doi: 10.13241/j.cnki.pmb.2017.10.036

七氟醚联合骶管阻滞麻醉对小儿疝气手术的麻醉效果分析

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摘要 目的:观察七氟醚联合骶管阻滞麻醉对小儿疝气手术的麻醉效果。**方法:**选取 80 例行腹股沟疝气手术患儿,按随机数字表法分为两组,对照组(39 例) 静脉注射氯胺酮,观察组(41 例) 先吸入 8 %七氟醚,然后进行骶管阻滞麻醉,通过观察并记录两组患儿生命体征、麻醉诱导时间、苏醒时间、手术麻醉时间、苏醒期躁动评分(Pediatric anesthesia emergence delirium,PAED)和麻醉诱导期合作量表(Induction Compliance Checklist,ICC)及麻醉期间不良反应情况,评价七氟醚联合骶管阻滞麻醉对小儿疝气手术的麻醉效果。**结果:**两组切皮后 T1、T2 时心率(HR)、平均动脉压(MAP)水平均高于 T0 时的值(P<0.05),两组切皮后 T1、T2 时组间 HR、MAP 水平相比,无统计学差异(P>0.05)。两组切皮后 T3 时 HR、MAP 水平基本恢复到 T0 时的水平。两组切皮前后 4 个时间点的血氧饱和度(SpO_2)相比,无统计学差异(P>0.05)。观察组患儿麻醉诱导时间,苏醒时间均明显短于对照组患儿(P<0.05),两组术中麻醉持续时间相比,无统计学差异(P>0.05),均能达到期望麻醉时间,观察组患儿 PAED 评分和 ICC 评分均低于对照组患儿(P<0.05),不良反应组间比较无统计学差异(P>0.05)。**结论:**七氟醚联合骶管阻滞麻醉对小儿疝气手术具有良好的麻醉效果,麻醉诱导快,苏醒快,小儿配合度高,术后躁动少,值得临床推广使用。

关键词:七氟醚;骶管阻滞麻醉;麻醉诱导时间;苏醒期躁动;不良反应

中图分类号:R726; R614 **文献标识码:**A **文章编号:**1673-6273(2017)10-1934-04

Anesthetic Effect of Sevoflurance Combined with Sacral Block Anesthesia in Treatment of Pediatric Hernia Surgery

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ABSTRACT Objective: To discuss the anesthetic effect of sevoflurance combined with sacral block anesthesia in treatment of pediatric hernia surgery. **Methods:** 80 children with inguinal hernia surgery were selected, they were divided into two groups randomly. The control group (39 cases) was given ketamine by intravenous injection. The observation group(41 cases) was inhaled 8 % sevoflurane, then given sacral block anesthesia. The anesthetic effect of sevoflurance combined with sacral block anesthesia in treatment of pediatric hernia surgery was evaluated by vital sign, induction time, recovery time, anesthesia time, Pediatric anesthesia emergence delirium (PAED). Induction Compliance Checklist (ICC) score and adverse reactions during anesthesia. **Results:** At T1 and T2, the HR, MAP of two groups were higher than that of the T0(P<0.05). But there were no statistical significance on HR and MAP at T1 and T2(P>0.05). At T3, the level of HR, MAP was close to the value of T1. At 4 point of time, there were no statistical significance on SpO_2 between two groups (P>0.05). The induction time and recovery time of observation group was shorter than that of the control group (P<0.05). There were no statistical significance on anesthesia duration between two groups (P>0.05). The expected anesthesia time was achieved in two groups. The PAED and ICC scores of observation group were lower than that of the control group (P<0.05). There were no statistical significance on the incidence of adverse reactions between two groups (P>0.05). **Conclusions:** Sevoflurane anesthesia combined with sacral block anesthesia have good anesthesia effect on pediatric hernia surgery with short anesthesia induction, and the children can recover quickly and cooperate well with less postoperative agitation, worthy of clinical use.

Key words: Sevoflurane; Sacral block anesthesia; Anesthesia induction time; Restlessness in recovery period; Adverse reaction

Chinese Library Classification(CLC): R726; R614 Document code: A

Article ID: 1673-6273(2017)10-1934-04

前言

腹股沟疝是小儿外科常见的疾病,多采用小儿疝囊高位结扎术进行治疗。氯胺酮静脉麻醉为小儿常用的麻醉方法,但氯胺酮可导致患儿心率增快、苏醒延迟、术后躁动,再加上小儿对针刺性麻醉方式抗拒性强,因此临床需选择更安全有效、患儿顺应性高的麻醉方式[1]。七氟醚为吸入性麻醉药物,麻醉效果好,苏醒快。小儿生理特点与成人不同,对麻醉药物耐受性更强,麻醉处理存在一定难度[2]。而采用骶管阻滞麻醉可较好地解决这一问题。既往研究中,麻醉药物及麻醉方式对患儿生命体征、麻醉效果的影响多有报道[3,4],然而小儿麻醉尤其需要注意

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(收稿日期:2016-09-21 接受日期:2016-10-20)

安全性问题，为此，本文回顾性分析 2014 年 3 月 -2016 年 3 月选取的 80 例需行小儿疝气手术的患儿，分别用七氟醚联合骶管阻滞麻醉和静脉注射氯胺酮进行麻醉，并对麻醉效果及安全性进行比较，对苏醒期躁动、小儿麻醉诱导时的行为表现也进行了评价。现报道如下。

1 资料与方法

1.1 病例资料

选取腹股沟疝气手术患儿 80 例，年限：2014 年 3 月 -2016 年 3 月，纳入标准：① 术前诊断为单侧腹股沟疝；② 美国麻醉医师协会(ASA)分级为Ⅰ-Ⅱ级；③ 患儿年龄 2~6 岁；④ 经本院伦理委员会同意，术前患儿家属均签署书面知情同意书。排除标准：合并肝肾功能异常、心脑疾病的患儿。按随机数字表法将患儿分为两组，对照组(39 例)患儿术前静脉注射氯胺酮，其中，男 25 例，女 14 例，平均年龄(5.9± 1.5) 岁；观察组(41 例) 术前吸入 8 %的七氟烷，然后行骶管阻滞，其中，男 27 例，女 14 例，平均年龄(5.6± 1.7)岁，两组患儿病例资料具有可比性(P>0.05)。

1.2 麻醉与手术方法

所有患儿麻醉前禁食 6 h，禁饮 4 h，入室后常规持续监测血压、心率、血氧饱和度。

观察组：面罩持续吸入 8 %七氟醚 1-2 min，入睡后建立静脉通道，观察患儿睫毛反射情况，待反射消失后，置入喉罩并固定，七氟醚调整 2 %-3 %，氧流量 1 L/min，1 人辅助让患儿取左侧卧位，双腿屈曲，颈部不曲，定位骶管并标记，常规消毒铺巾，进行骶管穿刺，骶管穿刺成功后，注入 1 %利多卡因 0.5 mL/kg+0.3 %罗哌卡因 0.5 mL/kg 的混合液，注射完毕后患儿取平卧位，保持呼吸顺畅。采用传统疝囊高位结扎术进行治疗，下腹部皮肤正中横纹处取手术切口，逐层切开皮肤，显露精索，游离疝囊至疝颈部，8 字缝合后高位结扎，逐层缝合手术切口。术中麻醉维持剂量：2 %-3 %七氟醚，氧流量 1 L/min，根据麻醉程度调整七氟醚浓度。手术结束前 10 min 停止吸入七氟醚。

对照组：患儿入室后，从静脉给予阿托品 0.01 mg/kg，氯胺酮 2 mg/kg，面罩吸氧 2 L/min，2 min 后行手术，也采用传统疝囊高位结扎术进行治疗，术中按 1 mg/kg 间断追加，术前 10 min 停止静脉注射氯胺酮。

1.3 观察指标

① 生命体征监测：观察并记录两组患儿心率(HR)，平均动脉压(MAP)，血氧饱和度(SpO_2)，分别在切皮前 5 min(T0)、切皮后 5 min(T1)、切皮后 10 min(T2)及切皮后 15 min(T3)四个时间点记录；② 观察并记录两组患儿麻醉诱导时间、苏醒时间和手术麻醉时间；③ 苏醒期躁动评分(Pediatric anesthesia emergence delirium，PAED)和麻醉诱导期合作量表（Induction Compliance Checklist，ICC）：PAED 可以用于评估小儿麻醉术后躁动情况，量表包括 5 项，满分 20 分，>16 分记为苏醒期躁动。ICC 用于评定患儿麻醉诱导时的行为表现，满分 10 分，得分越低说明小儿合作程度越好；④ 不良反应：观察并记录麻醉期间两组不良反应情况。

1.4 统计方法

采用 SPSS 17.0 统计软件分析，数据以 $\bar{x}\pm s$ 表示，组内术前与术后相比采用配对 t 检验，组间比较采用两独立样本 t 检验，计数资料采用卡方检验，以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 HR, MAP, SpO_2 比较

两组切皮后 T1、T2 时 HR、MAP 水平均高于 T0 时的值(P<0.05)，两组切皮后 T1、T2 时组间 HR、MAP 水平相比，无统计学差异(P>0.05)。两组切皮后 T3 时 HR、MAP 水平基本恢复到 T0 时的水平。两组切皮前后 4 个时间点的 SpO_2 相比，无统计学差异(P>0.05)，见表 1。

表 1 两组 HR，MAP，SpO_2 指标对比 ($\bar{x}\pm s$)

Table 1 Comparison of HR, MAP, SpO_2 between two groups ($\bar{x}\pm s$)

Groups	Indexes	T_0	T_1	T_2	T_3
Observation group	HR (time/min)	106.7± 5.9	127.1± 6.9*	120.5± 5.7*	110.8± 3.9
N=41	MAP (mm Hg)	56.5± 3.7	62.8± 4.7*	64.1± 6.1*	57.8± 7.3
	SpO_2 (%)	97.6± 1.4	96.5± 1.3	95.8± 1.8	97.1± 1.1
Control group	HR (time/min)	107.2± 5.5	126.4± 6.6*	119.4± 4.7*	109.3± 3.9
N=39	MAP (mm Hg)	56.2± 3.4	61.2± 3.6*	62.4± 4.1*	56.2± 4.2
	SpO_2 (%)	97.4± 2.1	97.6± 1.7	97.1± 1.5	96.7± 1.4

Note: compared with T0, *P<0.05.

2.2 麻醉诱导及苏醒时间比较

观察组患儿麻醉诱导时间，苏醒时间均明显短于对照组患儿(P<0.05)，两组术中麻醉持续时间相比，无统计学差异(P>0.05)，均能达到期望麻醉时间，见表 2。

表 2 两组麻醉效果比较 ($\bar{x}\pm s$)

Table 2 Comparison of anesthetic effect between two groups ($\bar{x}\pm s$)

	n	Anesthesia induction time(s)	Recovery time (min)	Anesthesia duration time (min)
Observation group	41	48.6± 10.2*	7.9± 2.5*	33.8± 3.4
Control group	39	86.2± 9.7	18.7± 5.2	31.6± 3.5

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

2.3 PAED 和 ICC 评分比较

观察组患儿 PAED 评分和 ICC 评分均低于对照组患儿(P<0.05),见表 3。

表 3 两组 PAED 和 ICC 评分对比 ($\bar{x}\pm$ s)

Table 3 Comparison of PAED and ICC between two groups ($\bar{x}\pm$ s)

Groups	n	PAED	ICC
Observation group	41	15.2± 4.7*	1.71± 0.52*
Control group	39	18.1± 5.6	2.89± 0.74

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

2.4 不良反应比较

麻醉期间,观察组患儿 1 例体温升高,1 例恶心呕吐,不良反应率 4.9 %,对照组患儿 1 例恶心呕吐,不良反应率 2.6 %,组间比较无统计学差异(P>0.05)。

3 讨论

腹股沟疝是小儿常见的外科疾病,多发生在 3 个月以上的小儿,该疾病几乎不能自愈,而采用手术治疗的方式可以取得较为满意的治疗结果[5,6]。其中,小儿疝囊高位结扎术是常用手术方式之一,用于治疗双侧斜疝或隐性疝,可降低疝复发和腹腔内粘连[7,8]。该种手术术前麻醉多采用局部麻醉或半身麻醉,较少用全身麻醉。2-6 岁的小儿由于其特殊的生理结构,麻醉既要考虑麻醉有效性又要考虑安全性[9,10]。

手术要求麻醉诱导时间短,麻醉深度可调控,麻醉苏醒期短。七氟醚是临床使用的吸入性麻醉药物,对小儿呼吸道刺激小,无损伤,再加上七氟醚本身具有一定芳香气味,小儿普遍易于接受[11-13]。七氟醚血气分布系数仅为 0.63,麻醉药物能迅速在肺泡进行扩散,麻醉诱导时间短,麻醉深度可调控。七氟醚本身理化性质稳定,用药安全性高,即便小儿吸入高浓度七氟醚,也没有出现屏气、咳嗽、喉痉挛等不良反应[14-16]。除了吸入麻醉方式,骶管阻滞麻醉也是小儿外科手术常用的麻醉方式,麻醉效果可靠且易于操作,成功率高。2-6 岁小儿骶骨没有骨性融合,小儿骶裂孔大,容易穿刺,该种麻醉方法的镇痛和肌松程度均达到疝气手术需要的效果[17,18]。

刘瑶等[19]研究发现七氟醚复合骶管阻滞进行麻醉对小儿生命体征影响较小。本研究中两组切皮后 T1、T2 时 HR、MAP 水平均高于 T0 时的值 (P<0.05), 两组切皮后 T1、T2 时组间 HR、MAP 水平相比,无统计学差异(P>0.05)。两组切皮后 T3 时 HR、MAP 水平基本恢复到 T0 时的水平。两组切皮后四个时间点的 SpO_2 相比,无统计学差异(P>0.05)。七氟醚麻醉对交感神经的兴奋作用较弱,故七氟醚联合骶管阻滞麻醉对小儿生命体征影响较小。孙红梅等[20]研究发现采用骶管阻滞复合七氟醚麻醉 25 例患儿,平均苏醒时间为(11.0± 4.0) min。观察组患儿麻醉诱导时间(48.6± 10.2) min,苏醒时间(7.9± 2.5) min,均短于对照组患儿(P<0.05),也比孙红梅等报道的苏醒时间短。两组术中麻醉持续时间相比,无统计学差异(P>0.05),均能达到期望麻醉时间,说明七氟醚联合骶管阻滞麻醉诱导快,苏醒快,麻醉效果与静脉注射氯胺酮相当。观察组患儿 PAED 评分和 ICC 评分均低于对照组患儿(P<0.05),静脉注射氯胺酮,需要扎针,故小儿配合度较低。此外,静脉注射氯胺酮,小儿苏醒期间躁动频率增加。采用七氟醚复合骶管阻滞,不仅小儿配合度有所提高,苏醒期躁动频率也较低,与七氟醚药物性质、骶管阻滞麻醉的有效性相关。麻醉期间,观察组患儿 1 例体温升高,但术后 12 h 内小儿体温自行恢复正常;共出现 1 例恶心、呕吐,给予止吐药缓解症状。

综上所述,七氟醚联合骶管阻滞麻醉对小儿疝气手术具有良好的麻醉效果,麻醉诱导快,苏醒快,小儿配合度高,术后躁动少,值得临床推广使用。

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