

Department of Surgery

Divisions of Thoracic Surgery and of Breast and Endocrine Surgery

Thoracic Surgery

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General Summary

The Divisions of Thoracic Surgery and Breast and Endocrine Surgery were established in June 2005. Since then, we provide comprehensive diagnostic and therapeutic services for patients with surgical diseases of the chest, breast, and endocrine systems. We are leaders in our field of surgery, with a focus on minimal invasive surgery.

Research Activities

Thoracic Surgery

Thoracic surgeons of The Jikei University connect biomedical breakthroughs to practical applications to improve lives. Clinical research is an important part of our program and can provide novel treatments before they are widely available. Our research topics include (1) pulmonary function after lung resection, (2) surgery for lung cancer with oligometastatic disease, and (3) the effect of pleural abrasion and coverage with a polyglycolic acid sheet for pneumothorax. We are also involved in multiple basic research studies to understand, diagnose, and develop new treatments for pulmonary disorders and lung cancer.

Lung transplantation has become a well-established therapy for patients with severe or terminal pulmonary diseases that cannot be cured completely by medical treatments. Lung transplantation has become a well-established therapy for patients with severe or terminal pulmonary diseases that cannot be cured completely by medical treatments. Bronchiolitis obliterans and bronchiolitis obliterans-related syndrome are recognized as severe complications of lung transplantation. We have hypothesized that carbon monoxide can improve bronchiolitis obliterans through the inhibition of T-cell infiltration and the downregulation of inflammatory cytokine expressions in the transplanted grafts. To assess this hypothesis, we will examine the effect of carbon monoxide with an artificial gas carrier in a mouse model of orthotopic tracheal transplant.

We are also starting our basic research in oncology. Tumors exhibit multiple somatic mutations. Neoantigens derived from such tumor-specific mutations are potential targets for antitumor immune responses. The role of neoantigens in naturally occurring and therapeutically induced immune responses to cancer. We are planning to investigate mutation burden, neoantigen load, and the depletion of expected antigenic mutations in cases of lung cancer surgically removed by our division. Our aim is to find the new neoantigens

derived from tumor-specific mutations that can be targets for antitumor immune responses.

Breast and Endocrine

I. Breast

A. Clinical study

1. We have evaluated the pathological characteristics of microcalcification in breast cancer and its predictive value of the pathological response after neoadjuvant chemotherapy.
2. We performed a retrospective clinical study to evaluate the short- and long-term outcomes of immediate breast reconstruction after mastectomy following neoadjuvant chemotherapy in patients with breast cancer.
3. We have performed a multicenter clinical trial to evaluate the oncological safety of patients with 1 or 2 sentinel lymph nodes positive for metastases after axillary lymph node dissection has been omitted.
4. Aromatase inhibitors have been established as the gold-standard therapy for postmenopausal patients. We have performed a multicenter clinical trial to evaluate the efficacy of denosumab in the treatment of aromatase inhibitor-associated bone loss.
5. For 30 years, we have analyzed patients with metastatic breast cancer. The analysis has indicated that oligometastatic breast cancer is a distinct subgroup with a long-term prognosis superior to that of other metastatic breast cancers. We have performed prospective studies to characterize oligometastatic breast cancer and to evaluate the efficacy of multidisciplinary strategies, including medication, radiotherapy, and resection, to improve prognosis.
6. Because of recent progress in the diagnosis and treatment of breast cancer and the development of fertility preservation, oncofertility has become more important. With close cooperation among health care providers, we have analyzed in a multicenter clinical trial how information about fertility preservation is given to young patients with breast cancer.

B. Research study

1. We have recently established a conditionally reprogrammed cell system that enables us to examine heterogeneity, drug sensitivity, and cell function in patient-derived tumor samples. Furthermore, we have revealed the mechanism of drug resistance using conditionally reprogrammed cells obtained from the metastatic lesions of patients with HR+/HER2 – breast cancer.
2. Accumulating evidence suggests that dual-specificity tyrosine-regulated kinase 2 (DYRK2) functions as a tumor suppressor by regulating cell survival, differentiation, proliferation and apoptosis. We explored the mechanism of DYRK2 in cancer progression using breast cancer tissue from patients.

II. Endocrine

A. Clinical study

1. The effect of lenvatinib on thyroid carcinoma metastasis

Lenvatinib, a tyrosine kinase inhibitor, prolongs the progression-free survival of patients with thyroid cancer. We have participated in multicenter clinical trial to evaluate the anti-

tumor effects and side effects of lenvatinib for patients with thyroid carcinomas, including papillary carcinoma, medullary carcinoma, and undifferentiated carcinoma.

2. Tumor marker for thyroid differentiated carcinomas

A monoclonal antibody, designated JT-95, was made against a thyroid papillary carcinoma obtained by our Department of Breast and Endocrine Surgery. We have investigated, in collaboration with the Division of Molecular Cell Biology of The Jikei University, the clinical usefulness of JT-95. With the permission of the institutional review board of The Jikei University, we have performed a clinical study in which we have detected the antigen of JT-95 in the sera of patients with thyroid papillary carcinoma and of patients with breast tumor but no thyroid mass.

3. Endoscopic surgery for thyroid and parathyroid diseases

Starting this year, we have evaluated the usefulness and feasibility of endoscopic thyroidal and parathyroidal surgery for thyroid carcinoma, benign thyroid tumor, and parathyroid tumors.

We believe that endoscopic thyroidal and parathyroidal surgeries have almost the same surgical results, comparable to those of conventional surgery, with excellent cosmetic outcomes.

B. Research study

1. The detection of antigens of thyroid carcinoma in sera.

A monoclonal antibody, designated JT-95, was made against a thyroid papillary carcinoma obtained by our Department of Breast and Endocrine Surgery. We are attempting, in collaboration with the Molecular Cell Biology Division of The Jikei University, to measure the antigen recognized by JT-95 in the serum of patients with papillary carcinoma. The quantity of JT-95 antigens is higher in patients with papillary carcinoma, especially those with metastasis to the lung or bone, than in patients with breast carcinoma. We are now trying to improve chromatography for JT-95 to more easily detect thyroid carcinoma antigen.

Publications

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