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Anesth Analg July 2013 117:271-278; published ahead of print April 30, 2013

全麻復蘇期間靜脈注射葡萄糖與術後噁心嘔吐的關係：一項隨機對照試驗

The Relationship of Intravenous Dextrose Administration During Emergence from Anesthesia to Postoperative Nausea and Vomiting: A Randomized Controlled Trial

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Anesth Analg July 2013 117:34-42

背景：儘管預防性使用止吐藥，術後噁心嘔吐(PONV)仍有可能發生；並與意外入院、費用增加以及患者不滿相關。以往的研究表明靜脈注射（IV）葡萄糖對 PONV 有不同影響。本研究試圖確定全麻復蘇期間靜脈注射葡萄糖與 PONV 的關係。

方法：這是一項前瞻性、隨機、雙盲、對照試驗。預定接受婦科、泌尿科或乳腺日間手術，ASA 分級爲 I 級和 II 級的非糖尿病成年女性患者，隨機分配接受 250ml 乳酸林格氏液（P 組; n=75）或加入 5%葡萄糖的乳酸林格氏液輸注（D 組，n=87），她們在手術結束時開始輸液，持續 2h。在進入手術室前，在手術室內接受試驗液體輸注的前一刻及在麻醉恢復室內輸液完成時分別用快速血糖儀測量血糖。在抵達恢復室前不給予止吐藥。記錄抵達恢復室 0min，30min，60min，120min 以及 24h 的 PONV 評分，並記錄其他用藥。

結果：分析來源於 162 名有正常基線血糖患者的資料。這兩組患者的人口統計學、PONV 史或吸煙史沒有明顯差異。在麻醉結束後的第一個 2h 內，兩組患者的 PONV 發生率沒有明顯差異（D 組爲 52.9%，P 組爲 46.7%；差值 6.2%；95%置信區間〔CI〕爲-9.2%到 21.6%；P=0.43）。在 D 組與 P 組中，麻醉後 2h 內發生 PONV 的患者在恢復期間嚴重度評分>1 分的程度相似（分別爲 1.5 分、1.0 分；差值爲 0；95%CI 值爲 0%－0%；P =0.93）；兩組在到達恢復室 30min 內 PONV 的發生率相似（分別爲：65.2%，57.1%；差值 8.1%；95%CI 值爲-13.1%到 28.8%；P=0.46）；兩組超過 1 個劑量的止吐藥使用率相

似（分別爲：56.5%，62.9%；差值 6.3%；95%CI 值爲-26.9%到 15.1%；P=0.65）；兩組使用超過一種止吐藥的比例相似（分別爲：50.0%，54.3%；差值 4.3%；95%CI 值爲-25.5%到 17.4%；P=0.82）。

結論：在麻醉復蘇期間靜脈給予葡萄糖與麻醉結束後 2h 內 PONV 發生率的差異（超過 20%）或嚴重程度與 PONV 並不相關。PONV 與靜脈注射葡萄糖的最佳劑量以及注射時間之間的關係尚不清楚，可能需要進一步的研究。

（王苑　譯　陳傑　校）

BACKGROUND: Postoperative nausea and vomiting (PONV) may occur despite antiemetic prophylaxis and is associated with unanticipated hospital admission, financial impact, and patient dissatisfaction. Previous studies have shown variable impact of IV dextrose on PONV. We sought to determine the relationship of IV dextrose administered during emergence from anesthesia to PONV.

METHODS: This was a prospective, double-blind randomized placebo-controlled trial. Adult female ASA physical status I and II nondiabetic patients scheduled for outpatient gynecologic, urologic, or breast surgery were randomly assigned to infusion of 250 mL lactated Ringer's solution (group P; n = 75) or dextrose 5% in lactated Ringer's solution (group D; n = 87) over 2 hours beginning with surgical closing. Blood glucose was determined using a point-of-care device before transfer to the operating room, in the operating room immediately before study fluid infusion, and in the recovery room after study fluid infusion. No antiemetics were given before arrival in the recovery room. PONV scores were recorded at 0, 30, 60, and 120 minutes and 24 hours after arrival in the recovery room. Medication administration was recorded.

RESULTS: Data from 162 patients with normal baseline blood glucose were analyzed. There were no significant intergroup differences in demographics, history of PONV, or tobacco use. There was no significant intergroup difference in PONV during the first 2 hours after anesthesia (group D 52.9% vs group P 46.7%; difference, 6.2%; 95% confidence interval [CI], −9.2% to 21.6%; P = 0.43). Patients in groups D or P who developed PONV within 2 hours of anesthesia had similar number of severity scores ≥1 during recovery stay (1.5 vs 1.0; difference, 0; 95% CI, 0%–0%; P = 0.93); and similar proportions of: PONV onset within 30 minutes of recovery room arrival (65.2% vs 57.1%; difference, 8.1%; 95% CI, −13.1% to 28.8%; P = 0.46); more than 1 dose of antiemetic medication (56.5% vs 62.9%; difference, 6.3%; 95% CI, −26.9% to 15.1%; P= 0.65); or more than 1 class of antiemetic medication (50.0% vs 54.3%; difference, 4.3%; 95% CI, −25.5% to 17.4%; P = 0.82).

CONCLUSIONS: The administration of dextrose during emergence from anesthesia was not associated with a difference in the incidence of PONV exceeding 20% or in the severity of PONV in the first 2 hours after anesthesia. The relationship between PONV and the optimal dose and timing of IV dextrose administration remains unclear and may warrant further study.

技術交流：異丙酚在聚苯乙烯細胞培養皿中的穩定性

Technical Communication: Stability of Propofol in Polystyrene-Based Tissue Culture Plates

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Anesth Analg July 2013 117:65-67

據報導，異丙酚在玻璃中有高穩定性並且在聚氯乙烯醫學塑膠製品中有長達 24h 的相對高的穩定性。近期一些發表的文章觀察了異丙酚對培養皿中細胞和組織的影響。許多細胞培養皿由聚苯乙烯構成的，但很難找到有關暴露於聚苯乙烯中異丙酚穩定性的相關資訊。發現暴露于盛有細胞培養基的玻璃制器皿的異丙酚長達 24h 基本沒有變化，而暴露于 96-孔聚苯乙烯細胞培養皿中時出現了大量的藥物損失。於第一個小時藥物減少最快且一直持續 24h。用於與異丙酚一起進行試驗的細胞和組織培類的器皿類型可通過增加達到效應的所需劑量來改變結果。

（鄭華容　譯　陳傑　校）

Propofol has been reported to have high stability in glass and relatively high stability up to 24 hours in polyvinyl chloride-based medical plastics. Recent publications have observed the effects of propofol on cells and tissues grown in culture. Many cell culture plastics are formulated from polystyrene but we could find little information on the stability of propofol exposed to these products. We observed very little change in the concentration of propofol diluted in cell culture medium over 24 hours when exposed to glass, but substantial loss of the drug when exposed to 96-well polystyrene cell culture plates. This decrease was most rapid in the first hour but continued until 24 hours. The type of plastic used in cell and tissue culture experiments with propofol may influence the results by increasing the apparent dose required to see an effect.

單肺通氣時全心舒張末容量和血管外肺水指數的評價：經肺熱稀釋技術是否可用？

An Assessment of Global End-Diastolic Volume and Extravascular Lung Water Index During One-Lung Ventilation: Is Transpulmonary Thermodilution Usable?

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Anesth Analg July 2013 117:83-90

背景：使用經肺熱稀釋技術得到的熱稀釋曲線是計算全心舒張末容量指數（GEDI）和血管外肺水指數（EVLWI）的基礎。此方法是否受單肺通氣的影響，直至現今尚未明確。因此，本研究目的爲評估單肺通氣對熱稀釋曲線和對 GEDI 及 EVLWI 評估的影響。
方法：23 頭豬使用經肺熱稀釋技術來評估平均通過時間、下坡時間和血溫差（ΔTb）。通過肺動脈血流探頭（PAFP）測得“金標準”的心輸出量並用於 GEDIPAFP 和 EVLWIPAFP 的計算。分別測量正常血容量狀態下雙肺通氣時（M1），單肺通氣 15min 後（M2）和低血容量狀態（放血 20ml/kg）下雙肺通氣時（M3）和單肺通氣 15 分鐘後（M4）的參數。
結果：正常血容量和低血容量狀態下，ΔTb 的增加和平均通過時間及下坡時間的減少（所有 P<0.04）證明了熱稀釋曲線的形態明顯受單肺通氣影響。正常血容量（M1: 459.9 ± 67.5 mL/m2; M2: 397.0 ± 54.8 mL/m2; P = 0.001）和低血容量狀態下（M3: 300.6 ± 40.9 mL/m2; M4: 275.2 ± 37.6 mL/m2; P = 0.03）GEDIPAFP 在單肺通氣後有明顯降低。同樣正常血容量（M1: 9.0 [7.3, 10.1] mL/kg; M2: 7.4 [5.8, 8.3] mL/kg; P = 0.01）和低血容量狀態下（M3: 7.4 [6.3, 9.7] mL/kg; M4: 5.8 [5.2, 7.4]) mL/kg; P = 0.0009）EVLWIPAFP 在單肺通氣後也有明顯降低。
結論：熱稀釋曲線形態和 GEDI 及 EVLWI 的評估明顯受到單肺通氣的影響。

（孫莉荔　譯　陳傑　校）

BACKGROUND: The thermodilution curve assessed by transpulmonary thermodilution is the basis for calculation of global end-diastolic volume index (GEDI) and extravascular lung water index (EVLWI). Until now, it was unclear whether the method is affected by 1-lung ventilation. Therefore, aim of our study was to evaluate the impact of 1-lung ventilation on the thermodilution curve and assessment of GEDI and EVLWI.
METHODS: In 23 pigs, mean transit time, down slope time, and difference in blood temperature (ΔTb) were assessed by transpulmonary thermodilution. "Gold standard" cardiac output was measured by pulmonary artery flowprobe (PAFP) and used for GEDIPAFP and EVLWIPAFP calculations. Measurements were performed during normovolemia during double-lung ventilation (M1), 15 minutes after 1-lung ventilation (M2) and during hypovolemia (blood withdrawal 20 mL/kg) during double-lung ventilation (M3) and again 15 minutes after 1-lung ventilation (M4).
RESULTS: Configuration of the thermodilution curve was significantly affected by 1-lung ventilation demonstrated by an increase in ΔTb and a decrease in mean transit time and down slope time (all $P < 0.04$) during normovolemia and hypovolemia. GEDIPAFP was lower after 1-lung ventilation during normovolemia (M1: 459.9 ± 67.5 mL/m2; M2: 397.0 ± 54.8 mL/m2; $P = 0.001$) and hypovolemia (M3: 300.6 ± 40.9 mL/m2; M4: 275.2 ± 37.6 mL/m2; $P = 0.03$). EVLWIPAFP also decreased after 1-lung ventilation in normovolemia (M1: 9.0 [7.3, 10.1] mL/kg; M2: 7.4 [5.8, 8.3] mL/kg; $P = 0.01$) and hypovolemia (M3: 7.4 [6.3, 9.7] mL/kg; M4: 5.8 [5.2, 7.4]) mL/kg; $P = 0.0009$).
CONCLUSION: Configuration of the thermodilution curve and therefore assessment of GEDI and EVLWI are significantly affected by 1-lung ventilation.

自主呼吸狀態下成人完全呼氣對於鎖骨下靜脈位置和大小的影響

The Effect of Full Expiration on the Position and Size of the Subclavian Vein in Spontaneously Breathing Adults

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Anesth Analg July 2013 117:109-113

背景：如果鎖骨下靜脈穿刺時進行完全呼氣可增加鎖骨下靜脈和胸膜間的距離或增加靜脈直徑，它有可能減少氣胸發生率和/或增加靜脈穿刺成功率。此項研究評估自主呼吸狀態下的成年人進行完全呼氣對鎖骨下靜脈到胸膜的距離和對鎖骨下靜脈橫斷面面積的影響。
方法：分別用超聲測量 20 名成年人平臥位時在吸氣末和呼氣末右鎖骨下靜脈的下緣與胸膜的距離（SCVinf-Pleura distance），靜脈中心與胸膜的距離(SCVcen-Pleura distance)和靜脈的橫斷面面積。然後在 15°頭低腳高位時再次測量這些資料。
結果：靜脈中心與胸膜的距離在平臥位 (0.005 cm, 95%可信區間 −0.04 到 0.05) 和頭低腳高位(0.02 cm, 95%可信區間−0.005 to 0.05)時變化均較小。SCV 下緣與胸膜的距離在平臥位呼氣末時減小, 但改變僅有 0.07 cm (95% 可信區間 0.03–0.11; $P = 0.003$). 在頭低腳高位

時, 這些距離未有變化(0.02 cm, 95% 可信區間 −0.01 to 0.06)。不論在平臥位元還是頭低腳高位，與吸氣末相比，完全呼氣狀態下鎖骨下靜脈的橫斷面至少增加 14%。
結論：鎖骨下靜脈與胸膜的距離在完全呼氣狀態下未有改變。然而在自主呼吸病人的鎖骨下導管放置時此種最簡單技術仍能考慮使用，因爲它顯著增加鎖骨下靜脈的橫斷面面積。
（詹愷誕　譯　陳傑　校）
BACKGROUND: If full expiration during subclavian venous cannulation increases the distance between the subclavian vein (SCV) and the pleura or increases the diameter of the vein, it might decrease the incidence of pneumothorax and/or increase the success rate of venous cannulation. In this study, we evaluated the effect of full expiration on the distance from the SCV to the pleura and on the crosssectional area (CSA) of the SCV in spontaneously breathing adults.
METHODS: The distance from the inferior border of the right SCV and the pleura (SCVinf-Pleura distance), the distance from the center of the vein to the pleura (SCVcen-Pleura distance), and the CSA of the vein were measured using ultrasound at the end of inspiration and at the end of full expiration in 20 adults placed in the horizontal position. The subjects were then placed in 15° Trendelenburg tilt, and the distances and the CSA were measured again.
RESULTS: The SCVcen-Pleura distances were changed minimally in the horizontal position (0.005 cm, 95% confidence interval [CI] −0.04 to 0.05) and in the Trendelenburg position (0.02 cm, 95% CI −0.005 to 0.05). The SCVinfPleura distances decreased at the end of full expiration in the horizontal position, but the change was only 0.07 cm (95% CI 0.03–0.11; P = 0.003). In the Trendelenburg position, those distances remained unchanged (0.02 cm, 95% CI −0.01 to 0.06). Compared with endinspiration, the SCV CSA after full expiration increased by at least 14% in both the horizontal position and the Trendelenburg position.
CONCLUSIONS: The distance from the SCV to the pleura did not change after full expiration. However, this simple technique can still be considered during placement of subclavian catheters in spontaneously breathing patients, because it significantly enlarges the CSA of the SCV.

術後殘餘肌松與不良臨床預後的相關性

Postoperative Residual Neuromuscular Blockade Is Associated with Impaired Clinical Recovery

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Anesth Analg July 2013 117:133-141

背景：此項調查試圖確定在麻醉後監護室中，神經肌肉阻滯殘餘作用的客觀證據（四個成串刺激 [TOF]比值<0.9) 與主觀肌無力症狀的類型、發生率和嚴重程度之間的聯繫。
方法：在進入 PACU 時，使用肌肉加速度描計法將 149 例患者的 TOF 比值進行量化。患者被分爲兩組：TOF <0.9 組 (n = 48)和 TOF ≥0.9（對照）組(n = 101)。使用一項標準化測試來確定從進入 PACU 時和之後 20min，40min，60min 是否存在肌無力的 16 種症狀和 11 種跡象。
結果: 從進入 PACU (TOF <0.9 組 vs 對照組的肌無力症狀中位數[區間]：7 [3–6] vs 2 [0–11]；差值=5，,99%可信區間差值=4-6)到之後 60min（TOF <0.9 組 vs 對照組：(2 [0–12] vs

0 [0–11] 對照組; 差值=2, 99%可信區間差值=1-2)（所有 P < 0.0001)，TOF <0.9 組在各時間點上肌無力的發生率要顯著高於對照組 (P < 0.001)，。
結論：在麻醉後監護室中，TOF<0.9 的病人會增加肌無力症狀的發生率和嚴重程度。
（諸琳婕　譯　陳傑　校）

BACKGROUND: In this investigation, we sought to determine the association between objective evidence of residual neuromuscular blockade (train-of-four [TOF] ratio <0.9) and the type, incidence, and severity of subjective symptoms of muscle weakness in the postanesthesia care unit (PACU).
METHODS: TOF ratios of 149 patients were quantified with acceleromyography on arrival to the PACU. Patients were stratified into 2 cohorts: a TOF <0.9 group (n = 48) or a TOF ≥0.9 (control) group (n = 101). A standardized examination determined the presence or absence of 16 symptoms and 11 signs of muscle weakness on arrival to the PACU and 20, 40, and 60 minutes after admission.
RESULTS: The incidence of symptoms of muscle weakness was significantly higher in the TOF <0.9 group at all times (P < 0.001), as was the median (range) number of symptoms from PACU arrival (7 [3–6] TOF <0.9 group vs 2 [0–11] control group; difference 5, 99% confidence interval of the difference 4–6) until 60 minutes after admission (2 [0–12] TOF <0.9 group vs 0 [0–11] control group; difference 2, 99% confidence interval of the difference 1–2) (all P < 0.0001).
CONCLUSION: The incidence and severity of symptoms of muscle weakness were increased in the PACU in patients with a TOF <0.9.

一項關於驗證胃食管反流疾病作爲腦癱患者脊椎術後手術部位感染的一個新危險因素的回顧性研究

A Retrospective Identification of Gastroesophageal Reflux Disease as a New Risk Factor for Surgical Site Infection in Cerebral Palsy Patients After Spine Surgery

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Anesth Analg July 2013 117:162-168

背景：神經肌肉性脊柱側彎是造成脊柱融合術術後手術部位感染（SSI）的一項已知危險因素，據報導感染率高達 11.2%。儘管某些感染因素如抗生素使用時間掌握之前也被提及，而本研究目的爲驗證合併神經肌肉性脊柱側彎的腦癱（CP）患者發生 SSI 的內在危險因素。本研究假設脊柱融合術後出現 SSI 的 CP 患者與那些發生院內感染的患者有著類似的風險特徵。

方法：本文回顧分析了從 1998 年 1 月到 2008 年 6 月接受脊柱融合術後出現手術部位感染的腦癱患者的資料，這些患者由作者單位所屬感染控制辦公室使用國家院內感染監測系統標準（N=34）來確認。從作者單位的脊柱資料庫中尋找人口統計學及程式相關匹配的非感染對照患者（N=37）。本研究比較了兩組的胃食管返流疾病（GERD），胃酸抑制藥物使用，術前褥瘡發生率，先前感染和術後機械通氣幾個方面。使用多因素 logistic 回歸來評估各預測因素對於“深度感染”和“任意感染”的相對影響。
結果：在 30 例可評價的感染患者中，70%發生了切口 SSI。儘管許多感染是多種微生物引起，但最常見的病原體是格蘭氏陰性菌。許多重要的預測因素通過單因素 logistic 回歸分析確認與任意感染和深度感染相關。多因素 logistic 回歸僅發現了一項重要影響即 GERD（比值比 6.1；95%可信區間 1.9-21.3；P=0.002）與任意感染相關；反之，使用胃酸抑制藥物進行治療所產生的影響沒有達到統計學意義（比值比 6.1，95%可信區間 0.84-44.6；P=0.07）。未發現兩兩因素間有相互作用。在所有入組物件中，GERD 發生率爲 46.3%。
結論：GERD 增加了腦癱患者脊柱融合術後感染的風險，還需要前瞻性多中心研究來證實此危險因素的預測價值。
（瞿亦楓　譯　陳傑　校）

BACKGROUND: Neuromuscular scoliosis is a known risk factor for surgical site infection (SSI) after spinal fusion, with reported infection rates as high as 11.2%. Although risk factors such as antibiotic timing have been previously addressed, our objective was to identify intrinsic risk factors for SSI in cerebral palsy (CP) patients with neuromuscular scoliosis. We hypothesized that CP patients who develop SSI after spine fusion would have a risk profile similar to those who develop nosocomial infection.
METHODS: We retrospectively analyzed records from patients with CP who developed infections after spinal fusion from January 1998 until July 2008, who were identified by our Infection Control Officer using National Nosocomial Infection Surveillance System criteria (N = 34). Demographically and procedurally matched controls without infection were identified from our spine database (N = 37). We compared these groups for gastroesophageal reflux disease (GERD), use of gastric acid inhibitors, presence of preoperative decubitus ulcer, previous infection, and postoperative ventilation. Multivariable logistic regression was then performed to assess the relative contributions of the predictors to “deep infection” and “any infection.”
RESULTS: Of 30 evaluable infected patients, 70% had incisional SSI. Although many of the infections were polymicrobial, the most common pathogens identified were Gram-negative bacilli. Many significant predictors were identified by univariable logistic regression for any infection and deep infection. Multivariable logistic regression found a significant effect only for GERD (odds ratio, 6.4; 95% confidence interval, 1.9–21.3; P = 0.002) for any infection, whereas the effect of therapy with gastric acid inhibitors did not reach statistical significance (odds ratio, 6.1 [95% confidence interval, 0.84–44.6]; P = 0.07). No significant interaction between the 2 factors was detected. Among our controls and infected patients altogether, 46.3% had GERD.
CONCLUSIONS: We show that GERD increases the risk for infection in CP patients after spine fusion. Prospective multicenter studies are necessary to further validate the predictive value of this risk factor.

特約撰稿：口頰壞疽重建手術的氣道管理
Special Article: Airway Management in Reconstructive Surgery for Noma (Cancrum Oris)

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Anesth Analg July 2013 117:211-218;

走馬疳（口頰壞疽）是一種貧窮和營養不良性疾病，主要發病於發展中國家 10 歲以下的兒童。儘管大部分兒童在最初感染時因敗血症、或繼發於因嚴重牙關緊閉或不能進食造成的饑餓而死亡，仍有小部分患者存活，並需要對嚴重的面部瘢痕和畸形進行重建手術。這些患者給麻醉醫師帶來氣道管理方面的問題。對 26 例接受 I 期和 II 期重建手術的患者進行報導，重點關注於如何行氣道管理。結果顯示通過先進的技術和工具制定個性化的計畫，可以安全和成功地進行氣道管理。側重於前/上氣道的傳統性測試有助於評估患者因口頰壞疽導致的面部畸形。
（黃萍　譯　陳傑　校）
Noma (cancrum oris) is a disease of poverty and malnutrition, which predominantly affects children younger than 10 years in developing countries. Although the majority of sufferers die of sepsis at the time of the initial infection, or of subsequent starvation due to severe trismus and an inability to eat, a small minority of patients survive and require reconstructive surgery for severe facial scarring and deformity. These patients present significant problems to the anesthesiologist with regard to airway management. We present a series of 26 patients undergoing primary and subsequent reconstructive surgery, with particular focus on airway management. We show that airway management, while challenging, can be performed safely and successfully by using individualized airway plans but may require advanced techniques and equipment. Traditional tests focusing on the anterior/superior airway are helpful in assessing patients with facial deformity due to noma.

綜述:超聲引導是否有利於疼痛介入治療?一項慢性疼痛預後的系統性綜述

Review Article: Is Ultrasound Guidance Advantageous for Interventional Pain Management? A Systematic Review of Chronic Pain Outcomes

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Anesth Analg July 2013 117:236-251

背景:現代超聲(US)是一種替代解剖標誌物、神經刺激及螢光介導的治療慢性疼痛綜合征的熱門技術。
方法:此綜述比較了傳統引導技術和超聲引導技術對介入治療慢性疼痛的操作、有效性及安全性的影響。本文確定了 46 項關於超聲引導應用於不同慢性疼痛介入治療的研究,包括品質較高的 41 項系列病例報導和 5 項隨機試驗。

結果:研究結果表明較解剖標誌法、神經刺激法及螢光介導法，通過超聲引導法來治療慢性疼痛，有著非劣或更優的可操作性和安全相關預後。
結論:目前缺乏足夠的資料來支援超聲引導治療短期和長期慢性疼痛的有效性。
（孫曉瓊　譯　陳傑　校）
BACKGROUND: Modern ultrasound (US) is an attractive alternative to anatomical landmark-, nerve stimulation-, and fluoroscopic-guided techniques for interventional procedures performed to treat chronic pain syndromes.
METHODS: In this review, we evaluated the effects of US guidance compared with traditional guidance techniques on performance, efficacy, and safety outcomes for interventional chronic pain procedures. We identified 46 studies, including 41 case series and 5 randomized trials of intermediate-to-good quality that investigated the use of US guidance for a diverse variety of chronic pain procedures.
RESULTS: Our results suggest that US guidance can match or improve performance- and safety-related outcomes compared with many anatomic landmark-, nerve stimulation-, and fluoroscopic-guided techniques for treating chronic pain.
CONCLUSIONS: There are presently insufficient data to support improved efficacy with procedures performed with US guidance for relieving both short- and long-term chronic pain.

超聲引導技術和解剖定位技術行隱神經阻滯的比較：一項前瞻、對照、雙盲、交叉試驗

A Comparison of Ultrasound-Guided and Landmark-Based Approaches to Saphenous Nerve Blockade: A Prospective, Controlled, Blinded, Crossover Trial

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Anesth Analg July 2013 117:265-270

背景：隱神經阻滯通常用於膝蓋以下的手術。採用不同的方法，成功率的變化可以在33%至 88%之間。此項前瞻性志願者實驗對 2 種超聲引導技術，即改進的股內側隱神經阻滯和股骨周圍隱神經神經阻滯，與膝部下區域阻滯技術進行比較。
方法:在此項單盲，交叉，前瞻性的試驗中，20 名成年志願者接受用 3 種不同的隱神經阻滯方法。阻滯成功的主要終點爲在隱神經分佈的遠端三分之二區域產生感覺消失。次要終點包括阻滯時間，感覺消失時間，阻滯過程中的疼痛，以及運動無力。
結果：和膝以下區域阻滯 30%的成功率相比，改良的股內側阻滯和股骨周圍阻滯技術兩者的成功率更高（80%，分別 50%的置信區間[CI]的差異, 23%–77%, P = 0.009, 和 100%, 70%的置信區間的差異，41%–91%, P < 0.001 ）。但超聲引導的股骨周圍神經阻滯技術和改良股內側神經阻滯技術之間並沒有顯著的差異（置信區間的差異爲 20%，-7%到 49%，p=0.125）。除了與膝部以下區域阻滯相比，股骨周圍技術的操作時間更短(P=0.07)；其他測量參數也無統計學差異。
結論：此項前瞻性研究證明超聲引導下膝部以上隱神經神經阻滯與膝部以下區域阻滯相比，有更高的成功率且操作時間更短。
（馬霄雯　譯　陳傑　校）

BACKGROUND: Blockade of the saphenous nerve is often used for surgeries below the knee. Depending on the approach, success rates vary widely ranging from 33% to 88%. In this prospective volunteer study, we compared 2 ultrasound-guided techniques, the modified vastus medialis and perifemoral saphenous nerve block with a below the knee field block.
METHODS: Twenty volunteer adults, in a single-blinded, crossover, prospective trial underwent 3 different saphenous nerve blocks. The primary end point of block success was loss of sensation in the distal two-thirds distribution of the saphenous nerve. Secondary variables included time to perform the block, time to sensory loss, pain during block, and motor weakness.
RESULTS: Compared with the below the knee field block success rate (30%), both the modified vastus medialis and perifemoral techniques had significantly higher success rates (80%, difference 50% with confidence interval [CI], 23%–77%, P = 0.009, and 100%, difference 70% with CI, 41%–91%, P < 0.001, respectively). However, the difference when comparing the perifemoral ultrasound technique against the modified vastus medialis ultrasound technique did not show significance (difference 20% with CI, −7% to 49%, P = 0.125). Also, no statistical differences were found with the other variables measured, except the perifemoral technique showed faster block performance times than below the knee field block (P = 0.007).
CONCLUSION: In our prospective study, we have demonstrated that ultrasound-guided above the knee saphenous nerve blocks have higher success rates than a below the knee field block and are easily performed in a short amount of time.

使用旋轉式血栓彈力儀分析無血小板血漿的最大血凝塊穩定性受不同實驗方法影響

Thromboelastometric Maximum Clot Firmness in Platelet-Free Plasma Is Influenced by the Assay Used

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Anesth Analg July 2013 117:23-29

背景：粘彈性測試是測定外源性活化途徑的凝血塊在血小板抑制情況下的彈性，如血栓彈力圖(TEG)或旋轉式血栓彈力儀(ROTEM)對功能性纖維蛋白原聚合分析(FFPAs)。尚沒有研究顯示除了受血小板抑制的影響外，FFPAs 的組成對纖維蛋白聚合是否有影響。
方法：我們使用多種不含血小板的血漿製品，並比較了外源性活化途徑 ROTEM 分析(EXTEM)和 3 種 FFPAs：細胞鬆弛素 D 修正的血栓彈力測定(FIBTEM)，FIBTEM+和功能性纖維蛋白原測試(FFTEG)。我們使用了校準血漿(I.L 公司和西門子)、混合新鮮冰凍血漿(octaplas)和取自一名健康志願者的新鮮製備的不含血小板的血漿。EXTEM 和所有的 FFPAs 均在 ROTEM 儀器上平行測定。
結果：所有血漿製品的最大血凝塊穩定性(MCF)值中位數(四分位距)爲：EXTEM 組 20.5mm (17.25-22.0mm)；FIBTEM 組 23.0mm(18.5-24.0mm)；FIBTEM+組 23.0mm(18.25-24.75mm)；FFTEG 組 18.0mm(16.0-19.0mm)。與 EXTEM 組相比，FIBTEM 組和 FIBTEM+組 MCF 值升高而 FFTEG 組 MCF 值降低(p<0.001)。進一步使用不含血小板的血漿實驗結果顯示，FFPAs 組中含有的血小板抑制劑(細胞鬆弛素 D 或血小板糖蛋白 IIb/IIIa

受體抑制劑阿昔單抗)並不引起 MCF 值的變化。然而降低活化組織因數的濃度(稀釋 EXTEM)會降低 MCF 值。
結論：我們推測 FIBTEM 和 FIBTEM+可能含有促進纖維蛋白聚合的穩定劑，而與 ROTEM 分析相比 FFTEG 中組織因數含量較少。
（朱怡琦譯 薛張綱校）
BACKGROUND: Viscoelastic tests such as functional fibrinogen polymerization assays (FFPAs) in thrombelastography (TEG®) or thromboelastometry (ROTEM®) measure the elasticity of extrinsically activated clotting under conditions of platelet inhibition. There are no reports on whether components of the FFPAs have any effects on fibrin polymerization, aside from the effects of platelet inhibition.
METHODS: Using various platelet-free plasma (PFP) preparations, we compared the extrinsically activated EXTEM thromboelastometric assay with 3 FFPAs: FIBTEM, FIBTEM PLUS, and the Functional Fibrinogen Test® (FFTEG). These FFPAs activate coagulation extrinsically but additionally inhibit platelet function. We used calibration plasma (Instrumentation Laboratory and Siemens), pooled fresh-frozen plasma (Octaplas) and freshly prepared PFP from a healthy volunteer. EXTEM and all FFPAs were run in parallel on a ROTEM device.
RESULTS: Median (interquartile range) maximum clot firmness (MCF) values for all plasma preparations were: 20.5 mm (17.25–22.0 mm) in EXTEM, 23.0 mm (18.5–24.0 mm) in FIBTEM, 23.0 mm (18.25–24.75 mm) in FIBTEM PLUS, and 18.0 mm (16.0–19.0 mm) in FFTEG. Compared with EXTEM, FIBTEM and FIBTEM PLUS ($P < 0.01$) showed increased MCF values whereas FFTEG ($P < 0.001$) showed decreased MCF values. Further experiments in PFP showed that the platelet inhibitors used in the FFPAs (cytochalasin D or the glycoprotein-IIb/IIIa inhibitor abciximab) were not causing these alterations in MCF. However, reducing the activating tissue factor concentration (by diluting the extrinsic assay) decreased the MCF.
CONCLUSIONS: We speculate that FIBTEM and FIBTEM PLUS may contain stabilizing agents that enhance fibrin polymerization whereas FFTEG might contain less tissue factor than the ROTEM assays.

美沙酮在人體肝細胞內自身誘導 N 脫甲基化的機制

Mechanism of autoinduction of methadone N-demethylation in human hepatocytes.
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Anesth Analg July 2013 117:52-60

背景：美沙酮的代謝和清除機制在個體與個體間以及個體內都有相當大的差異。由於美沙酮隨時間增長的肝內清除（自身誘導），使其在治療的初期的劑量確定受到相當大的挑戰。儘管 美沙酮的 N 脫甲基化在體外由細胞色素酶 P4502B6(CYP2B6)以及 CYP3A4 誘導，並由 CYP2B6 活化清除，它的自身誘導機制並未完全明確。在本研究中，研究者利用人類肝細胞明確美沙酮自身誘導的機制。
方法：將新鮮的人體肝細胞暴露於 0.1 至 10μM 濃度的美沙酮 72 小時後，進行細胞清洗並評估美沙酮的 N 脫甲基化。同時測量 CYP2B6，CYP3A4，以及 CYP3A5 信使 RNA

（mRNA）,蛋白質表達（通過無凝膠高效液相色譜質譜分析）以及其催化活性（CYP2B6 對安非他酮的羥基化以及 CYP3A4/5 對阿芬太尼的脫烷基化的作用）。通過研究孕烷 X 受體構造雄甾烷的受體的基因檢測研究 CYP 的誘導機制

結果：美沙酮（10 μM）可以提高美沙酮的 N 脫甲基化 2 倍，CYP2B6 和 CYP3A4 mRNA 三倍，以及蛋白質表達 2 倍。CYP3A5 mRNA 無改變。CYP2B6 和 CYP3A4/5 活性提高兩倍。美沙酮對映異構體的誘導作用（R-美沙酮 對比 S-美沙酮）無顯著差異。與最大劑量的苯巴比妥以及利福平的誘導相比其誘導作用相對較弱。低濃度美沙酮劑量影響較小。美沙酮是孕烷 X 受體激動劑，但不是構造雄甾烷受體激動劑。

結論： 由美沙酮引起的濃度依賴的在人體肝細胞內的美沙酮自身誘導 N 去甲基化與其誘導 CYP2B6 和 CYP3A4 mRNA 表達，蛋白表達以及催化活性相關。其誘導作用去孕烷 X 受體有關，但與結構雄甾烷受體啓動無關。這些體外研究的結果可以給予臨床上美沙酮的自身誘導的代謝與清除機制提供一定的見解。

（陳婉南譯 薛張綱校）

BACKGROUND: There is considerable interindividual and intraindividual variability in methadone metabolism and clearance. Methadone dosing is particularly challenging during initiation of therapy, because of time-dependent increases in hepatic clearance (autoinduction). Although methadone N-demethylation is catalyzed in vitro by cytochrome P4502B6 (CYP2B6) and CYP3A4, and clearance in vivo depends on CYP2B6, mechanism(s) of autoinduction are incompletely understood. In this investigation, we determined mechanism(s) of methadone autoinduction using human hepatocytes.

METHODS: Fresh human hepatocytes were exposed to 0.1 to 10 μM methadone for 72 hours. Cells were washed and methadone N-demethylation assessed. CYP2B6, CYP3A4, and CYP3A5 messenger RNA (mRNA), protein expression (by gel-free high-performance liquid chromatography mass spectrometry) and catalytic activity (bupropion hydroxylation and alfentanil dealkylation for CYP2B6 and CYP3A4/5, respectively) were measured. Mechanisms of CYP induction were characterized using pregnane X receptor and constitutive androstane receptor reporter gene assays.

RESULTS: Methadone (10 μM) increased methadone N-demethylation 2-fold, CYP2B6 and CYP3A4 mRNA 3-fold, and protein expression 2-fold. CYP3A5 mRNA was unchanged. CYP2B6 and CYP3A4/5 activities increased 2-fold. Induction by methadone enantiomers (R-methadone versus S-methadone) did not differ. Induction was relatively weak compared with maximum induction by phenobarbital and rifampin. Lower methadone concentrations had smaller effects. Methadone was an agonist for the pregnane X receptor but not the constitutive androstane receptor.

CONCLUSIONS: Methadone caused concentration-dependent autoinduction of methadone N-demethylation in human hepatocytes, related to induction of CYP2B6 and CYP3A4 mRNA expression, protein expression, and catalytic activity. Induction was related to pregnane X receptor but not constitutive androstane receptor activation. These in vitro findings provide mechanistic insights into clinical autoinduction of methadone metabolism and clearance.

連續無創動脈血壓在經導管主動脈瓣置換術中快速心室起搏時的準確度和靈敏度

The accuracy and responsiveness of continuous noninvasive arterial pressure during rapid ventricular pacing for transcatheter aortic valve replacement.

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Anesth Analg July 2013 117:76-82

背景：連續無創動脈血壓監測(CNAP)技術在心跳驟停時的準確度尚不明確。
方法：選取 33 例擇期行經股動脈介入主動脈瓣置換術,鎮痛鎮靜中的病人。比較嚴重低血壓暴露下（快速心室起搏所致的功能性心跳驟停）的功能性有創動脈血壓（IAP）和 CNAP，其餘時間無嚴重低血壓。兩組均記錄收縮壓、舒張壓和平均動脈壓並使用 Bland-Altman plots 法進行統計分析。CNAP 技術的靈敏度通過嚴重低血壓相關的時間和變化幅度各個方面來評估。
結果：CNAP 相較 IAP 總的準確度(偏倚)爲收縮壓-6.3 ± 18.9, 舒張壓 7.4 ± 10.5, 平均壓 4.0 ±11.3mm Hg(mean ± SD)。嚴重低血壓時偏倚增加爲收縮壓 11.8 ± 14.5,舒張壓 13.8 ± 12.4, 平均壓 12.9 ± 12.4 mm Hg.CNAP 對應的 IAP 兩組血壓差值小於 15mmHg 定義爲一致性(95%可信限),總的一致性爲舒張壓 58.5% (57.9-58.6), 舒張壓 75.8% (75.5-76.0), 平均壓 82.2% (81.9-82.4);快速起搏時一致性爲收縮壓 56.4% (54.2-58.9; P = 0.71), 舒張壓 53.2%* (51.1-56.0), 平均壓 57.4%* (56.3-59.1; *P < 0.001) . CNAP 和 IAP 平均值的相關性較好,在快速起搏各時相差別不顯著.
結論：快速起搏中突然發生心跳驟停和血壓恢復基礎水準時,CNAP 監護儀(model 500at, software V3.5)可以準確快速的測量血壓變化。CNAP 可以檢測停搏時程。
（李春譯 薛張綱校）
BACKGROUND: The accuracy ofmeasurementofthe continuous noninvasive arterial blood pressure (CNAP) technique is unknown during sudden cardiocirculatory arrest.
METHODS: In33patientsundergoingelective transfemoral aortic valve implantation procedures under analgesic sedation, invasive arterial bloodpressure (IAP) was compared with a CNAP device during episodes of severe hypotension (functional cardiocirculatory arrests by rapid pacing) and the remaining time without severe hypotension. Systolic, diastolic, and mean pairs of blood pressure measurements were extracted for both groups and were analyzed by Bland-Altman plots. The responsiveness of the CNAP technique was assessed in the various phases of severe hypotension concerning time and amplitude of changes.
RESULTS: Overall CNAP accuracy (bias), calculated by subtracting IAP from CNAP, was -6.3 ± 18.9, 7.4 ± 10.5, and 4.0 ± 11.3 mm Hg (mean ± SD, systolic, diastolic, and mean). Bias increased during episodes of severe hypotension to 11.8 ± 14.5, 13.8 ± 12.4, and 12.9 ± 12.4 mm Hg. The percentage of agreements (95% confidence interval) between the blood pressure pairs with a difference ≤15 mm Hg was 58.5% (57.9-58.6), 75.8% (75.5-76.0), 82.2% (81.9-82.4; systolic, diastolic, mean) for all data and 56.4% (54.2-58.9; P = 0.71), 53.2%* (51.1-56.0), and 57.4%* (56.3-59.1; *P < 0.001) during rapid pacing. The responsiveness of mean CNAP and mean IAP did not differ significantly during the various phases of rapid pacing.
CONCLUSIONS: The stand-alone CNAP monitor (model 500at, software V3.5) accurately and rapidly measures the changes of blood pressure that occur during sudden development of cardiocirculatory arrest and recovery to baseline blood pressures. CNAP monitors the duration of the arrest.

專論：術中放置中心靜脈導管後導絲誤留體內

Special article: retained guidewires after intraoperative placement of central venous catheters.

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Anesth Analg July 2013 117:102-108

摘要：導引鋼絲誤留體內是中心靜脈導管放置過程中少見的併發症，與操作者的疲勞、經驗不足、注意力不集中以及缺乏適當的監督有關。術中放置中心靜脈導管後導絲誤留的真實發生率是未知的。我們報導了 4 例手術室麻醉人員在中心靜脈穿刺操作時誤留導絲的病例。在涉及的病例中，往往出現了導管放置過程中患者臨床狀況惡化及進行了需要插入多根導絲的複雜操作。6 年以來在我們的機構中，術中誤留導絲的發生率爲 1/3291（95% 可信區間爲 1/10000 到 8/10000）。
（凌曉敏譯 薛張綱校）
Guidewire retention is a rare complication of central venous catheter placement, and has been related to operator fatigue, inexperience, and inattention, and inadequate supervision of trainees. The true incidence of guidewire loss after intraoperative placement of central venous catheters is unknown. We report 4 cases of guidewire loss after central venous access procedures performed by anesthesia providers in the operating room. Worsening of patients' clinical condition during catheter placement and complex procedures necessitating more than one guidewire insertion are recurring scenarios in cases involving guidewire loss. Over 6 years at our institution, intraoperative wire loss occurred at a rate of 1:3291 procedures (95% confidence interval of 1/10,000 to 8/10,000).

關於 4 種寰樞椎頸椎病人的氣道設備在屍體模型上的比較

A Comparison of 4 Airway Devices on Cervical Spine Alignment in Cadaver Models of Global Ligamentous Instability at C1-2.

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Anesth Analg July 2013 117:126-132

背景：先進的氣道管理的效果對於高位頸椎病人的效果是不確定的。
方法：研究對不穩定型頸椎屍體氣管插管時機械中斷的可能性，我們進行了一項對於 3 具屍體前瞻性觀察性的群組研究的專案。我們先在略微做了防腐處理的屍體上建立了一個不穩定的 2 型寰樞椎齒狀突骨折和薄弱的 global ligamentous，然後進行重複插管並與 4 個不同的氣道設備（Airtraq 喉鏡，光棒，插管型喉罩，和 Macintosh 喉鏡）以說明建立穩定的人工氣道軸。通過使用電磁設備收集動作分析資料來評估在困難插管時每種設備 3 個軸的角度運動的程度（屈伸，軸向旋轉，側彎）。插管由急診技術人員或主治麻醉師來操作。
結果：總體而言，4 種設備共插管 153 次並進行記錄。在寰樞椎病人，光棒設備可以顯著減少屈伸和自旋的角度。對比插管型喉罩（屈伸角度的平均差在 3.2°{CI}, 0.9°–5.5°],P = 0.003;自旋角度的平均差在 1.6°[95% CI, 0.3°–2.8°], P = 0.01）。對比 Macintosh 喉鏡（屈伸角度的平均差在 3.1° [95% CI, 0.8°–5.4°], P = 0.005; 自旋角度的平均差在 1.4° [95% CI 0.1°–2.6°], P = 0.03).）

結論：在不穩定型寰樞椎屍體模型上，光棒技術使用的動作幅度可以比 Macintosh 喉鏡和插管型喉罩更小。

（徐崢譯 薛張綱校）

BACKGROUND: The effects of advanced airway management on cervical spine alignment in patients with upper cervical spine instability are uncertain.

METHODS: To examine the potential for mechanical disruption during endotracheal intubation in cadavers with unstable cervical spines, we performed a prospective observational cohort study with 3 cadaver subjects. We created an unstable, type II odontoid fracture with global ligamentous instability at C1-2 in lightly embalmed cadavers, followed by repetitive intubations with 4 different airway devices (Airtraq laryngoscope, Lightwand, intubating laryngeal mask airway [LMA], and Macintosh laryngoscope) while manual in-line stabilization was applied. Motion analysis data were collected using an electromagnetic device to assess the degree of angular movement in 3 axes (flexion-extension, axial rotation, and lateral bending) during the intubation trials with each device. Intubation was performed by either an emergency medical technician or attending anesthesiologist.

RESULTS: Overall, 153 intubations were recorded with the 4 devices. The Lightwand technique resulted in significantly less flexion-extension and axial rotation at C1-2 than with the intubating LMA (mean difference in flexion-extension 3.2° [95% confidence interval {CI}, 0.9°–5.5°],
P = 0.003; mean difference in axial rotation 1.6° [95% CI, 0.3°–2.8°], P = 0.01) and Macintosh laryngoscope (mean difference in flexion-extension3.1° [95% CI, 0.8°–5.4°], P = 0.005; mean difference in axial rotation 1.4° [95% CI 0.1°–2.6°], P = 0.03).

CONCLUSIONS: In cadavers with instability at C1-2, the Lightwand technique produced less motion than the Macintosh and intubating LMA. (Anesth Analg 2013;117:126–32)

使用椎管內麻醉術的胎頭外倒轉術促進分娩時胎兒臀部先出術的總費用分析。

Brief report: cost analysis of neuraxial anesthesia to facilitate externalcephalic version for breech fetal presentation.

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Anesth Analg July 2013 117:155-159

背景：在本次研究中，探索使用椎管內麻醉術的胎頭外倒轉術促進胎兒臀部先出術的總費用分析。

方法:我們使用可以同時可以分析結果和不確定性概率的電腦成本分析模型。通過在試驗中使用椎管內麻醉術的胎頭外倒轉術與不使用椎管內麻醉術的胎頭外倒轉術的對比，估計胎兒臀部先出術的總預期成本。

結果：研究發現，使用椎管內麻醉術的胎頭外倒轉術的成功平均概率爲 60%（單獨研究從 44%到 87%），而不使用椎管內麻醉術的胎頭外倒轉術的成功平均概率爲 38%（單獨研究從 31%到 58%）。　　使用椎管內麻醉術的胎頭外倒轉術的成功或者失敗的預計費用

平均爲$8931（95%的可信區間爲$8541-$9252）。的不使用椎管內麻醉術的胎頭外倒轉術的成功或者失敗的費用平均爲$9207（95%的可信區間爲$8896-$9419）。使用椎管內麻醉術的胎頭外倒轉術的平均預計費用比不使用椎管內麻醉術的胎頭外倒轉術的平均預計費用少$-276（95%的可信區間爲$-720- $112）。

結論：對於使用椎管內麻醉術的胎頭外倒轉術的胎兒臀部先出術的總成本可能比不使用軸椎管內麻醉術減少最多 720 美元或增加最多 112 美元。使用椎管內麻醉術可以增加胎頭外倒轉術的成功率，同時，隨後減少的臀部剖宮產率可以抵消麻醉促進胎頭外倒轉術的費用。

（徐升譯 薛張綱校）

BACKGROUND: In this study, we sought to determine whether neuraxial anesthesia to facilitate external cephalic version (ECV) increased delivery costs for breech fetal presentation.

METHODS: Using a computer cost model, which considers possible outcomes and probability uncertainties at the same time, we estimated total expected delivery costs for breech presentation managed by a trial of ECV with and without neuraxial anesthesia.

RESULTS: From published studies, the average probability of successful ECV with neuraxial anesthesia was 60% (with individual studies ranging from 44% to 87%) compared with 38% (with individual studies ranging from 31% to 58%) without neuraxial anesthesia.

The mean expected total delivery costs, including the cost of attempting/performing ECV with anesthesia, equaled $8931 (2.5th-97.5th percentile prediction interval $8541-$9252). The cost was $9207 (2.5th-97.5th percentile prediction interval $8896-$9419) if ECV was attempted/performed without anesthesia. The expected mean incremental difference between the total cost of delivery that includes ECV with anesthesia and ECV without anesthesia was $-276 (2.5th-97.5th percentile prediction interval $-720 to $112).

CONCLUSION: The total cost of delivery in women with breech presentation may be decreased (up to $720) or increased (up to $112) if ECV is attempted/performed with neuraxial anesthesia compared with ECV without neuraxial anesthesia. Increased ECV success with neuraxial anesthesia and the subsequent reduction in breech cesarean delivery rate offset the costs of providing anesthesia to facilitate ECV.

GlideScope® 可視喉鏡和直接喉鏡在兒童困難氣道的比較試驗，以及對鏡片型號作用的評估

A Comparative Trial of the GlideScope® Video Laryngoscope to Direct Laryngoscope in Children with Difficult Direct Laryngoscopy and an Evaluation of the Effect of Blade Size

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Anesth Analg July 2013 117:176-181

背景：GlideScope® 可視喉鏡(GVL)有助於氣道管理，但在兒科患者的困難氣道管理中尚未明確其有效性。在這項試驗中，我們入選了在直接喉鏡下 Cormack 和 Lehane 評分(C&L grade) ≥3 分的兒科患者，評估了 GVL 改善咽喉暴露的有效性。我們同時評估了不同型號鏡片的作用。

方法：這個隨機開放試驗在協力廠商兒科中心進行。入選了 C&L 評分≥3 分，或者之前就是困難氣道的患者。由直接喉鏡(DL)評估初始 C&L 評分。如果患者 C&L 評分≥3 分，再隨機地用可視喉鏡 GVLw(根據體重選擇鏡片型號)和 GVLs(比 GVLw 小一個型號)評估。以上都由同一位有經驗的麻醉科醫生完成。所有咽喉部顯示圖像的評分都需有或無各個方向上甲狀軟骨按壓(BURP 手法)。試驗的主要結果是用 DL 和 GVLw 時 C&L 評分的差異，次要結果是 GVLw 和 GVLs 間 C&L 評分的差異。爲了統計分析，C&L 評分做了資料轉化。

結果：共有 23 個患者入組。DL 和 GVLw 在暴露咽喉視野上沒有顯著差異(98.3%的置信區間[CI]，0-1 無 BURP，P= 0.15；0-1 有 BURP，P= 0.11)。然而，GVLs 和 DL，GVLs 和 GVLw 在暴露咽喉視野上有顯著差異。前者(98.3%的置信區間[CI]，3.5-5.0 無 BURP，P= 0.00007；3.5-4.5 有 BURP，P= 0.0001)，後者(98.3%的置信區間[CI]，3.0-4.5 無 BURP，P= 0.00007；2.5-4.0 有 BURP，P= 0.0001)。試驗中無不良事件發生。

結論： 直接喉鏡下 C&L 評分≥3 分的患者，與 DL 或 GVLw 相比，GVLs 能顯著改善咽喉部暴露。GVLs 更推薦用於困難氣道的兒科患者。

(陳實玉譯 薛張綱校)

BACKGROUND: GlideScope® video laryngoscope (GVL) has been proposed to be useful for airway management, but its efficacy for difficult airways has not been confirmed in pediatric patients. In this study, we evaluated the usefulness of the GVL for improving the laryngoscopic view in patients whose Cormack and Lehane grade (C&L grade) was ≥3 under direct laryngoscopy. We also assessed the effect of GVL blade size on the laryngoscopic view.

METHODS: This randomized open trial was conducted in a tertiary pediatric center. Patients whose previous C&L grade was ≥3, or who were anticipated to have a difficult airway, were enrolled. The initial modified C&L grade was scored using a direct laryngoscope (DL). If the patient's C&L grade was ≥3, the laryngoscopic view was scored again using GVLw (selected based on weight) and GVLs (1 size smaller than GVLw) in random order by a single experienced anesthesiologist. All laryngoscopic views were graded both with and without the backward, upward, and right lateral displacement of the thyroid cartilage (BURP) maneuver. The primary outcome was the difference in the C&L grade between DL and GVLw, and the secondary outcome was that between GVLw and GVLs. For statistical analysis, the modified C&L grade was converted to an ordinal scale.

RESULTS: Data from 23 pediatric patients were analyzed. When compared with DL, improvement of laryngoscopic view with the GVLw wa not obvious (98.3% confidence interval [CI] for differences of ordinal scale, 0–1 without BURP, P = 0.15 and 0–1 with BURP, P = 0.11). However, GVLs improved the laryngoscopic view in comparison with both DL (98.3% CI for differences, 3.5–5.0 without BURP, P = 0.00007 and 3.5–4.5 with BURP, P = 0.0001) and GVLw (98.3% CI for differences, 3.0–4.5 without BURP, P = 0.00007 and 2.5–4.0 with BURP, P = 0.0001). There was no adverse outcome during this study.

CONCLUSIONS: In patients with C&L grade ≥3 under direct laryngoscopy, GVLs significantly improved the laryngoscopic view when compared with DL or GVLw. The GVLs is recommended for improving the laryngoscopic view in patients with a difficult airway.

一組對比腰椎關節腔內注射類固醇類激素治療背部疼痛和腰椎內射頻去神經根治療背部疼痛的隨機，控制，雙盲臨床試驗。

A comparison of intraarticular lumbar facet joint steroid injections and lumbar facet joint radiofrequency denervation in the treatment of low back pain: a randomized, controlled, double-blind trial.

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Anesth Analg July 2013 117:228-235

背景：15%到 45%的腰背部疼痛的病人是由腰椎關節退行性變而引起慢性腰背部疼痛。文獻報導了多種針對腰椎關節平面相關性疼痛的治療方法，例如腰椎關節腔內注射類固醇激素及腰椎內射頻去神經根。在這項研究中，我們對比了這兩種方法的效果。
方法：本研究是以隨機，雙盲，控制的研究方法選取在腰椎平面（L3/L4-L5/S1）注射類固醇激素的病人及在（L3/L4-L5/S1）節段接受射頻去神經跟治療的病人入組。入組標準首先基於核磁共振成像顯示 L3/L4-L5/S1 關節平面的腫大及 L3/L4-L5/S1 關節腔內注射局麻藥的陽性反應。第一終點評價是 Roland-Morris 調查問卷，第二個終點評價是視覺類比測量和 Osewesry 功能障礙指數。所有結果的評估都是 6 月之內根據相同基線執行的。
結果：入組 56 個隨機病人，其中 29 個類固醇藥物注射組病人中有 24 個在 6 個月中完成隨訪，27 個去神經跟組病人中有 26 個在 6 個月中完成隨訪。兩個組中都觀察到了疼痛的緩解和功能的改善。用第一終點評估方法（95%可靠區間，-3 到 4）及第二終點評估方法（視覺類比測量法 95%可靠區間，-2 到 1；Osewesry 功能障礙指數 95%可靠區間，-18 到 0）評估兩組病人的療效並未見顯著差別。
結論：關節腔內注射類固醇藥物，射頻去神經根法已成爲治療慢性功能限制性性腰背部疼痛的可選方法，並可取得中短期內疼痛緩解及功能恢復等效果，但兩種方法的療效是相似的。
（蔣鑫梅譯 薛張綱校）

BACKGROUND：Lumbar facet joint degeneration is a source of chronic low back pain, with an incidence of 15% to 45% among patients with low back pain. Various therapeutic techniques in the treatment of facet-related pain have been described in the literature, including intraarticular lumbar facet joint steroid injections and radiofrequency denervation. In this study, we compared the effectiveness of intraarticular facet joint steroid injections and radiofrequency denervation.
METHODS: Our randomized, double-blind, controlled study included patients who received intraarticular steroid infiltrations in the lumbar facet joints (L3/L4-L5/S1) and patients who underwent radiofrequency denervation of L3/L4-L5/S1 segments. The inclusion criteria were based first on magnetic resonance imaging findings showing hypertrophy of the facet joints L3/L4-L5/S1 and a positive response to an intraarticular test infiltration of the facet joints L3/L4-L5/S1 with local anesthetics. The primary end point was the Roland-Morris Questionnaire. Secondary end points were the visual analog scale and the Oswestry Disability Index. All outcome assessments were performed at baseline and at 6 months.
RESULTS: Fifty-six patients were randomized; 24 of 29 patients in the steroid injection group and 26 of 27 patients in the denervation group completed the 6-month follow-up. Pain relief and functional improvement were observed in both groups. There were no significant differences between the 2 groups for the primary end point (95% confidence interval [CI], -3 to 4) and for

both secondary end points (95% CI for visual analog scale, -2 to 1; 95% CI for Oswestry Disability Index, -18 to 0).
CONCLUSIONS: Intraarticular steroid infiltration or radiofrequency denervation appear to be a managing option for chronic function-limiting low back pain of facet origin with favorable short- and midterm results in terms of pain relief and function improvement, but improvements were similar in both groups.

聯合應用羅呱卡因和舒芬太尼在老年人創傷性股骨頸手術中進行椎管內減壓麻醉的劑量反應研究

Hypobaric spinal anesthesia with ropivacaine plus sufentanil for traumatic femoral neck surgery in the elderly: a dose-response study.

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Anesth Analg July 2013 117:259-264

背景:在這項針對老年人創傷性股骨頸手術中進行的隨機性前瞻試驗中，我們試圖確定在提供 95%有效藥物劑量(ED95)舒芬太尼的條件下輕比重羅呱卡因的有效劑量。
方法:68 位單側髖部骨折老年患者隨機接受 6、8、10 和 12mg 輕比重羅呱卡因脊髓內注射，同時聯合進行 5μg 舒芬太尼的注射。患者接受脊髓注射後保持側臥位 15 分鐘。如果能實現單側第 12 胸椎以上的感覺阻斷，則判定該劑量爲有效。通過 logit 回歸分析確定 ED95。應用卡方趨勢檢驗對嚴重和極嚴重的低血壓(分別指收縮壓減少大於標準的 30% 和 40%)以及瑞芬太尼的使用在各組間進行比較。
結果:三名病人由於藥物未能達到蛛網膜下腔被排除。各組間標準人口統計資料無差異。輕比重羅呱卡因 ED95 確定爲 9mg(95% 可信區間爲 8-14mg)。輕比重羅呱卡因劑量的逐步增加 (6、8、10 和 12mg)和低血壓的發生率呈正相關(53%、47%、87%和 81%，P=0.0004)，而和瑞芬太尼的使用則呈負相關(41%、12%、0%和 0%，P=0.0004)。手術組和非手術組的感覺阻滯效應存在顯著統計學差異(P<0.0001)，但在使用羅呱卡因的各組中無明顯差異(P=0.16)。各組間在運動阻滯、極嚴重低血壓、麻黃堿總劑量、手術時間、病人滿意度、手術狀況以及外科醫生滿意度得分等指標上均無顯著差異。試驗過程中沒有出現心動過緩的病例，沒有病人第 12 胸椎以下部位在術前保持側臥位 15 分鐘後出現感覺，也沒有一例轉變爲全身麻醉狀態。各組間病例術後不良後果和肌鈣蛋白值均無顯著差異。
結論:聯合應用舒芬太尼 5μg 條件下，輕比重羅呱卡因在老年創傷性股骨頸手術患者進行脊髓麻醉中的 ED95 爲 9mg(95%可信區間爲 8-14mg)。輕比重羅呱卡因使用劑量一旦超過 ED95 可使低血壓的發生率增高，如果使用劑量小於 ED95，則必須使用額外的鎮痛量。（劉毅譯 薛張綱校）

BACKGROUND: In this randomized, prospective trial, we sought to determine the effective dose of hypobaric ropivacaine with sufentanil providing 95% success (ED95) in spinal anesthesia for traumatic femoral neck surgery in the elderly.
METHODS: Sixty-eight elderly patients with unilateral hip fracture randomly received 6, 8, 10, or 12 mg spinal hypobaric ropivacaine combined with 5 μg sufentanil. Patients remained in a

lateral position for 15 minutes after spinal injection. The dose was considered successful if a unilateral sensory block >T12 was achieved, and there was no need for additional analgesia or conversion to general anesthesia. The ED95 was determined using logit analysis. The incidence of severe and very severe hypotension (systolic blood pressure decrease by >30% and >40% baseline, respectively) and the use of remifentanil were compared among groups using $\chi(2)$ test for trend.

RESULTS: Three patients were excluded because of failure to reach the subarachnoid space. No differences in baseline demographic data were observed among groups. The ED95 for hypobaric ropivacaine was determined to be 9 mg (95% confidence interval, 8-14). Increasing doses of ropivacaine (6, 8, 10, and 12 mg) demonstrated a positive trend with respect to incidence of hypotension (53%, 47%, 87%, and 81%, P = 0.0004) and a negative trend with respect to the use of remifentanil (41%, 12%, 0%, and 0%, P = 0.0004). A significant difference in the level of sensory block (P < 0.0001) was observed among operative and nonoperative sides but not among ropivacaine dosing groups (P = 0.16). No difference in motor blockade, incidence of very severe hypotension, total dose of ephedrine, duration of surgery, patient satisfaction, operating conditions, or surgeon satisfaction scores was observed among groups. No cases of bradycardia were observed. No patient had a preoperative sensory level <T12 after 15 minutes in the lateral decubitus position, and no cases were converted to general anesthesia. There was no difference in undesirable outcomes or postoperative troponin values among groups.

CONCLUSIONS: The effective dose of hypobaric ropivacaine combined with sufentanil 5 μg providing 95% success in spinal anesthesia for traumatic femoral neck surgery in the elderly is ED95 = 9 mg (95% confidence interval, 8-14). Using doses exceeding the ED95 may increase the incidence of hypotension. If doses less than the ED95 are chosen, the use of additional analgesia may be necessary.

心肺轉流術後纖維蛋白原水準與心臟手術中大量紅細胞輸注之間的關係：一項觀察性研究

The Relationship Between Fibrinogen Levels After Cardiopulmonary Bypass and Large Volume Red Cell Transfusion in Cardiac Surgery: An Observational Study

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Anesth Analg July 2013 117:14-22

背景：凝血障礙導致的過多失血和大量紅細胞輸注是心肺轉流的心臟手術中由於圍術期纖維蛋白原水準降低而發生的一個常見併發症。我們探索了心肺轉流術後纖維蛋白原水準與大量紅細胞輸注之間的關係。

方法：在這項回顧性觀察性研究中，收集了某一個機構中從 2005 年到 2011 年行心臟手術且在心肺轉流術後測定了纖維蛋白原水準的患者。用三次樣條函數和接受者運行特性分析來評估心肺轉流術後纖維蛋白原水準和大量紅細胞輸注之間的關係（大量紅細胞輸注的定義爲：手術當天或者術後一天大於或等於 5 個單位的輸血量）。用多變數 logistic 回歸分析和傾向評分分析以評估纖維蛋白原水準和大量輸血之間的獨立關係。
結果：在納入的 4605 例患者中，當纖維蛋白原水準降低到低於大約 2.0 g/L，大量輸血的概率會增加。以低於 2.0 g/L 作爲纖低維蛋白原臨界值，1918（42%）名患者被劃分爲低纖維蛋白原組群，其有 363（18.9%）人需要大量輸血，而纖維蛋白原水準≥2.0 g/L 的 2688 名患者中有 164（13.5%）人需要大量輸血(P < 0.0001)。在低纖維蛋白原組中，大量輸血的未經調整比值比（95%置信區間）爲 1.5（1.3–1.7）。通過 Logistic 回歸和傾向評分方法得到的風險調整後比值比分別爲 1.8 (1.4–2.2)和 1.5(1.2–2.0)。
結論：雖然在本研究的目的不是來檢測出血病人的臨界纖維蛋白原水準，但是其結果表明“在出血患者中不能開始補充纖維蛋白原，除非纖維蛋白原水準降低到 0.8 至 1.0 g/L”的目前建議太過於保守。需要隨機試驗來確定在出血患者中是否需要維持高的纖維蛋白原水準以便能減少失血和輸血，從而達到提高改善心臟外科手術的臨床預後。
（趙曉 譯 馬皓琳 李世通 校）

BACKGROUND: Coagulopathy leading to excessive blood loss and large volume red cell transfusion is a frequent complication of cardiac surgery with cardiopulmonary bypass (CPB) that may be caused by low perioperative fibrinogen levels. We explored the relationship between post-CPB fibrinogen levels and large volume red cell transfusion.
METHODS: Patients who underwent cardiac surgery with CPB from 2005 to 2011 at a single institution and had a fibrinogen level measured after CPB were included in this retrospective observational study. The relationship between post-CPB fibrinogen levels and large volume red cell transfusion (defined as ≥5 units transfused on the day of or the day after surgery) was assessed by cubic spline function and receiver operating characteristic analyses. The independent relationship between fibrinogen levels and large volume transfusion was assessed by multivariable logistic regression and propensity score analyses.
RESULTS: In the 4606 patients included, the probability of large volume transfusion increased when fibrinogen levels decreased below approximately 2.0 g/L. Using <2.0 g/L as the threshold for low fibrinogen, 1918 (42%) were categorized into the low fibrinogen group, of whom 363 (18.9%) had large volume transfusion compared with 164 (13.5%) of the 2688 patients whose fibrinogen level was ≥2.0 g/L (P < 0.0001). In the low fibrinogen group, the unadjusted odds ratio (95% confidence interval) for large volume transfusion was 1.5 (1.3–1.7). The risk-adjusted odds ratio obtained by logistic regression was 1.8 (1.4–2.2) and by propensity score methods was 1.5 (1.2–2.0).
CONCLUSIONS: While this study was not equipped to detect the critical fibrinogen level in bleeding patients, its results suggest that current recommendations that fibrinogen replacement not be initiated in bleeding patients unless fibrinogen levels decrease below 0.8 to 1.0 g/L may be too conservative. Randomized trials are needed to determine whether maintaining higher fibrinogen levels in bleeding patients can reduce blood loss and transfusions and by that means improve clinical outcomes in cardiac surgery.

牙科診所中小兒面罩麻醉誘導期間雙面罩對麻醉廢氣水準的影響

The Effect of the Double Mask on Anesthetic Waste Gas Levels During Pediatric Mask Inductions in Dental Offices

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Anesth Analg July 2013 117:43-46

小兒患者使用吸入麻醉藥進行面罩誘導，接受全身麻醉有一大部分發生在牙科診所，這可能導致廢氣污染。我們評估了牙科診所內小兒全麻期間麻醉藥物的職業性暴露和應用“雙面罩”誘導的有效性。9 家獨立性牙科診所分別在雙面罩系統應用之前和之後即刻進行麻醉廢氣濃度的測定。應用雙面罩時 9 家診所中笑氣水準的中位數從 40.0 兆北率（ppm；四分位區間=23.0—46.0 ppm，n=9）下降到 3.0 ppm，（四分位區間=2.3—4.7 ppm，n = 9，P=0.0055），沒有一家診所中笑氣水準超出 25 ppm（95%可信區間上限 34%）。使用雙面罩時七氟烷水準的中位數從 4.60 ppm（四分位區間=3.10—7.00 ppm，n = 9）下降到 0 ppm（四分位區間=0—0.39 ppm，n = 9，P = 0.0024），沒有一家診所中超出 2 ppm（95%可信區間上限 34%）。在這一研究中我們展示了在獨立性牙科診所中小兒面罩麻醉誘導期間，應用雙面罩系統協同牙科“高容量”吸引器（抽空裝置產生約 12 m3/h 的高容量）與傳統面罩誘導相比較，足以降低至少三分之二診所對麻醉廢氣的暴露。
（盛嘉君 譯 馬皓琳 李士通 校）

A significant portion of office-based general anesthesia for pediatric patients is performed in dental offices and involves mask inductions with inhaled drugs. This can lead to significant pollution with waste gases. We assessed occupational exposure to anesthetic drugs during pediatric general anesthesia in dental offices and assessed the effectiveness of the “double mask.” Nine freestanding dental offices had measurements of anesthetic waste gas levels taken before and immediately after implementation of a double-mask system. Levels of nitrous oxide decreased from a median of 40.0 parts per million (ppm; interquartile range [IQR] = 23.0–46.0 ppm, n = 9) to 3.0 ppm, (IQR = 2.3–4.7 ppm, n = 9, P = 0.0055) and exceeded 25 ppm in 0% of the 9 offices (upper 95% confidence limit 34%) when using the double mask. Levels of sevoflurane decreased from a median of 4.60 ppm (IQR = 3.10–7.00 ppm, n = 9) to 0 ppm (IQR = 0–0.39 ppm, n = 9, P = 0.0024) and exceeded 2 ppm in 0% of the 9 offices (upper 95% confidence limit 34%) when using the double mask. We demonstrated in our study that the double-mask system, when used with dental “high-volumes” suctions (high-volume evacuators producing approximately 12 m3/h) in freestanding dental offices, was sufficient to decrease the exposure to anesthetic waste gas during pediatric mask induction in at least two thirds of offices when compared with the traditional mask.

彩虹聲學監測和二氧化碳監測測定呼吸頻率及發現呼吸暫停的準確性、精確性以及可靠性

The Accuracy, Precision and Reliability of Measuring Ventilatory Rate and Detecting Ventilatory Pause by Rainbow Acoustic Monitoring and Capnometry

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Anesth Analg July 2013 117:69-75

背景：目前用於監測呼吸頻率方法的限制性包括準確性和精確性較差以及患者耐受性差。這項研究中，我們在術後患者評估了一種新的聲學呼吸頻率監測技術相對於二氧化碳監測儀和一種參照方法的準確性、精確性、可靠性以及發現通氣中呼吸暫停的能力。
方法：送到麻醉後監護室中的成年患者通過一個粘在頸部的生物聲學感測器（RAS-125, rev C）與帶有聲學監測技術的脈搏 CO-血氧監測儀（Rad-87, 版本號 7804, Masimo, Irvine, 加利福尼亞州）連接。同時每位患者帶有一個鼻腔插管與一台床旁二氧化碳監測儀（Capnostream20, 版本號 4.5, Oridion, Needham, 麻塞諸塞州）相連接。聲學監測儀和二氧化碳監測儀與電腦連接進行連續聲學和呼末二氧化碳波形記錄。記錄結果由一位元經過培訓的技術員進行回顧性分析，通過觀察兩種波形同時傾聽聲學信號記錄的呼吸聲音來辨別並標記呼吸週期中吸氣相和呼氣相，不使用聲學監測儀或二氧化碳監測儀來計算呼吸頻率。每台設備通過一個軟體程式（TagEditor, Masimo）來自動計算參照呼吸頻率。評估每台設備的準確性（與各自參照值相比）和精確性並相互比較。同時也測定發現呼吸暫停的敏感性（呼吸暫停定義爲在通氣週期中無吸氣或呼氣活動≥30 秒）。還評估了設備的可靠性，即每個設備顯示一個數值且沒有落下一個測定值的發生率。
結果：33 例成年患者（73%女性）被納入研究，年齡爲 45 ± 14 歲，體重爲 117 ± 42 千克。2 台設備共分析了總時長爲 3712 分鐘（平均每位患者 112 分鐘）的監護記錄，參照呼吸頻率範圍從 1.9 到 49.1 次/分。聲學監測儀與二氧化碳監測儀相比，其呼吸頻率準確性(P = 0.0056)和精確性(P- = 0.0024)明顯較好。兩種監護儀平均超過 97%的監護時間顯示了監護資料。聲學監測儀和二氧化碳監測儀的（0.95, 0.95）較低耐受限度分別爲 94%和 84%。在 21 次呼吸暫停事件中，聲學監測儀發現呼吸暫停的敏感性稍好（81%比 62%，P = 0.0461）。
結論：這項針對術後患者人群的研究中，聲學監測儀和二氧化碳監測儀均能可靠地監測呼吸頻率。統計學顯示，聲學監測儀較二氧化碳監測儀有更好的準確性和精確性，但表現出的差別並不明顯。觀察到的差別是否有臨床意義尚未得知。聲學監測儀在發現呼吸暫停方面較二氧化碳監測儀更敏感。聲學監測儀可以爲術後患者提供一個有效而方便的呼吸頻率監測手段。
（張怡 譯 馬皓琳 李士通 校）
BACKGROUND: Current methods for monitoring ventilatory rate have limitations including poor accuracy and precision and low patient tolerance. In this study, we evaluated a new acoustic ventilatory rate monitoring technology for accuracy, precision, reliability, and the ability to detect pauses in ventilation, relative to capnometry and a reference method in postsurgical patients.
METHODS: Adult patients presenting to the postanesthesia care unit were connected to a Pulse CO-Oximeter with acoustic monitoring technology (Rad-87, version 7804, Masimo, Irvine, CA) through an adhesive bioacoustic sensor (RAS-125, rev C) applied to the neck. Each subject also wore a nasal cannula connected to a bedside capnometer (Capnostream20, version 4.5, Oridion, Needham, MA). The acoustic monitor and capnometer were connected to a computer for

continuous acoustic and expiratory carbon dioxide waveform recordings. Recordings were retrospectively analyzed by a trained technician in a setting that allowed for the simultaneous viewing of both waveforms while listening to the breathing sounds from the acoustic signal to determine inspiration and expiration reference markers within the ventilatory cycle without using the acoustic monitor- or capnometer-calculated ventilatory rate. This allowed the automatic calculation of a reference ventilatory rate for each device through a software program (TagEditor, Masimo). Accuracy (relative to the respective reference) and precision of each device were estimated and compared with each other. Sensitivity for detection of pauses in ventilation, defined as no inspiration or expiration activity in the reference ventilatory cycle for ≥30 seconds, was also determined. The devices were also evaluated for their reliability, i.e., the percentage of the time when each displayed a value and did not drop a measurement.
RESULTS: Thirty-three adults (73% female) with age of 45 ± 14 years and weight 117 ± 42 kg were enrolled. A total of 3712 minutes of monitoring time (average 112 minutes per subject) were analyzed across the 2 devices, reference ventilatory rates ranged from 1.9 to 49.1 bpm. Acoustic monitoring showed significantly greater accuracy (P = 0.0056) and precision (P- = 0.0024) for respiratory rate as compared with capnometry. On average, both devices displayed data over 97% of the monitored time. The (0.95, 0.95) lower tolerance limits for the acoustic monitor and capnometer were 94% and 84%, respectively. Acoustic monitoring was marginally more sensitive (P = 0.0461) to pauses in ventilation (81% vs 62%) in 21 apneic events.
CONCLUSIONS: In this study of a population of postsurgical patients, the acoustic monitor and capnometer both reliably monitored ventilatory rate. The acoustic monitor was statistically more accurate and more precise than the capnometer, but differences in performance were modest. It is not known whether the observed differences are clinically significant. The acoustic monitor was more sensitive to detecting pauses in ventilation. Acoustic monitoring may provide an effective and convenient means of monitoring ventilatory rate in postsurgical patients.

評估對各種臨床情況中的非臥床病人提供分鐘通氣量持續監測的一種新型無創呼吸監測儀

Evaluation of a Novel Noninvasive Respiration Monitor Providing Continuous Measurement of Minute Ventilation in Ambulatory Subjects in a Variety of Clinical Scenarios

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Anesth Analg July 2013 117:91-100

背景：目前還沒有一種技術可以對未插管的病人進行通氣量是否充足的無創監測。現在發明了一種新型的無創通氣量檢測儀(RVM)，對各種臨床病人可以持續監測和顯示分鐘通氣量(MV)、潮氣量(TV)和呼吸頻率(RR) 。我們探討未插管的病人在不同的臨床相關的呼吸模式下，RVM 相較於標準的肺活量計的準確性和精准度。
方法：31 個自願者完成了這次基礎研究。我們分別在第一天和第二天從 RVM 和肺活量計上同時收集和分析每個受試者的 MV、TV 和 RR 的測定值，來測定呼吸正常、快、慢、無規律及聲門閉合時的準確性、精准性和偏倚。

結果：資料表明對較廣範圍的非臥床受試者來說，RVM 和肺活量計監測到的 MV 和 TV 相當，其中平均誤差<10% (準確性的 95% 可信區間<16%, 精度性 <12%, 偏倚 <11%)。再次進行差異分析發現 RVM 和肺活量計在監測 MV、TV 和 RR 上無顯著差異（P > 0.7）。然而，成對差異等效檢驗表明來自於兩種儀器的 MV 和 TV 監測值相等，差異都是在 ±15%範圍內。

結論：本研究說明 RVM 可以在臨床上相當準確且精確地在 24 小時裡各種呼吸模式期間監測 MV、TV 和 RR。

（王慧娟 譯 馬皓琳 李士通 校）

BACKGROUND: Currently there is no technology that noninvasively measures the adequacy of ventilation in nonintubated patients. A novel, noninvasive Respiratory Volume Monitor (RVM) has been developed to continuously measure and display minute ventilation (MV), tidal volume (TV), and respiratory rate (RR) in a variety of clinical settings. We demonstrate the RVM's accuracy and precision as compared with a standard spirometer under a variety of clinically relevant breathing patterns in nonintubated subjects.

METHODS: Thirty-one voluntary subjects completed the primary study. MV, TV, and RR measurements were collected from the RVM and spirometer simultaneously for each participant on day 1 and day 2 and analyzed to determine accuracy, precision, and bias for normal, fast, slow, irregular, and closed-glottis breathing.

RESULTS: Data demonstrated that RVM and spirometer measurements of MV and TV are equivalent in a wide range of ambulatory subjects with an average error <10% (95% confidence interval for accuracy <16%, precision <12%, and bias <11%). Repeated measures analysis of variance found no significant difference between spirometry and RVM individual measurements of MV, TV, and RR (P > 0.7), whereas a paired-difference equivalent test demonstrated, with 99% power, that both MV and TV measurements from the 2 devices are equivalent within ±15%.

CONCLUSIONS: This study demonstrates RVM's clinically relevant accuracy and precision in measuring MV, TV, and RR over a 24-hour period and during various breathing patterns.

頭低足高位和胸內壓對麻醉患者鎖骨下橫截面積及鎖骨下靜脈到胸膜距離的影響

The Effects of the Trendelenburg Position and Intrathoracic Pressure on the Subclavian Cross-Sectional Area and Distance from the Subclavian Vein to Pleura in Anesthetized Patients

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Anesth Analg July 2013 117:114-118

背景: 增加胸內壓和處於頭低足高位對於鎖骨下靜脈（SCV）的橫截面積（CSA）的影響以及鎖骨下靜脈和毗鄰組織之間的關係尚未被研究過。

方法:在超聲引導下行鎖骨下靜脈穿刺(例數=10)時，在開放氣道 10 秒及保持 10 秒的正壓通氣於 20cm 水柱壓力期間，分別於仰臥(S-0 和 S-20)和 10° 頭低足高位(T-0 和 T-20)測定

鎖骨下靜脈的橫截面積及鎖骨下靜脈到胸膜距離 (DSCV-pleura) 。除了 P<0.05 爲有統計學差異以外，將 CSA 和 DSCV-pleura 差異≥15%定義爲有臨床意義的變化。
結果:在 S-20、T-0 和 T-20 的 CSA（均數[95%可信區間]）（分別爲 1.02 [0.95–1.14] cm2、1.04 [0.95–1.15] cm2 和 1.14 [1.04–1.24] cm2），都顯著大於在 S-0 的 CSA（0.93 [0.86–1.00] cm2，所有的 P<0.001）。然而只有 T-20 比 S-0 的 CSA 增大（0.21 cm2, 23.2%）有臨床意義（≥15%）。從 S-10 到 T-20 的 CSA 增加≥15%的病人數（57%）比從 S-0 到 S-20（23%）及從 S-0 到 T-0（27%）的病人數多。S-20 和 T-20 的 DSCV-pleura 均數（0.61 和 0.60 cm）明顯短於 S-0 (0.70 cm, 所有的 P < 0.001)，但這種縮短沒有臨床意義 (≥15%)。
結論:聯合應用保持胸內壓和頭低足高位可提供一個更大且更相關程度的 CSA 增大，而不會縮短 DSCV-pleura，這可能有利於 SCV 穿刺。需要進一步研究來明確這些結果是否會影響穿刺的成功率和操作損傷的風險。
（邢怡安 譯 馬皓琳 李士通 校）
BACKGROUND: The effects of maneuvers to increase intrathoracic pressure and of Trendelenburg position on the cross-sectional area (CSA) of the subclavian vein (SCV) and the relationship between the SCV and adjacent structures have not been investigated.
METHODS: In ultrasonography-guided SCV catheterization (N = 30), the CSA of the SCV and the distance between the SCV and pleura (DSCV-pleura) were determined during 10-second airway opening, and 10-second positive inspiratory hold with 20 cm H2O in the supine position (S-0, and S-20) and the 10° Trendelenburg position (T-0, and T-20). In addition to a statistical significance of P < 0.05, CSA and DSCV-pleura differences of ≥15% were defined as clinically relevant changes.
RESULTS: CSA (mean [95% confidence interval]) in S-20, T-0, and T-20 (1.02 [0.95–1.14] cm2, 1.04 [0.95–1.15] cm2, and 1.14 [1.04–1.24] cm2, respectively) was significantly larger than a CSA in S-0 (0.93 [0.86–1.00] cm2, all P < 0.001). However, only the increase of CSA in T-20 vs S-0 (0.21 cm2, 23.2%) was clinically meaningful (≥15%). The number of patients who showed CSA increase ≥15% was more in S-0 to T-20 (57%) compared with those in S-0 to S-20 (23%) and S-0 to T-0 (27%). DSCV-pleura measurements (mean) in S-20 and T-20 (0.61 and 0.60 cm) were significantly shorter than those in S-0 (0.70 cm, all P < 0.001), but the reductions of DSCV-pleura were not clinically meaningful (≥15%).
CONCLUSIONS: The combined application of inspiratory hold and Trendelenburg position provided a greater and more relevant degree of CSA increase without compromising DSCV-pleura, which may facilitate SCV catheterization. Further investigations are needed to determine whether these results affect the success rate of catheterization and the risk of procedural injury.

視頻喉鏡在危重病人緊急氣管插管過程中應用的影響

The Impact of Video Laryngoscopy Use During Urgent Endotracheal Intubation in the Critically Ill

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Anesth Analg July 2013 117:144-149

背景：已有研究顯示，與直接喉鏡（DL）相比，在擇期手術室中視頻喉鏡（VL）改善喉鏡視野和首次嘗試成功率，並且能模擬氣管插管。然而，關於在危重病人緊急氣管內插管過程中視頻喉鏡與直接喉鏡比較的有效性資料有限。我們評估了缺乏經驗的操作者在危重病人緊急氣管插管中將視頻喉鏡作爲主要的氣管插管裝置的有效率。
方法：我們比較了在內科監護病房和內科或外科病房中，由肺科和重症醫學（PCCM）的專科被培訓人員操作進行的緊急氣管插管的成功率。一組 PCCM 專科被培訓人員使用 GlideScope 視頻喉鏡作爲主要的氣管插管裝置，另一組使用傳統麥金托什機或米勒喉鏡片的直接喉鏡。主要的觀測指標爲首次嘗試氣管插管的成功率。次要觀測指標包括成功的氣管插管需要的嘗試總次數、食管插入的頻率、是否需要上級主治醫生的干預、插管的持續時間及低氧血症和低血壓的發生率。
結果：在 138 例緊急氣管插管的病例中，78 例和 50 例分別應用視頻喉鏡和直接喉鏡作爲主要的氣管插管裝置。視頻喉鏡的首次嘗試成功率優於直接喉鏡（91%比 68%,P<0.01）。需要≥3 次嘗試的插管概率（4%比 20%，P<0.01）、誤入食管的概率（0%比 14%，P<0.01）、成功氣管插管所需要的平均嘗試次數（1.2±0.56 比 1.7±1.1，P<0.01）在使用視頻喉鏡時均比直接喉鏡顯著改善。
結論：當 PCMM 專科被培訓人員爲主要操作者時，應用視頻喉鏡作爲緊急氣管插管的主要裝置與使用直接喉鏡相比，能改善氣管插管的成功率，減少併發症。這些資料表明，缺乏經驗的操作者實施緊急氣管插管時，應當選用視頻喉鏡作爲主要裝置。
（董靜 譯 馬皓琳 李士通 校）
BACKGROUND: The video laryngoscope (VL) has been shown to improve laryngoscopic views and first-attempt success rates in elective operating room and simulated tracheal intubations compared with the direct laryngoscope (DL). However, there are limited data on the effectiveness of the VL compared with the DL in urgent endotracheal intubations (UEIs) in the critically ill. We assessed the effectiveness of using a VL as the primary intubating device during UEI in critically ill patients when performed by less experienced operators.
METHODS: We compared success rates of UEIs performed by Pulmonary and Critical Care Medicine (PCCM) fellows in the medical intensive care unit and medical or surgical wards. A cohort of PCCM fellows using GlideScope VL as the primary intubating device was compared with a historical cohort of PCCM fellows using a traditional Macintosh or Miller blade DL. The primary measured outcome was first-attempt intubation success rate. Secondary outcomes included total number of attempts required for successful tracheal intubation, rate of esophageal intubation, need for supervising attending intervention, duration of intubation sequence, and incidence of hypoxemia and hypotension.
RESULTS: There were 138 UEIs, with 78 using a VL and 50 using a DL as the primary intubating device. The rate of first-attempt success was superior with the VL as compared with the DL (91% vs 68%, P < 0.01). The rate of intubations requiring ≥3 attempts (4% vs 20%, P < 0.01), unintended esophageal intubations (0% vs 14%, P < 0.01), and the average number of

attempts required for successful tracheal intubation (1.2 ± 0.56 vs 1.7 ± 1.1, P < 0.01) all improved significantly with use of the VL compared with the DL.
CONCLUSIONS: UEI using a VL as the primary device improved intubation success and decreased complications compared with a DL when PCCM fellows were the primary operators. These data suggest that the VL should be used as the primary device when urgent intubations are performed by less experienced operators.

小兒圍手術期低氧血症的發生率和年齡的相關性

Incidence of Intraoperative Hypoxemia in Children in Relation to Age

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Anesth Analg July 2013 117:169-175

背景：儘管到目前爲止，呼吸道問題是小兒麻醉最常見的併發症，但當前仍沒有關於圍手術期小兒低氧血症發生率的可信資料。大部分觀察小兒呼吸道併發症發生率的研究都是基於一些自己的個案報導。
方法：我們前瞻性地研究了一所大學附屬三級兒科醫院的 575 名年齡介於 0 到 16 歲之間的小兒非心臟手術患者的術中低氧血症的發生率及脈搏氧飽和度依僞像的發生率。隨後，我們對登記在同一家醫院的麻醉資訊管理系統（AIMS）中的 8277 名患者回顧性分析術中低氧血症的發生率。
結果：在前瞻性組，576 名患者中有 69 名至少出現一次氧飽和度（Spo2) ≤ 90%持續至少一分鐘（12%；95%的可信區間【CI】，9%-15%）。此外，576 名患者中有 35 名（6%；95%CI，4%-8%）出現至少一次真正的血氧過低事件。在前瞻性研究組，總共有 117 起 Spo2 ≤ 90%，其中有 3 起不能詳細說明，114 例中有 67 起（54%；95%CI，42%-65%）可歸類於真正的血氧過低。假陽性低 Spo2 值主要由脈搏氧飽和度儀的移動所致。在回顧性分析中，AIMS 中登記的 Spo2 ≤ 90%和 Spo2 ≤ 80%持續至少 1 分鐘的發生率分別爲 18%（95%CI，17%-19%）和 7.5%（95%CI，7%-8%）；每 100 例中分別爲 31 起和 10 起。低氧血症的發生率隨年齡的降低而增加：Spo2 ≤ 90%持續至少 1 分鐘在新生兒中的發生率爲 56%（95%CI，49%-63%）（170 起每 100 例）。
結論：術中低氧血症的發生率隨年齡的降低而增加，新生兒的發生率最高。由於較高的僞像發生率，應該謹慎解讀 AIMS 中未經證實的脈搏氧資料，因爲小兒麻醉中記錄到的低氧血症事件中只有最多 65%是由真正的低氧所導致。
（楊禮 譯 馬皓琳 李士通 校）

BACKGROUND: Although respiratory problems are by far the most frequent complications of pediatric anesthesia, there are currently no reliable data on the incidence of perioperative hypoxemia in children. Most studies investigating the incidence of pediatric respiratory complications were based on self-report.

METHODS: We studied the incidence of intraoperative hypoxemia as well as that of pulse oximeter artifacts prospectively in 575 pediatric noncardiac surgery patients aged between 0 and 16 years operated in a tertiary pediatric university hospital. Subsequently, the incidence of intraoperative hypoxemia was determined retrospectively in 8277 patients registered in an anesthesia information management system (AIMS) of the same hospital.
RESULTS: In the prospective cohort, at least 1 episode of oxygen saturation (Spo2) ≤ 90% for at least 1 minute occurred in 69 of 575 cases (12%; 95% confidence interval [CI], 9%–15%). Furthermore, in 35 of 575 (6%; 95% CI, 4%–8%) cases at least 1 true hypoxemic event was observed. In total, 117 episodes of Spo2 ≤ 90% were observed in the prospective study, of which 3 of 117 could not be specified and 67 of 114 (54%; 95% CI, 42%–65%) episodes were classified as true hypoxemia. False-positive low Spo2 values were mainly caused by dislodgment of the pulse oximeter. In the retrospective analysis, Spo2 ≤ 90% and Spo2 ≤ 80% for at least 1 minute were documented in the AIMS in 18% (95% CI, 17%–19%) and 7.5% (95% CI, 7%–8%) of the cases, respectively; 31 and 10 episodes per 100 cases, respectively. The incidence of hypoxemia increased in younger age groups: Spo2 ≤ 90% for at least 1 minute occurred in 56% (95% CI, 49%–63%) of neonates (170 episodes per 100 cases).
CONCLUSIONS: The incidence of intraoperative hypoxemia increased with younger age, with the highest incidence in neonates. Because of the high artifact rate, unvalidated pulse oximeter data in AIMS should be interpreted with caution because only up to 65% of all hypoxemic episodes recorded during pediatric anesthesia were caused by true hypoxia.

經側旁途徑與正中椎板間途徑腰段硬膜外類固醇注射治療伴有腰骶神經根痛的腰痛的比較：一項雙盲隨機研究

Lateral Parasagittal Versus Midline Interlaminar Lumbar Epidural Steroid Injection for Management of Low Back Pain with Lumbosacral Radicular Pain: A Double-Blind, Randomized Study

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Anesth Analg July 2013 117:219-227;

背景：硬膜外類固醇注射通常用於治療伴有腰骶部神經根痛的腰痛，可經椎板間途徑或椎間孔途徑兩種方法實施。根據報導，椎間孔途徑可使腹側硬膜外隙有更多藥物分佈，故比椎板間途徑更有效。但椎間孔途徑可導致脊髓損傷和永久性癱瘓等嚴重併發症。因此，需要尋找一種技術上更好且併發症更少的進針途徑以達到腹側硬膜外隙藥物分佈。近來有報導稱，經椎板旁（PIL）途徑行硬膜外造影劑注射可達 100%腹側硬膜外隙擴散。然而，該進針途徑的療效尚未被研究過。本研究旨在比較 PIL 途徑和正中椎板間（MIL）途徑的療效。我們提出如下假說：與 MIL 途徑相比，PIL 途徑因藥物更好的腹側硬膜外隙擴散，可能產生更好的預後。
方法：37 名患者被隨機分爲兩組，分別在透視導向下接受經 PIL（PIL 組，n=19）或 MIL（MIL 組，n=18）途徑注射 80mg 甲潑尼龍。在治療後 15 天、1、2、3 和 6 個月，對患者通過直觀類比標度評估有效的疼痛緩解情況（比基線改善≥50%），並通過改良 Oswestry 殘疾問卷法評估功能障礙的改善情況。疼痛改善與基線相比<50%的患者再次接受相同藥

物、劑量和給藥途徑的硬膜外注射，最多接受三次注射，至少間隔 15 天。本研究主要觀察指標是第 6 個月時的有效疼痛緩解率。

結果：PIL 組患者第 6 個月末時的有效疼痛緩解率(13/19 [68.4%])高於 MIL 組(3/18 [16.7%])。6 個月隨訪結束時，PIL 組有效疼痛緩解的相對成功率明顯更高(相對危險度 4.10; 95%可信區間 1.40–12.05; P = 0.001)，所需總注射量更少(29 比 41 MIL 組, P = 0.043)。治療後所有時點的直觀類比標度和改良 Oswestry 殘疾問卷評分，PIL 組均顯著低於 MIL 組。PIL 組造影劑的腹側硬膜外隙分佈(89.7%)比 MIL 組更多(31.7%)。無併發症硬膜外類固醇注射的確切 95% Clopper-Pearson 可信區間在 PIL 組爲 0.0%~17.6%，在 MIL 組爲 0.0%~18.5%。

結論：在治療由腰骶部神經根痛引起的腰痛中，與經 MIL 途徑相比，經 PIL 途徑的硬膜外類固醇注射在 6 個月中對疼痛的緩解和功能障礙的改善更有效。

（陳彬彬 譯， 馬皓琳、李士通 審校）

BACKGROUND: Epidural steroid injections are commonly used for management of low back pain with lumbosacral radicular pain and can be administered by either interlaminar or transforaminal routes. The transforaminal route is reported to be more effective than the interlaminar route due to higher delivery of drug at the ventral epidural space. However, the transforaminal route has been associated with serious complications including spinal cord injury and permanent paralysis. Hence, there is a search for a technically better route with fewer complications for drug delivery into the ventral epidural space. Recently, a parasagittal interlaminar (PIL) approach of epidural contrast injection was reported to have 100% ventral epidural spread. However, the therapeutic efficacy of this route has never been investigated. We compared the therapeutic efficacy of the PIL approach and midline interlaminar (MIL) approach. We hypothesized that the PIL approach may produce a better clinical outcome because of better ventral epidural spread of the drug compared with MIL approach.

METHODS: Thirty-seven patients were randomized to receive injection of 80 mg methylprednisolone either by the PIL (PIL group, n = 19) or MIL (MIL group, n = 18) approach under fluoroscopic guidance. Patients were evaluated for effective pain relief (≥50% from baseline) by visual analog scale and improvement in disability by the modified Oswestry Disability Questionnaire at intervals of 15 days, 1, 2, 3, and 6 months. Patients having <50% pain relief from baseline received additional epidural injection of the same drug, dosage, and route, a maximum of 3 injections at least 15 days apart. The primary outcome of our study was the incidence of effective pain relief at 6 months.

RESULTS: The incidence of patients having effective pain relief was higher with the PIL approach (13/19 [68.4%]) vs MIL (3/18 [16.7%]) at the end of 6 months. A significantly higher relative success of effective pain relief was noted in the PIL group (relative risk, 4.10; 95% confidence interval, 1.40–12.05; P = 0.001) at the end of the 6-month follow up with the requirement of fewer total injections (29 vs 41 in MIL, P = 0.043). Visual analog scale and modified Oswestry Disability Questionnaire scores were significantly lower in the PIL group compared with the MIL group at all time intervals after the procedure. Ventral epidural spread of contrast was significantly higher in the PIL 89.7% vs 31.7% in the MIL group. The administration of epidural steroid injection was without any complications with an exact 95% Clopper-Pearson confidence interval of 0.0% to 17.6% in the PIL group and 0.0% to 18.5% in the MIL group.

CONCLUSIONS: Epidural steroid injection administered with the PIL approach was significantly more effective for pain relief and improvement in disability than the MIL approach for 6 months in the management of low back pain with lumbosacral radicular pain.

對施行乳房手術的女性引導下的椎旁阻滯有和沒有可寧定進行對比：一項前瞻性雙盲對照研究

Guided Paravertebral Blocks With Versus Without Clonidine for Women Undergoing Breast Surgery: A Prospective Double-Blinded Randomized Study

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Anesth Analg July 2013 117:252-258

背景：椎旁阻滯已經作爲乳腺癌手術全麻的一項選擇。增加可樂定作爲椎旁阻滯的輔助用藥可能增強鎮痛的品質及持續時間，並且明顯減少乳房手術後止痛劑的消耗量。在這項前瞻性隨機雙盲研究中，我們評估了用於女性患者切除乳房手術的麻醉合計中添加可樂定的意義。
方法：60 個病人隨機平均分爲兩組，兩組都接受椎旁阻滯，一組有可樂定，另一組沒有可樂定。止痛藥的使用記錄到術後兩周。用直觀類比標度來評定住院期間的術後疼痛，當患者出院後用數位等級量表。
結果：在可樂定組中術後 48 小時裡止痛藥的消耗量明顯減少，差異的 95%可信區間爲（-69.5%~-6.6%）。術後 24 到 72 小時這段時間可樂定組的靜息疼痛評分明顯降低，術後 24、48 和 72 小時時的 2 種方法比率的 95%可信區間分別爲(1.09–3.61)、(2.04–9.04)和(2.54–16.55)，肩膀活動時則分別爲(1.10–3.15)、(1.32–6.38)和(1.33–8.42)。可樂定組恢復日常活動所需時間比對照組短，2 種方法比率的 95%可信區間爲(1.14–1.62)。
結論：對於施行乳腺手術的病人，在椎旁阻滯中加入可樂定可增強術後鎮痛效應達 3 天。
(王曉莉譯 馬皓琳 李士通校)

BACKGROUND: Paravertebral blocks (PVBs) have been introduced as an alternative to general anesthesia for breast cancer surgeries. The addition of clonidine as an adjuvant in PVBs may enhance quality and duration of analgesia and significantly reduce the consumption of analgesics after breast surgery. In this prospective randomized double-blind study, we assessed the significance of adding clonidine to the anesthetic mixture for women undergoing mastectomy.
METHODS: Sixty patients were randomized equally into 2 groups, both of which received PVB block, either with or without clonidine. Analgesic consumption was noted up to 2 weeks after the operation. A visual analog scale was used to assess pain postoperatively during the hospital stay, and a numeric rating scale was used when patients were discharged.
RESULTS: Analgesic consumption was significantly lower in the clonidine group 48 hours postoperatively with 95% confidence interval (CI) for the difference (−69.5% to −6.6%). Pain scores at rest showed significant reduction in the clonidine group during the period from 24 to 72 hours postoperatively with 95% CI for the ratios of 2 means (1.09–3.61), (2.04–9.04), and (2.54–

16.55), respectively, with shoulder movement at 24, 48, and 72 hours postoperatively 95% CI for the ratio of 2 means (1.10–3.15), (1.32–6.38), and (1.33–8.42), respectively. The time needed to resume daily activity was shorter in the clonidine group compared with the control group with 95% CI for the ratio of 2 means (1.14–1.62).
CONCLUSION: The addition of clonidine enhanced the analgesic efficacy of PVB up to 3 days postoperatively for patients undergoing breast surgery.

靜脈內右美托咪定對脊麻持續時間的易化作用：系統回顧和薈萃分析

The Facilitatory Effects of Intravenous Dexmedetomidine on the Duration of Spinal Anesthesia: A Systematic Review and Meta-Analysis

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Anesth Analg July 2013 117:271-278

背景：已有人提出中樞機制來解釋報導的藥品核准標示外使用右美托咪定作爲佐劑加入到局麻藥混合液中延長作用時間。我們評價了靜脈推注美托咪定是否可延長脊麻的感覺阻滯持續時間。
方法：作者在 MEDLINE、Embase、Cochrane 系統回顧資料庫及 Cochrane 對照試驗資料庫的中央寄存器，搜索了觀察靜脈內給予右美托咪定（右美托咪定組）與安慰劑（對照組）相比較對基於單劑量注射局部麻醉藥的脊麻易化作用的隨機對照試驗。評估感覺及運動阻滯的持續時間、感覺及運動阻滯的起效時間、術後疼痛評分、第一次請求使用止痛藥的時間、止痛藥的使用量及右美托咪定相關的副作用。在需要時運用隨機效應模型綜合分析結果。
結果：分析了來自於中-高品質的隨機對照試驗的共 364 例患者。脊麻複合靜脈使用右美托咪定時，感覺阻滯持續時間延長至少 34%（點估計：38%），P＜0.00001；運動阻滯持續時間延長至少 17%（點估計：21%），P＜0.00001；首次請求止痛藥的時間延後至少 53%（點估計 60%），P＜0.00001。右美托咪定的使用可能使短暫、可逆性的心動過緩增加 3.7 倍（95%可信區間，1.53-8.82，P=0.004）。在低血壓及術後鎮靜的發生率上，兩組沒有差別；沒有患者出現呼吸抑制。
結論：靜脈使用右美托咪定可以延長脊麻的感覺及運動阻滯的持續時間及首次要求鎮痛的時間。
（王贇譯 馬皓琳、李士通校）

BACKGROUND: Central mechanisms have been proposed to explain the prolongation of effect reported with the off-label use of dexmedetomidine as an adjuvant in local anesthetic admixtures. We evaluated whether IV dexmedetomidine can prolong the duration of sensory block associated with spinal anesthesia.
METHODS: The authors searched MEDLINE, Embase, Cochrane Database of Systematic Reviews, and Cochrane Central Register of Controlled Trials databases for randomized controlled trials investigating the facilitatory effects of IV administration of dexmedetomidine (dexmedetomidine group) compared with placebo (control group) on single-injection local anesthetic-based spinal anesthesia. Durations of sensory and motor block, sensory and motor

block onset times, postoperative pain scores, time to first analgesic request, analgesic consumption, and dexmedetomidine-related side effects were evaluated. Results were combined using random effects modeling when appropriate.
RESULTS: A total of 364 patients were analyzed from 7 intermediate to high-quality randomized controlled trials. When IV dexmedetomidine accompanied spinal anesthesia, sensory block duration was prolonged by at least 34% (point estimate: 38%), $P < 0.00001$, motor block duration was prolonged by at least 17% (point estimate: 21%), $P < 0.00001$, and time to first analgesic request was increased by at least 53% (point estimate: 60%), $P < 0.00001$. The use of dexmedetomidine was associated with a 3.7-fold increase (95% confidence interval, 1.53–8.82, $P = 0.004$) in transient reversible bradycardia. There was no difference in the incidence of hypotension or postoperative sedation, and none of the patients experienced respiratory depression.
CONCLUSION: IV dexmedetomidine can prolong the duration of sensory block, motor block, and time to first analgesic request associated with spinal anesthesia.