Results: Multivariate analysis revealed four significant predictors of ELA: the presence of GGO, the size of consolidation, air-bronchogram, and CEA. The probability of ELA is evaluated based on the following equation.

$$\Pr(ELA) = \frac{1}{1 + \mathrm{Exp}\left[-(2.965 - 0.189 \times CEA - 1.083 \times G - 0.103 \times Cons + 1.217 \times AB)\right]}$$

$$G \begin{cases} 0 & \text{Presence of GGO} \\ 1 & \text{Absence of GGO} \end{cases}$$

$$AB \begin{cases} 1 & \text{Presence of Air Bronchogram} \\ 0 & \text{Absence of Air Bronchogram} \end{cases}$$

CEA: (continuous variable, in ng/ml)

Cons: the size of consolidation (mm)

Conclusion: Pathological ELA can be predicted with four significant preoperative factors. Based on these findings, candidate for limited surgical resection among clinical IA lung adenocarcinoma could be properly selected. Or other local therapy such as radiotherapy or radiofrequency ablation, might be indicated for those tumors, though careful clinical trials are mandatory for evaluating the efficacy of these new modalities.

A4-03 **Surgery, Mon, 13:45 - 15:30**

A surgical predictive risk model of in-hospital mortality for primary resectable lung cancer: statistical analysis of 10,205 patients from a nationally representative database

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Background: The aim of this study was twofold: to identify factors associated with in-hospital mortality among patients operated on for primary resectable lung cancer and to construct a risk model that could be used prospectively to inform decisions and retrospectively to enable comparisons and outcomes.

Methods: Data from a nationally representative thoracic surgery database were collected prospectively in 59 hospitals between June 1, 2002 and February 1, 2006. Only adult patients with more than 95% of completed data were selected for the final analysis (n=8,796 patients). Logistic regression analysis was used to predict the risk of in-hospital mortality. A risk model was developed with a training set of data (50% of patients) and validated on an independent test set (50% of patients). Its fit was assessed by the Hosmer-Lemeshow test (larger p value signifies greater reliability), and predictive accuracy was indicated by the area under the receiver operating characteristic curve (c-index).

Results: Of the 10,205 original patients, 316 (3.1%) died during the same hospital admission. Within the data used to develop the model, the factors found to be significantly associated with the occurrence of in-hospital mortality in a multivariate analysis were: age, gender, performance status (World Health Organization) classification, side, class of procedure (lobectomy or wedge resection versus pneumonectomy), tumor histology, TNM stages and presence of co-morbid disease. The model was reliable (Hosmer-Lemeshow test = 8.94; p=0.35) and accurate: the c-index (95% confidence interval) = 0.83 (0.81 to 0.85) for the training set and 0.82 (0.79 to 0.85) for the test set of data. The correlation between the expected and observed number of deaths was 0.99.

Conclusions: The validated multivariate model for risk of in-hospital mortality among adult patients requiring surgery for primary resectable lung cancer described in this report was developed with national data, uses only 8 variables and has good performance characteristics. It would be useful both for calculating the mortality risk of an individual patient and contrasting expected and observed mortality rates for an institution or independent clinician.

A4-04 **Surgery, Mon, 13:45 - 15:30**

Anatomical basis of systematic bilateral mediastinal nodal dissection for n3 left lung cancer through median sternotomy

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Background: Patients with mediastinal lymph node metastasis have a poor prognosis, and lung operation is not normally indicated. We have performed bilateral mediastinal lymph node dissection by median sternotomy to resect lung cancer and dissect the bilateral mediastinal lymph nodes. However, some studies have examined the communication between the left and right tracts in lung cancer cases, we anatomically analyzed this technique, and confirmed its usefulness.

Methods: We have performed this operation in 266 patients with primary left lung cancer excluding small cell carcinoma and stageIV since 1987. Thirty out of 266 patients had p-N3 lymph node metastases. For anatomical study eighteen adult male cadavers were used to analyze the anatomical details. According to the macroscopic dissection procedure, dissection of the lymphatics from the lungs to the supraclavicular lymph nodes was performed by sequential removal of the related organs. We systematically compared and reviewed the route of lymphatic communications to the contralateral side with the anatomical significance of left-to-right lymphatic communications in the bilateral mediastinal lymph nodes.

Results: The overall 5-year survival rate (Kaplan-Meier method), including operative deaths and deaths due to unrelated diseases, was 54.1% in the patients with left lung cancer. With respect to the p-N factor, the 5-year survival rate was 41.2% in p-N3 left lung cancer patients. Anatomical investigation showed left-to-right lymphatic communications in the following 4 regions: 1. regions around the brachiocephalic veins, 2. regions around the ascending aorta and the arch of the aorta, 3. regions around the trachea, 4. regions around the esophagus.

Conclusions: We clarified the route of lymphatic communications to the contralateral side, and systematically reviewed the anatomical significance of left-to-right lymphatic communications. We found various lymphatic communications such as between the left and right mediastinal lymph nodes and around the trachea in terms of clinical and anatomical status. Our results suggest the importance of the dissection of the bilateral mediastinal lymph nodes by median sternotomy.