

# Thoracic Surgery

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## Introduction

The Division of Thoracic Surgery has three missions: treatment via surgery, surgical resident training and clinical research. This year, our surgical load dropped slightly. However, training continued normally with one resident leaving us, and two residents joining us. We also started one trial, and two others continued.

The thoracic surgeries involve treatment of neoplasms in the thorax, primary and metastatic lung tumors, and mediastinal, pleural, and chest wall tumors. The division specializes in surgical treatment of pulmonary carcinomas. The surgical treatment modes include routine limited resection (wedge or segmental resection), simple resection (lobectomy or pneumonectomy) with or without systematic lymph node dissection. Thoracoscopic assistance is used as appropriate. Non-routine surgical treatments are complex approaches such as bronchoplasty, combined resection with adjacent structures, and perioperative adjuvant treatment.

The division has three consultant surgeons and usually four residents. In the three year general thoracic surgery junior residency course, one to two years is devoted to study of pathology, endoscopy, image diagnosis and/or medical oncology depending on the resident's interest. One year of the two year senior residency program is dedicated to research work, on and off site. Our oncologic specialty rotation system provides our residents with a great learning opportunity. They leave the National Cancer Center East campus familiar with lung cancer not only from the surgical aspect, but with a pathologic and radiologic view, and involvement with other organs.

The Division ranks number two for primary lung cancer surgical treatment patients in Japan, to the National Cancer Center Tokyo. Since its establishment in 1992, the Division has been one of the most active leaders in the lung cancer field. The Division of Thoracic Surgery has also been an active participant in scientific conferences.

## Routine Activities

Our multi-specialty approach is not only for resident's training. Every Tuesday evening, potential surgical

intervention candidates are presented at a multidiscipline team conference where the thoracic surgeons, oncology physicians, radiologists, and pathologists, including residents, gather for ardent discussion. To improve staff members' English fluency and to better involve visiting physicians from other countries, the treatment modality discussions are conducted in English. Every Friday morning, selected patients' records are radiologically and cytopathologically reviewed. These reviews are conducted to better understand radiologic indications versus pathology findings, evaluate surgery indications, and learn more of rare histologies.

For non-small cell histology, primary pulmonary carcinomas in clinical stages I/II, and IIIA without bulky mediastinal nodes, and small cell primary pulmonary carcinomas in clinical stage I, surgical resection is indicated for cure. Optimum treatment modalities are sought via clinical trials attempting to improve the poor prognosis of patients with bulky, or clinically and histologically proven, mediastinal lymph node metastases, with disease invading neighboring vital structures, or with small cell cancers stage II and later.

Metastatic lung tumor resection is attempted based on modified Thomfold's criteria after consultation with the patient. Based on histology, the majority of these cases are metastases from colorectal carcinomas. The majority of mediastinal tumors were thymic epithelial tumors. While some attempt surgical resection via thoracoscopic procedures, we don't think it is appropriate in these patients.

In addition to our bimonthly meetings with National Cancer Center Tokyo Thoracic Surgery Division, we attended seven regional, seven national, and five international conferences, and made 41 conference presentations this year in addition to the 12 published papers.

## New Developments in 2005

Our surgical procedures stayed unchanged for the past several years. Fifteen percent of the surgeries were completed by 3-port access, and 80% of the surgeries were thoracoscopically assisted. Due to National Cancer Center East operating room

renovation, the number of surgeries decreased. For the first time in our 13-year history, we had fewer surgeries than last year. However, we continued our teaching mission and innovative research into improved surgical techniques for thoracic neoplasm treatment. Our patients had shorter than average postoperative hospital stays, with the shortest being four days and averaging seven for primary lung cancer cases. Only one 30-day operative mortality occurred this year.

We started a new limited resection trial for small ground-glass opacity (GGO) lung lesions in November 2003. Patient selection is based solely on high resolution CT (HRCT) findings: pure or mixed GGO lesion 2 cm or smaller in the lung periphery with tumor disappearance ratio (TDR) 0.5 or greater on HRCT. TDR is defined as  $1 - \frac{DM}{DL}$ , where DM is the maximum tumor diameter on mediastinal settings and DL on lung settings.

We started investigation of a new negative resection margin technique this year. It uses lavage cytology examination for primary and metastatic lung cancer patients treated by limited resection. This method uses washing the used stapler cartridges and intraoperative cytological evaluation of the wash saline sediment.

### Ongoing Clinical Trials

1. Surgical margin lavage cytology examination in limited resection for primary and metastatic lung cancer patients [observational].
2. Limited resection trial for small ground-glass opacity (GGO) lung tumors [phase II].
3. Induction chemotherapy and irradiation for advanced thymic epithelial tumor [phase II].

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Number of Patients Surgically Treated

	2001	2002	2003	2004	2005
Lung carcinoma	270	263	291	317	286
Metastatic lung tumor	29	43	31	41	38
Mediastinal tumor	26	14	23	21	19
Esophageal carcinoma	24	37	29	57	64
Others	39	40	58	33	45
Total	388	397	432	469	452

Primary Lung Carcinoma Operative Method

	2001	2002	2003	2004	2005
Pneumonectomy	8	15	12	17	18
Lobectomy	207	203	217	233	221
(Bronchoplasty)	( 7 )	( 5 )	( 5 )	( 6 )	( 8 )
Limited resection	30	12	37	36	31
Lung resection	245	230	266	286	278

Survival Rates for Resected Primary Lung Carcinoma

p-Stage	3-year survival rate(%)	5-year survival rate(%)
I A	94.0	87.5
I B	82.5	70.3
II A	76.7	51.7
II B	64.8	58.4
III A	55.2	38.7
III B	52.2	41.1