·论著·

腰硬联合麻醉与硬膜外麻醉在老年股骨颈骨折防旋股骨近端髓内钉内固定患者中的效果对比

董伟岭* 乔丽娜 杨南南
开封市人民医院麻醉科 (河南 开封 475000)

【摘要】**目的** 探讨腰硬联合麻醉对老年股骨颈骨折防旋股骨近端髓内钉内固定患者的麻醉效果、认知功能及应激反应的影响。**方法** 收集2019年2月至2022年10月在本院就诊的老年股骨颈骨折且行防旋股骨近端髓内钉内固定术治疗患者68例，采用随机数字表法进行分组，即对照组、观察组，均34例。对照组患者采用硬膜外麻醉，观察组患者采用腰硬联合麻醉。统计两组患者麻醉效果、脑电双频指数(bispectral index，BIS)、认知功能、应激反应相关指标、麻醉满意度、术后并发症发生率。**结果** 观察组患者麻醉起效时间、阻滞完善时间短于对照组患者，观察组患者痛觉阻滞时间长于对照组患者，差异均具有统计学意义(t=18.633、26.171、19.215，*P*<0.001)；麻醉前，两组患者BIS评分比较，差异无统计学意义(*P*>0.05)，麻醉后30min，观察组患者BIS评分高于对照组患者，差异具有统计学意义(t=7.990，*P*<0.001)。麻醉前，两组患者认知功能比较，差异无统计学意义(*P*>0.05)，术前、术后24h、48h，观察组患者认知功能评分高于对照组患者，差异均具有统计学意义(t=6.263、3.593、4.071，*P*<0.001)。麻醉前，两组患者后应激反应相关指标Cor、NE、BG、Ang-Ⅱ水平比较，差异均无统计学意义(*P*>0.05)，术后10h，两组患者应激反应相关指标Cor、NE、BG、Ang-Ⅱ水平均上升，组间比较，观察组患者应激反应相关指标Cor、NE、BG、Ang-Ⅱ水平均低于对照组患者，差异均具有统计学意义(t=3.953，*P*<0.001；t=4.741，*P*<0.001；t=2.649，*P*=0.010；t=6.247，*P*<0.001)。观察组患者满意度97.06%显著高于对照组患者满意度79.41%，差异具有统计学意义(2=5.100，*P*=0.024)。观察组患者术后并发症发生率8.82%显著低于对照组患者并发症发生率35.29%，差异具有统计学意义(2=6.928，*P*=0.008。**结论** 腰硬联合麻醉用于老年股骨颈骨折防旋股骨近端髓内钉内固定患者，可改善麻醉效果，降低术后认知功能异常及应激反应异常发生率，还可减少并发症发生率，值得在临床上广泛应用。

【关键词】腰硬联合麻醉；老年股骨颈骨折；防旋股骨近端髓内钉内固定；麻醉效果；认知功能；应激反应
【中图分类号】R683.42
【文献标识码】A
DOI:10.3969/j.issn.1009-3257.2024.3.037

Effects of Combined Lumbar and Epidural Anesthesia on the Anesthetic Effect, Cognitive Function and Stress Response in Elderly Patients with Proximal Femoral Nail Fixation for Femoral Neck Fracture

DONG Wei-ling*, QIAO Li-na, YANG Nan-nan.
Anesthesia Department of Kaifeng People's Hospital 475000 Kaifeng, Henan Province, China

Abstract: ***Objective*** To investigate the effects of combined lumbar and epidural anesthesia on anesthesia effect, cognitive function and stress response in elderly patients with proximal femoral nail fixation for femoral neck fracture. ***Methods*** A total of 68 elderly patients with femoral neck fracture admitted to our hospital from February 2019 to October 2022 and treated with anti-rotation proximal femur intramedullary nail fixation were collected. Random number table method was used to group them, i.e., control group and observation group, with 34 cases in both. The control group received epidural anesthesia, and the observation group received combined lumbar and epidural anesthesia. Anesthesia effect, BIS index (BIS), cognitive function, stress response related indexes, satisfaction with anesthesia and incidence of postoperative complications were analyzed in the two groups. ***Results*** The duration of anesthesia onset and block completion in observation group was shorter than that in control group, while the duration of pain block in observation group was longer than that in control group, the differences were statistically significant (t=18.633, 26.171, 19.215, *P*<0.001). Before anesthesia, there was no significant difference in BIS score between the two groups (*P*>0.05). 30min after anesthesia, BIS score in the observation group was higher than that in the control group, with statistical significance (t=7.990, *P*<0.001). Before anesthesia, there was no statistically significant difference in cognitive function between the two groups (*P*>0.05). Before surgery, 24h and 48h after surgery, the cognitive function scores of the observation group were higher than those of the control group, with statistically significant differences (t=6.263, 3.593, 4.071, *P*<0.001). Before anesthesia, there was no statistical significance in the levels of Cor, NE, BG and Ang-Ⅱ of stress response related indexes between the two groups (*P*>0.05). At 10h after surgery, the levels of Cor, NE, BG and Ang-Ⅱ of stress response related indexes in the two groups were increased. The levels of Cor, NE, BG and Ang-Ⅱ of stress response in observation group were lower than those in control group, and the differences were statistically significant (t=3.953, *P*<0.001; t=4.741, *P*<0.001;t=2.649, *P*=0.010; t=6.247, *P*<0.001). The satisfaction of observation group was 97.06% higher than that of control group 79.41%, and the difference was statistically significant (2=5.100, *P*=0.024). The incidence of postoperative complications in observation group was 8.82% significantly lower than that in control group, which was 35.29%, and the difference was statistically significant (2=6.928, *P*=0.008. ***Conclusions*** Combined lumbar and epidural anesthesia for elderly patients with femoral neck fracture and proximal intramedullary nail fixation can improve the anesthetic effect, reduce the incidence of postoperative cognitive dysfunction and abnormal stress response, as well as reduce the incidence of complications, and is worthy of wide clinical application.

Keywords: Combined Epidural Anesthesia; Femoral Neck Fracture in the Elderly; Antirotation Femoral Proximal Intramedullary Nail Internal Fixation; Anesthetic Effect; Cognitive Function; Stress Response

年龄越大，机体内各个脏器功能也在不断退化。尤其对于老年女性人群而言，新陈代谢率低，机体内雌激素水平下降，使得骨质中钙磷分泌较少，新骨形成下降，骨质疏松、骨质脱钙等风险性增加，骨支持耐受能力下降，骨折风险上升[1-2]。老年人群钙

【第一作者】董伟岭，女，主治医师，主要研究方向：麻醉方面。E-mail：khsuyesdss@163.com
【通讯作者】董伟岭

质流失较多，属于骨折高发人群[3]。临床常通过手术治疗，腰硬麻醉、全麻等均常用麻醉方法[4-5]。本次研究主要对比了硬膜外麻醉、腰硬联合麻醉对老年股骨颈骨折且行防旋股骨近端髓内钉内固定术的影响，现将内容报道如下。

1 资料与方法

1.1 一般资料

1.1.1 研究对象 收集2019年2月至2022年10月在本院就诊的老年股骨颈骨折且行防旋股骨近端髓内钉内固定术治疗患者68例，采用随机数字表法进行分组，即对照组、观察组，均34例。对照组：其中男性19例，女性15例，年龄60~85岁，平均年龄(71.56±7.42)岁，麻醉等级：Ⅱ级20例，Ⅲ级14例，致伤原因：摔伤19例，交通意外10例，重物砸伤5例。观察组：男性21例，女性13例，年龄60~85岁，平均年龄(71.48±7.33)岁，麻醉等级：Ⅱ级22例，Ⅲ级12例，致伤原因：摔伤17例，交通意外12例，重物砸伤5例。两组一般资料比较，差异均无统计学意义(*P*>0.05)。

纳入标准：年龄≥60岁；对本研究所用麻醉药物无过敏；同意参加本研究，且已签署知情同意书。排除标准：合并其他类型骨折；既往存在瘫痪或肢体功能异常；心、肝、肾等重要脏器功能异常；凝血功能异常；合并认知、预言、精神异常；合并中枢系统、全身系统感染疾病等。

1.2 研究方法 术前，完善相关检查，麻醉前30min，采用静脉注射方式予以咪达唑仑1mg，麻醉期间，密切观察患者血压、心率等生命体征变化。对照组患者采用硬膜外麻醉，观察组患者采用腰硬联合麻醉。

1.2.1 对照组 于腰椎L2~4椎间隙选取穿刺点，消毒，采用穿刺针在硬膜外穿刺置管。穿刺后，取平卧位，予以3~5mL利多卡因注射液试验量。观察5~10分钟后，分次数予以0.5% 盐酸罗哌卡因15~20mL，保持在T10平行的麻醉平面下，依据手术时间予以追加适量麻醉药物

1.2.2 观察组 于L2-4椎间隙选取穿刺点，与穿刺点应用硬膜外针穿刺进入硬膜外间隙后，取腰麻针经硬膜外穿刺针内向前推进，拔出针芯，见脑脊液流出后，予以0.5%布比卡因注射液2mL，药物进入蛛网膜下腔，硬膜外导管置入硬膜外腔，病人取平卧位，调整麻醉平面在T10以下，依据手术时间追加适量麻醉药物。

1.3 观察指标 统计两组患者麻醉效果、脑电双频指数(Bispectral Index，BIS)、认知功能、应激反应相关指标、麻醉满意度、术后并发症发生率。①麻醉效果，包括麻醉起效时间、痛觉阻滞时间、阻滞完善时间、BIS评分。采用脑电检测仪检测BIS[6]，满分100分，BIS评分≥90分表示脑部脑电活动状态正常；BIS评分范围为60至90分，表示脑部大脑皮层存在轻度抑制情况，且患者处于镇静状态；BIS评分范围为30至60分，表示大脑皮层存在明显抑制，且处于麻醉状态；BIS评分范围为0至30分，表示大脑皮层存在重度抑制，且处于爆发抑制状态；BIS评分为0分时，大脑皮层活动完全停止。BIS评分范围在45至60分表示适宜麻醉深度。②认知功能，评估患者麻醉前、术前、术后24h、术后48h认知功能，采用简易智力评价量表(Mini-mental State Examination，MMSE)评估[7]，满分为30分，分值越高说明患者认知功能越好。③应激反应相关指标，如糖皮质激素(Cortisol，Cor)、去甲肾上腺(Norepinephrine，NE)、血糖(Blood Glucose，BG)、人血管紧张素Ⅱ(Angiotensin Ⅱ，Ang-Ⅱ)水平，抽取手臂静脉血10mL，离心机离心，3200r/min，获取上清液，采用全自动化学发光免疫分析仪(生产厂家：上海聚慕医疗器械有限公司，型号：HISCL-800)检测血清Cor、NE、BG、Ang-Ⅱ水平。④麻醉满意度，采用麻醉满意度评级标准进行评估，其中Ⅰ级表示麻醉期间无痛、肌松良好，且患者心肺功能和血流动力学水平处于稳定状态；Ⅱ级表示麻醉完善度差，患者存在轻度疼痛、牵引痛，需要予以镇定剂，且患者血流动力学水平处于波动状态；Ⅲ级表示麻醉不完善，疼痛感较为明显，予以药物干预后明显得到改善，勉强可以完成手术；Ⅳ级表示患者需要联合其他麻醉方案。

1.4 统计学方法 将本次研究中所涉及到的两组病人的数据均录入到SPSS 25.0软件中，针对两组中的计量资料进行表述时，通过t值对检验结果进行检验，通过($\bar{x}\pm s$)进行，对于计数资料进行表述，通过χ^2对结果获取，当*P*<0.05表明存在显著性差异。

2 结 果

2.1 两组患者麻醉效果差异性观察 观察组患者麻醉起效时间、阻滞完善时间短于对照组患者，观察组患者痛觉阻滞时间长于对照组患者，差异均具有统计学意义(t=18.633、26.171、19.215，*P*<0.001)；麻醉前，两组患者BIS评分比较，差异无统计学意义(*P*>0.05)，麻醉后30min，观察组患者BIS评分高于对照组患者，差异具有统计学意义(t=7.990，*P*<0.001)。具体内容见表1。

2.2 两组患者麻醉前后认知功能差异性观察 麻醉前，两组患者认知功能比较，差异无统计学意义(*P*>0.05)，术前、术后24h、48h，观察组患者认知功能评分高于对照组患者，差异均具有统计学意义(t=6.263、3.593、4.071，*P*<0.001)。具体内容见表2。

2.3 两组患者麻醉前后应激反应相关指标差异性观察 麻醉前，两组患者后应激反应相关指标Cor、NE、BG、Ang-Ⅱ水平比较，差异均无统计学意义(*P*>0.05)，术后10h，两组患者应激反应相关指标Cor、NE、BG、Ang-Ⅱ水平均上升，组间比较，观察组患者应激反应相关指标Cor、NE、BG、Ang-Ⅱ水平均低于对照组患者，差异均具有统计学意义(t=3.953，*P*<0.001；t=4.741，*P*<0.001；t=2.649，*P*=0.010；t=6.247，*P*<0.001)。具体内容见表3。

2.4 两组患者麻醉满意度差异性观察 观察组患者满意度97.06%显著高于对照组患者满意度79.41%，差异具有统计学意义(2=5.100，*P*=0.024)。具体内容见表4。

2.5 两组患者术后并发症发生率差异性观察 观察组患者术后并发症发生率8.82%显著低于对照组患者并发症发生率35.29%，差异具有统计学意义(2=6.928，*P*=0.008)。具体内容见表5。

表1 两组患者麻醉效果差异性观察

组别	例数	麻醉起效时间(min)	痛觉阻滞时间(min)	阻滞完善时间(min)	BIS评分(麻醉前)	BIS评分(麻醉后30min)
对照组	34	18.61±1.62	334.32±24.19	15.57±1.75	90.51±8.76	44.81±4.17*
观察组	34	12.11±1.23	504.45±45.61	6.41±1.05	90.61±8.77	53.44±4.72*
t		18.633	19.215	26.171	0.047	7.990
P		<0.001	<0.001	<0.001	0.963	<0.001

注：*与麻醉前比较，*P*<0.05。

表2 两组患者麻醉前后认知功能差异性观察

组别	例数	麻醉前	术前	术后24h	术后48h
对照组	34	30.11±2.62	23.18±2.04*	25.18±2.14*1)	26.75±2.21*1)2)
观察组	34	29.25±2.65	26.34±2.12*	27.08±2.22*1)	29.09±2.52*1)2)
t		1.346	6.263	3.593	4.071
P		0.183	<0.001	0.001	<0.001

注：*与麻醉前比较，*P*<0.05；1)与术前比较，*P*<0.05；2)与术后24h比较，*P*<0.05。

表3 两组患者麻醉前后应激反应相关指标差异性观察

组别	例数	Cor(nmol/L)		NE(mmol/L)		BG(nmol/L)		Ang-Ⅱ(pg/mL)	
		麻醉前	术后10h	麻醉前	术后10h	麻醉前	术后10h	麻醉前	术后10h
对照组	34	327.72±26.09	419.52±35.11*	1.28±0.52	1.85±0.35*	5.61±1.08	6.91±1.31*	36.85±3.78	56.02±5.21*
观察组	34	325.95±27.72	386.92±32.85*	1.24±0.48	1.53±0.18*	5.55±1.14	6.13±1.11*	35.75±3.81	48.63±4.52*
t		0.271	3.953	0.330	4.741	0.223	2.649	1.195	6.247
P		0.787	<0.001	0.743	<0.001	0.824	0.010	0.236	<0.001

注：*与麻醉前比较，*P*<0.05。

表4 两组患者麻醉满意度差异性观察

组别	例数	满意	一般满意	不满意	满意度
对照组	34	15(44.12)	12(35.29)	7(20.59)	27(79.41)
观察组	34	19(55.88)	14(41.18)	1(2.94)	33(97.06)
χ^2					5.100
P					0.024

表5 两组患者术后并发症发生率差异性观察

组别	例数	恶心呕吐	肺部感染	低氧血症	头晕	总发生率
对照组	34	4(11.76)	2(5.88)	1(2.94)	5(14.71)	12(35.29)
观察组	34	1(11.76)	1(2.94)	0	1(2.94)	3(8.82)
χ^2		1.943	0.349	1.015	2.925	6.928
P		0.163	0.555	0.314	0.087	0.008

3 讨 论

骨折类型最为常见得到为下肢骨折，尤其好发于老年人群，近年来骨折发生率呈现上升趋势[8-9]。因老年人群股骨颈细，耐受弯曲力矩差，股骨颈骨折发生风险较高[10]。又因股骨颈血液循环差，血供不足，可延长骨折愈合时间[11]。且大部分老年人群患有高血压、糖尿病等基础疾病较多，也可影响骨折愈合时间[12]。临床上对于老年股骨颈骨折患者，常采用防旋股骨近端髓内钉内固定治疗，此类手术属于微创手术，中心性髓内固定骨折更加稳定，可促进患者肢体功能恢复，还可降低并发症的发生率[13-14]。

多项研究均报道[15-16]，老年股骨颈骨折因需要长时间卧床，一定程度上增加护理难度，需要及时进行手术治疗，但是由于老年患者机体功能较弱，因此积极选取合适手术、麻醉方式具有重要意义。老年股骨颈骨折患者机体功能衰退，且多数合并基础疾病，因此还需要考虑手术的安全性[17]。全麻药物剂量大，对机体呼吸系统影响大，对生命体征影响也大，临床常选用椎管内麻醉，如硬膜外麻醉或腰硬联合麻醉。近年来，腰硬联合麻醉逐渐替代常规单一麻醉，麻醉时，通过硬膜外增加麻醉药物，可以维持局部麻醉效果[18-19]。腰硬联合麻醉结合两者优势，有效提高麻醉作用。但也有研究表示[20]，腰硬联合麻醉对于操作人员技术水平高。但是大部分研究学者认为腰硬联合麻醉效果理想，可减少麻醉药物剂量，降低药物中毒风险，尤其为手术提供充足的时间[21-22]。

本次研究结果显示，与对照组比较，观察组麻醉起效时间、阻滞完善时间均更短，痛觉阻滞时间更长，且麻醉干预后，两组BIS评分均下降，但观察组更高。且观察组麻醉满意度高于对照组。表明腰硬联合麻醉效果理想。腰硬联合麻醉通过蛛网膜下腔注入药物，阻滞脊神经根，可避免呼吸抑制，减少对血流动力学的影响，腰硬联合麻醉结合两者优势，可避免阻滞不全的现象，进而提高麻醉效果。本研究结果还发现，观察组术前、术后24h、48h MMSE评分均更高，说明腰硬联合麻醉可有效促进患者认知功能的恢复，效果较单一麻醉理想。且观察组患者应激反应指标如Cor、NE、BG、Ang-Ⅱ水平均低于对照组患者，说明腰硬联合麻醉对机体刺激性小，可避免阻滞不全的情况。

综上所述，腰硬联合麻醉用于老年股骨颈骨折防旋股骨近端髓内钉内固定患者，可改善麻醉效果，降低术后认知功能异常及应激反应异常发生率，还可减少并发症发生率，值得在临床上广泛应用。

参考文献

[1]Lv H,Chen W,Yao M,et al.Collecting data on fractures:a review of epidemiological studies on orthopaedic traumatology and the Chinese experience in large volume databases[J].Int Orthop,2022,46(5):945-951.

[2]Doany M,Garcia A,Komatsu D,et al.Avulsion Fractures of the Calcaneal Tuberosity:A Single-Center Review of Outcomes and Complications[J].J Am Acad Orthop Surg Glob Res Rev,2021,5(12).

[3]Toscano MJ,Dunn IC,Christensen JP,et al.Explanations for keel bone fractures in laying hens:are there explanations in addition to elevated egg production[J]? Poult Sci,2020,99(9):4183-4194.

[4]Nyffeler RW,Altioklar B,Bissig P Causes of acromion and scapular spine fractures following reverse shoulder arthroplasty:a retrospective analysis and literature review[J].Int Orthop,2020,44(12):2673-2681.

[5]Kremer L,Frank J,Lustenberger T,et al.Epidemiology and treatment of phalangeal fractures:conservative treatment is the predominant therapeutic concept[J].Eur J Trauma Emerg Surg,2022,48(1):567-571.

[6]Oliveira CR,Bernardo WM,Nunes VM. Benefit of general anesthesia monitored by bispectral index compared with monitoring guided only by clinical parameters. Systematic review and meta-analysis[J].Braz J Anesthesiol,2017,67(1):72-84.

[7]Jia X,Wang Z,Huang F,et al.A comparison of the Mini-Mental State Examination (MMSE) with the Montreal Cognitive Assessment(MoCA)for mild cognitive impairment screening in Chinese middle-aged and older population:a cross-sectional study[J].BMC Psychiatry,2021,21(1):485.

[8]Pflüger P,Zyskowski M,Völk C,et al.Funktionelles Outcome nach konservativer im Vergleich zu operativer Therapie von 111 Mittelfußfrakturen [Functional outcome of 111 metatarsal fractures following conservative in comparison to operative treatment][J].Unfallchirurg,2022,125(4):288-294.

[9]Harbrecht A,Hackl M,Leschinger T,et al.Metacarpal fractures - A method to simulate life-like fractures in human cadaveric specimens for surgical education[J].Hand Surg Rehabil,2022,41(2):214-219.

[10]Okike K,Udogwu UN,Isaac M,et al.Not All Garden-I and II Femoral Neck Fractures in the Elderly Should Be Fixed:Effect of Posterior Tilt on Rates of Subsequent Arthroplasty[J].J Bone Joint Surg Am,2019,101(20):1852-1859.

[11]Vazquez O,Gamulin A,Hannouche D,et al.Osteosynthesis of non-displaced femoral neck fractures in the elderly population using the femoral neck system (FNS):short-term clinical and radiological outcomes[J].J Orthop Surg Res,2021,16(1):477.

[12]Biz C,Berizzi A,Crimì A,et al.Management and treatment of femoral neck stress fractures in recreational runners:a report of four cases and review of the literature[J].Acta Biomed,2017,88(4S):96-106.

[13]Yu W,Han X,Chen W,et al.Conversion from a failed proximal femoral nail anti-rotation to a cemented or uncemented total hip arthroplasty device: a retrospective review of 198 hips with previous intertrochanteric femur fractures[J].BMC Musculoskelet Disord,2020,21(1):791.

[14]Chen XK,Xiong J,Liu YJ,et al.A rare complication of pelvic perforation by an excessive medial slide of the helical blade after treatment of an intertrochanteric fracture with proximal femoral nail anti-rotation:A case report and literature review[J].Chin J Traumatol,2022,25(2):118-121.

[15]Wang X,Zhang Y,Du S,et al.[Reasons of the guide pin eccentricity of helical blade during proximal femoral nail anti-rotation internal fixation for femoral intertrochanteric fractures][J].Zhongguo Xiu Fu Chong Jian Wai Ke Za Zhi,2021,35(8):950-955.

[16]Song QC,Dang SJ,Zhao Y,et al.Comparison of clinical outcomes with proximal femoral nail anti-rotation versus bipolar hemiarthroplasty for the treatment of elderly unstable comminuted intertrochanteric fractures[J].BMC Musculoskelet Disord,2022,23(1):628.

[17]Li M,Chen J,Ma Y,et al.[Comparison of proximal femoral nail anti-rotation operation in traction bed supine position and non-traction bed lateral position in treatment of intertrochanteric fracture of femur][J]. Zhongguo Xiu Fu Chong Jian Wai Ke Za Zhi,2020,34(1):32-36.

[18]Wang X,Wei W,Qi Y,et al.Clinical Effects of Integrated Traditional Chinese and Western Medicine in Treating Severe Preeclampsia and Its Influence on Maternal and Infant Outcomes after Cesarean Section under Combined Lumbar and Epidural Anesthesia[J].Evid Based Complement Alternat Med,2021,2021:6366914.

[19]Thepsoparn M,Sereeyotin J,Pannangpetch P.Effects of Combined Lower Thoracic Epidural/General Anesthesia on Pain Control in Patients Undergoing Elective Lumbar Spine Surgery:A Randomized Controlled Trial[J].Spine (Phila Pa 1976),2018,43(20):1381-1385.

[20]Herbert KA,Gatta LA,Fuller M,et al.Anesthetic management of placenta accreta spectrum at an academic center and a comparison of the combined spinal epidural with the double catheter technique:A retrospective study[J].J Clin Anesth,2022,77:110573.

[21]Manchikanti L,Pampati V,Benyamin RM,et al.Analysis of efficacy differences between caudal and lumbar interlaminar epidural injections in chronic lumbar axial discogenic pain: local anesthetic alone vs. local combined with steroids[J].Int J Med Sci,2015,12(3):214-222.

[22]Kang SY,Kashlan ON,Singh R,et al.Advantages of the Combination of Conscious Sedation Epidural Anesthesia Under Fluoroscopy Guidance in Lumbar Spine Surgery[J].J Pain Res,2020,13:211-219.

(收稿日期：2023-04-25)
(校对编辑：孙晓晴)