主动脉瓣置换术后左右心室的早期反应

Early Left and Right Ventricular Response to Aortic Valve Replacement

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背景：在主动脉缩窄对 主动脉瓣置换（AVR）围手术期心肌功能的即时影响尚不清楚。左心室（LV）功能可能因心脏停搏液和缺血再灌注受损，尤其是左心室肥厚患者。另外，左心室功能可以在主动脉瓣置换术后提高，但是右心室功能却没有提高。主动脉瓣置换在主动脉缩中对围手术期心肌功能的影响尚未深入探讨。我们的首要目标是使用超声心动图描述主动脉瓣置换术中左室功能的影响。其次，我们评估右心室功能。

方法：在这个 100 例患者的临床试验中（NCT01187329），97 例是做过主动脉瓣置换术的主动脉狭窄患者。这些患者中，95 例在切皮前和关胸前使用经食管超声心动图检查收缩和舒张功能。采用二维追踪超声心动图分析心肌纵向应变和应变率。使用配对 t 检验分析比较手术开始时与手术结束时的心肌变形。

结果：手术结束时左室容积、动脉血压下降而心率增加。超声心动图用来分析其中 72 例左室应变、67 例的左室应变率，54 例的右室应变和应变率。72 例左心室应变心动图中，9 例患者需要肾上腺素，22 例需要去甲肾上腺素，2 例两者都需要。手术结束时与手术开始时左心室应变没有改变（差异：0.7[97.6%可信区间，-0.2-1.5] %，P = 0.07），而左心室收缩应变率提高（变为阴性）（-0.3 [-0.4 --0.2] s ；P＜0.001）。相反，右心室收缩期应变恶化（变为阳性）（差异：4.6[3.1-6]%；P＜0.001），虽然右室收缩期应变率不变（0.00 [97.6%置信区间，-0.1-0.1]；P = 0.83）。

结论：左心室功能在主动脉瓣置换术后提高。相反，通过纵向应变的评估，右心室功能下降。

(高洋洋 译 李士通 校)

BACKGROUND: The immediate effect of aortic valve replacement (AVR) for aortic stenosis on perioperative myocardial function is unclear. Left ventricular (LV) function may be impaired by cardioplegia-induced myocardial arrest and ischemia-reperfusion injury, especially in patients with LV hypertrophy. Alternatively, LV function may improve when afterload is reduced after AVR. The rightventricle (RV), however, experiences cardioplegic arrest without benefiting from improved loading conditions. Which of these effects on myocardial function dominate in patients undergoing AVR for aortic stenosis has not been thoroughly explored. Our primary objective is thus to characterize the effect of intraoperative events on LV function during AVR using echocardiographic measures of myocardial deformation. Second, we evaluated RV function.
METHODS: In this supplementary analysis of 100 patients enrolled in a clinical trial (NCT01187329), 97 patients underwent AVR foraortic stenosis. Of these patients, 95 had a standardized intraoperative transesophageal echocardiographic examination of systolic and diastolic function performed before surgical incision and repeated after chest closure. Echocardiographic images were analyzed off-line for global longitudinal myocardial strain and strain rate using 2D speckle-tracking echocardiography. Myocardial deformation assessed at the beginning of surgery was compared with the end of surgery using paired t tests corrected for multiple comparisons.
RESULTS: LV volumes and arterial blood pressure decreased, and heart rate increased at the end of surgery. Echocardiographic images were acceptable for analysis in 72 patients for LV strain, 67 for LV strain rate, and 54 for RV strain and strain rate. In 72 patients with LV strain images, 9 patients required epinephrine, 22 required norepinephrine, and 2 required both at the end of surgery. LV strain did not change at the end of surgery compared with the beginning of surgery (difference: 0.7 [97.6% confidence interval, -0.2 to 1.5]%; P = 0.07), whereas LV systolic strain rate improved (became more negative) (-0.3 [-0.4 to -0.2] s; P < 0.001). In contrast, RV systolic strain worsened (became less negative) at the end of surgery (difference: 4.6 [3.1 to 6.0]%; P < 0.001) although RV systolic strain rate was unchanged (0.0 [97.6% confidence interval, -0.1 to 0.1]; P = 0.83).
CONCLUSIONS: LV function improved after replacement of a stenotic aortic valve demonstrated by improved longitudinal strain rate. In contrast, RV function, assessed by longitudinal strain, was reduced.

氟哌啶醇与昂丹司琼对全麻手术既定的恶心和呕吐治疗效果的对比：一项随机临床试验

Haloperidol Versus Ondansetron for Treatment of Established Nausea and Vomiting Following General Anesthesia: A Randomized Clinical Trial

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背景：氟哌啶醇是一种抗精神病药。在低剂量时，它是预防手术后的恶心和呕吐（PONV）的有效药物。然而，它治疗既定的 PONV 的作用还没有被很好的研究。

方法：这项随机双盲试验，测试氟哌啶醇在治疗成人全麻术后恶心呕吐的早期治疗中是否不劣于昂丹司琼。主要结果是患者是否在第一个 4 小时内未发生恶心呕吐。结果的非劣效率为 15%。120 例在术后发生恶心呕吐的病人静脉注射氟哌啶醇 1 mg（n = 60）或昂丹司琼 4 mg（n = 60）。

结果：分析从 112 例病人（氟哌啶醇组 59 例和昂丹司琼组 53 例）中得到的数据。氟哌啶醇组的 35 例病人（52%）接受了 1 或 2 预防性止吐药，对比昂丹司琼组为 42 例（79%）。在术后阶段的早期（0-4 小时）和 0- 24 小时，通过合方案集分析和意向治疗分析，氟哌啶醇在治疗完全反应的终点是不劣于昂丹司琼（定义为术后未恶心呕吐的患者率）的。在合方案集分析中，氟哌啶醇组和昂丹司琼组在早期阶段被记录的的完全反应分别（差异性 5%；95%可信区间[CI：-13%—22 %）为在 59 位病人中有 35 例（59%）和在 53 位病人有 29 例（55%），在 0-24 小时阶段被记录的的完全反应分别（差异性 4%；95%可信区间[CI：-15%—21 %）为在 59 位病人中有 31 例（59%）和在 53 位病人有 26 例（55%）。在意向治疗分析中，氟哌啶醇组和昂丹司琼组在早期阶段被记录的的完全反应分别（差异性 10%；95%可信区间[CI：-8%—27%）为在 60 位病人中有 35 例（58%）和在 60 位病人有 29 例（48%），在 0-24 小时阶段被记录的的完全反应分别（差异性 8%；95%可信区间[CI：-9%—25%）为在 60 位病人中有 31 例（52%）和

在 60 位病人有 26 例（43%）。所有其他的 PONV 次要结果是可比的，在氟哌啶醇组中 25%的病人被镇静，对比昂丹司琼组为 2%(P < .001; 差异性 23%; 95%差异性可信区间: 11%-36%)。而疼痛、满意度得分、对止痛药的需求和 QTc 区间的变化在 2 组之间无明显差异。

结论：通过意向性治疗分析和完成治疗分析方法，氟哌啶醇在最坏的情况下效果分别低于昂丹司琼 13%和 8%。因此，氟哌啶醇在既定的恶心呕吐的早期治疗中不劣于昂丹司琼，但是它和镇静密切相关。

（冯亚飞 译 李士通 校）

BACKGROUND: Haloperidol is an antipsychotic. At low doses, it is a useful agent for the prophylaxis of postoperative nausea and vomiting (PONV). However, its use for treating established PONV has not been well studied.
METHODS: This randomized double-blinded trial tested whether haloperidol is noninferior to ondansetron for the early treatment of established PONV in adult patients undergoing general anesthesia. The primary outcome is whether patients were PONV free during the first 4 hours. The noninferiority margin was set at 15%. One hundred twenty patients with PONV received either haloperidol 1 mg intravenously (n = 60) or ondansetron 4 mg intravenously (n = 60).
RESULTS: Data from 112 patients (59 in the haloperidol group and 53 in the ondansetron group) were analyzed. Thirty-five patients (52%) in the haloperidol group received 1 or 2 prophylactic antiemetics compared with 42 (79%) in the ondansetron group. Haloperidol was noninferior to ondansetron for the end point of complete response to treatment (defined as the rate of PONV-free patients) for the early (0-4 hour) and the 0- to 24-hour postoperative periods by both the per-protocol and intention-to-treat analyses. In the per-protocol analysis, complete responses in the early period were noted in 35 of 59 patients (59%) and 29 of 53 patients (55%) for the haloperidol and ondansetron groups, respectively (difference 5%; 95% confidence interval [CI]: -13% to 22 %), and in the 0- to 24-hour period in 31 of 59 patients (53%) and 26 of 53 patients (49%) for the haloperidol and ondansetron groups, respectively (difference 4%; 95% CI of the difference: -15% to 21%). In the intention-to-treat analysis, complete responses in the early period were noted in 35 of 60 patients (58%) and 29 of 60 patients (48%) for the haloperidol and ondansetron groups, respectively (difference 10%; 95% CI of difference: -8% to 27%) and in the 0- to 24-hour period in 31 of 60 patients (52%) and 26 of 60 patients (43%) for the haloperidol and ondansetron groups, respectively (difference 8%; 95% CI of the difference: -9% to 25%). All other PONV secondary outcomes were comparable. Twenty-five percent of patients in the haloperidol group were sedated versus 2% in the ondansetron group (P

< .001; difference 23%; 95% CI of the difference: 11%-36%). Pain, satisfaction scores, need for analgesics, and changes in QTc intervals were not different between the 2 groups.
CONCLUSIONS: Haloperidol is at worst 13% and 8% less effective than ondansetron by per-protocol analysis and by intention-to-treat analysis, respectively. Thus, it is noninferior to ondansetron for the early treatment of established PONV, but is associated with sedation.

地氟烷在敏感性气道中的时间和剂量依赖性作用

Time- and Dose-Dependent Effects of Desflurane in Sensitized Airways
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背景：尽管挥发性麻醉剂如氟烷，异氟烷和七氟醚的支气管扩张作用在以前的研究中已被充分记载，但地氟醚的相关性质仍然有争议。本研究的目的是调查不同浓度和持续时间的地氟醚在卵白蛋白致敏的气道高反应性豚鼠模型中的影响。

方法：根据接受的地氟烷的最小肺泡浓度（MAC），176 只卵清蛋白敏化的豚鼠被随机分为 5 组，分别为：0.0、0.5、1.0、1.5 和 2.0MAC。测量体内总肺阻力、体外气道平滑肌张力和细胞内环腺苷酸（AMP）水平以评价地氟烷的作用。

结果：在 5 个致敏组中，在吸入地氟烷过程中，总肺阻力在约 8 分钟时从基线增加到峰值，然后缓慢降低，总过程约 17 分钟。无论有无增加乙酰胆碱的剂量，地氟烷都会增加总肺阻力，但随着乙酰胆碱浓度的增加可以减少的肌肉张力。地氟烷会引起环磷酰胺水平的增加：在 60 分钟时间点，具有 0.5MAC（1.96±0.40）和 1.0MAC（2.11±0.50）地氟烷的 cAMP 浓度（平均值±SD）高于 8 分钟时间点（1.11±0.23 和 1.32±0.32）。

结论：地氟烷具有时间和剂量依赖性效应，并且在 0.5 和 1.0MAC 浓度下使用，对于卵清蛋白敏化的豚鼠没有显著的支气管收缩。cAMP 介导的气道平滑肌松弛可能是地氟醚诱导支气管扩张的一种机制。

（顾明露 译 李士通 校）

BACKGROUND: Although the bronchodilatory actions of volatile anesthetics, such as halothane, isoflurane, and sevoflurane, have been well documented in previous studies, the properties of desflurane remain controversial. The aim of this study was to investigate the effects of desflurane at different concentrations and durations in an ovalbumin-sensitized guinea pig model of airway hyper-responsiveness.
METHODS: Ovalbumin-sensitized animals (n = 176) were randomly assigned to 5 groups according to the minimum alveolar concentration (MAC) of desflurane they received: 0.0, 0.5, 1.0, 1.5, and 2.0 MAC. Total lung resistance in vivo, airway smooth muscle tension in vitro, and intracellular cyclic adenosine monophosphate (AMP) levels were measured to evaluate the effects of desflurane.
RESULTS: In 5 sensitized groups, total lung resistance increased from baseline to peak at approximately 8 minutes and then decreased slowly until about 17 minutes with extended administration of desflurane. Desflurane dose-dependently increased total lung resistance with or without incremental doses of acetylcholine and reduced muscle tension with increasing concentrations of carbacholine. Cyclic AMP levels were increased by desflurane: at the 60-minute time point, cyclic AMP concentrations (means ± SD) with 0.5 MAC (1.96 ± 0.40) and 1.0 MAC (2.11 ± 0.50) desflurane were higher than those at the 8-minute time point (1.11 ± 0.23 and 1.32 ± 0.32).
CONCLUSIONS: Desflurane exerted time- and dose-dependent effects and could be used at 0.5 and 1.0 MAC concentrations without significant bronchoconstriction in ovalbumin-sensitized guinea pigs. Cyclic AMP-mediated airway smooth muscle relaxation might be one mechanism by which desflurane induces bronchodilation.

全身血管阻力对 **Pulsioflex** 监测设备准确性的影响

Impact of Systemic Vascular Resistance on the Accuracy of the Pulsioflex Device

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背景：现有使用脉搏曲线分析的设备，没有心脏指数(CI)测定的外部校准，其准确性受到高动力循环状态、低系统血管阻力(SVR)和 SVR 突然变化的负面影响。本研究的目的是在接受肝移植的患者中评估新设备 Pulsioflex（心排量监测系统）的准确性。

方法：肝移植计划表上按序的 30 名患者被包括在内。CI 监测使用肺动脉导管(CI-PAC)和 Pulsioflex(CI-Pulsio)。在术中 9 个不同阶段进行同时的 CI 测量。

结果：对 270 对测量结果进行了分析。CI-Pulsio 的中位数值(3.3；四分位范围 2.8-3.8 L·min·m)明显不同于 CI-PAC 的中位数值(4.1 ；四分位范围 3.1-5.0 L·min·m) (P < .0001)。Bland-Altman 分析显示,平均偏差为 0.8 L·min·m(95%置信区间 -2.5-4.1 L·min·m)。百分比误差为 65%(95%置信区间 60% -71%)。考虑到 CI 两阶段之间的差异，对比 CI-PAC 的变化与 CI-Pulsio 的变化显示平均偏差为 0.1 L·min·m(95%置信区间-2.1-2.2 L·min·m)。当排除 CI 变化< 0.5 L·min·m (154 组配对分析)时，一致率为 62%(95%的置信区间，54%-70%)。CI-PAC 与 CI-Pulsio 之间的偏差与 SVR 呈负相关(r = -0.67，P < .0001)。CI-PAC 的变化与 CI-Pulsio 的变化之间的偏差与 SVR 也呈负相关(r = -0.52，P < .0001)。

结论：接受肝移植的患者中，Pulsioflex 不能准确估计 CI。其准确性受到 SVR 高度影响， SVR 发生大变化时的不能追踪 CI 的变化。

（黄凫卿 译 李士通 校）

BACKGROUND: The accuracy of currently available devices using pulse contour analysis without external calibration for cardiac index (CI) estimation is negatively impacted by hyperdynamic states, low systemic vascular resistance (SVR), and abrupt changes in SVR. The aim of this study was to evaluate the accuracy of a new device, the Pulsioflex (Pulsion Medical System), in patients undergoing liver transplantation.
METHODS: Thirty consecutive patients scheduled for liver transplantation were included. CI was monitored using pulmonary arterial catheter (CI-PAC) and Pulsioflex (CI-Pulsio). Simultaneous CI measurements were made intraoperatively at 9 different stages of the procedure.
RESULTS: Two hundred seventy pairs of measurements were analyzed. The median CI-Pulsio values (3.3; interquartile range, 2.8-3.8 L·min·m) were significantly different from the median CI-PAC (4.1; interquartile range, 3.1-5.0 L·min·m; P < .0001). Bland and Altman analysis showed a mean bias of 0.8 L·min·m and 95% limit of agreement from -2.5 to 4.1 L·min·m. Percentage error was 65% (95% confidence interval, 60%-71%). Considering the variations in CI between 2 stages, the comparison between changes in CI-PAC and changes in CI-Pulsio showed a mean bias of 0.1 L·min·m and 95% limit of agreement of -2.1 to 2.2 L·min·m. When excluding changes in CI <0.5 L·min·m (154 paired analyzed), the concordance rate was 62% (95% confidence interval, 54%-70%). The bias between CI-PAC and CI-Pulsio was negatively correlated with SVR (r = -0.67, P < .0001). The bias

between changes in CI-PAC and changes in CI-Pulsio was also negatively correlated with changes in SVR (r = -0.52, P < .0001).
CONCLUSIONS: In patients undergoing liver transplantation, Pulsioflex does not accurately estimate CI. Its accuracy is highly impacted by SVR, and it is not able to track changes in CI when large variations in SVR occur.

最佳的俯卧位下心肺复苏术 :通过电脑断层扫描确定与最大的左心室横截面积相关联的椎体节段位置

Optimizing Prone Cardiopulmonary Resuscitation: Identifying the Vertebral Level Correlating With the Largest Left Ventricle Cross-Sectional Area via Computed Tomography Scan

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背景：临床工作中，一些外科手术要求我们将病人摆放于俯卧位。如果术中病人出现心脏骤停，则不能安全的将病人转为俯卧位，心肺复苏可能就需要我们在病人处于俯卧位的情况下实施。虽然仰卧位心肺复苏已经有清晰的认识，但俯卧位实施心肺复苏的最佳手法还没有明确的规定。本研究的目的是确定在俯卧位情况下，如何从解剖学上确定心肺复苏的最佳手法。

方法：我们回顾性分析了在俯卧位姿势下 100 例患者的胸部计算机断层扫描图像。我们确定了跨越肩胛骨内侧角,肩胛骨下角椎体水平以及棘突椎体与最下面肋骨连接的位置,我们选择的图像水平是处在左心室横截面积最大的平面上。这一水平被认为是最优压缩水平以及相关表面解剖标志。我们计算的距离的比值从第七颈椎棘突水平到最大的左心室横截面积水平除以从第七颈椎棘突到最下端的肋骨之间的距离。

结果：在俯卧位下，45%的病人的最大的左心室横截面是低于肩胛下角 1 个椎体节段位置，95%的病人是低于肩胛下角的 0-2 个节段。从第七颈椎棘突水平到最

大的左心室横截面积水平除以从第七颈椎棘突到胸 12 椎体棘突之间距离的均值(SD)为 67%±7%(99% CI, 65-69).

结论：当病人被摆放在俯卧位下，86%的病人的最大的左心室横截面积是低于肩胛下角 0-2 个椎体节段的位置。在俯卧位下，低于肩胛下角 0~2 个椎体节段的位置是不是最合适的胸部挤压的位置需要我们进一步的研究确定。

（解建 译 李士通 校）

BACKGROUND: Placing the patient in the prone position frequently is required for some surgical procedures. If cardiac arrest occurs and the patient cannot be safely turned supine, cardiopulmonary resuscitation (CPR) may need to be performed with the patient in the prone position. Although clear landmarks have been defined for supine CPR, the optimal hand position for CPR in the prone position has not been clearly determined. The purpose of this study was to determine anatomically the optimal hand position for CPR in the prone position.
METHODS: We reviewed retrospectively the chest computed tomography images of 100 patients taken in the prone position. The vertebral body levels crossing the medial angle of the scapula, the inferior angle of the scapula, and the spinous process of the vertebral body connected to the most inferior rib were identified, and we selected the image level at which the left ventricular (LV)cross-sectional area was the largest. This level was defined as the optimal compression level and correlated to surface anatomical landmarks. We calculated the ratio of the distance from the C7 spinous process to the level of the largest LV cross-sectional area divided by the distance from the C7 spinous process to the spinous process of the vertebral body connected with the most inferior rib.
RESULTS: The level of the largest LV cross-sectional area in the prone position was 1 vertebral segment below the inferior angle of the scapula in 45% (99% confidence interval [CI], 33-58) of patients and 0 to 2 vertebral segments below that in 95% (99% CI, 86-98) of patients. The mean (SD) ratio of the distance from the C7 spinous process to the level of the largest LV cross-sectional areadivided by the distance from the C7 spinous process to T12 spinous process was 67% ± 7% (99% CI, 65-69).
CONCLUSIONS: When the patient is positioned prone, the largest LV cross-sectional area is 0 to 2 vertebral segments below the inferior angle of the scapula in at least 86% of patients. Further studies are needed to determine whether this position is optimal for chest compressions in the prone position.

程序化间断硬膜外输注在第一产程分娩镇痛中的应用：一项随机的连续分配实验以确定输注 0.0625%布比卡因与 2μg/mL 芬太尼混合液 10mL 的最佳间隔时间

Programmed Intermittent Epidural Bolus for Labor Analgesia During First Stage of Labor: A Biased-Coin Up-and-Down Sequential Allocation Trial to Determine the Optimum Interval Time Between Boluses of a Fixed Volume of 10 mL of Bupivacaine 0.0625% With Fentanyl 2 μg/mL

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背景：许多研究已经将间断硬膜外输注 (PIEB)与连续硬膜外输注进行比较，比如患者自控硬膜外镇痛与疼痛加重时的单次手动按压镇痛。因此，PIEB 的最佳间隔时间还待研究。我们设计了一项实验来确立 PIEB 的最佳间隔时间，其组成为 0.0625%布比卡因与 2 μg/mL 芬太尼混合液，以期待能使 90%的产妇在第一产程能产生有效镇痛。

方法：我们进行了一项双盲连续分配实验，以随机设计来获得 PIEB 90%的有效间隔时间。我们收集的病人为 ASA2-3 级未生育过的女性，在硬膜外镇痛下进行自然分娩或人工引产。在超声引导下将硬膜外导管置入 L2/3 或 L3/4。试验剂量为 3mL0.125%的布比卡因与 3.3 μg/mL 芬太尼的混合液，随后再给予 12 毫升的负荷量。在负荷剂量给完之后，若 20 分钟内患者视觉模拟评分≤1/10 ，则患者将进行 PIEB 镇痛方案。在所有研究的产妇当中，PIEB 单次给药剂量均为 10 mL 0.0625% 的布比卡因与 2 μg/mL 芬太尼的混合液。第一次程序性间断给药是在负荷剂量给药 1 小时之后。共随机分为四组，第一组产妇的间隔时间为 60 分钟，接下来依次为间隔 50、40、30 分钟。主要结果为有效镇痛，即硬膜外镇痛后 6 小时或者在宫颈完全扩张之前，产妇不需要进行患者自控镇痛或单次手动按压镇痛。每小时对疼痛评分、冷感觉阻断平面、运动阻滞程度和血压进行测量。

结果：我们收集了 40 名女性。采用 DM 评估方法则估计 90%的有效间隔时间为 42.6 分钟（95%的可信区间为 38.9-46.4）。采用等张回归分析则为 36.8 分钟 (95%

的可信区间为 31.0-49.0)。在 30 分钟组有 70%的产妇感觉阻滞平面达到了 T6 以上，而 40、50、60 分钟组分别为 44%、22%、11%。只有 30 分钟组能对运动进行阻滞。所有组低血压发生率均较低且不需处理。

结论：PIEB 给药方法输注 10 毫升 0.0625%布比卡因与 2 μg/mL 芬太尼混合液的最佳间隔时间大约为 40 分钟。仍需要进一步的实验来确定在整个分娩过程中该方法的有效性。

（廖汝婷 译 李士通 校）

BACKGROUND: Most studies that have compared programmed intermittent epidural bolus (PIEB) with continuous epidural infusion regimens have included patient-controlled epidural analgesia and/or manual bolus as rescue analgesia for breakthrough pain. Consequently, the optimal time interval between PIEB is yet to be determined. We designed a study to establish the optimal timeinterval between PIEB of 10 mL of bupivacaine 0.0625% with fentanyl 2 μg/mL to produce effective analgesia in 90% of women duringfirst stage of labor without breakthrough pain.

METHODS: We conducted a double-blind sequential allocation trial with a biased-coin up-down design to obtain the effective interval90% for the PIEB regimen. We included American Society of Anesthesiologists physical status 2-3 nulliparous women at term undergoing spontaneous or induced labor requesting epidural analgesia. An ultrasound-assisted epidural catheter placement was performed at L2/3 or L3/4. A test dose of 3 mL of bupivacaine 0.125% plus fentanyl 3.3 μg/mL was followed by a loading dose of 12 mL of the same solution. PIEB was then started in women whose pain scores achieved Verbal Numerical Rating Score ≤1/10 within 20 minutes after the end of the loading dose. In all subjects, the programmed bolus dose was fixed at 10 mL of bupivacaine 0.0625% withfentanyl 2 μg/mL. The first bolus was delivered 1 hour after the loading dose. The PIEB interval was set at 60 minutes for the firstpatient and at varying time intervals (60, 50, 40, and 30 minutes; groups 60, 50, 40 and 30, respectively) for the subsequent patients, according to a biased-coin design. The primary outcome was effective analgesia, defined as no requirement for a patient-controlled epidural analgesia or a manual bolus for 6 hours after the initiation of the epidural analgesia or until the patient presented with full cervical dilatation, whichever event occurred first. Pain scores, sensory block levels to ice, degree of motor block, and blood pressure were assessed hourly.

RESULTS: We studied 40 women. The estimated effective interval 90% was 42.6 minutes (95% confidence interval 38.9-46.4) using the truncated Dixon and Mood

method and 36.8 minutes (95% confidence interval 31.0-49.0) using the Isotonic Regression analysis. Almost 70% of the patients in group 30 presented with sensory block above T6, compared with 44%, 22%, and 11% in groups 40, 50, and 60, respectively. Only patients in group 30 presented with motor blockade. The incidence of hypotension was low in all groups with no treatment required.
DISCUSSION: The optimal time interval between PIEB of 10 mL of bupivacaine 0.0625% with fentanyl 2 μg/mL is approximately 40 minutes. Further studies to determine the efficacy of this regimen throughout the entire duration of labor are warranted.

腹腔内滴注利多卡因有利于改善剖宫产术后镇痛

Intraperitoneal Instillation of Lidocaine Improves Postoperative Analgesia at Cesarean Delivery: A Randomized, Double-Blind, Placebo-Controlled Trial
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背景: 剖宫产是一种常见的手术。尽管多模式镇痛得到了发展，但仍有一部分女性术后镇痛不完善、病人满意度低。腹腔内滴注局麻药已证实能有效缓解腹部手术术后疼痛。我们旨在研究腹腔内滴注利多卡因作为多模式镇痛的一部分，对剖宫产术后镇痛的有效性。

方法：我们选择了择期行剖宫产腰麻的产妇。以 0.75%布比卡因、芬太尼和吗啡配成重比重进行腰麻。在剖宫产快要结束时，腹膜壁层或筋膜关闭之前，产妇随机给予利多卡因（2%利多卡因加肾上腺素共 20 毫升）或安慰剂（20 毫升生理盐水）滴注入腹腔内。主要观察结果是 24 小时运动疼痛评分。次要观察结果是 2、24、48 小时静止疼痛评分和运动疼痛评分；产妇满意度评分；镇痛药消耗量；恶心呕吐瘙痒发生率和胃肠道功能恢复情况。

结果：共收集了 204 位产妇。利多卡因组跟安慰剂组基本特征相似。术后 24 小时运动疼痛评分（参数估计 0.02，[95% 可信区间{CI} -0.14 到 0.18]；P = .823)），静止时 (参数估计 0.00 [95% CI -0.32 到 0.33]；P = .986)，两组是相同的。术后

2 小时运动疼痛评分(参数估计-0.58 [95% CI -0.90 到 -0.26]；P = .001) ，静止时(参数估计-1.00 [95% CI -1.57 到 -0.43]；P = .001) ，利多卡因组相对较低。次要观察结果中，腹膜关闭的产妇利多卡因组 24 小时运动疼痛评分有显著的降低(参数估计-0.33 [95% CI -0.64 到 -0.03]；P = .032)。利多卡因组术后对阿片类镇痛药的需求也比对照组显著减少(40 [40%] 比 61 [65%], 相对风险 0.59 [95% CI 0.43-0.81]； P = 0.001)。

结论：腹腔内滴注利多卡因有利于缓解剖宫产术后早期术后疼痛。而且能减少产妇术后对阿片类药物镇痛的需求。产妇在关腹过程中进行此项干预能从中获益。

（廖汝婷 译 李士通 校）

BACKGROUND: Cesarean delivery is a commonly procedure worldwide. Despite improvements in balanced multimodal analgesia, there remains a proportion of women for whom postoperative pain relief and patient satisfaction are still inadequate. Intraperitoneal instillation of local anesthetic has been shown to be effective in reducing postoperative pain after abdominal surgery. We sought to investigate the effect of intraperitoneal instillation of lidocaine on postcesarean delivery pain as part of a multimodal analgesia regimen.
METHODS: We studied women scheduled for elective cesarean delivery under spinal anesthesia. Spinal anesthesia was performed with 0.75% hyperbaric bupivacaine, fentanyl, and morphine. At the end of the cesarean delivery, immediately before parietal peritoneum or fascia closure, patients were randomized to receive either lidocaine (20 mL 2% lidocaine with epinephrine) or placebo (20 mL normal saline) instilled into the peritoneal cavity. The primary outcome was pain score on movement at 24 hours. Secondary outcomes were pain score at rest and on movement at 2, 24, and 48 hours; maternal satisfaction score; analgesic consumption; incidence of nausea, vomiting, and itching; and return of bowel function.
RESULTS: Two hundred four women were recruited. Baseline characteristics were similar between the lidocaine and placebo groups. Pain scores at 24 hours postcesarean delivery on movement (parameter estimate 0.02 [95% confidence interval {CI} -0.14 to 0.18]; P = .823) and at rest (parameter estimate 0.00 [95% CI -0.32 to 0.33]; P = .986) were similar in both groups. Pain scores at 2 hours postcesarean delivery on movement (parameter estimate -0.58 [95% CI -0.90 to -0.26]; P = .001) and at rest (parameter estimate -1.00 [95% CI -1.57 to -0.43]; P = .001) were lower in the lidocaine group. Subgroup analysis of patients with peritoneum closure revealed significantly lower pain scores at 24 hours on movement (parameter estimate -0.33 [95% CI -0.64 to -0.03]; P = .032) in the lidocaine group. The number

of women requesting postoperative opioids for breakthrough pain was significantly lower in the lidocaine group compared with that of the placebo (40 [40%] vs 61 [65%], respectively, relative risk 0.59 [95% CI 0.43-0.81]; P = 0.001).
CONCLUSIONS: The use of intraperitoneal instillation of lidocaine improves early postoperative pain management after cesarean delivery. Furthermore, it reduces the number of women requesting systemic opioids in the immediate postpartum period. Women undergoing peritoneal closure may particularly benefit from this intervention.

大鼠海马脑片的长时程增强中异氟醚，肿瘤坏死因子（TNF-α）和 β-淀粉样肽的相互作用

Interaction of Isoflurane, Tumor Necrosis Factor-α and β-Amyloid on Long-term Potentiation in Rat Hippocampal Slices
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背景：吸入麻醉药如异氟醚和老年认知功能障碍之间的关系一直存在争议。与阿尔茨海默病的相关的 β-淀粉样肽（Aβ），和促炎症反应应激肽，即肿瘤坏死因子（TNF-α），均可损害突触功能。我们推测，短暂暴露于异氟醚和这些肽会损害突触功能，大鼠海马将表现为抑郁的长时程增强（LTP）和双脉冲易化（PPF）。

方法：准备 3-4 周龄 Wistar 雄性大鼠的海马脑片。初步实验确定 Aβ1–42 肽和 TNF-α 对 LTP 产生抑制影响的最低浓度（600 nM Aβ1–42 和 5 ng/mL TNF-α）。将这些浓度的肽分别与 1.5%异氟醚应用于海马切片，或将两者组合 1 小时后洗脱应用。通过 Schaffer-Collateral 侧支通路的高频刺激（100 Hz，1 秒），测量海马 CA1 区神经元的 LTP（兴奋性突触后电位[fEPSPs]）。使用多重比较校正的方差分析来比较在稳态下的 LTP 和 LTP 诱导后的 40 到 60 分钟。

结果：LTP 诱导后 EPSP 幅度在基线的 155%±9%，若没有异氟醚暴露和洗脱影响为（基线的 150%±4%，P = .47）。与对照组相比，Aβ1–42 和 TNF-α 均可使 LTP 减少约 15%（基线的 129%±7%和 131%±11%，均数±标准差，P 均＜.001）。当异氟醚与 Aβ1–42 联合时，LTP 没有受损（对照的 151%±9%，P = .85），但异

氟醚联合 TNF-α 或同时联合 Aβ 和 TNF-α 时，LTP 的降低未受到影响。

结论：异氟醚的短暂暴露可抑制而非损害大鼠海马 LTP 的降低，这主要与 Aβ1–42 有关。与此相反，异氟醚不通过 TNF-α 或 Aβ 和 TNF-α 联合体，对突触造成损害。虽然这是一项体外研究，将其转换为临床医学还需额外的工作，但这意味着异氟醚，Aβ 和 TNF-α 的相互作用可能对阿尔茨海默病患者或围手术期的炎症反应患者有一定的影响。

（陆晓斐 译 李士通 校）

BACKGROUND: The relationship between inhalational anesthetics such as isoflurane and cognitive impairment in the elderly is controversial. Both β-amyloid peptide (Aβ), associated with Alzheimer disease, and tumor necrosis factor-α (TNF-α), a proinflammatory stress-related peptide, impair the synaptic function. We hypothesized that transient exposure to isoflurane and these peptides would impair synaptic function, manifest as a depression of long-term potentiation (LTP) and paired pulse facilitation (PPF), in the rat hippocampus.
METHODS: Hippocampal slices were prepared from 3- to 4-week-old male Wistar rats. Preliminary experiments identified minimal concentrations of Aβ1–42 peptide and TNF-α that produced statistically detectable suppressing effects on LTP (600 nM Aβ1–42 and 5 ng/mL TNF-α). These concentrations of peptides were applied to slices alone, with 1.5% isoflurane, or in combination for 1 hour and then washed out. Measurements of LTP (field excitatory postsynaptic potentials [fEPSPs]) from neurons in the CA1 area by stimulation of the Schaffer-Collateral pathway were made after high-frequency stimulation (100 Hz, 1 second). Analysis of variance with correction for multiple comparisons was used to compare LTP under steady-state conditions and averaged for the 40- to 60-minute period after LTP induction.
RESULTS: EPSP amplitude after LTP induction was 155% ± 9% of baseline and was not affected by isoflurane exposure and washout (150% ± 4% of baseline, P = .47). Both Aβ1–42 and TNF-α reduced LTP by approximately 15% compared with control (129% ± 7% and 131% ± 11% of baseline respectively, means ± SD, both P < .001). When Aβ1–42 was combined with isoflurane, LTP was not impaired (151% ± 9% of control, P = .85), but isoflurane had no effect on LTP depression caused by TNF-α or a combination of Aβ and TNF-α.
CONCLUSIONS: Brief exposure to isoflurane prevents rather than impairs the decrease in LTP caused by Aβ1–42 in rat hippocampus. In contrast, isoflurane had no effect on synaptic impairment caused by TNF-α or a combination of TNF-α and Aβ. Although this is an in vitro study and translation to clinical medicine requires additional work, the interactions of isoflurane, Aβ, and TNF-α revealed here could have implications for patients with Alzheimer disease or perioperative

neuroinflammation.

锁骨上和锁骨下臂丛神经阻滞的比较：一项随机对照试验的系统综述

Comparison of Supraclavicular and Infraclavicular Brachial Plexus Block: A Systemic Review of Randomized Controlled Trials

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背景：锁骨上臂丛神经阻滞和锁骨下臂丛神经阻滞通常被广泛用于上肢手术。近期有许多的临床研究比较了锁骨上臂丛神经阻滞和锁骨下臂丛神经阻滞的影响，但是这两者在臂丛四个周围神经分支的感觉阻滞方面的影响还存在争议。

方法：本研究是一个系统综述，使用的是 2016.03 之前的 MEDLINE 和 EMBASE 数据库。选择的是比较锁骨上臂丛神经阻滞和锁骨下臂丛神经阻滞的随机对照试验。本次研究的主要结果是比较两者在臂丛四个神经分支的不完全阻滞发生率。次要结果包括两者成功阻滞的发生率，阻滞的时间，感觉阻滞的发生，镇痛的持续时间，和并发症的发生率。

结果：本次研究共纳入十个随机对照试验，共计 676 例患者。汇总分析显示 30 分钟时锁骨下臂丛神经阻滞的桡神经不完全阻滞的发生率显著高于锁骨上臂丛神经阻滞（风险比 0.39；95%置信区间[0.17-0.88]，P = .02，I = 0%）。而根据锁骨下臂丛神经阻滞注射数量的亚组分析显示，双次注射或三次注射对于桡神经不完全阻滞的发生没有差异。此外，当锁骨下臂丛神经阻滞进行双次注射或三次注射时， 30 分钟时尺神经不完全阻滞的发生率显著降低。锁骨上臂丛神经阻滞局部麻醉注射时感觉异常和疼痛的发生，膈神经麻痹，Horner 综合征均显著高于锁骨下组，其余的次要结果两者之间没有差异。

结论：这项荟萃分析结果表明，锁骨下臂丛神经阻滞 30 分钟时桡神经不全阻滞

的发生率较高，这可能可以通过双次或三次注射避免。此外，锁骨下臂丛神经阻滞的多次注射技术使其在尺神经不完全阻滞的发生率显著低于锁骨上组。在神经阻滞的成功率，阻滞起效时间，镇痛持续时间方面，锁骨上和锁骨下臂丛神经阻滞无差异。但锁骨上臂丛神经阻滞在感觉异常、疼痛和周围神经相关并发症方面的发生率更频繁。然而，由于样本量小，发表偏倚仍然值得关注。进一步的研究还需足够的样本量和大量的试验结果。

（陆晓斐 译 李士通 校）

Background: Supraclavicular (SC) and infraclavicular (IC) brachial plexus block (BPB) are commonly used for upper extremity surgery. Recent clinical studies have compared the effect of SC- and IC-BPB, but there have been controversies over spread of sensory blockade in each of the 4 peripheral nerve branches of brachial plexus.
Methods: This study included a systemic review, using the Medline and EMBASE database from their inceptions through March 2016. Randomized controlled trials (RCTs) comparing SC- and IC-BPB were included. The prespecified primary outcome was the incidences of incomplete sensory blockade in each of the 4 terminal nerve branches of brachial plexus. Secondary outcome included the incidence of successful blockade, performance time, onset of sensory block, duration of analgesia, and complication rates.
Results: Ten RCTs involving 676 patients were included. Pooled analyses showed the incidence of incomplete block at 30 minutes in radial nerve territory was significantly higher in IC-BPB, favoring SC-BPB (risk ratio 0.39; 95% confidence interval [0.17-0.88], P = .02, I = 0%). However, subgroup analysis according to the number of injections of IC-BPB showed that double or triple injections IC-BPB yielded no difference in the incomplete radial block. Furthermore, the incidence of incomplete ulnar block at 30 minutes was significantly lower in IC-BPB when using double or triple injection IC-BPB. There was no difference in the secondary outcomes between SC- and IC-BPB groups, with the exception of complication rates. The incidence of paresthesia/pain on local anesthetic injection, phrenic nerve palsy, and Horner syndrome was significantly higher in the SC group, favoring IC-BPB.
Conclusions: This meta-analysis demonstrated that IC-BPB showed a significantly high incidence of incomplete radial nerve sensory block at 30 minutes, which may be avoided by double or triple injection. Furthermore, IC-BPB with multiple injection technique showed significantly lower incidence of incomplete ulnar block than SC-BPB. There were no differences in the incidence of successful blockade, block onset, and duration of analgesia between SC- and IC-BPB. Procedure-related paresthesia/pain and adjacent nerve-related complications were more frequent in

SC-BPB. However, because of the small sample size, publication bias remains a concern when interpreting our results. Further studies with sufficient sample size and reporting large number of outcomes are required.

一个新颖控制炎症性疼痛的方法:前列腺素 E2 络合 β-Cyclodextrins 通过随机的甲基化

A Novel Approach for the Control of Inflammatory Pain: Prostaglandin E2 Complexation by Randomly Methylated β-Cyclodextrins

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背景：环氧酶抑制剂阻断前列腺素(PG)E2 的形成，是治疗炎症性疼痛的标准药物。然而，这些药物有严重的胃肠道、肾和心血管副作用限制其临床应用。环糊精葡萄糖是中性的寡聚物，形成外部亲水结构，内部疏水腔用于携带亲水性物质。甲基化的 β 环糊精目前使用在一些药物作为增强剂，还提供动力。因此，我们假设随机甲基化 β 环糊精(RAMEB)可以用于疼痛治疗。

方法：硅片筛选重要的炎症介质(如 PGE2、P 物质、缓激肽和降钙素相关基因肽)被用来进行预测这些分子与甲基化 β 环糊精 RAMEB 相绑定的可能性。之后，一个全面的体外研究在 RAMEB 或其 RAMEB FL 之间使用毛细管电泳调查了络合亲和力的最佳目标。Wistar 鼠是足底注射完全弗氏佐剂(CFA)96 小时诱导炎性痛觉过敏。随后，老鼠足底注射或静脉注射治疗 RAMEB 或 RAMEB FL 并给予相应的治疗。帕瑞昔布作为积极的治疗手段。机械(爪压痛阈值，PPT)和热(缩足反应潜伏期)疼痛的阈值确定之前注入和在指定的时间点。将爪组织收集后，测量 PGE2 和 PGD2。方差分析是用于数据分析并采取适当的事后比较。

结果：在硅片筛选表明，PGE2 拥有最高的亲和力是最好的人选与 RAMEB 绑定。同样，在毛细管电泳实验，RAMEB 有高亲和力的形式包含复合物与 PGE2(稳定

常数(K)，360 1/M；95%置信区间[C]：347.58-372.42M)。局部应用 RAMEB 缓解 CFA 诱导的机械(PPT：76.25g；95%置信区间：76.25-56.24g)和热痛觉过敏(PPT：8.50 秒；95%置信区间：8.50-6.76 秒)。此外，全身性应用 RAMEB 减少 CFA-诱导的机械痛(PPT：126.66g；95%置信区间：126.66-114.54 g)和热痛觉过敏(缩足反应潜伏期：11.47 秒；95%置信区间：9.26-13.68 秒)。体外应用 RAMEB FL 导致更大的 PGE-2 的结合容量并且降低 PG 含量，与体内痛觉过敏相似的程度。大鼠的运动活动并不由 RAMEB 或 RAMEB FL 改变的。

结论：通过环糊精结合 PGs 可以是一个新奇的和创新的工具用于治疗炎症性疼痛并且可以绕过一些不必要的环氧酶抑制剂的副作用。

（吴昕菀 译 李士通 校）

BACKGROUND: Inhibitors of cyclooxygenase, which block the formation of prostaglandin (PG) E2, are the standard treatment of inflammatory pain. These drugs, however, have serious gastrointestinal, renal, and cardiovascular side effects that limit their clinical use. Cyclodextrins are neutral glucose oligomers that form a hydrophilic outer and a hydrophobic interior cavity used to carry hydrophilic substances. Methyl-β-cyclodextrins are used currently in several drugs as enhancers and also to deliver PGs. We therefore hypothesized that randomly methylated β-cyclodextrins (RAMEB) could be used for pain treatment.
METHODS: An in silico screening for important inflammatory mediators (eg, PGE2, substance P, bradykinin, and calcitonin gene-related peptide) was performed to predict the probability of these molecules binding to RAMEB. Thereafter, a comprehensive in vitro study investigated the complexation affinity of the best target toward RAMEB or its RAMEB-fraction L (FL) using capillary electrophoresis. Wistar rats were injected intraplantarly with complete Freund's adjuvant (CFA) for 96 hours to induce inflammatory hyperalgesia. Subsequently, rats were treated intraplantarly or intravenously either with RAMEB or RAMEB FL and compared with the respective controls. Parecoxib was used as positive control. Mechanical (paw pressure threshold, PPT) and thermal (paw withdrawal latency) nociceptive thresholds were determined before injection and at the indicated time points thereafter. Paw tissue was collected after treatments, and PGE2 and PGD2 contents were measured. Analysis of variance was used for data analysis followed by appropriate post hoc comparisons.
RESULTS: In silico screening indicated that PGE2, with the highest affinity, was the best candidate for RAMEB binding. Likewise, in capillary electrophoresis experiments, RAMEB had a high affinity to form inclusion complexes with the PGE2

(stability constant [K], 360 1/M; 95% confidence interval [C]: 347.58-372.42 M). Local treatment with RAMEB alleviated CFA-induced mechanical (PPT: 76.25 g; 95% CI: 56.24-96.25 g) and thermal hyperalgesia (PPT: 8.50 seconds; 95% CI: 6.76-10.23 seconds). Moreover, a systemic administration of RAMEB decreased CFA-induced mechanical (PPT: 126.66 g; 95% CI: 114.54-138.77 g) and thermal hyperalgesia (paw withdrawal latency: 11.47 seconds; 95% CI: 9.26-13.68 seconds). RAMEB FL resulted in greater in vitro PGE2-binding capacity and decreased PG content as well as hyperalgesia in vivo to a similar extent. Motor activity of the rats was not altered by RAMEB or RAMEB FL.
CONCLUSIONS: Capture of PGs by cyclodextrins could be a novel and innovative tool for the treatment of inflammatory pain and bypassing some unwanted side effects of cyclooxygenase inhibitors.

术前应用三维超声应变成像技术评估心脏手术后左室功能减退和预测临床预后

Preoperative Three-Dimensional Strain Imaging Identifies Reduction in Left Ventricular Function and Predicts Outcomes After Cardiac Surgery
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背景:基于心动超声图的斑点追踪应变成像技术是一项评估左心室功能的最新技术。本次研究旨在运用三维（3D）斑点追踪应变成像技术评估心脏术后左心室收缩功能的变化，并分析术前运用该项技术能否独立预测主动脉瓣膜手术、二尖瓣手术和冠脉搭桥术的短期和长期预后。

方法:前瞻性纳入共 163 名接受主动脉瓣手术、二尖瓣手术和冠脉搭桥术的患者，并详细记录临床资料。并收集患者的一般资料、手术记录和结果数据。在患者术前和术后 2-4 天进行经胸超声心动图检查。盲法离线分析患者左室二维和三维射血分数（EF2D 和 EF3D），左心室整体收缩期峰值面积，纵向、圆周和径向应变。

结果：三维整体应变与三维射血分数结果关联性好。应变成像技术发现在各种心脏手术术后左心室功能均显著降低。通过结合术前 EF3D，绘制 ROC 曲线计算

得出了对应左心室功能正常、轻度降低和严重降低的 3D 整体应变参考值。左心室功能正常（(EF3D ≥ 50%)对应 3D 整体面积应变-25%，曲线下面积 0.86(0.81-0.89)。术前整体面积应变减少的患者预后较差，包括 ICU 时间延长（4 vs 3 days, P = .001），存在更多严重不良事件(27% vs 11%, P = .03)和较低的 1 年无事件生存率(69% vs 88%, P = .005)。通过校正基线时其他危险因素（包括欧洲心脏手术风险评估评分和手术类型），发现术前应变是一项短期和长期预后（包括 ICU 住院时间，术后正性肌力药物评分和 1 年无事件生存率）的独立预测因子。

结论：本次研究发现通过 3D 应变成像技术评估，在各种心脏手术术后左心室功能均显著降低。同时术前三维应变是一项短期和长期预后的独立预测因子。心脏手术术前使用这项无创三维经胸超声心动图应变成像检查能够为高危患者的围术期危险因素分层和管理提供更多的有益信息。

（吴玮译　陈杰校）

BACKGROUND: Echocardiography-based speckle-tracking strain imaging is an emerging modality to assess left ventricular function. The aim of this study was to investigate the change in left ventricular systolic function after cardiac surgery with 3-dimensional (3D) speckle-tracking strain imaging and to determine whether preoperative 3D strain is an independent predictor of acute and long-term clinical outcomes after aortic valve, mitral valve, and coronary artery bypass grafting operations.
METHODS: In total, 163 adult patients undergoing aortic valve, mitral valve, and coronary artery bypass surgeries were enrolled prospectively and had complete data sets. Demographic, operative, and outcome data were collected. 3D transthoracic echocardiograms were preformed preoperatively and on second to fourth postoperative day. Blinded off-line analysis was performed for left ventricular 2-dimensional (2D) ejection fraction (EF2D) and 3D ejection fraction (EF3D) and global peak systolic area, longitudinal, circumferential, and radial strain.
RESULTS: 3D global strain correlated well with EF3D. Ventricular function as measured by strain imaging decreased significantly after all types of cardiac surgery. When preoperative EF3D was used, receiver operating characteristic curves identified reference values for 3D global strain corresponding to normal, mildly reduced, and

severely reduced ventricular function. Normal ventricular function (EF3D ≥ 50%) corresponded to 3D global area strain -25%, with area under curve = 0.86 (0.81-0.89). Patients with reduced preoperative 3D global area strain had worse postoperative outcomes, including length of intensive care unit stay (4 vs 3 days, P = .001), major adverse events (27% vs 11%, P = .03), and decreased 1-year event-free survival (69% vs 88%, P = .005). After we controlled for baseline preoperative risk models including European System for Cardiac Operative Risk Evaluation score and surgery type, preoperative strain was an independent predictor of both short- and long-term outcomes, including length of intensive care unit stay, postoperative inotrope score, and 1-year event-free survival.
CONCLUSIONS: This study shows that cardiac surgery was associated with an acute reduction in postoperative left ventricular function, when evaluated with 3D strain imaging. In addition, preoperative 3D strain was demonstrated to be an independent predictor of acute and long-term clinical outcomes after cardiac surgery. The use of noninvasive 3D transthoracic echocardiogram strain imaging before cardiac surgery may provide added information to aid in perioperative risk stratification and management for these high-risk patients.

2.闭环系统的临床性能和安全性：一项对随机对照试验的系统综述与荟萃分析

Clinical Performance and Safety of Closed-Loop Systems: A Systematic Review and Meta-analysis of Randomized Controlled Trials
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自动化系统可以提高受控变量的稳定性，减少临床实践中的工作量，而不增加患者的风险。因此进行这项系统性综述与荟萃分析来比较闭环系统与手动控制系统的临床性能表现。主要指标是评价闭环系统与手动控制系统相比较下将给定变量保持在期望目标范围内的精准程度。次要指标是发生过冲和下冲次数。检索闭环系统与手动控制系统准确性与安全性的随机对照试验。主要指标是系统能够在期望范围内维持给定变量（例如，双谱指数或氧饱和度）或在目标测量比例在所需范围内的百分比。次要指标是受控变量高于或低于目标范围的百分比或发生次数。连续变量计算标准化平均差和 95%置信区间（CI），而对二分变量计算优势比和 95%CI。共纳入 36 项临床研究。与手动控制体统相比，自动化系统能够

在麻醉药物输注装置（95％CI，11.7％-23.1％；时间百分比，P <0.0001，研究数目：n = 15），糖尿病病人（95％CI，11.5％-30.9％；P = 0.001，n = 8）与机械通气患者（95％CI，1.5％-23.1％，n = 8）中更好地维持受控变量。研究中的异质性较高（> 75％）。当使用闭环系统时，观察到过冲和下冲的发生显著减少。自动化系统的使用可以对所选范围内对给定目标具有更好控制。闭环系统中给定目标过冲或下冲减少。

（谢律译　陈杰校）

Automated systems can improve the stability of controlled variables and reduce the workload in clinical practice without increasing the risks to patients. We conducted this review and meta-analysis to assess
the clinical performance of closed-loop systems compared with manual control. Our primary outcome was the accuracy of closed-loop systems in comparison with manual control to maintain a given variable in a desired target range. The occurrence of overshoot and undershoot episodes was the secondary outcome.We
retrieved randomizedcontrolled trials on accuracy
and safety of closed-loop systems versus manual control. Our primary outcome was the percentage of time during which the system was able to maintain a given variable (eg, bispectral index or oxygen saturation) in a desired range or the proportion of the target measurements that was within the required range. Our secondary outcome was the percentage of time or the number of episodes that the controlled variable was above or below the target range. The standardized mean difference and 95% confidence interval (CI) were calculated for continuous outcomes, whereas the odds ratio and 95% CI were estimated for dichotomous outcomes.Thirty-six trialswere included. Compared with manual control, automated systems allowed better maintenance of the controlled variable in the anesthesia drug delivery setting (95% CI, 11.7%-23.1%; percentage of time, P < 0.0001, number of studies: n = 15), in patients with diabetes mellitus (95% CI, 11.5%-30.9%; percentage of time, P = 0.001, n = 8), and in patients mechanically ventilated (95% CI, 1.5%-23.1%; percentage of time, P = 0.03, n = 8). Heterogeneity among the studies was high (>75%). We observed a significant reduction of episodes of overshooting and undershooting
when closed-loop systems were used. The use of automated systems can result in better control of a given target within a selected range. There was a decrease of overshooting or undershooting of a given target with closed-loop systems.

在低于 0℃及使用一种新型麻醉输送装置情况下各麻醉药物蒸气压的变化

Vapor Pressures of Anesthetic Agents at Temperatures Below 0°C and a Novel

Anesthetic Delivery Device

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在室温下，地氟烷、异氟烷和七氟烷的蒸气压在临床有效范围以上，假设在室温低于 0℃时这些麻醉剂的治疗浓度可达成，但此时蒸气压-温度关系曲线是未知的。其次假设这个关系能够被运用入输送治疗范围浓度的麻醉气。因此着手确定每种麻醉剂的低温-蒸气压关系曲线，以及确定每种麻醉剂在 0℃以下任意温度的饱和蒸气浓度。为了验证以上假设，测量在一个大气压下温度-60℃到 0℃的饱和蒸气浓度，由此描绘每种麻醉剂的经验关系曲线。所有三种麻醉剂的重复实验具有一致性。为了验证这组经验性数据，构建了一个有此特征的数控热电麻醉蒸发器，用于给实验室大鼠输送麻醉气体，研究首次发现在 0℃以下地氟烷，异氟烷，七氟烷的蒸气压-温度关系曲线以及蒸气压等于最低肺泡有效浓度时的温度（TMAC）。研究显示一定程度上验证了此麻醉蒸发器的原理。挥发性麻醉剂也能够在低温下达到的临床治疗相关浓度。

（袁天杰译　陈杰校）

At room temperature, the vapor pressures of desflurane, isoflurane, and sevoflurane are well above the clinically useful range. We hypothesized that therapeutic concentrations of these agents could be achieved at temperatures below 0°C, but the vapor pressure-temperature relationship is unknown below 0. Second, we hypothesized that this relationship could be exploited to deliver therapeutic-range concentrations of anesthetic vapor. We therefore set out to determine the low temperature-vapor pressure relationships of each anesthetic agent, thereby identifying the saturated vapor concentration of each agent at any temperature below 0°C. To test our hypothesis, we measured the saturated vapor concentration at 1 atm of pressure for temperatures between -60 and 0°C, thus developing an empiric relationship for each agent. There was consistency in repeated experiments for all 3 agents. To test the empiric data, we constructed a digitally controlled thermoelectric anesthetic vaporizer, characterized the device, and used it to deliver anesthetic vapor to laboratory mice. We report, for the first time, the temperature-vapor pressure relationship at

temperatures below 0°C for desflurane, isoflurane, and sevoflurane as well as the TMAC of these agents: the temperature at which the vapor pressure is equal to the minimum alveolar concentration. We describe the construction and limited validation of an anesthetic vaporizer prototype on the basis of this principle. We conclude that clinically relevant concentrations of volatile anesthetics may be achieved at low temperatures.

肺超声用于围术期肺不张的评估：一项初步可行性研究

Lung Ultrasonography for the Assessment of Perioperative Atelectasis: A Pilot Feasibility Study

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背景：当面对术中低氧血症时，麻醉医生可使用的诊断工具有限。肺超声是一种安全和准确的床边成像模式。本项研究的目的是评估肺超声在围术期的可行性，并评估其检测术中呼吸道并发症和围手术期肺不张引起氧合变化的能力。

方法：在这项前瞻性观察性初步研究中，连续招募了 30 名腹腔镜手术患者。使用标准化的机械通气。在 5 个预定的时间点进行肺部超声检查：全麻诱导之前，全麻诱导之后，气腹建立之后，到达恢复室之后和离开恢复室之前。每个超声的图像检测中，形成 12 个肺部区域成像。由此计算肺超声评分（LUS）---一项半定量评分，来评估每个时间点的肺通气情况。

结果：对所有患者均进行了肺部超声检查。诱导之后和到达恢复室的 LUS 评分变化与氧合变化一致(Spearman r=-0.43, P=.018)。全麻的诱导与 LUS 评分增加相关，在之后时间点逐渐恶化直到出恢复室。这种恶化在基地段和依赖性肺区更显著。肺超声帮助观察到两例二氧化碳气胸、一例支气管内插管和一例亚临床肺水肿。

结论：肺超声在围术期的应用是可行的，可用于追踪围术期肺不张，并协助呼吸道并发症的诊断。通气损失的演变与氧合的变化中度相关。

（殷智宇译 陈杰校）

BACKGROUND: Few diagnostic tools are available to anesthesiologists when confronted with intraoperative hypoxemia. Lungultrasonography is a safe and accurate bedside imaging modality. The aim of this study was to evaluate the feasibility of lungultrasonography during the perioperative period and assess its ability to detect intraoperative respiratory complications and oxygenation changes resulting from perioperative atelectasis.
METHODS: In this prospective observational pilot study, 30 consecutive patients scheduled for laparoscopic surgery were recruited. Mechanical ventilation was standardized. Lung ultrasonography was performed at 5 predefined time points: before induction of general anesthesia (GA), after induction of GA, after pneumoperitoneum insufflation, on arrival in the recovery room, and before recovery room discharge. For each echographic examination, 12 pulmonary quadrants were imaged. From these, a semiquantitative score, the lungultrasound (LUS) score, was calculated to assess lung aeration at each time point.
RESULTS: Lung ultrasonography was possible in all patients. Changes in the LUS score between the postinduction period and arrival in the recovery room were correlated with changes in oxygenation (Spearman r = -0.43, P = .018). Induction of GA was associated with an increase in the LUS score, which gradually worsened at all time points until recovery room discharge. This increase was significantly worse in the basal and dependent lung zones. Lung ultrasonography helped in the detection of 2 capnothoraces, 1 endobronchial intubation, and 1 episode of subclinical pulmonary edema.
CONCLUSIONS: Lung ultrasonography in the perioperative period is feasible, allows tracking of perioperative atelectasis, and facilitates the diagnosis of respiratory complications. The evolution of aeration loss correlates moderately with changes in oxygenation.

呼气流量受限是腹部大型手术后肺部并发症的一项危险因素

Expiratory Flow Limitation as a Risk Factor for Pulmonary Complications After Major Abdominal Surgery

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背景：术后肺部并发症是增加术后发病率和死亡率的主要因素。虽然术后肺部并发症的发生与多种危险因素相关，但各项研究之间结果并非一致，即使在某些确

定因素的研究中，其预测能力也较低。此研究假定术后肺并发症与术中呼气流速受限存在相关性。

方法：这项前瞻性观察性研究的候选人是接受全身麻醉进行腹部大型手术的患者。术前数据采集包括年龄、体重指数、ASA 分级、吸烟及呼吸困难病史和室内空气氧分压。使用呼气末正压试验在术中评估呼气流速受限情况。术后数据收集包括术后肺并发症的发生率。

结果：在招募的 330 名患者中，31％发生了呼气流速受限。单因素分析显示，发生呼气流速受限的患者更易患术后肺炎（5％vs 0％，P <0.001）和急性呼吸衰竭（11％vs 1％，P <0.001），且住院时间更长（7 天 vs 9 天，P <0.01）。多变量分析确定呼气流速受限增加术后肺并发症的发生风险> 50％（风险比，2.7; 95％置信区间，1.7-4.2）。年龄和 MRC 呼吸困难量表也是肺并发症的显著多变量危险因素。

结论：此研究结果表明，术中呼气流速受限与腹部大型手术后的肺并发症相关。需要进一步研究来更好地了解呼气流速受限与术后肺部情况的相关性。

（陈依译 陈杰校）

BACKGROUND: Postoperative pulmonary complications are major causes of postoperative morbidity and mortality. Although several risk factors have been associated with postoperative pulmonary complications, they are not consistent between studies and, even in those studies in which these factors were identified, the predictive power is low. We hypothesized that postoperative pulmonary complications would correlate with the presence of intraoperative expiratory flow limitation.
METHODS: Candidates for this prospective observational study were patients undergoing general anesthesia for major abdominal surgery. Preoperative data collection included age, body mass index, American Society of Anesthesiologists class, smoking and dyspnea history, and room air PO2. Expiratory flow limitation was assessed intraoperatively using the positive end-expiratory pressure test. Postoperative data collection included the incidence of postoperative pulmonary complications.
RESULTS: Of the 330 patients we enrolled, 31% exhibited expiratory flow limitation. On univariate analysis, patients with expiratory flow limitation were more likely to

have postoperative pneumonia (5% vs 0%, P < .001) and acute respiratory failure (11% vs 1%, P < .001) and a longer length of hospital stay (7 vs 9 days, P < .01). Multivariate analysis identified that expiratory flow limitation increased the risk of developing postoperative pulmonary complications by >50% (risk ratio, 2.7; 95% confidence interval, 1.7-4.2). Age and Medical Research Council dyspnea score were also significant multivariate risk factors for pulmonary complications.
CONCLUSIONS: Our results show that intraoperative expiratory flow limitation correlates with that of postoperative pulmonary complication after major abdominal surgery. Further work is needed to better understand the relevance of expiratory flow limitation on postoperative pulmonary outcomes.

硬膜外导管放置期间使用音乐对分娩产妇焦虑、疼痛和满意度影响的一项随机对照试验

A Randomized Controlled Trial of Music Use During Epidural Catheter Placement on Laboring Parturient Anxiety, Pain, and Satisfaction
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背景：虽然音乐常用来营造舒适轻松的分娩环境,但其在硬膜外导管放置期间使用的效果是未知的。本研究试图证明音乐在分娩产妇硬膜外导管放置期间的作用，并提出以下假设：音乐使用会减少焦虑,降低疼痛,增加病人满意度。

方法：进行了此项分娩产妇在音乐有无两种情况下接受硬膜外导管放置的前瞻、随机、对照试验。音乐组患者通过外部放大扬声器接听潘多拉®电台广播的受个人喜爱的音乐; 对照组没有听音乐。对所有女性使用标准化的硬膜外技术和局部麻醉剂量。主要结果是焦虑相关的 3 次测评。次要结果包括疼痛、病人满意度、血流动力学参数、产科参数、新生儿预后和麻醉医生的焦虑程度。Bonferroni 校正用于主要结果分析。对于次要结果, P 值<001 被认为是具有统计学意义。

结果：共有 100 名产妇被随机分配，99 位患者纳入意向治疗分析。两组病人特征相似;音乐组,音乐使用的持续时间为 31.1±7.7min(平均数±标准差) 。音乐组在硬膜外导管放置当时使用数字评定量表分数测量后具有更高的焦虑程度(2.9±3.3 vs

1.4±1.7,平均差 1.5(95%置信区间 CI) { 0.2 - -2.7},P = 02), 在硬膜外导管放置 1 小时后感到“非常舒适”的产妇更少(51% vs 78%,优势比{或} 0.3(95% CI 0.1 - -0.9),P = 02)。据观察两组在硬膜外导管放置前后患者的疼痛评分和整个期间病人满意度没有差异。然而,音乐组对未来硬膜外穿刺时使用音乐的意愿更高(84% vs 45%,或 6.4(95% CI 2.5 - -16.5),P <.0001。)。据观察两组硬膜外导管放置的难度或剖腹产率并没有差异。

结论 :分娩产妇在硬膜外导管放置期间听音乐可能导致更多的术后焦虑而且疼痛或满意度并没有得到改善;然而,对未来硬膜外穿刺时使用音乐的意愿更高，需要进一步研究以确定音乐对使用硬膜外分娩镇痛且有音乐需求临产妇的作用。

（董璐译　陈杰校）

BACKGROUND: Although music is frequently used to promote a relaxing environment during labor and delivery, the effect of its use during the placement of neuraxial techniques is unknown. Our study sought to determine the effects of music use on laboring parturients during epidural catheter placement, with the hypothesis that music use would result in lower anxiety, lower pain, and greater patient satisfaction.

METHODS: We conducted a prospective, randomized, controlled trial of laboring parturients undergoing epidural catheter placement with or without music. The music group listened to the patient's preferred music on a Pandora® station broadcast through an external amplified speaker; the control group listened to no music. All women received a standardized epidural technique and local anesthetic dose. The primary outcomes were 3 measures of anxiety. Secondary outcomes included pain, patient satisfaction, hemodynamic parameters, obstetric parameters, neonatal outcomes, and anesthesia provider anxiety. Intention-to-treat analysis with Bonferroni correction was used for the primary outcomes. For secondary outcomes, a P value of <.001 was considered statistically significant.

RESULTS: A total of 100 parturients were randomly assigned, with 99 included in the intention-to-treat analysis. Patient characteristics were similar in both groups; in the music group, the duration of music use was 31.1 ± 7.7 minutes (mean ± SD). The music group experienced higher anxiety as measured by Numeric Rating Scale scores immediately after epidural catheter placement (2.9 ± 3.3 vs 1.4 ± 1.7, mean difference 1.5 [95% confidence interval {CI} 0.2-2.7], P = .02), and as measured by fewer parturients being "very much relaxed" 1 hour after epidural catheter placement (51% vs 78%, odds ratio {OR} 0.3 [95% CI 0.1-0.9], P = .02). No differences in mean pain

scores immediately after placement or patient satisfaction with the overall epidural placement experience were observed; however, the desire for music use with future epidural catheter placements was higher in the music group (84% vs 45%, OR 6.4 [95% CI 2.5-16.5], P < .0001). No differences in the difficulty with the epidural catheter placement or in the rate of cesarean delivery were observed.
CONCLUSIONS: Music use during epidural catheter placement in laboring parturients is associated with higher postprocedure anxiety and no improvement in pain or satisfaction; however, a stronger desire for music with future epidural catheter placements was observed. Further investigation is needed to determine the effect of music use in parturients requesting and using epidural labor analgesia.

硬膜穿破硬膜外麻醉技术与硬膜外麻醉联合脊椎麻醉技术相比改善产妇麻醉效果、减小副反应：一项随机临床试验

Dural Puncture Epidural Technique Improves Labor Analgesia Quality With Fewer Side Effects Compared With Epidural and Combined Spinal Epidural Techniques: A Randomized Clinical Trial
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背景：硬膜穿破硬膜外麻醉技术是在腰硬联合技术基础上的改进，用腰麻针穿透硬膜但不向鞘内注麻醉药。硬膜穿破硬膜外麻醉技术（DPE）与硬膜外麻醉技术（EPL）相比，改善了尾部麻醉药的扩散，与腰硬联合技术（CSE）相比，减少了麻醉副反应。作者假设产妇麻醉的起效时间：CSE>DPE>EPL。

方法：120 例产妇在分娩早期随机分成 EPL、DPE、CSE 组。EPL 和 DPE 组的起始给药剂量为硬膜外 20ml 0.125%布比卡因和 2ug/ml 芬太尼 ,超过 5min 给完，CSE 组鞘内注射 0.125%布比卡因 1.7mg 和芬太尼 17ug。阻滞完全后由不知道分组的合作研究者评估麻醉效果 .双盲研究中由产科医生回顾性评估椎管阻滞前后 1h 产妇的子宫收缩力和胎儿胎心率情况。第一研究结果通过 Kaplan-Meier 曲线和比例风险模型分析麻醉后达到 NPRS≤ 1 的时间。第二个研究结果通过 χ 检验 Yates 连续性校正分析包括阻滞效果，产妇麻醉副反应，子宫收缩情况及胎儿情

况。

结果： DPE 组和 EPL 组达到 NPRS ≤ 1 的时间无明显差异（RR 1.4；95%置信区间[CI] 0.83-2.4, P = .21）。DPE 组达到 NPRS ≤ 1 的时间明显慢于 CSE 组（RR 0.36；95%置信区间 0.22-0.59, P = .0001）。时间中位数（四分位数法）CSE 达到 NPRS ≤ 1 为 2(0.5-6)min。而 DPE 组为 11(4-120)min；EPL 组为 18 (10-120)min。与 EPL 组相比，DPE 组双侧 S2 阻滞的发生率明显增高。10min：([RR] 2.13; 95% CI 1.39-3.28; P < .001）；20min：(RR 1.60; 95% CI 1.26-2.03; P < .001)；30min(RR 1.18; 95% CI 1.01-1.30; P < .034)。同时 30min 后不对称阻滞的发生率更低：(RR 0.19; 95% CI 0.07-0.51; P < .001)；医师补加麻药干预的发生率更低(RR 0.45; 95% CI 0.23-0.86; P = .011)。与 CSE 组相比，DPE 组瘙痒(RR 0.15; 95% CI 0.06-0.38; P < .001)，低血压(RR 0.38; 95% CI 0.15-0.98; P = .032)，子宫强直收缩(RR 0.22; 95% CI 0.08-0.60; P < .001)，医师加药干预(RR 0.45; 95% CI 0.23-0.86; p = .011)的发生率均显著降低。

结论：对于分娩早期椎管麻醉的产妇来说：CSE 的麻醉起效最快，而 DPE 和 EPL 组无差异。DPE 技术与 EPL 技术相比阻滞效果更好，与 CSE 技术相比产妇和胎儿副反应更少。

（戴依利译　陈杰校）

BACKGROUND: The dural puncture epidural (DPE) technique is a modification of the combined spinal epidural(CSE) technique, where a dural perforation is created from a spinal needle but intrathecal medication administration is withheld. The DPE technique has been shown to improve caudal spread of analgesia compared with epidural (EPL) technique without the side effects observed with the CSE technique. We hypothesized that the onset of labor analgesia would follow this order: CSE > DPE > EPL techniques.

METHODS: A total of 120 parturients in early labor were randomly assigned to EPL, DPE, or CSE groups. Initial dosing for EPL and DPE consisted of epidural 20 mL of 0.125% bupivacaine plus fentanyl 2 μg/mL over 5 minutes, and for CSE, intrathecal

0.25% bupivacaine 1.7 mg and fentanyl 17 μg. Upon block completion, a blinded coinvestigator assessed the outcomes. Two blinded obstetricians retrospectively interpreted uterine contractions and fetal heart rate tracings 1 hour before and after the neuraxialtechnique. The primary outcome was time to numeric pain rating scale (NPRS) ≤ 1 analyzed by using Kaplan-Meier curves and Cox proportional hazard model. Secondary outcomes included block quality, maternal adverse effects, uterine contraction patterns, and fetal outcomes analyzed by using the χ test with Yates continuity correction.
RESULTS: There was no significant difference in the time to NPRS ≤ 1 between DPE and EPL (hazard ratio 1.4; 95% confidence interval [CI] 0.83-2.4, P = .21). DPE achieved NPRS ≤ 1 significantly slower than CSE (hazard ratio 0.36; 95% CI 0.22-0.59, P = .0001). The median times (interquartile range) to NPRS ≤ 1 were 2 (0.5-6) minutes for CSE, 11 (4-120) minutes for DPE, and 18 (10-120) minutes for EPL. Compared with EPL, DPE had significantly greater incidence of bilateral S2 blockade at 10 minutes (risk ratio [RR] 2.13; 95% CI 1.39-3.28; P < .001), 20 minutes (RR 1.60; 95% CI 1.26-2.03; P < .001), and 30 minutes (RR 1.18; 95% CI 1.01-1.30; P < .034), a lower incidence of asymmetric block after 30 minutes (RR 0.19; 95% CI 0.07-0.51; P < .001) and physician top-up intervention (RR 0.45; 95% CI 0.23-0.86; P = .011). Compared with CSE, DPE had a significantly lower incidence of pruritus (RR 0.15; 95% CI 0.06-0.38; P < .001), hypotension (RR 0.38; 95% CI 0.15-0.98; P = .032), combined uterine tachysystole and hypertonus (RR 0.22; 95% CI 0.08-0.60; P < .001), and physician top-up intervention (RR 0.45; 95% CI 0.23-0.86; p = .011).
CONCLUSIONS: Analgesia onset was most rapid with CSE with no difference between DPE and EPLtechniques. The DPEtechniquehas improved block quality over the EPL technique with fewer maternal and fetal side effects than the CSE technique for parturients requesting early labor analgesia.

神经影像学中意识障碍患者的镇静：对静息状态脑功能连接的影响

Sedation of Patients With Disorders of Consciousness During Neuroimaging: Effects on Resting State Functional Brain Connectivity

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背景：为了减少静息状态功能性磁共振成像时的头部动作，临床上对意识障碍（DOC）患者经常用异丙酚镇静。然而，基于不同的鉴别诊断时镇静对于受损的大脑连接模式有何影响知之甚少。这项研究旨在评估这些影响。

方法：在过去几年内，以诊断和研究为目的，通过基于静息状态功能性磁共振成像扫描病人获得 3T 数据。在 20 例健康非镇静对照患者，8 例非镇静的意识障碍患者，8 例异丙酚镇静的意识障碍患者中，采用种子相关分析法检查高阶（默认模式，双侧外部控制，特征）静息状态的连接性和低阶（听觉、感觉运动和视觉）静息状态连接性，及与丘脑的连接性。根据发病年龄、病因、意识障碍时间、标准化行为评估分数、运动强度和脑损伤结构模式（如评估以 T1 为基础的像素形态分析方法）对 DOC 组患者进行匹配。

结果：除了视觉网络，意识障碍和其余所有的静息状态大脑网络功能连接的严重受损有关。丘脑和高阶网络区域连接也减少。患者接受异丙酚注射，导致丘脑和脑岛的连接性进一步减少。

结论：本研究表明大脑，包括丘脑和脑岛，功能连接性降低与异丙酚镇静相关，但与那些已经由于意识障碍引起的相关结构脑损伤相比较小。尽管如此，考虑到丘脑在脑兴奋的重要性，其破坏很可能反映了这些患者运动减少。然而，在这个问题上还需要更多的研究去完全解释这种现象。

（傅丹云译　陈杰校）

BACKGROUND: To reduce head movement during resting state functional magnetic resonance imaging, post-coma patients with disorders of consciousness (DOC) are frequently sedated with propofol. However, little is known about the effects of this sedation on the brain connectivity patterns in the damaged brain essential for differential diagnosis. In this study, we aimed to assess these effects.
METHODS: Using resting state functional magnetic resonance imaging 3T data obtained over several years of scanning patients for diagnostic and research purposes, we employed a seed-based approach to examine resting state connectivity in higher-order (default mode, bilateral external control, and salience) and lower-order (auditory, sensorimotor, and visual) resting state networks and connectivity with the thalamus, in 20 healthy unsedated controls, 8 unsedated patients with DOC, and 8 patients with DOC sedated with propofol. The DOC groups were matched for age at onset, etiology, time spent in DOC, diagnosis, standardized behavioral assessment scores, movement intensities, and pattern of structural brain injury (as assessed with

T1-based voxel-based morphometry).
RESULTS: DOC were associated with severely impaired resting state network connectivity in all but the visual network. Thalamic connectivity to higher-order network regions was also reduced. Propofol administration to patients was associated with minor further decreases in thalamic and insular connectivity.
CONCLUSIONS: Our findings indicate that connectivity decreases associated with propofol sedation, involving the thalamus and insula, are relatively small compared with those already caused by DOC-associated structural brain injury. Nonetheless, given the known importance of the thalamus in brain arousal, its disruption could well reflect the diminished movement obtained in these patients. However, more research is needed on this topic to fully address the research question.

周围神经阻滞后与神经系统并发症的相关风险因素：一项系统回顾

Factors Associated With Risk of Neurologic Complications After Peripheral Nerve Blocks: A Systematic Review
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局部麻醉后神经并发症的发生是一个复杂的过程，可能是由病人机体，药和环境相关危险因素的相互作用结果。这个系统综述的目的是为了评估定性的证据：与周围神经阻滞(PNB)后神经功能障碍有关的各种危险因素。MEDLINE, OVID 和 EMBASE 数据库是文献的主要来源。Cochrane、 LILACS、 DARE、IndMed、ERIC、NHS 和 HTA 通过进入英文综述和传播中心数据库 (CRD；约克大学)数据库被用来寻找额外的独特的研究结果。随机对照研究、病例对照研究、队列研究、回顾性调查和周围神经阻滞后神经系统的症状的案例报告或者病例系列报告都被包括在内。相关的、高质量的系统评价也符合要求。人类和动物研究中的危险因素对于神经阻滞研究结果是重要的，它们被分别进行评估。关于研究的设计、结果、质量信息由 2 位作者独立提取和评论审查。整体评级质量的证据被分配使用 GRADE (分级的建议评估、开发和评价)标准。有关全文的分类基于类型(前瞻性、回顾性和非临床的研究)。依据协会研究的质量和方向，研究异质性的等级被定义为高、中等、不确定或者不充分的。77 项临床研究的证据用来审查评估

各种人体机体、药和环境因素有相关的可能风险。大部分关于 3 种主要药品的损伤机制、压力、神经毒性的有害作用的证据是通过动物实验研究提取的(42 项研究)。在人类的危险因素调查中，神经的阻滞类型和神经系统并发症有着强烈的因果关系。神经内注射，这似乎通常发生在周围神经阻滞中，荟萃的结果显示为不一致性。为了提高神经阻滞精确度和减少并发症的发生的措施，如目前引导技术，结果显示相关措施的开展与神经并发症的发生率影响不大。预先存在风险因素的患者神经损伤后恢复似乎更糟糕。从不同的研究来分类和定义的神经系统并发症，综合证据变成难题。同时，一部分关于周围神经损伤与周围神经阻滞有意义的证据来自动物或实验室的研究，结果导致很难转化为临床现象。很少有预先设计为了验证某种特定的风险暴露因素和导致的神经系统后遗症之间关联的临床研究。在临床研究中仅有一些相关联的危险因素被确定，但证据的总体质量很低。大部分风险因素的证据来自于动物模型和案例报告。最后神经系统的并发症似乎表现的是机体、药和环境相关因素复杂的相互作用结果。

（方洪伟译　陈杰校）

The onset of neurologic complications after regional anesthesia is a complex process and may result from an interaction of host, agent, and environmental risk factors. The purpose of this systematic review was examine the qualitative evidence relating to various risk factors implicated in neurologic dysfunction after peripheral nerve block (PNB). The MEDLINE, OVID, and EMBASE databases were primary sources for literature. Cochrane, LILACS, DARE, IndMed, ERIC, NHS, and HTA via Centre for Reviews and Dissemination (CRD; York University) databases were searched for additional unique results. Randomized controlled studies, case-control studies, cohort studies, retrospective reviews, and case reports/case series reporting neurologic outcomes after PNB were included. Relevant, good-quality systematic reviews were also eligible. Human and animal studies evaluating factors important for neurologic outcomes were assessed separately. Information on study design, outcomes, and quality was extracted and reviewed independently by the 2 review authors. An overall rating of the quality of evidence was assigned using GRADE (Grading of Recommendations Assessment, Development and Evaluation) criteria. Relevant full-text articles were separated based on type (prospective, retrospective, and

nonhuman studies). Strengths of association were defined as high, moderate, inconclusive, or inadequate based on study quality and direction of association. The evidence from 77 human studies was reviewed to assess various host, agent, and environmental factors that have been implicated as possible risks. Most of the available evidence regarding the injurious effects of the 3 cardinal agents of mechanical insult, pressure, and neurotoxicity was extracted from animal studies (42 studies). Among the risk factors investigated in humans, block type had a strong association with neurologic outcome. Intraneural injection, which seems to occur commonly with PNBs, showed an inconsistent direction of association. Measures meant to increase precision and ostensibly reduce the occurrence of complications such as currently available guidance techniques showed little effect on the incidence of neurologic complications. Recovery from neurologic injury appears to be worse in patients with pre-existing risk factors. Categorization and definition of neurologic complication varied among studies, making synthesis of evidence difficult. Also, a significant portion of the evidence surrounding neurologic injury associated with PNB comes from animal or laboratory studies, the results of which are difficult to translate to clinical scenarios. Of the human studies, few had an a priori design to test associations between a specific risk factor exposure and resultant neurologic sequelae. A few risk factor associations were identified in human studies, but overall quality of evidence was low. Much of the evidence for risk factors comes from animal models and case reports. The final neurologic outcome seems to represent the complex interaction of the host, agent, and the environment.