

SCA1

CONTROL OF POSTOPERATIVE PAIN BY EPIDURAL CATHETER USING NERVE STIMULATION IN THORACIC SURGERY

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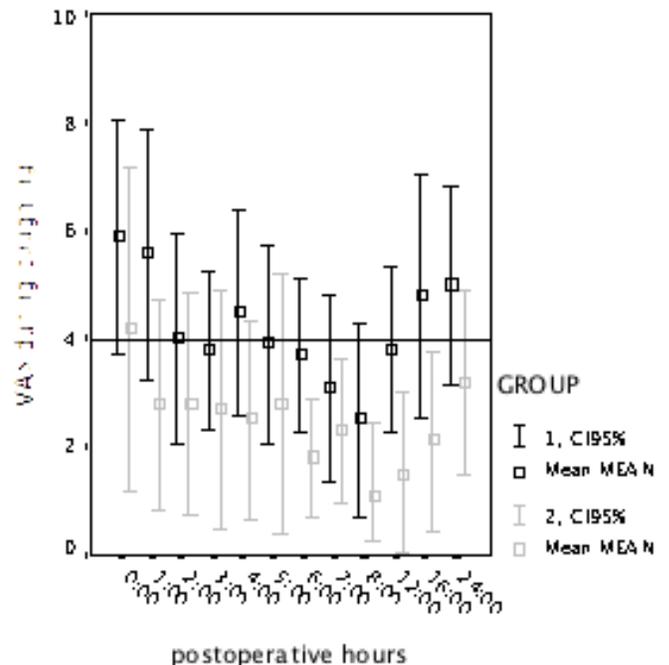
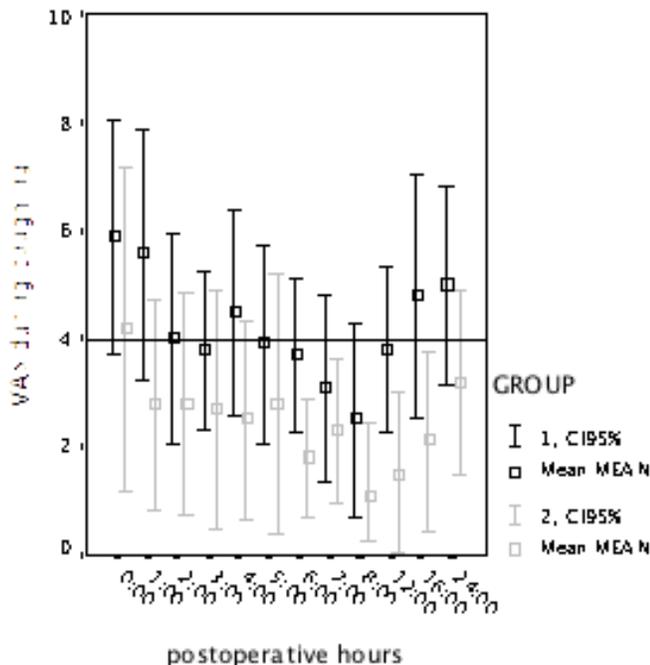
Background: Adequate relief of post-thoracotomy pain is essential to enhance postoperative outcome. Thoracic epidural analgesia (TEA) is superior to conventional methods of analgesia (1). Electrical stimulation (ES) during epidural needle and catheter placement has been recently introduced. (2). The aim of the study is to determine if the placement of the catheter tip unilaterally with ES eliciting intercostal muscles motor response can be beneficial for postoperative analgesia.

Methods: After IRB approval and informed consent, 20 adults patients scheduled for an anterior thoracotomy were randomized to conventional (group 1, n = 10) or ES (group 2, n=10) thoracic epidural catheter placement (Stimulong Plus (Pajunk®, GmbH, Geisingen, Germany). In group 2, the negative lead of the nerve stimulator (Stimulex, BBraun®, Melsungen, Germany) was connected to the catheter, the ES (1Hz;0.3ms) was gradually decreased from 5 mA until motor activity disappeared. Ropivacaine 0.5 % was used perioperatively. For the postoperative period, a continuous infusion of ropivacaine 0.15 % plus fentanyl 2 mcg/ml was started at a rate of 6 ml/h with additional bolus injection of 3 ml every 60 min if VAS was >= 4, combined with an increase of the infusion by 2ml/h. All patients without contra-indications received diclofenac and paracetamol. Analgesia was evaluated with a visual analog scale (VAS) during the

first 24 postoperative hours. Statistical analysis was performed using Student's t-test, Fisher's exact test or Log-Rank test, with a p<0.05 considered significant.

Results: Groups were not statistically different for gender, age, weight, level of epidural insertion. The VAS scores at rest are presented in graph 1 and in graph 2, during coughing, showing the mean value and 95% confidence interval (CI95), allowing to evaluate whether the CI95 for a group at a given time lies entirely within the zone defined as analgesic success (VAS pain score 0-3). At rest, the rate of painful events (p = 0.145) and painful patients (p = 0.131) was not statistically different. During coughing, the rate of painful patients (p = 0.048) and painful events (p = 0.008) was lower in group 2, with a 38.2 % relative risk decrease of the rate of painful events (95% CI 53.7 % - 17.5 %). No statistical difference was found between groups for shoulder pain (p = 0.602).

Conclusion: Postoperative analgesia with TEA was satisfactory at rest in both groups but better during coughing in unilateral ES placed thoracic epidural catheter. References:
 1 Block B.M. et al. JAMA, 2003; 290(18): 2455-63.
 Tsui B.C.H. et al. Reg Anesth Pain Med 2000; 25: 306-9.



SCA2

NONINVASIVE MONITORING OF CARDIAC OUTPUT IN MAJOR VASCULAR SURGERY USING A NEW SYSTEM BASED ON CONTINUOUS PULSE CONTOUR ANALYSIS

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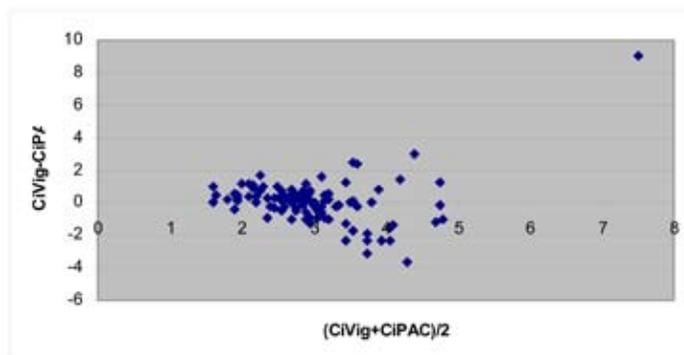
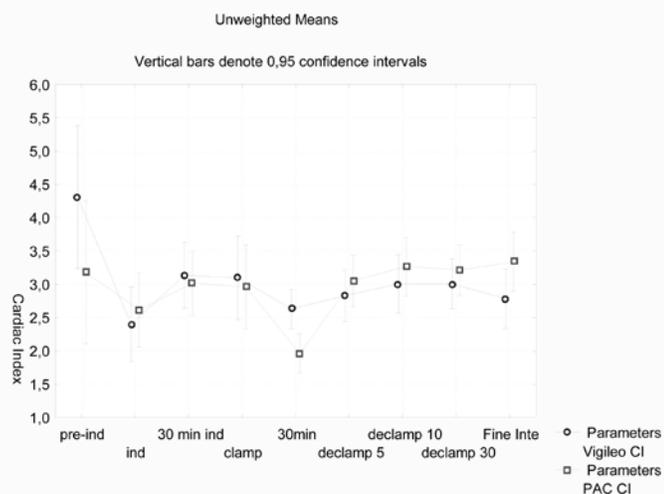
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Background:The Vigileo System (Edwards,Irvine,Ca USA)is a new device allowing continuous cardiac output(CO) monitoring by pulse contour analysis. The objective of this study was to determine the agreement between CO measured by a continuous thermodilution method in the pulmonary artery catheter (CCOpa) and the CO obtained with Vigileo system (CCOart) based on a fundamentally different principle of determining CO in major vascular surgery.

Methods: We studied 10 consecutive patients with abdominal aortic aneurism underwent to elective surgical repair. Patients with heart valve pathology,dysrhythmias and ejection fraction <40% were excluded from the study. All patients were monitored by a 8 French pulmonary artery catheter (Edwards Lifesciences, Irvine, Ca Usa) and by a radial artery catheter that was connected to a sensor FloTrac (Edwards, Irvine, Ca Usa)to processed data by Vigileo monitor. CO measurements were recorded simultaneously at baseline(T1), after induction(T2), 30 min after induction (T3),at aortic clamp (T4), 30 min after aortic clamp (T5), and at 5 (T6),10 (T7),30(T8)min after declamp and at the end of surgery (T9). We used Bland-Altman and correlation analysis.

Results: A total of 180 determinations of CO could be analyzed. We found close agreement between the techniques. Variations in CO obtained in all recorded times were similar in direction and magnitude, but CCOart were overestimated when CO was very high.

Conclusions: These results demonstrated acceptable agreement between the thermodilution method and the Vigileo system, which provide a non -invasive clinically useful estimate of CO in all patients studied



SCA3

CONTINUOUS INSULIN INFUSION MAY PREVENT MYOCARDIAL INJURY FOLLOWING VASCULAR SURGERY

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Background: Perioperative tight glucose control reduces morbidity and mortality after cardiac surgery in particular the incidence of myocardial ischemia and perioperative wound infections(1)(2). However, there is no evidence that such a strategy is beneficial in patients having non- cardiac surgery. We hypothesized that continuous insulin infusion reduces myocardial injury when compared to intermittent insulin therapy following vascular bypass surgery.

Methods: 75 patients were enrolled in this prospective randomized single blinded pilot study. 7 patients were excluded from the study due to protocol violations. Patients were randomized to one of two groups, the continuous insulin infusion group and the intermittent insulin bolus group. Both groups had a perioperative blood glucose target of 100-150mg/dL. Both diabetics and non-diabetics were included in the study. Both the groups had a strict protocol based insulin treatment for the first 48 postoperative hours. Troponin-T levels were collected on postoperative day 1 and day 2. Normal values of troponin- T are less than <0.01. Troponin leak was defined as a change (0.01 to 0.10) in the troponin level. Myocardial ischemia was defined as a troponin-T level greater than 0.10. Groups were compared using the Pearson chi-square test and are reported as odds ratios.

Results: Demographic data is comparable between the two groups. The odds of having a troponin leak was greater in the intermittent insulin group 1.77 [confidence interval of 0.63 to 4.93] (p=0.268). The odds of troponin positive myocardial ischemia was also greater in the intermittent insulin group {1.45 [0.36-5.7] (p=0.594)}. There were three episodes of hypoglycemia (<65mg/dL) without any permanent sequelae in the insulin infusion group. The average blood glucose over 48 hours was 125 to 143 in the intermittent insulin group and 121 to 132 in the continuous insulin infusion group.

Discussion: Both the groups had a set glucose target of 100-150mg/dl. This target was met as evidenced by the mean 48 hour glucose. However, intermittent insulin therapy was associated with an increased risk of troponin leak and myocardial ischemia when compared to continuous insulin infusion. Abnormal but low postoperative troponins are associated with increased mortality and may lead to delayed postoperative myocardial ischemia (3). In this pilot study the sample size was inadequate to demonstrate statistical significance. An ongoing randomized control trial is underway at our institution.

SCA4

SIGNIFICANT ELEVATION OF CEREBROSPINAL FLUID S-100 PROTEIN LEVEL INDUCED BY ISCHEMIA OF THE CENTRAL NERVOUS SYSTEM OR THE SPINAL CORD DURING SURGERY FOR ANEURYSMS OF THE DESCENDING THORACIC AORTA

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The present study was undertaken to examine which changes occur in S-100 protein level in cerebrospinal fluid and serum following injury of the central nervous system or spinal cord during surgery for aneurysms of the descending thoracic aorta.

Subjects and Methods: The subjects of this study were 40 adults who underwent prosthetic vascular replacement for the treatment of aneurysms of the descending thoracic aorta. Before surgery, a catheter was inserted via the lumbar area into the subarachnoid cavity of each patient to measure spinal cord pressure and collect cerebrospinal fluid, and general anesthesia was then introduced. Blood and cerebrospinal fluid for measurement of S-100 protein level were collected at the time of introduction of anesthesia, immediately before, and during the operation, at release of occlusion of the aorta, and at the end of and 24 hours after the operation. The patients were examined neurologically postoperatively. Based on the findings of this examination, they were retrospectively divided into three groups: Group D (12 patients with central nervous system injury), Group S (2 patients with spinal cord infarction), and Group C (26 patients free from problems; the control group).

Results: In all three groups, blood S-100 protein level rose from immediately before to the time of release of aortic occlusion. The magnitude of increase was in the order of Group D = Group S > Group C. Until immediately before occlusion of the aorta, cerebrospinal fluid S-100 level did not differ significantly among the three groups. However, immediately after release of aortic occlusion, this parameter began to rise sharply in Group S alone (Group S > Group D = Group C).

Discussion and Conclusion: Serum S-100 protein level rose significantly after occlusion of the aorta in patients with injury of the central nervous system or spinal cord. Cerebrospinal S-100 protein level rose only in patients with spinal cord infarction. These findings suggest that serum and cerebrospinal fluid S-100 levels serve as indicators of central nervous system or spinal cord injury, and that cerebrospinal fluid S-100 level is particularly useful in the early diagnosis of spinal cord injury.

SCA5

PLACEMENT OF THORACIC EPIDURAL CATHETER USING ELECTRICAL STIMULATION: FEASIBILITY AND THRESHOLD CURRENT

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Background: Electrical stimulation (ES) has proven to be effective for confirming epidural catheter placement in obstetric and pediatric patients (1,2). The purpose of this study is to determine if the placement of a thoracic epidural catheter tip unilaterally with ES eliciting muscles motor response is feasible and to determine the threshold current.

Methods: After IRB approval and informed consent, 10 adults patients scheduled for an anterior thoracotomy had the placement of a thoracic (T3-T4, T4-T5 or T5-T6) epidural catheter with ES. An 18-gauge Tuohy needle was inserted and advanced until loss of resistance to saline was detected, then a catheter was inserted. The negative lead of a nerve stimulator (Stimulex, BBraun®, Melsungen, Germany) was connected to the catheter (Stimulong Plus, Pajunk®, GmbH, Geisingen, Germany). An attempt was made to place the catheter at the operated patient's side with the stimulating current (1Hz;0.3ms) at 5 mA, eliciting anterior intercostals muscles motor response. When done, the ES was gradually decreased from 5 mA until intercostals muscles motor activity disappeared, determining the threshold current (time 1). The catheter was removed until 4 cm was let in the epidural space and the threshold was noted (time 2). Statistical analysis was performed using Student's t-test, with a $p < 0.05$ considered significant.

Results: The success rate for placement of the catheter tip unilaterally was 100 % at time 1 with a mean threshold current of 1.26

± 0.64 mA. Patients didn't experience a painful episode. After the catheter was removed and let 4 cm in the epidural space, at time 2, for one patient the control of the ES showed a migration of the catheter tip to the opposite side. The mean threshold current was 1.16 ± 0.75 mA at time 2. There was not any statistical difference between time 1 and 2 ($p=0.603$). No complication was detected during the perioperative period. **Discussion:** Tsui has established criteria for the placement of an epidural catheter in the epidural space with a range of current between 1 and 10 mA (Tsui test). He emphasized that any motor response particularly unilateral observed at < 1 mA or barely above 1 mA may suggest catheter placement in the subarachnoid or subdural space or in close proximity to a nerve root (3). The observed threshold current levels are in accordance with the Tsui test for the catheter used in this study. The low intensity corresponds to the placement of the catheter tip unilaterally, in close proximity to a nerve root.

Conclusion: Our study demonstrates the feasibility to place a thoracic catheter tip unilaterally at the operated side in adults patients, in an attempt to improve the quality of analgesia. **References:**

- 1 Tsui B.C.H. et al. *Reg Anesth Pain Med* 1999; 24(1): 17-23
- 2 Tsui B.C.H. et al. *Anesth Analg* 2003; 100(3): 683-9
- 3 Tsui B.C.H. *Anesth Analg* 2006; 103: 775-776

SCA6

AGING & WORKING MEMORY IMPAIRMENT WITH ISOVOLEMIC ANEMIA

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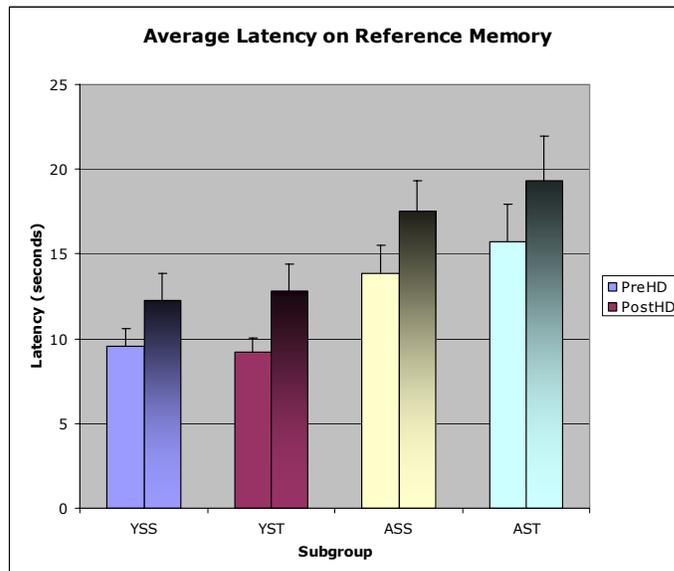
Background: Cognitive dysfunction has been identified after major surgery in cardiac, vascular, and orthopedic surgery. Major surgery is often associated with the occurrence of a rather acute anemia. We hypothesize that acute anemia may have an important role in postoperative cognitive dysfunction across the various surgical disciplines.

Methods: Following a period of training and creation of acute isovolemic anemia, cognitive performance was tested in a Spontaneously Hypertensive rat(SHR) model using reference & working memory paradigms in the Morris water maze. Two groups of young(3 months of age) SHR-sham(YS-S)and test(YS-T) animals, and two groups of aged(18 months of age) SHR-sham(AS-S) and test(AS-T) rats were studied. Following hemodilution, all animals were allowed one day of rest. Beginning on post-hemodilution day #2, animals were challenged with a working memory platform paradigm for 10 consecutive days.

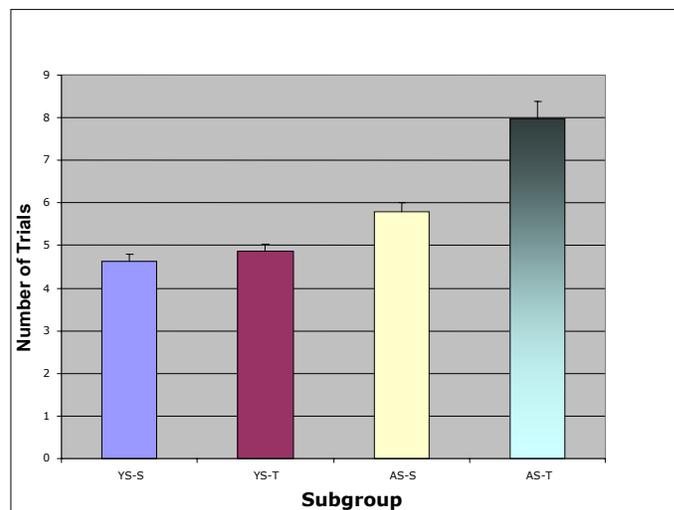
Results: The average hemoglobin in the four groups after the final hemodilution was as follows: YS-S(12.6 ± 0.70), YS-T(4.63 ± 0.28), AS-S(12.8 ± 0.5), and AS-T(4.74 ± 0.5). Isovolemic anemia was associated with a significant impairment of working memory in the aged SHR.(Figure-1)

Conclusion: Isovolemic anemia results in a marked and prolonged impairment in the ability to acquire new memory in the aged rat with hypertension.

Group	N	Trials (SD)	*P=
YS-S	13	4.6(1.7)	<.05
YS-T	13	4.9(1.7)	<.05
AS-S	14	5.8(2.3)	<.05
AS-T	15	8.0(4.0)	



Mean Trials to Meet Platform Criteria



SCA7

OPERATIVE MORTALITY AS A FUNCTION OF SURGICAL CASE VOLUME IN LUNG RESECTION SURGERY

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Introduction: Each year tens of thousands of lung resections are performed for lung cancer in the United States for a variety of reasons. Previous studies have shown a relationship between mortality and surgical volume in the case of coronary bypass surgery, and esophageal surgery. We hypothesized that patients undergoing lung resection in surgical centers with a high case volume would have a lower mortality than those treated at low volume centers.

Methods: After IRB approval, the Nationwide Inpatient Sample (NIS) database was used to identify discharges following lung resection surgery each year from 1988 to 2003. Discharges with the Clinical Classification Software (CCS) procedure codes 36 and ICD-9 codes 323, 324, and 325 were identified as the study population. Logistic regression analyses was used to investigate the association between case volume and mortality among three subpopulations: segmental lung resection, lobectomy, and pneumonectomy. Case volume was calculated for each surgery subtype, for each year, at each hospital. Restricted cubic splines were incorporated into the regression analyses to allow the slopes of the fitted curves to vary where appropriate (1). Raw and adjusted mortality rates are presented. Mortality adjustment for co-existent disease was accomplished through the use of a comprehensive set of 30 comorbidity measures, described by Elixhauser (2), which were incorporated individually as covariates in multivariable analyses. Discharge weights were applied to all analyses to approximate national estimates. Hospital weights were applied to analyses using procedure volumes per hospital.

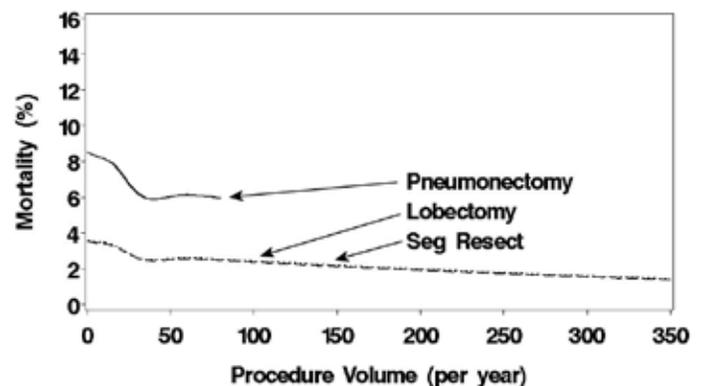
Results: The analysis dataset consisted of 135,716 discharges, representing 15,107 pneumonectomies, 91,321 lobectomies, and 29,288 segmental lung resections. Applying discharge weights, these represent national estimates of 79,627, 475,674, and 154,302, respectively. Case volume ranges (per year) were: pneumonectomy, 1-81; lobectomy, 1-343; and segmental lung resection, 1-386. Overall mortality rates were: pneumonectomy, 11.4%; lobectomy, 3.7%; and segmental lung resection, 4.2%. Regression modeling showed that hospital volume was significantly associated with mortality in each of the three procedure types ($p < .0001$). Significance remained after adjustment for comorbidities.

Discussion: This study confirms that there is a significant relationship between surgical volume and operative mortality in lung resection surgery. This effect is most pronounced in centers with a volume of less than 50 resections per year. We suggest that the overall outcome after lung resection may be improved if patients are treated in centers performing at least 50 lung resections per year.

References:

- 1 Harrell, Frank E. Springer Series in Statistics. Springer-Verlag, New York: 2001.
- 2 Elixhauser A, et al. Med Care. 1998 Jan;36(1):8-27.

Figure 1: Mortality vs. Annual Procedure Volume For All Lung Resections



SCA8

TYPICAL AND ATYPICAL IMAGING FEATURES OF AORTIC DISSECTION, AORTIC ANEURYSMS & ATHEROMATOUS ULCERS: A COMPARISON OF IMAGING TECHNIQUES: INTRAOPERATIVE LIVE 3 D EPICARDIAL ECHOCARDIOGRAPHY, MULTIPLANE TRANSESOPHAGEAL ECHOCARDIOGRAPHY & MULTISLICE SPIRAL COMPUTED TOMOGRAPHY

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OBJECTIVE Noninvasive imaging allows prompt and reliable diagnosis of acute aortic dissection. However, atypical imaging features and diagnostic pitfalls can delay lifesaving therapy. These pitfalls may be attributed to technical factors; streak artifacts, aortic wall motion, aortic variations such as aortic aneurysm with thrombus and penetrating atheromatous ulcers. Here we illustrate the spectrum of potential pitfalls in the three diagnostic modalities Live 3 D echocardiography, multiplane transesophageal echocardiography & multislice computed tomography (MSCT), along with their sensitivity in diagnosis of the aortic pathology.

METHODS Sixty two patients with clinically suspected aortic dissection were studied from September 2003 through June 2006. They were examined preoperatively with multiplane transesophageal echocardiography, then contrast material-enhanced MSCT and intraoperatively with Live 3D epicardial echocardiographic evaluation of the ascending aorta and arch was performed. Imaging results in terms of detection of aortic pathology were confirmed at intraoperative exploration by the operating surgeon as the reference standard.

RESULTS Of the sixty two patients studied, aortic dissection was detected in 28, aortic aneurysm in 24 and aortic atheromatous ulcers in 10. Sensitivity in the detection of thoracic aortic dissection, ascending aorta aneurysm and atheromatous ulcers was

100% for all techniques. Specificity was 92%, 97%, and 100% for live 3-dimensional epicardial echocardiography, multiplane TEE, and MSCT imaging, respectively.

CONCLUSION MSCT is the imaging technique of choice at our institution for patients with suspected aortic dissection before undergoing surgery. Additional information can be obtained from Intraoperatively transesophageal echocardiography and live 3 D epicardial imaging. Although several of the pitfalls and artifacts that mimic aortic dissection can be easily recognized, while others can pose a diagnostic challenge. Familiarity with these common pitfalls, along with a knowledge of normal intrathoracic anatomy can help to avoid interpretive errors by the various imaging modalities.

References:

- 1 Sebastia C, Pallisa E, Quiroga S, et al. Aortic dissection and follow up with helical CT. *Radiographics*. 1999;19:45-60.
- Mishra M, Khurana P, Meharwal ZS, Trehan N. A Comparative Study of Imaging Techniques in Aortic Dissection, DeBakey Type I: Intraoperative Live Three-Dimensional Epicardial Echocardiography, Multiplane Transesophageal Echocardiography, and Multislice Computed Tomography. *Innovations: Technology and Techniques in Cardiothoracic and Vascular Surgery: Volume 1(1) Fall 2005 pp 40-47*

SCA9

RENAL INJURY AFFECTING LONG TERM OUTCOMES AFTER OFF-PUMP BILATERAL LUNG TRANSPLANTATION

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Purpose: Several predictors of renal damage have been shown to affect clinical outcomes in lung transplantation (1). Renal injury (RI, doubling of serum creatinine [Cr]) is a commonly used component of the RIFLE classification to quantify the extent of renal dysfunction (2). We sought to identify perioperative predictors of RI and their potential relationship with long term outcomes after primary, off-pump bilateral orthotopic lung transplantation (BOLT).

Methods: The study design was a retrospective review of an end-stage respiratory disease, adult, primary, off-pump, BOLT cohort between January 2000-2005 at Duke (n=158). The incidence of RI on POD 3 and 30 is reported. Following univariate analysis, a multivariate linear regression model, based on a stepwise elimination of 22 potential predictors (e.g. demographics, procedure parameters, co-morbidities, hemodynamics, vasoactive agents, fluids, blood products, allograft function [PaO₂/FiO₂ ratio after transplantation], immunosuppressants, and antibiotics), was developed for % change in creatinine (Cr) from baseline to POD 3 and 30. A Kaplan-Meier survival analysis was performed and Cox proportional hazards regression used to compare event free survival up to 1000 days between those patients who had RI 3 and 30 days after surgery, using the combined end-point of dialysis or death.

Results: The incidence of RI by POD 3 and 30 was 11% (17 of 158) and 12%, respectively. 59% of Day 3 RI patients recovered before day 30 (therefore 12 patients developed new, later onset RI between days 3 and 30). Independent predictors of % change in Cr at Days 3 and 30 are listed below (see Table). An increased incidence of dialysis or death was seen in patients with RI on POD 30 (hazard ratio 2.2 (1.04-4.64); p<0.05) but not in those with RI on POD 3 (p=0.23).

Conclusions: The incidence of RI after primary, off-pump BOLT for end-stage respiratory disease was less than that previously reported for a broader lung transplant population (12% versus 56%) (1). Perioperative RI is still relatively common following BOLT, but often recovers, with only those patients suffering sustained RI at 30 days experiencing poorer outcomes (dialysis and death). We identified factors associated with early and late creatinine increase and nephrotoxic antibiotics are highly significant predictors most amenable to modification. Investigating less nephrotoxic antibiotics with similar antimicrobial activity may improve outcome after BOLT.

(1) Palmer SM. Am J Transpl (2005).

(2) Kuitunen A. Ann Thorac Surg (2006).

Independent Predictors of % change in creatinine at POD 3 and 30

Variable	Values	Day 30 P Values
Baseline Cr	0.004	NS
Inhaled tobramycin use	0.0001	0.003
Prolonged vancomycin use	0.008	NS
PaO ₂ /FiO ₂ ratio	0.02	NS
POD 3 Cr	NS	<0.0001
Female	NS	0.015
Amount of perioperative transfusion	NS	0.026
Last blood pressure in OR	NS	0.036
Age	NS	0.038

SCA10

INFLUENCE OF THE α -AGONIST CLONIDINE ON THE MYOCARDIAL PERFUSION IN PREOPERATIVE PATIENTS WITH CORONARY ARTERY DISEASE

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Introduction: Coronary Artery Disease (CAD) is known to be the main cause of death in industrial nations. Severe perioperative cardiovascular complications such as myocardial infarction, unstable angina, postoperative heart failure or cardiac death are expected in 5-15% of all patients. α_2 -agonists are thought to attenuate the surgical stress reaction and reduce the incidence of cardiovascular complications. The aim of this blinded randomised trial was to investigate the myocardial perfusion by MRI imaging in preoperative patients presenting with clinical symptoms of CAD in a dobutamine stress test with randomized administration of the α_2 -agonist clonidine.

Methods: After approval of the local ethical committee and informed consent 20 patients with CAD scheduled for coronary artery bypass grafting were randomized either to receive clonidine or placebo during a dobutamine stress test. The investigators were blinded towards the medication applied. After a baseline measurement of the myocardial perfusion the clonidine group received a bolus of 1.5 $\mu\text{g}/\text{kg}$ followed by a maintenance dose of 1.5 $\mu\text{g}/\text{kg}/\text{h}$ until the end of the study. The dobutamine infusion was started with an initial dose of 5 $\mu\text{g}/\text{kg}/\text{min}$ and increased up to a maximum of 40 $\mu\text{g}/\text{kg}/\text{min}$. Myocardial perfusion was examined with a 1.5T MRT system. The contrast agent used was Gd-DTPA. Perfused myocardium gives a higher MRI signal intensity than low or not perfused myocardium. The myocardial perfusion was determined by the change of the signal intensity during the Gd-DTPA perfusion over the time. The perfusion index is the maximal signal intensity in a myocardial segment compared to the maximal signal intensity in the left ventricle during the Gd-DTPA perfusion.

Results: 20 patients were included in this trial. 15 patients had triple CAD, 4 patients had a double and one patient had a single CAD. Patients basic characteristics did not differ between groups. Hemodynamic data did not differ significantly between groups. Ischemic segments in the placebo group (n=10) did not show any increase in perfusion comparing rest $9.0\pm 2.3\%$ to stress $9.0\pm 1.9\%$. In the clonidine group (n=10), however, the perfusion index showed an increase compared to the baseline measurements: 7.3 ± 1.3 vs $9.2\pm 2.8\%$ ($p<0.01$). There was an increase of perfusion in the non-ischemic segments in the control group during the dobutamine stress test compared to baseline measurements 10.7 ± 4.0 to 16.2 ± 4.1 au/s ($p<0.01$). The clonidine group showed a lower increase of perfusion rates 10.5 ± 1.8 to 12.5 ± 4.2 au/s ($p=0.01$). The perfusion of ischemic subendocardial myocardium was increased under stress conditions in the clonidine group ($p<0.01$), but remained constant in the placebo group. No increase of perfusion under stress conditions was found in both groups in ischemic subepicardial myocardium.

Conclusion: In patients with multiple CAD the application of clonidine led to a significant improvement of myocardial perfusion under dobutamine stress induction in ischemic subendocardial regions and non-ischemic regions. Therefore, perioperative clonidine administration might preserve myocardial perfusion and reduce the incidence of perioperativen myocardial ischemia and infarction.

SCA11

A CLINICAL COMPARISON OF THREE DESIGNS OF BRONCHIAL BLOCKERS WITH DOUBLE LUMEN TUBES FOR LUNG ISOLATION

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Studies suggest that bronchial blockers (BBs) may be equivalent choices to double-lumen tubes (DLTs) for lung isolation in thoracic surgery. Recently three new designs of BB have become available the Arndt, the Cohen and the Fuji. This study compared these 3 BBs with DLTs to determine whether there were clinical advantages of one over the other during one-lung ventilation (OLV). Fifty-two patients having left-sided thoracic or esophageal procedures were randomly assigned to one of four groups.

The following were documented: 1) Time to endotracheal intubation; 2) Time required to position each tube/blocker 3) Number of attempts at placing the lung isolation device; 4) Frequency of intra-operative re-positioning. 5) Intra-operative lung isolation problems; 6) Lung collapse analog scores (10= complete collapse, 0= no collapse) ranked by surgeons blinded to type of tube used; and 6) Time to complete surgery. DLTs needed to be repositioned 8.3% of the time and the BB needed to be repositioned to 37.5% of the time. There was no statistical difference between the Fuji, Cohen and Arndt BBs in the need to reposition them during the case. There was a significant difference between the DLTs and BBs for lung isolation problems during the case (DLTs 0% versus BB 40.5%; $p < 0.01$). No difference was found between the three BBs. The mean time to lung isolation was

significantly different between the DLT (93.8 s) versus BB (250 s) $p < 0.001$. There was no statistical difference in the percentage of lung isolation devices that were placed during the first attempt (DLT 78.6% versus 62.1% BB). There was no difference between the different BBs in the percentage that were placed on first attempt. There was no correlation with respect to the angle the Left Main bronchus (LMB) to the trachea and the difficulty in placing the lung isolation device. The lung deflation scores were significantly different at chest opening DLT mean score 7.1 versus BB 4.8 ($p = 0.014$). There were no differences in the lung deflation scores at 10, and 20 minutes after chest opening. There was no significant effect in this interim analysis of data to suggest that either early or late suction applied to the unventilated lung made any difference to the lung deflation score.

We conclude that there were more intra-operative problems with BBs, irrespective of the design, compared to DLTs. After 10 min of chest opening, lung collapse was equivalent between BBs and DLTs. Campos JH, Hallam EA, Van Natta T, Kernstine KH: Device for lung isolation used by anesthesiologists with limited thoracic experience: Comparison of double-lumen endotracheal tube, Univent® torque control blocker, and Arndt wire-guided endobronchial blocker®. *Anesthesiology* 2006; 104:2616

SCA12

STATIN USE AND THE INCIDENCE OF ATRIAL FIBRILLATION AFTER LOBECTOMY BY MINIMALLY INVASIVE SURGERY OR OPEN THORACOTOMY

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Objective: Recently, statins were reported to reduce the incidence of atrial fibrillation (AF) after thoracic surgery. Our goal was to determine whether statins reduced the incidence of AF after video-assisted thoracic surgery (VATS) lobectomy or lobectomy with thoracotomy (THOR).

Methods: Using our prospective database of consecutive pts. we identified 389 pts. who were in sinus rhythm before surgery and had elective lobectomy (THOR, n=267; VATS, n=122). After VATS pts. were age- and gender-matched with THOR pts., 244 pts. remained eligible for analysis. All pts. had clinical stage-I NSCLC, and none received medications to prevent AF. **Results:** AF was observed in 15/122 (12%) VATS vs. 20/122(16%) THOR pts., P=0.36. With exception of a greater DLCO % pred. among VATS (n=31) 95 ± 22 patients on statins vs. THOR (n=33) patients on statins 83 ± 15, P=0.01, the two groups did not differ in any other clinical characteristic such as history of hy-

pertension, coronary disease, COPD or diabetes mellitus. Statin use was associated with lower AF rates: 4/64 (6%) vs. No-statin 31/180 (17%), P=0.037. This lower incidence of AF associated with statins was significant only within the THOR group (1/33 (3%) vs. 19/89 (21%), P=0.013) but not within the VATS group (3/31 (9.7%) vs. 12/91 (13.2%), P=0.76)(Table).

Conclusions: The protective effect of chronic statin use against AF appears to be limited to THOR rather than minimally invasive VATS lobectomy. The mechanism by which statins protect against AF after THOR is unclear but may be related to their mitigating of inflammatory and/or oxidant states that are most likely greater after THOR than VATS. Regardless of statin use, AF occurred as frequently after VATS-and THOR-lobectomy and support the theory that autonomic denervation and stress-mediated neurohumoral mechanisms are responsible for the pathogenesis of AF after anatomical pulmonary resection.

	VATS Group (n=122)			THOR group (n=122)		
	Statin Yes (n = 31)	Statin No (n = 91)	P value	Statin Yes (n = 33)	Statin No (n = 89)	P value
Age	68 ± 6	67 ± 10	0.528	69 ± 9	66 ± 10	0.165
Male (%)	12 (39)	26 (29)	0.369	8 (24)	30 (34)	0.383
AF (%)	3 (10)	12 (13)	0.76	1 (3)	19 (21)	0.013
HTN (%)	13(42)	33 (36)	0.669	13(39)	27 (30)	0.388
COPD (%)	8 (26)	17 (19)	0.443	9 (27)	24 (27)	1.000
CAD (%)	8 (26)	4 (4.4)	0.002	9 (27)	2 (2.2)	0.001
DM (%)	5 (16)	5(5.5)	0.121	2 (6)	7(8)	1.000
MI (%)	3 (10)	1 (1)	0.05	3 (9)	1 (1)	0.60
Chem (%)	1 (3)	4 (4.4)	1.000	4 (12)	9 (10)	0.747
β-Blocker (%)	13 (42)	12 (13)	0.001	11 (33)	15 (17)	0.079
Ca⁺⁺ Blocker (%)	2 (6.5)	12 (13)	0.515	8 (24)	8 (9)	0.036
DLCO % pred.	95 ± 22	90 ± 30	0.373	83 ± 15	79 ± 19	0.308
FEV1 % pred.	91 ± 18	90 ± 19	0.799	87 ± 17	85 ± 19	0.701
LOS, d	5 ± 2.8	5 ± 2.3	0.067	7 ± 4.3	7 ± 3.6	0.335