 1。

表 1 两组丙泊酚、麻黄碱以及芬太尼的使用剂量比较($\bar{x} \pm s$)

Table 1 Comparison of intraoperative doses of sevoflurane, ephedrine and sufentanil between the two groups($\bar{x} \pm s$)

Groups	n	Propofol(mg/kg/h)	Ephedrine (mg)	Fentanyl(μ g)
Control group	60	2.51 $\pm$ 0.37	4.63 $\pm$ 1.27	31.49 $\pm$ 4.32
Observation group	60	1.92 $\pm$ 0.48*	3.01 $\pm$ 1.14*	28.23 $\pm$ 3.51*

Note: Compared with the control group, * $P < 0.05$.

2.2 两组术后不同时间点的 VAS 评分比较

观察组术后 1 h(T_0)、5 h(T_1)、10 h(T_2)、1 d(T_3)、2 d(T_4)的

VAS 评分均明显低于对照组($P < 0.05$),见表 2。

表 2 两组术后不同时间点的 VAS 评分比较($\bar{x} \pm s$, 分)

Table 2 Comparison of VAS scores between the two groups at different time points after surgery($\bar{x} \pm s$, points)

Groups	n	T_0	T_1	T_2	T_3	T_4
Control group	60	5.14 $\pm$ 0.93	4.86 $\pm$ 0.92	3.42 $\pm$ 0.73	3.16 $\pm$ 0.78	2.73 $\pm$ 0.64
Observation group	60	2.13 $\pm$ 0.57*	2.11 $\pm$ 0.43*	2.03 $\pm$ 0.41*	1.94 $\pm$ 0.37*	1.92 $\pm$ 0.36*

Note: Compared with the control group, * $P < 0.05$.

2.3 两组苏醒期芬太尼的追加次数比较

观察组患者苏醒期芬太尼的追加次数为 (0.23 ± 0.08) 次,显著少于对照组的 (0.65 ± 0.17) ($t = 17.316$, $P < 0.001$)。

2.4 两组术后恢复情况比较

观察组术后恶心呕吐的发生率(6.67%)、进食时间、肠道功能恢复时间以及下床活动时间均明显低于对照组($P < 0.05$),见表 3。

3 讨论

疝气是外科常见病,通常是指是指人体内某个脏器或组织离开其正常解剖位置,通过先天或后天形成的薄弱点、缺损或孔隙进入另一部位所引发的临床综合征,主要包括腹股沟疝、切口疝和脐疝等,对于疝气患者而言,通常需要进行手术治疗,而众所周知手术是一种具有创伤性的治疗手段,术后难免出现并发症和疼痛等问题^[10-13]。疝气手术过程中会涉及到极为复杂的神经支配,因此患者术后早期极易出现不同程度的内脏痛以及切口痛等急性疼痛,加上改变常见于老年人,其免疫功能明显降低,合并症较多,需充分麻醉镇痛,因而,必须采取有效的

表 3 两组术后恢复情况比较

Table 3 Comparison of postoperative recovery between the two groups

Groups	n	Feel sick and vomit (n,%)	Eating time (h)	Intestinal function recovery time (h)	Get out of bed time (h)
Control group	60	10 (16.67)	54.36± 11.27	44.28± 12.93	45.36± 13.72
Observationgroup	60	4 (6.67)*	46.32± 10.14*	39.14± 11.28*	40.26± 10.38*

Note: Compared with the control group, * $P<0.05$.

麻醉镇痛治疗,以促进术后转归^[14,15]。静脉镇痛主要是在临床医师掌握患者疼痛程度以及身体状况情况的基础之上采用镇痛药物进行静脉干预的方法^[16-18]。静脉镇痛对于麻醉镇痛药物的使用剂量具有较高的要求,无法准确地控制使用剂量,易出现麻醉镇痛不足或者过度现象,引发多种不良反应,对术后转归极为不利^[19,20]。

横肌平面阻滞是一种相对较新的区域麻醉技术,通过在腹横肌平面中引入局部麻醉剂来阻断供应前外侧腹壁的神经传入,其为术后多模式镇痛方案的一部分正在逐渐被广泛应用,其在各种下腹部手术后提高镇痛质量和持续时间的潜力已得到充分证实^[21]。其具体作用机制为:把局部麻醉药物罗哌卡因注入腹横肌以及腹内斜肌之间的筋膜平面,使腹壁前侧的神经支配受到明显的阻断,抑制伤害性刺激经由腹壁前侧感觉神经的传导,避免中枢敏化以及外周敏化的形成,进而有效降低腹部切口的疼痛程度^[22,23]。腹横肌平面阻滞对术后镇痛的重要性及其在所有类型腹部手术中具有多功能性,研究显示:腹横肌平面阻滞可在手术后的前 24 h 内提供高效的术中和术后镇痛^[24,25]。腹横肌平面阻滞能对同侧腹部的侧壁以及前壁的感觉神经,包括髂腹股沟及髂腹下神经、T7~T12 肋间神经、L1~L3 背侧支分支进行有效的镇痛,具有血流动力学干扰轻、不引发尿潴留以及不影响下肢运动等优点^[26,27]。

本研究中,在超声引导下可以清晰地识别患者腹外斜肌、腹横肌以及腹内斜肌的声像图,再采取平面内穿刺手段,能对穿刺针的"轨迹"进行实时的跟踪,并且可以观察药液在筋膜间的扩散情况,防止穿刺针尖穿透腹膜而对腹腔内脏器造成损伤,与以前的盲探穿刺法相比具有更高的安全性。结果发现,观察组术中芬太尼的使用剂量以及术后恶心呕吐的发生率低于对照组,与姜勇等^[28]研究结果一致,表明腹横肌平面阻滞在确保强有效的麻醉镇痛效果的基础之上,最大限度地降低麻醉镇痛药物芬太尼的使用剂量,有助于保持稳定的生命体征以及血流动力学,降低阿片类药物引发的恶心呕吐发生率,有效促进患者术后转归。

疼痛作为外科手术术后主要的应激因素以及并发症,会对术后的快速康复造成阻碍。观察组术后 1 h (T_0)、5 h (T_1)、10 h (T_2)、1d (T_3)、2 d(T_4) 的 VAS 评分均明显低于对照组,表明腹横肌平面阻滞对腹股沟疝气手术后患者的镇痛效果明显优于静脉镇痛,结合 Prabhu R^[29]和 Raft J^[30]分析其原因可能是由于腹横肌平面阻滞可以对交感神经冲动的传导进行有效的阻断,导致疼痛传入的途径受到阻滞而使疼痛刺激明显减轻,从而促进患者术后转归。另外,本研究结果中,观察组患者苏醒期芬太尼的追加次数、术后恶心呕吐的发生率、进食时间、肠道功能恢复时间以及下床活动时间显著少于对照组,表明该麻醉方式用药

量少、术后不良反应少、术后恢复快,且安全性较好,与相关研究结论类似。

综上所述,腹横肌平面阻滞对腹股沟疝气手术后患者的镇痛效果明显优于静脉镇痛,且更有助于促进术后恢复,且安全性较好。

参考文献(References)

- [1] Nordberg, E M. Incidence and estimated need of caesarean section, inguinal hernia repair, and operation for strangulated hernia in rural Africa [J]. British medical journal (Clinical research ed.), 2019, 289 (6437): 92-93
- [2] Kabir A A, Ahmad I, Sharmin M, et al. Early outcome of Lichtenstein technique for complete variety of inguinal hernia repair in a tertiary care hospital [J]. Northern International Medical College Journal, 2020, 10(2): 389-392
- [3] Wright R, Salisbury T, Landes J. Groin anatomy, preoperative pain, and compression neuropathy in primary inguinal hernia: What really matters[J]. The American Journal of Surgery, 2019, 217(5): 873-877
- [4] B Frbová, J Trka, Dotlail V, et al. Laparoscopic inguinal hernia repair in children via PIRS (percutaneous internal ring suturing)[J]. Rozhledy v chirurgii: měsíčník Československé chirurgické společnosti, 2020, 99(6): 277-281
- [5] Seidu A S, Yenli E, Kyereh M, et al. Necrotizing Fasciitis of the Anterior Abdominal Wall: A Rare Complication of Neglected Strangulated Richter's Epigastric Hernia[J]. International Journal of Innovative Research in Medical Science, 2020, 5(12): 602-605
- [6] Seyedhejazi M, Karami T, Iranpour A, et al. The Successful Awake Caudal Anesthesia for Bilateral Inguinal Hernia Repair in Triple Premature Infants: Case report and Review of Literature [J]. Advances in Bioscience and Clinical Medicine, 2021, 9(1): 44
- [7] Argo M, Favela J, Phung T, et al. Local VS. other forms of anesthesia for open inguinal hernia repair: A meta-analysis of randomized controlled trials [J]. The American Journal of Surgery, 2019, 218 (5): 1008-1015
- [8] Senapathi T, Irawan A, Pradhana A P. Anesthesia management of a patient undergoing exploration-decompression spinal canal and lumbar fusion procedure with diaphragmatic hernia [J]. Bali Journal of Anesthesiology, 2020, 4(4): 200
- [9] Zhang J F, Zhang W W, Wang J, et al. Distribution of the T12 erector spinal muscle plane block in the dorsal region guided by ultrasound [J]. Journal of Orthopaedic Surgery and Research, 2021, 16(1): 1-5
- [10] Hori S, Otsuki H, Sawatani T, et al. Lateral Port Site Hernia Following Robot Assisted Laparoscopic Radical Prostatectomy : A Case Report and Literature Review[J]. Hinyokika kyo. Acta urologica Japonica, 2021, 67(2): 73-77

- [11] Ioffe O Y, Negria N M, Omelchenko A V, et al. Mri and ultrasound criteria for the diagnosis of a sports hernia in football players [J]. Wiadomości lekarskie (Warsaw, Poland: 1960), 2020, 73(4): 755-760
- [12] Kumar A, Pukh R, Choudhary, et al. SAS Journal of Surgery Giant Inguinal Hernia-A Great Escape From Second Abdomen: Report of a Case and review of different surgical techniques [J]. SAS Journal, 2020, 2(jan- feb 2016): 26-30
- [13] Dipp Ramos R, O'Brien WJ, Gupta K, et al. Incidence and Risk Factors for Long-Term Mesh Explantation Due to Infection in More than 100,000 Hernia Operation Patients[J]. J Am Coll Surg, 2021, 232(6): 872-880, e2
- [14] Mh A, Sbd A, Tg A, et al. Resultados de la reparación de la hernia incisional asociada al trasplante renal en un centro especializado. Análisis de nuestra experiencia de 7 aos[J]. Cirugía Española, 2020, 98(6): 350-356
- [15] Kckerling F, Lammers B, Weyhe D, et al. What is the outcome of the open IPOM versus sublay technique in the treatment of larger incisional hernias?: A propensity score-matched comparison of 9091 patients from the Herniamed Registry[J]. Hernia, 2021, 25(1): 23-31
- [16] Omaygenc D O, N Citak, Isgorucu O, et al. Comparison of Thoracic Epidural and Intravenous Analgesia from the Perspective of Recovery of Respiratory Function in the Early Post-Thoracotomy Period in Lung Cancer Surgery [J]. Turkish Thoracic Journal, 2021, 22 (1): 31-36
- [17] Sarica F, Erturk E, Kutaniş D, et al. Comparison of Thoracic Epidural Analgesia and Traditional Intravenous Analgesia with Respect to Postoperative Respiratory Effects in Cardiac Surgery [J]. Journal of Cardiothoracic and Vascular Anesthesia, 2021, 35(6): 1800-1805
- [18] Huang Y, Xu C, Zeng T, et al. Intravenous patient-controlled analgesia hydromorphone combined with pregabalin for the treatment of postherpetic neuralgia: a multicenter, randomized controlled study[J]. The Korean journal of pain, 2021, 34(2): 210-216
- [19] Wilson M, Macarthur C, Hewitt CA, et al. Intravenous Remifentanyl Patient-controlled Analgesia Versus Intramuscular Pethidine for Pain Relief in Labour (RESPITE): An Open-label, Multicenter, Randomized Controlled Trial [J]. Obstetric Anesthesia Digest, 2019, 39(2): 100-101
- [20] Xiao, Lu, Tan, et al. Dose-response Relationship of Dexmedetomidine Combined with Sufentail for Postoperative Intravenous Analgesia in Video-assisted Thoracoscopic Surgery [J]. Zhongguo yi xue ke xue yuan xue bao [J]. Acta Academiae Medicinae Sinicae, 2019, 41 (3): 373-378
- [21] John R, Ranjan RV, Ramachandran TR, et al. Analgesic Efficacy of Transverse Abdominal Plane Block after Elective Cesarean Delivery - Bupivacaine with Fentanyl versus Bupivacaine Alone: A Randomized, Double-blind Controlled Clinical Trial [J]. Anesth Essays Res, 2017, 11(1): 181-184
- [22] Faiz S, Nader N D, Niknejadi S, et al. A clinical trial comparing ultrasound-guided ilioinguinal/iliohypogastric nerve block to transversus abdominis plane block for analgesia following open inguinal hernia repair[J]. Journal of Pain Research, 2019, 12(11): 201-207
- [23] Vargas C B. Efficacy of the Block in the Transverse Abdominal Plane in Laparoscopic and Robot-assisted Hysterectomy. Systematic Review and Meta - Analysis[J]. Journal of Minimally Invasive Gynecology, 2019, 26(7): S95
- [24] Dal Moro F, Aiello L, Pavarin P, et al. Ultrasound-guided transversus abdominis plane block (US-TAPb) for robot-assisted radical prostatectomy: a novel '4-point' technique-results of a prospective, randomized study[J]. J Robot Surg, 2019, 13(1): 147-151
- [25] Restrepo-Garcés C E, Chin K J, Suarez P, et al. Bilateral Continuous Erector Spinae Plane Block Contributes to Effective Postoperative Analgesia After Major Open Abdominal Surgery: A Case Report[J]. A & A Case Reports, 2017, 9(11): 1
- [26] Faried A M, Lahloub F M, Elzebery M M. Ultrasound guided Transversus Abdominal Plane Block versus Ilioinguinal/iliohypogastric Nerve Blocks for Postoperative Analgesia in Infants Undergoing Lower Abdominal Surgery[J]. Enliven Journal of Anesthesiology and Critical Care Medicine, 2015, 02(1): 24-29
- [27] Desmet M, D Helsloot, Vereecke E, et al. Pneumoperitoneum Does Not Influence Spread of Local Anesthetics in Midaxillary Approach Transversus Abdominis Plane Block: A Descriptive Cadaver Study[J]. Reg Anesth Pain Med, 2015, 40(4): 349-354
- [28] 姜勇, 唐晓慧. 腹横肌平面阻滞联合静脉自控镇痛用于剖宫产术后镇痛效果[J]. 中国计划生育学杂志, 2019, 27(01): 51-54
- [29] Prabhu R, Singh D R, Krishnaveni N. A Comparative Study of Postoperative Analgesia Provided by Ultrasound-Guided Transversus Abdominis Plane Block Using Two Concentrations of Bupivacaine in Patients Undergoing Inguinal Hernia Repair [J]. Anesthesia Essays & Researches, 2017, 11(4): 934-939
- [30] Raft J, Chin K J, Richeb , Philippe. Erector spinae plane (ESP) block with a transverse in-plane approach for management of referred shoulder pain after laparoscopic cholecystectomy[J]. Journal of Clinical Anesthesia, 2019, 55(12): 100-101