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双侧股神经阻滞用于双膝关节置换术患者的麻醉效果 和对血清炎症因子水平的影响*

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摘要 目的:研究双侧股神经阻滞用于双膝关节置换术患者麻醉效果和对患者血清炎症因子水平的影响。**方法:**选择 2015 年 10 月~2018 年 10 月在我院进行双膝关节置换术的 110 例患者,按照其入院顺序经随机数字表法分为两组,每组 55 例。对照组采用全身麻醉,研究组采用双侧股神经阻滞联合全身麻醉。比较两组的麻醉情况,治疗前后血清炎症因子白介素 6(IL-6)、C 反应蛋白(CRP)、舒张压(DBP)、收缩压(SBP)、心率(HR)水平的变化。**结果:**两组麻醉时间比较差异无统计学意义($P>0.05$);研究组拔管、恢复室停留和苏醒时间均显著短于对照组($P<0.05$)。两组术后 24 h、48 h 血清炎症因子 IL-6、CRP 水平均高于术前,但研究组以上指标均显著低于对照组($P<0.05$);两组术中 DBP、SBP、HR 水平均较术前显著降低($P<0.05$),但研究组 DBP、SBP、HR 水平均显著高于对照组($P<0.05$),两组术后 DBP、SBP、HR 水平比较差异均无统计学意义($P<0.05$)。**结论:**与单纯采用全身麻醉相比,双侧股神经阻滞可有效改善双膝关节置换术患者的麻醉效果,并降低其血清炎症因子和稳定其血流动力学。

关键词:双侧股神经阻滞;双膝关节置换术;麻醉效果;炎症因子

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Anesthetic Effect of Bilateral Femoral Nerve Block on the Patients Undergoing Double Knee Arthroplasty and its Effect on the Serum Inflammatory Factor Levels*

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ABSTRACT Objective: To investigate the anesthetic effect of bilateral femoral nerve block on the patients undergoing double knee arthroplasty and its effect on the serum inflammatory factor levels. **Methods:** 110 patients who underwent double knee arthroplasty in our hospital from October 2015 to October 2018 were randomly divided into two groups according to their admission order with 55 patients in each group. General anesthesia was used in the control group, and bilateral femoral nerve block combined with general anesthesia was used in the observation group. The changes of serum interleukin-6 (IL-6), c-reactive protein (CRP), diastolic blood pressure (DBP), systolic blood pressure (SBP) and heart rate (HR) levels were compared between the two groups before and after treatment. **Results:** There was no significant difference in the anesthesia time between the two groups ($P>0.05$). The extubation time, recovery room retention time and recovery time of observation group were significantly shorter than those of the control group ($P<0.05$). The serum IL-6 and CRP levels in both groups were higher at 24 h and 48 h after surgery than those before surgery, but the above indexes in the study group were significantly lower than those in the control group ($P<0.05$). There was no difference in the DBP, SBP and HR levels between the two groups ($P>0.05$). The intraoperative DBP, SBP and HR levels of both groups were significantly lower than those of the control group ($P<0.05$), but the DBP, SBP and HR levels of study group were significantly higher than those of the control group ($P<0.05$), and the postoperative DBP, SBP and HR levels of both groups showed no statistically significant difference ($P<0.05$). **Conclusion:** Compared with general anesthesia alone, bilateral femoral nerve block can effectively improve the anesthetic effect of patients with double knee arthroplasty, and stabilize its serum inflammatory factors and hemodynamics.

Key words: Bilateral femoral nerve block; Double knee arthroplasty; Anesthetic effect; Inflammatory factor

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前言

随着人口老龄化程度的加剧,膝关节退行性疾病的发病率也呈逐年上升趋势。双膝关节置换术作为治疗膝关节疾病的主要方式,可有效缓解膝关节病变所引发的功能障碍和疼痛,疗效确切^[1-3]。尽管双膝关节置换术的麻醉方式众多,但不同麻醉方式对患者造成的影响也不同,且老年患者多伴有复杂的慢性疾病,对麻药的耐受性较差,手术的刺激很容易引发患者发生脑血管意外,麻醉风险较高^[4,5],故选择合适的麻醉方式是对双膝关节置换术患者安全的重要保障。

有研究显示神经阻滞对患者的麻醉效果较好,具有对循环呼吸影响小、手术并发症低等优点,且股神经穿刺的位置相对较浅,患者只需在穿刺过程中保持仰卧位即可^[6,7],加之神经刺激仪对神经定位的准确性较高,保证了麻醉的成功率^[8,9]。本研究主要探讨了双侧股神经阻滞用于双膝关节置换术患者麻醉效果和对患者血清炎症因子水平的影响,旨在为膝关节退行性疾病的临床治疗提供更多的参考依据。

1 材料与方法

1.1 研究对象

选择 2015 年 10 月~2018 年 10 月在我院进行双膝关节置换术的 110 例患者,均符合相关的诊断标准,对外周神经阻滞无禁忌,排除合并有严重心、肝、肺、肾疾病者、意识障碍或者认知障碍者。本研究已取得经医院伦理委员会的同意,患者签署同意书支持本研究。110 例患者按照其入院顺序随机数字表法分为两组,每组 55 例。研究组中,男 23 例,女 22 例,平均年龄 (62.65 ± 2.42) 岁,平均体质量 (54.47 ± 2.53) kg,美国麻醉医师协会分级(ASA):I 级 28 例,II 级 27 例;对照组中,男 25 例,女 25 例,平均年龄 (63.15 ± 2.35) 岁,平均体质量为 (54.11 ± 2.58) kg,ASA 分级:I 级 30 例,II 级 25 例。两组患者的基础资料对比差异无(统计学意义 $P > 0.05$),具有可比性。

1.2 研究方法

对照组:患者在全身麻醉后进行气管插管,在机械通气后行静吸复合维持麻醉,手术缝合时停止用药,手术结束后不使

用肌松拮抗剂和催醒剂。

(1)麻醉诱导操作如下所示,咪达唑仑:0.02-0.03 mg/kg,芬太尼:3-5 μ g/kg,丙泊酚:1.0-1.5 mg/kg,罗库溴铵:0.4-0.6 mg/kg;(2)麻醉维持:采用 1%七氟醚不断吸入,3-4 mg/(kg·h)丙泊酚,0.15-0.2 μ g/(kg·min)瑞芬太尼进行麻醉维持;(3)术中应用:芬太尼 1.0-1.5 μ g/kg,不再追加肌松剂,需根据术中情况对麻醉深度进行调整,调控输液速度。

研究组:采用双侧股神经阻滞联合全身麻醉,操作步骤如下:在麻醉诱导前,通过神经刺激器引导,进行双侧股神经阻滞,在双侧注入 20 mL 0.375%罗哌卡因(AstraZeneca AB,进口药品的合格证号 H20100106),待神经阻滞麻醉效果满意后,常规诱导行气管内插管全身麻醉。双侧股神经阻滞操作步骤如下所示:首先定位股动脉,选择患者腹股沟韧带下 2 cm 处定位,在与皮肤形成 30° 股动脉外侧 1 cm 处,采用 50 mm 长的电刺激针进针,初始刺激电流为 1 mA,当患者出现膝盖跳动或股四头肌明显收缩时,将电流降至 0.3 mA,并注入 3 mL 罗哌卡因,5 min 后无局部麻药中毒反应后,单侧注入 17ml 罗哌卡因,并观察是否出现血液回流的现象。

1.3 观察指标

① 记录两组麻醉、拔管、恢复室停留和苏醒的时间;② 采用双抗夹心酶联免疫吸附法检测两组术前、术后 24 h、48 h 的血清 IL-6、CRP 水平;③ 检测两组术前、术中、术后 DBP、SBP、HR 水平。

1.4 统计学分析

所有数据分析采用 SPSS21.0 软件,两组间差异分析比较采用 t 检验,计数资料采用 χ^2 检验,以 $P < 0.05$ 为差异具有统计学意义。

2 结果

2.1 两组麻醉情况的比较

如表 1 所示,两组麻醉时间比较差异无统计学意义 ($P > 0.05$);但研究组患者的拔管时间、恢复室停留时间和苏醒时间均明显短于对照组($P < 0.05$)。

表 1 两组麻醉情况的对比($\bar{x} \pm s$, min)

Table 1 Comparison of the anesthesia between the two groups($\bar{x} \pm s$, min)

Groups	n	Anesthesia time	Extubation time	Time of stay in the recovery room	Recovery time
Observation group	55	256.3 $\pm$ 38.4	14.0 $\pm$ 3.7*	51.3 $\pm$ 12.1*	11.2 $\pm$ 3.5*
Control group	55	255.8 $\pm$ 40.3	22.3 $\pm$ 7.1	67.1 $\pm$ 13.5	18.8 $\pm$ 5.0

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

2.2 两组术前和术后血清 IL-6、CRP 水平的对比

如表 2 所示,两组术前血清 IL-6、CRP 水平对比差异无统计学意义($P > 0.05$);术后 24 h、48 h,两组血清 IL-6、CRP 水平均高于术前($P < 0.05$);但研究组术后 24 h、48 h 血清 IL-6、CRP 水平均显著低于对照组($P < 0.05$)。

2.3 两组术前、术中和术后血流动力学指标对比

如表 3 所示,两组术前、术后 DBP、SBP、HR 水平比较差异

均无统计学意义($P > 0.05$);两组术中 DBP、SBP、HR 水平均较术前显著降低($P < 0.05$),但研究组的 DBP、SBP、HR 水平均明显高于对照组($P < 0.05$)。

3 讨论

双膝关节置换术是骨科常见的手术,治疗骨关节炎、膝关节退行性病变的疗效显著。手术过程中所采用的麻醉方式不

表 2 两组术前和术后血清 IL-6、CRP 水平的对比($\bar{x}\pm s$)Table 2 Comparison of the levels of serum IL-6 and CRP levels between the two groups before and after operation($\bar{x}\pm s$)

Groups	n		IL-6 (ng/L)	CRP (mg/L)
Control group	55	Preoperation	3.0± 0.8	0.62± 0.13
		At 24h postoperation	59.2± 11.2* [#]	2.85± 0.93* [#]
		At 48h postoperation	38.2± 7.9* [#]	1.33± 0.40* [#]
Observation group	55	Preoperation	3.1± 0.9	0.58± 0.15
		At 24h postoperation	40.6± 8.9 [#]	4.23± 1.01 [#]
		At 48h postoperation	26.4± 6.5 [#]	2.96± 0.78 [#]

Note: compared with the control group, * $P<0.05$; compared with Preoperation, [#] $P<0.05$.

表 3 两组血流动力学指标水平对比($\bar{x}\pm s$)Table 3 Comparison of the hemodynamic index levels between the two groups($\bar{x}\pm s$)

Groups	n		DBP (mm Hg)	SBP (mm Hg)	HR (second/min)
Observation group	41	Preoperation	83.5± 12.2	163.5± 21.3	91.8± 13.5
		Intraoperation	78.8± 10.6* [#]	149.7± 15.9* [#]	85.5± 11.0* [#]
		Postoperation	84.1± 13.2	160.5± 18.2	92.0± 12.9
Control group	40	Preoperation	84.0± 10.5	165.2± 20.8	92.3± 13.1
		Intraoperation	70.1± 10.9 [#]	136.1± 13.6 [#]	79.6± 10.3 [#]
		Postoperation	83.6± 12.5	162.9± 16.8	91.8± 13.0

Note: compared with the control group, * $P<0.05$; compared with Preoperative, [#] $P<0.05$.

同会导致人工关节置换后生物相容性影响也不同。麻醉并发症的发生通常因麻醉方式不当产生,可能会引起周围组织损伤加重,导致关节松动或引起关节活动度不足。老年患者对麻醉药物的代谢情况略差,麻醉方式的不合适会导致患者产生认知功能的障碍,以致其生活质量下降、康复延迟、并发症的发生率升高。研究表明采用外周神经阻滞术镇痛效果好、出现的并发症少^[10-12]。随着超声技术的不断发展,神经刺激仪在双膝关节置换术老年患者的麻醉中越来越重要,已广泛应用于临床区域神经麻醉和术后自控镇痛过程中^[13-15]。目前,下肢外周神经阻滞最常用的是股神经阻滞技术,其对麻醉和术后的镇痛影响较大^[16,17]。

本研究结果显示双侧股神经阻滞联合全身麻醉的患者拔管时间、恢复室停留时间和苏醒时间研究组均明显低于采用单纯全身麻醉的患者,表明双侧股神经阻滞联合全身麻醉对双膝关节置换术患者的麻醉效果明显优于单一全身麻醉方式,可稳定维持患者的血流动力学水平。原因可能是由于老年患者术中会增加肾损伤、心脑血管等事件的危险性,并且老年人膜外穿刺较难,操作易引发问题^[18,19],所以采用全麻麻醉是当前临床治疗上双膝关节置换术患者首选的麻醉方式。但在麻醉过程中,全身麻醉用药会损害机体的中枢胆碱能系统,术后药物残留会抑制中枢神经系统,对神经突触的传递造成影响,减慢患者术后意识的恢复^[20,21],故采用神经阻滞辅助全身麻醉可使患者保持平稳状态,促进麻醉后意识的恢复,且对机体的损伤较小。

术后疼痛感受的产生机制主要是由于手术创伤可使机体的炎症反应的激活,炎症介质的合成、释放被加快,加之术后的持续疼痛又会放大炎症反应和增加炎症介质的合成^[22-24]。有研究认为 CRP 作为一种急性相反应蛋白,可直接通过其表达情

况反映机体发生炎症反应的程度^[25-27]。IL-6 作为体内重要的多功能细胞因子不仅可介导炎症反应,对组织造成损伤,还可引起或加重患者术后的疼痛^[28-30]。本研究结果显示双侧股神经阻滞辅助全身麻醉可更显著降低双膝关节置换术患者的血清炎症因子水平,提示其效果可能与其抗炎作用有关。

综上所述,与单纯采用全身麻醉相比,双侧股神经阻滞可有效改善双膝关节置换术患者的麻醉效果,并减轻其炎症反应和稳定血流动力学水平,临床应用价值较高。

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