

## Department of Surgery

### Division of Chest Surgery, Breast and Endocrinology Surgery

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### General Summary

The Divisions of Chest Surgery and of Breast and Endocrinology Surgery were established in June 2005. Since then, all staff members have been active in surgical practice, research, and education. Many studies are ongoing.

### Research Activities

#### *Chest surgery*

Thoracoscopic surgery is the focus of our clinical activity. This minimally invasive surgery produces fewer postoperative complications and sequelae and is especially beneficial for elderly, high-risk patients. Thoracoscopic surgery requires advanced skills, and we have independently developed total thoracoscopic surgery, which uses only a thoracoscope and video monitors to provide intraoperative views. Our method of thoracoscopic surgery can be used to treat many chest conditions, such as juvenile pneumothorax, peripheral lung nodules, mediastinal tumors, and lung cancer.

Thoracoscopic surgery is also indicated for higher-risk patients with such complications as advanced pulmonary emphysema, impaired pulmonary function, and extremely high age who are not candidates for conventional open surgery.

Operative procedures, including wedge resection, segmentectomy, lobectomy, and pneumonectomy of the lung, are all safely performed, in addition to resection of mediastinal tumors or the thymus. Surgery for lung cancer requires much more advanced skills and oncological considerations, which have also been independently developed. Of the mediastinal procedures, thymectomy is usually performed via thoracoscopy rather than via a conventional median sternotomy. In our department more than 90% of the chest operations are performed via thoracoscopy, which we assume to be the highest rate in the world.

The minimal invasiveness of thoracoscopic surgery is being investigated with prospective clinical studies. These studies include a comparative study of video-assisted lung cancer surgery with open surgery, an evaluation of video-assisted surgery for bullous lung diseases in elderly persons with impaired lung function, an evaluation of video-assisted surgery for thymic tumors, and an evaluation of video-assisted thymectomy for myasthenia gravis.

Our clinical studies are also evaluating new devices and methods, such as narrow-band imaging for the thoracoscopic diagnosis of benign and malignant lung diseases, and Laparo Sonic coagulating shears (Ethicon Endo-Surgery, Inc, Cincinnati, OH, USA) for small thoracotomy. Three-dimensional diagnosis with computed tomography is used to make thoracoscopic surgery safer. The diagnosis and treatment of ground glass opacity of the lung, which is considered to indicate early adenocarcinoma, are being evaluated.

Many basic research studies are also underway. In the morphological expression-related advancement of the molecular genetic analysis of lung cancer, we are investigating whether CA19-9 activity is an important marker of de novo carcinogenesis. The biological and genetic characteristics of peripheral adenocarcinoma of the lung are being investigated to establish the most appropriate surgical procedures.

#### *Breast and endocrinology surgery*

Cytotoxic chemotherapy is a standard treatment for breast cancer. However, responses to anticancer chemotherapy vary among individual tumors, and adverse reactions to therapy may outweigh the clinical benefits in some cases. Multicenter studies involving DNA microarray analysis are under way to seek effective drugs for individual tumors. Sentinel lymph-node navigation has become a standard procedure in breast cancer surgery worldwide. However, the use of sentinel lymph node biopsy after preoperative chemotherapy remains controversial. We are investigating its feasibility for standard use, especially after preoperative chemotherapy.

The usefulness of postoperative endocrine therapy for patients with hormone-receptor — positive breast cancer is recognized, but adverse effects, such as osteoporosis caused by aromatase inhibitors, must be considered. We are investigating the adverse effects of aromatase inhibitors, especially on bone mineral density, and comparing the effectiveness of therapeutic options in cases of decreased bone mineral density.

Various antihormonal agents have been used to treat hormone-receptor — positive breast cancer. We are evaluating several new antihormonal agents for patients with metastatic breast cancer refractory to previous antihormonal therapies.

#### **Publications**

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