

doi: 10.13241/j.cnki.pmb.2018.10.026

针刺麻醉复合小剂量瑞芬太尼用于甲状腺良性结节消融术的临床疗效观察 *

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摘要 目的:探讨小剂量瑞芬太尼复合针刺麻醉在甲状腺良性结节消融术中的麻醉镇痛效果。**方法:**选取 2015 年 6 月至 2016 年 6 月在我院进行甲状腺良性结节射频消融术的患者 71 例,并将其随机分为对照组(n=35)和复合麻醉组(n=36)。对照组患者接受单纯芬太尼麻醉,复合麻醉组患者接受小剂量瑞芬太尼复合针刺麻醉,观察和比较两组患者麻醉前(T0)、麻醉后(T1)、消融术中(T2)、手术结束(T3)时患者的平均动脉压(MAP)、心率(HR)、血氧饱和度(HPO₂)和 VAS 评分。**结果:**复合麻醉组患者 T2 和 T3 时间点 MAP (95.00± 6.09, 90.86± 3.23)(P<0.05)、HR 值(65.19± 3.52, 75.03± 6.00)均显著低于对照组(P<0.05),HPO₂ 水平(98.78± 1.15, 97.81± 1.47)均显著高于对照组(P<0.05),VAS 评分(3.25± 1.38, 1.69± 1.43)均显著低于对照组(P<0.05)。**结论:**电针刺刺激结合小剂量瑞芬太尼复合麻醉用于甲状腺良性结节消融术可有效镇痛并维持较稳定的血压和心率,效果明显优于单纯芬太尼麻醉。

关键词:针刺麻醉;甲状腺射频消融术;瑞芬太尼

中图分类号:R614;R653 文献标识码:A 文章编号:1673-6273(2018)10-1936-04

Observation on the Effect of Combined Anesthesia of Acupuncture and Low-dose Remifentanyl on the Microwave Ablation for Patient with Benign Thyroid Nodules*

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ABSTRACT Objective: To investigate the analgesic effect of combined anesthesia of acupuncture and low-dose remifentanyl in microwave ablation for patient with benign thyroid nodules. **Methods:** Seventy-one benign thyroid nodules patients receiving microwave ablation from July 2015 to July 2016 were randomly assigned to the control group and the combined anesthesia group. Patients in the control group received Fentanyl anesthesia, while patients in the combined anesthesia group received combined anesthesia of acupuncture and low-dose Remifentanyl during microwave ablation. The MAP, HR, HPO₂ and VAS scores were recorded and compared between two groups before anesthesia (T0), after anesthesia (T1), during ablation (T2) and at the end of ablation (T3). **Results:** Compared with the control group, the MAP (95.00± 6.09, 90.86± 3.23) and HR (65.19± 3.52, 75.03± 6.00) were significantly lower in the combined anesthesia group at T2 and T3(P<0.05), the HPO₂(98.78± 1.15, 97.81± 1.47) were significantly lower in the combined anesthesia group(P<0.05), and the VAS (3.25± 1.38, 1.69± 1.43) scores were significantly lower in the combined anesthesia group(P<0.05). **Conclusion:** Combined anesthesia of acupuncture and low-dose Remifentanyl had an effective analgesic action with stable blood pressure and heart rate, which was better than fentanyl.

Key words: Acupuncture anesthesia; Thyroid radiofrequency ablation; Remifentanyl

Chinese Library Classification(CLC): R614; R653 **Document code:** A

Article ID: 1673-6273(2018)10-1936-04

前言

甲状腺结节是指甲状腺构成细胞异常生长所形成的肿块样组织,大部分甲状腺结节为良性。一般情况下,良性甲状腺结节不会造成明显不适,恶化风险也较低,无需采取措施;但少数患者可能会由于甲状腺结节压迫出现不适症状,或患者甲状腺

结节呈进行性生长等情况下,会采取相应治疗^[1]。目前,临床上较常采用的是手术治疗,但随着近年来微创外科治疗的发展迅速,微波消融甲状腺良性结节也逐渐用于治疗甲状腺良性结节^[2]。射频消融甲状腺良性结节通常采用局部注射利多卡因的方式,但局部注射利多卡因可能会影响超声分辨率,并引起呼吸抑制等不良反应^[3]。

* 基金项目:上海市卫生和计划生育委员会基金项目(201640034);上海市科学技术委员会基金项目(17401933400);

上海中医药大学预算内项目(2016YSN56)

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(收稿日期:2017-09-01 接受日期:2017-09-25)

瑞芬太尼是一种快速起效的阿片类镇痛药物,在手术中常与麻醉药物合用以减轻疼痛,也在全身麻醉中用于镇静作用。瑞芬太尼起效快速,半衰期较短,体内蓄积性较弱,能够起到清醒镇痛麻醉的效果^[4]。针刺麻醉来自我国中医针灸学,其主要原理为通过对人体穴位的刺激,促进内源性阿片物质的释放,从而达到镇痛的效果。研究显示,针刺麻醉对于头颈部手术的麻醉效果镇痛效果较好^[5]。因此,近年来常使用针刺麻醉结合局部麻醉进行浅表手术^[6],这种手术方式可减少麻醉药物用量,增强镇痛效果,以减少麻醉药物带来的不良反应。本研究拟观察小剂量瑞芬太尼符合针刺麻醉在甲状腺结节射频消融术中的麻醉镇痛效果,通过对术中及术后患者生理指标的观察,确定小剂量瑞芬太尼复合针刺麻醉的应用价值,为临床麻醉方式提供新的思路。

1 对象与方法

表 1 两组受试者一般资料及临床特征比较

Table 1 Comparison of the general information and clinical characteristics of Subjects between two groups

	Control group	Combined Anesthesia group	Statistical value	P Value
Gender (M/F)	12/23	17/19	$\chi^2=1.229$	0.337
Age (Year)	43.1± 7.5	42.7± 8.8	$t=0.173$	0.153
Body Weight (Kg)	66.2± 12.6	68.5± 11.5	$t=-0.804$	0.424
Operation Time(min)	27.0± 4.5	28.0± 4.4	$t=-0.944$	0.348

1.2 治疗方法

所有患者术中均采取仰卧位,肩部垫高,充分暴露颈部。进入手术室后连接监护仪持续监控平均动脉压 (MAP)、心率 (HR)、血氧饱和度(SPO₂)。术前 30 min 常规肌注长托宁 0.5 mg,苯巴比妥 0.1 g。对照组患者采用 1%利多卡因 20 mL 局麻,芬太尼 3 μ g/kg 单次给药,必要时可追加芬太尼 0.05~0.1 mg。复合麻醉组患者取合谷穴、内关穴施针,捻转至患者有酸胀、沉重感后连接电针刺激仪,逐步调整刺激强度,至患者能承受的最大强度。针刺麻醉诱导 30 min 后手术开始,手术开始前 5 min 给予 0.1 μ g/kg 瑞芬太尼静注,射频刀开启时停止电针刺激,同时追加 0.1 μ g/kg 瑞芬太尼。

1.3 评价标准

患者就位,开始针刺麻醉诱导前记为 T0,手术开始前麻醉后记为 T1,射频消融开始 10 min 记为 T2,手术结束后停止麻醉记为 T3。分别记录所有患者各时间点的 MAP、HR 和 SPO₂,并采用视觉模拟量表评分(VAS)评价患者疼痛程度。

1.4 统计学分析

本研究采用 SPSS 21.0 软件进行数据统计及分析。连续变量采用平均值± 标准差表示,对照组与复合麻醉组之间采用独立样本 t 检验或卡方检验比较,同组不同时间点监测采用重复测量的方差分析比较,以 $P \leq 0.05$ 为差异有统计学意义。

2 结果

2.1 两组患者不同时点呼吸、血压水平的变化比较

对两组患者不同时间点的静脉监测指标进行多因素重复测量方差分析,结果显示在麻醉的不同阶段两种麻醉方式对患者平均动脉压水平(麻醉方式× 时间点, $P < 0.001$)、心率(麻醉方

1.1 研究对象

研究选取 2015 年 6 月至 2016 年 6 月在我院进行的甲状腺良性结节射频消融患者 71 例,其中男性患者 29 例,女性患者 42 例,平均年龄 42.9 ± 8.1 岁。将患者随机分为对照组和复合麻醉组,其中对照组 35 例,复合麻醉组 36 例。所有受试人群均签署知情同意书。两组受试者人口学资料见表 1,两组患者的年龄、性别、体重、手术时间比较差异均未见明显统计学意义。患者纳入标准:(1)符合甲状腺结节手术指征;(2)术后经病理检查确认为甲状腺良性结节;(3)术前检查无明显肝、肾疾病,凝血功能无异常;(4)签署知情同意书。

患者排除标准:(1)病理检查显示甲状腺结节发生恶变者;(2)有重要脏器衰竭或凝血功能异常者;(3)有射频消融禁忌症者。

式× 时间点, $P < 0.001$)有显著影响。在消融术进行中,两组患者 MAP 均有升高,但对照组患者 MAP 升高较为明显,且手术结束时仍处于较高状态,而复合麻醉组患者 MAP 升高幅度较小,且在手术结束时即恢复至麻醉前水平。在麻醉开始后,两组患者 HR 均可见下降,但在消融术中对对照组患者 HR 持续上升至手术结束,而复合麻醉组患者术中 HR 也较低,至手术结束时恢复至麻醉前水平。两组患者各时间点 SPO₂ 与麻醉方式无交互作用(麻醉方式× 时间点, $P = 0.1$),但独立样本 t 检验显示,复合麻醉组患者在麻醉开始后($P = 0.002$)、术中($P = 0.000$)和手术结束时($P = 0.027$)SPO₂ 均高于对照组。

2.2 两组患者不同时点疼痛指标的比较

对两组患者不同时间点的 VAS 评分进行多因素重复测量方差分析,结果显示在麻醉的不同时点两种麻醉方式对患者 VAS 评分(麻醉方式× 时间点, $P < 0.001$)有显著影响。复合麻醉组患者在消融术中($P < 0.001$)和手术结束时($P = 0.000$)VAS 评分均高于对照组。

3 讨论

目前,射频消融大多采用利多卡因局部浸润麻醉^[7],但此麻醉方法存在利多卡因入血引起不良反应及局部注射液体过多影响超声分辨率等问题^[8]。针刺镇痛起源于我国中医针灸术。传统中医理论认为"痛则不通,通则不痛",整个人体由复杂的相互连接的内部系统组成,其中"气",通过"经络"在每个器官中流动。当"气"的流动收到阻塞时,既会产生疼痛。在适当的部位采取针刺,可以使"气"重新畅通无阻,从而解除疼痛。而现代医学证实,针刺特定穴位可以促进内源性阿片物质释放,减轻炎症反应^[9]。随着科技的发展,目前多采用电针刺激镇痛

表 2 两组患者不同时间点呼吸血水平的比较

Table 2 Comparison of the changes of breathing and blood pressure of patients at different time points between two groups

Idicators	Group	T0	T1	T2	T3
MAP(mmHg)	Control Group	90.8± 2.9	87.51± 4.25	99.97± 6.93	99.09± 6.06
	Combined Anesthesia	90.72± 2.73	88.03± 4.68	95.00± 6.09*	90.86± 3.23*
HR(Times/min)	Control Group	74.17± 6.34	70.17± 6.23	82.11± 4.27	89.46± 3.26
	Combined Anesthesia	74.58± 5.63	69.92± 5.51	65.19± 3.52*	75.03± 6.00*
SPO ₂ (%)	Control Group	97.23± 1.85	96.23± 2.58	96.17± 2.22	96.69± 2.58
	Combined Anesthesia	97.56± 1.84	97.83± 1.50*	98.78± 1.15*	97.81± 1.47*

Note: * indicates P<0.05, compared with control group at the same time point.

表 3 两组患者不同时间疼痛指标的比较不同麻醉方式对各时间点患者 VAS 评分影响

Table 3 Comparison of the changes of VAS score of patients at different time points between two groups

Group	T0	T1	T2	T3
Control Group	1.83± 1.12	1.69± 1.05	4.54± 1.12	3.54± 1.27
Combined Anesthesia Group	1.36± 1.10	1.83± 1.11	3.25± 1.38*	1.69± 1.43*

Note: * indicates P<0.05, compared with control group at the same time point.

技术,即根据需麻醉部位将电针刺入相应穴道并给予刺激一段时间后起到麻醉作用。针刺镇痛已被证明在治疗癌痛^[10]、内脏痛^[11,12]、持续性痛^[13]中均有良好的效果,也被广泛应用于手术镇痛中^[14,15]。研究表明在刺激特定穴位时可调节中枢神经系统内啡肽释放,从而起到镇静镇痛作用^[16]。合谷穴为手阳明大肠经原穴,研究表明针刺合谷穴可显著提高血浆β内啡肽水平,起到缓解疼痛作用^[17]。内关穴为手厥阴心包经穴,有镇静定志,宁心安神作用。研究发现,针刺内关穴可调节心脏功能^[18],在一定程度上改善心律失常^[19]。并且针刺内关穴可对原发性高血压起到一定的治疗效果^[20]。也有研究显示针刺内关穴可扩张血管、抑制交感神经活性^[21]。同时,针刺合谷穴和内关穴可以镇静止痛,稳定血压和心率^[22,23]。

瑞芬太尼是近年来临床广泛应用的阿片类镇痛药,其作用靶点为μ受体^[24]。瑞芬太尼半衰期较短,由于其主要通过非特异性酯酶水解代谢^[25],不经过肝肾途径,因此在体内无蓄积作用^[26],可根据临床实际情况按需多次少量给药。在甲状腺手术和其他头颈手术中,针刺麻醉复合小剂量瑞芬太尼麻醉被证实有较好的镇痛镇静作用,且不良反应较少,优于局部浸润麻醉和单纯芬太尼麻醉^[27,28]。但在甲状腺结节射频消融术中针刺麻醉复合瑞芬太尼麻醉的效果研究较少。

本研究采用针刺合谷穴和内关穴实施麻醉,同时结合瑞芬太尼进行复合麻醉,以观察在甲状腺良性结节消融术中针刺结合瑞芬太尼复合麻醉的效果。静脉监控数据显示复合麻醉组患者术中血压和心率较为稳定,且血氧饱和度较高,提示相比芬太尼麻醉,针刺麻醉复合瑞芬太尼麻醉能够减少患者心血管应激反应^[29]。同时,复合麻醉对于患者的呼吸抑制作用也较弱。其原因可能有两点,一是复合麻醉时使用的麻醉剂剂量较小,对呼吸和血压抑制比较弱;二是针刺内关穴起到了稳定血压心率的作用。此外,本研究结果还显示两组患者麻醉前、麻醉后、术中及术后时间点 VAS 评分平均值均未超过 5 分,说明两种麻醉方式均能够发挥镇痛作用。两组患者 T2 时间点 VAS 评分均有一定程度上升,提示可能随着消融过程的进行,较大量热量

对周围组织造成了较强的热刺激,导致患者感受不适,复合麻醉组患者 T2 时间点 VAS 评分较低,提示复合麻醉法较芬太尼麻醉效果更好。同时复合麻醉组患者在 T3 时间点 VAS 评分恢复至术前,而对照组患者 T3 VAS 评分仍较高,说明复合麻醉的镇痛效应更为稳定和持久。与其他文献结果相似^[29]。同时,也有研究表明术后针刺麻醉可以起到明显的术后镇痛作用,与本研究结果相同^[30]。

综上所述,电针刺刺激结合小剂量瑞芬太尼复合麻醉可有效镇痛并维持较稳定的血压和心率,其效果明显优于单纯芬太尼麻醉。

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