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腹股沟韧带上髂筋膜间隙阻滞联合羟考酮用于老年髋部骨折术后的镇痛效果

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[摘　要]　**目的：**观察腹股沟韧带上髂筋膜间隙阻滞联合羟考酮用于老年髋部骨折术后的镇痛效果。**方法：**选择拟行髋部骨折手术的患者60例，美国麻醉医师学会(American Society of Anesthesiologists，ASA)评分II或III级，年龄65~89岁，随机分为腹股沟韧带上髂筋膜间隙阻滞联合羟考酮静脉自控镇痛组(SQ组)与腹股沟韧带下髂筋膜间隙阻滞联合羟考酮静脉自控镇痛组(IQ组)，每组30例。SQ组腹股沟韧带上髂筋膜间隙阻滞给予0.33%罗哌卡因40 mL，IQ组腹股沟韧带下髂筋膜间隙阻滞给予0.33%罗哌卡因40 mL。两组均蛛网膜下腔注射0.33%轻比重布比卡因2.0 mL，并留置硬膜外导管。术毕连接患者自控静脉镇痛泵，药物配方为羟考酮注射液50 mg用0.9%氯化钠注射液稀释到100 mL，背景剂量为0 mL/h，单次按压注药为4 mL，锁定时间为15 min，镇痛至术后48 h。记录患者入室(T_0)、摆放体位(T_1)、术后6 h(T_2)、术后12 h(T_3)、术后24 h(T_4)及术后48 h(T_5)的视觉模拟量表(Visual Analogue Scale，VAS)评分。记录羟考酮用量、患者满意度及局部麻醉药中毒、神经损伤、恶心呕吐、头晕、瘙痒、心动过缓等不良事件发生情况。**结果：**与IQ组比较，SQ组患者T_1、T_2时点静态VAS评分及T_1、T_2、T_3时点动态VAS评分降低(P<0.05)。与IQ组比较，SQ组羟考酮用量减少(P<0.05)。与IQ组比较，SQ组恶心呕吐、头晕发生率均降低(均P<0.05)。两组患者满意度、局部麻醉药中毒、神经损伤、瘙痒、心动过缓发生率差异均无统计学意义(均P>0.05)。**结论：**腹股沟韧带上髂筋膜间隙阻滞联合羟考酮可为老年髋部骨折患者提供完善的术后镇痛效果。

[关键词]　腹股沟韧带上髂筋膜间隙阻滞；羟考酮；髋部骨折；老年

Postoperative analgesic effect of supra-inguinal fascia iliaca compartment block combined with oxycodone for elderly patients undergoing surgery of hip fracture

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Abstract　**Objective:** To observe the postoperative analgesic effect of supra-inguinal fascia iliaca compartment block

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combined with oxycodone for elderly patients undergoing surgery of hip fracture. **Methods:** Sixty elderly patients undergoing surgery of hip fracture, aged 65–89 years, with ASA II or III, were randomly assigned into 2 groups (n=30): a supra-inguinal fascia iliaca compartment block combined with oxycodone group (Group SQ) and a infra-inguinal fascia iliaca compartment block combined with oxycodone group (Group IQ). In Group SQ, supra-inguinal fascia iliaca compartment block was performed with 0.33% ropivacaine 40 mL. In Group IQ, infra-inguinal fascia iliaca compartment block was performed with 0.33% ropivacaine 40 mL. In both groups, 2.0 mL of 0.33% light specific gravity of bupivacaine was injected into the subarachnoid space and an epidural catheter was left in place. The patient-controlled intravenous analgesia pump was connected after the operation. The patient-controlled intravenous analgesia solution contained oxycodone 50 mg diluted to 100 mL with 0.9% sodium chloride injection. The patient-controlled intravenous analgesia pump was set up with a bolus dose 4 mL, a 15-min lockout interval, and without background infusion, and the analgesia lasted to 48 h after the operation. The Visual Analogue Scales (VAS) of patients at entering the operation room (T_0), position change (T_1), 6 hours after surgery (T_2), 12 hours after surgery (T_3), 24 hours after surgery (T_4) and 48 hours after surgery (T_5) were recorded. The consumption of oxycodone, satisfaction of patients were recorded. Adverse events such as local anesthetic poisoning, nerve injury, nausea and vomiting, dizziness, pruritus and bradycardia were recorded. **Results:** Compared with Group IQ, the static VAS scores at T_1, T_2 and the dynamic VAS scores at T_1, T_2, T_3 in Group SQ decreased (P<0.05). Compared with Group IQ, the consumption of oxycodone was decreased in Group SQ (P<0.05). Compared with Group IQ, the incidence of nausea and vomiting and dizziness decreased in Group SQ (P<0.05). There was no significant difference between the 2 groups in term of the satisfaction of patients and the incidence of local anesthetic poisoning, nerve injury, pruritus, and bradycardia (P>0.05). **Conclusion:** Supra-inguinal fascia iliaca compartment block combined with oxycodone can provide perfect postoperative analgesic effect for elderly patients with hip fracture.

Keywords supra-inguinal fascia iliaca compartment block; oxycodone; hip fracture; elderly

髋部骨折是老年患者常见的外伤性疾病。尽早手术治疗可减少坠积性肺炎、压疮等并发症的发生，改善预后[1-2]。髋部骨折手术创伤大，疼痛剧烈，良好的术后镇痛有助于患者早期功能锻炼，利于患者康复。研究[3-4]表明：髂筋膜间隙阻滞可为髋部骨折手术患者提供较好的术后镇痛效果。与传统的腹股沟韧带下髂筋膜阻滞比较，腹股沟韧带上髂筋膜间隙阻滞可为髋部骨折手术患者提供更有效的术后镇痛效果[5-7]。然而，单次髂筋膜间隙阻滞作用时间短，至多可提供8~14 h的镇痛效果[8]。多数老年患者因术后疼痛而影响早期康复。神经周围留置导管持续给药虽可延长镇痛时间，但术后功能锻炼时导管移位、脱出及导管源性感染等并发症限制了其临床应用。多模式镇痛为老年髋部骨折患者围手术期镇痛提供了一种新的思路[9-11]。研究[12]表明：羟考酮患者静脉自控镇痛用于老年患者髋部手术术后镇痛效果良好。本研究拟探讨腹股沟韧带上髂筋膜间隙阻滞联合羟考酮静脉自控镇痛用于老年髋部骨折术后的镇痛效果，为优化镇痛策略提供参考。

1 对象与方法

1.1 对象

选择2019年2月至8月择期行髋部骨折手术的患者60例，美国麻醉医师学会(American Society of Anesthesiologists，ASA)评分II或III级，性别不限，年龄65~89岁，体重51~72 kg。排除标准：对罗哌卡因、羟考酮等研究药物过敏，凝血功能障碍，穿刺部位感染及沟通障碍不能配合者。采用随机数字表法，将患者分为腹股沟韧带上髂筋膜间隙阻滞联合羟考酮静脉自控镇痛组(SQ组)与腹股沟韧带下髂筋膜间隙阻滞联合羟考酮静脉自控镇痛组(IQ组)，每组30例。为保证研究结果的客观性，负责疼痛评估的麻醉医师不参与研究分组。本研究获保定市第一中心医院医学伦理委员

会批准，患者均签署知情同意书。

1.2 麻醉方法

所有患者禁食禁饮，未给予术前用药。入室后开放静脉通路，输注复方林格氏液5 mL/(kg·h)。鼻导管吸氧1~2 L/min，监测ECG、SpO_2和无创BP。局部麻醉下行桡动脉穿刺置管，持续监测有创动脉血压。SQ组患者行超声引导下腹股沟韧带上髂筋膜间隙阻滞。患者取仰卧位，将高频线阵超声探头纵向放置于患肢髂前上棘的位置，识别髂前上棘和髂肌后将超声探头向肚脐方向旋转，并在超声影像中辨认皮下组织、腹外斜肌、腹内斜肌、腹横肌、腰大肌及髂肌等结构，髂筋膜覆盖于髂肌上。局部麻醉后，采用平面内技术进针，当穿刺针尖到达髂筋膜下时，采用水分离技术确认针尖位置正确后，注射0.33%罗哌卡因40 mL。IQ组患者行超声引导下腹股沟韧带下髂筋膜间隙阻滞。患者仰卧位，将高频线阵超声探头平行腹股沟韧带放置腹股沟韧带下方1~2 cm，辨别股静脉、股动脉、股神经。向外侧平移探头，辨认缝匠肌内侧与髂腰肌之间的髂筋膜结构。局部麻醉后，采用平面内技术进针，当穿刺针尖到达髂筋膜下时，采用水分离技术确认针尖位置正确后，注射0.33%罗哌卡因40 mL。

两组患者均于完成髂筋膜阻滞10 min后行腰-硬联合麻醉。取患肢在上侧卧位，选择$L_{3\sim4}$间隙作为穿刺点，蛛网膜下腔注射0.33%轻比重布比卡因2.0 mL，将麻醉平面控制于T_{10}水平。术中静脉泵注右美托咪定镇静，负荷剂量为0.5 μg/kg，维持剂量为0.25 μg/(kg·h)。当MAP<基础值的80%或MAP<65 mmHg(1 mmHg=0.133 kPa)时，加快输液并静脉注射麻黄碱5 mg纠正低血压。当HR<50 min^{-1}时，静脉注射阿托品0.4 mg。术毕连接患者自控静脉镇痛泵，药物配方为羟考酮注射液50 mg用0.9%氯化钠注射液稀释到100 mL，背景剂量为0 mL/h，单次按压剂量为4 mL，锁定时间为15 min，镇痛至术后48 h。当视觉模拟量表(Visual Analogue Scale，VAS)评分>4时，按压镇痛泵。

1.3 观察指标

记录患者入室(T_0)、摆放体位(T_1)、术后6 h(T_2)、术后12 h(T_3)、术后24 h(T_4)及术后48 h(T_5)的VAS评分。记录羟考酮用量、患者满意度及局部麻醉药中毒、神经损伤、恶心呕吐、头晕、瘙痒等不良事件发生情况。

1.4 统计学处理

采用SPSS 17.0统计学软件进行数据分析。计量资料以均数±标准差($\bar{x}\pm s$)表示，组间比较采用t检验；计数资料以例(%)表示，组间比较采用χ^2检验。P<0.05为差异有统计学意义。

2 结果

2.1 一般资料比较

两组一般资料差异无统计学意义(P>0.05，表1)。

2.2 VAS 评分比较

与IQ组比较，SQ组患者T_1、T_2时点静态VAS评分降低(P<0.05)；SQ组患者T_1、T_2、T_3时点动态VAS评分降低(P<0.05，表2)。

2.3 羟考酮用量及患者满意度比较

与IQ组比较，SQ组羟考酮用量降低(P<0.05)；两组患者满意度差异无统计学意义(P>0.05，表3)。

2.4 不良反应比较

与IQ组比较，SQ组患者恶心呕吐、头晕发生率降低(P<0.05)；两组患者局部麻醉药中毒、神经损伤、瘙痒、心动过缓发生率差异均无统计学意义(均P>0.05，表4)。

表1 两组患者一般资料比较(n=30)

Table 1 Comparison of general information between the 2 groups (n=30)

组别	年龄/岁	性别(男/女)/例	ASA分级(II/III)/例	体重/kg	手术时间/min
SQ组	78.6 ± 4.6	14/16	19/11	63.2 ± 5.8	61.4 ± 4.8
IQ组	80.2 ± 5.7	15/15	20/10	64.0 ± 5.1	64.2 ± 3.6

表2 两组患者VAS评分比较(n=30)

Table 2 Comparison of VAS score between the 2 groups (n=30)

组别	VAS评分					
	T_0	T_1	T_2	T_3	T_4	T_5
SQ组						
静态	5.2 ± 0.8	2.2 ± 0.4*	2.2 ± 0.2*	2.0 ± 0.5	2.2 ± 0.3	2.2 ± 0.3
动态	7.5 ± 1.3	2.6 ± 0.3*	2.8 ± 0.5*	2.9 ± 0.3*	3.2 ± 0.6	3.2 ± 0.6
IQ组						
静态	5.1 ± 0.6	3.8 ± 0.7	2.8 ± 0.3	2.5 ± 0.4	2.4 ± 0.4	2.6 ± 0.4
动态	7.2 ± 1.6	4.2 ± 1.1	3.8 ± 0.8	4.0 ± 0.7	3.5 ± 0.3	3.3 ± 0.5

与IQ组相比，*P<0.05。

Compared with Group IQ, *P<0.05.

表3 两组羟考酮用量及患者满意度比较(n=30)

Table 3 Comparison of consumption of oxycodone and satisfaction of patients between the 2 groups (n=30)

组别	羟考酮用量/mg	患者满意度/分
SQ组	16.3 ± 0.4*	8.6 ± 0.3
IQ组	38.6 ± 0.7	7.9 ± 0.4

与IQ组相比，*P<0.05。

Compared with Group IQ, *P<0.05.

表4 两组不良反应发生率比较(n=30)

Table 4 Comparison of incidence of adverse reactions between the 2 groups (n=30)

组别	局部麻醉药中毒/[例(%)]	神经损伤/[例(%)]	恶心呕吐/[例(%)]	头晕/[例(%)]	瘙痒/[例(%)]	心动过缓/[例(%)]
SQ组	0 (0)	0 (0)	1 (3)*	0 (0)*	0 (0)	0 (0)
IQ组	0 (0)	0 (0)	6 (20)	5 (17)	1 (3)	0 (0)

与IQ组相比，*P<0.05。

Compared with Group IQ, *P<0.05.

3 讨论

目前老年髋部骨折麻醉方式多为椎管内麻醉。然而，体位摆放过程中的骨折端错位导致的疼痛可引起患者循环剧烈波动，甚至诱发心脑血管意外。研究[13]表明：传统的腹股沟韧带下髂筋膜阻滞对闭孔神经阻滞率较低，对髋关节内侧阻滞效果不满意，故对术前体位变动过程中产生的疼痛抑制较差。此外，腹股沟韧带下髂筋膜阻滞对股外侧皮神经阻滞率低，故对术后切口处疼痛抑制效果满意度欠佳[14]。腹股沟韧带上髂筋膜间隙阻滞时，腰丛神经分支更加集中，局部麻醉药向腰丛神经扩散范围更广，在理论上能够更加广泛地阻滞股神经、股外侧皮神经及闭孔神经[15-17]。本研究结果显示：SQ组体位摆放时VAS评分明显低于IQ组，提示腹股沟韧带上髂筋膜间隙阻滞较腹股沟韧带下髂筋膜阻滞可更有效抑制体位摆放过程中产生的疼痛，增加患者的舒适性。本研究还发现SQ组T_2时点静态VAS评分及T_2和T_3时点动态VAS评分低于IQ组，提示腹股沟韧带上髂筋膜间隙

阻滞术后镇痛效果优于传统的腹股沟韧带下髂筋膜间隙阻滞。这一结论与郑少强等[14]的研究结果相吻合。本研究中SQ组T_3时点静态VAS评分与IQ组无统计学差异，可能与腹股沟韧带下髂筋膜阻滞对股外侧皮神经阻滞不全所导致的切口静息状态下疼痛被羟考酮静脉自控镇痛所掩盖有关。

髋部手术感觉主要受股神经、闭孔神经、股外侧皮神经、肋下神经皮支、髂腹下神经外侧皮支、坐骨神经、臀上皮神经支配[18-19]。尽管超声引导下腹股沟韧带上髂筋膜间隙阻滞可同时阻滞股神经、股外侧皮神经、闭孔神经、髂腹下神经及肋下神经[15-16]，但仍需其他辅助镇痛方式来抑制坐骨神经支配区域产生的疼痛，从而达到完善的镇痛效果。羟考酮是μ和κ双阿片受体激动剂，可有效缓解骨科手术患者术后疼痛，且不易引起呼吸抑制及恶心、呕吐，适用于老年骨科手术患者术后镇痛[12,20]。本研究结果显示：术后48 h内SQ组患者术后无论是静态痛，还是动态痛，疼痛程度均较低，提示腹股沟韧带上髂筋膜间隙阻滞联合羟考酮可为老年髋部骨折患者提供完善的术后镇痛效果，为老年髋部骨折患者术后镇痛提供了一种新的思路。

《中国老年髋部骨折患者麻醉及围手术期管理指导意见》[21-22]建议：实施外周神经阻滞时，可持续输注低剂量右美托咪定辅助镇静，同时可预防老年患者术后谵妄的发生。心动过缓是右美托咪定的常见不良反应。本研究中未见心动过缓的发生，可能与右美托咪定应用剂量偏低有关。

综上所述，超声引导下腹股沟韧带上髂筋膜间隙阻滞联合羟考酮可为老年髋部骨折患者提供完善的术后镇痛效果。

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