

Department of Surgery

Division of Digestive Surgery

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General Summary

Publications in peer-reviewed journals are the main measure of research activity. According to a recent article, Japan is the second most productive country behind only the United States in terms of the absolute number of articles (9.1% of the total) published in 15 major surgical journals (as determined by impact factor). However, when corrected for population size, Japan ranks low in clinical medicine and surgery. According to a recent article in *The Lancet*, there is a considerable difference in activity between basic research and clinical research in Japan, which contributes to 8% of papers in *Nature* but is responsible for less than 4% of contributions to *The Lancet*.

We must take the initiative to fill the gap between basic research and clinical trials. Using a newly developed integrated system for searching the data of patients admitted to each Jikei University hospital, we are now performing or planning prospective clinical trials regarding outcomes of surgery, perioperative management, and adjuvant therapy for gastrointestinal and hepatobiliary malignant tumors.

Research Activities

Laparoscopic surgery for achalasia and reflux esophagitis has been intensely studied to clarify the significance of surgical treatment for such diseases. As the effectiveness of laparoscopic surgery becomes better known, the number of such operations are increasing nationwide. Also, hand-assisted laparoscopic-thoracoscopic surgery has been performed to treat esophageal cancer, and the advantages of less-invasive surgery and shorter hospitalization have been achieved in selected patients. Basic research in esophageal cancer has led us to identify molecular markers that are indicators of prognosis.

For early gastric cancer, we have established a new technique of sentinel node navigation surgery using indocyanine green without radioisotopes. A multicenter trial to evaluate our technique with radioisotopes has been completed and has obtained encouraging

results. We have also started to examine sentinel node navigation surgery in patients with early Barrett's esophageal cancer.

To improve the quality of laparoscopic operations we are evaluating the usefulness and reliability of the Virtual Reality Surgical Simulator for laparoscopic colectomy. We are also examining the relationship between reactions of various immunoglobulins in the serum of patients with cancer by means of enzyme-linked immunosorbent assay and several factors pertinent to clinicopathological data. Furthermore, we are evaluating bowel function by [¹³C]-breath testing after colorectal surgery to determine the appropriate duration of postoperative bowel rest. Preoperative diagnosis of lymph node metastasis for colorectal cancer by diffusion magnetic resonance is ongoing. Interim results are as follows: sensitivity, specificity, the positive predictive value, and the negative predictive value were 71%, 63%, 55%, and 77%, respectively. Various types of lymph node (> 10 mm) could be diagnosed with increasing frequency.

The ongoing research topics in the field of hepatopancreatic-biliary surgery are as follows: 1) living donor liver transplantation (LDLT), regenerative medicine, and artificial liver (especially, implantable artificial liver); 2) chemotherapy for pancreatic cancer; 3) expansion of surgical indications for multiple hepatic tumors by hepatic resection; 4) laparoscopic hepatic resection; 5) development of navigation systems for intraoperative evaluation of biliary surgery; and 6) the significance and clinical application of lipid mediators and high mobility group box-1 for hepatocellular carcinoma and liver diseases. Regarding topic 1, the first LDLT was successfully performed for a patient with postnecrotic cirrhosis with hepatocellular carcinoma on February 9, 2007. Our ongoing research on regenerative medicine and artificial organs is expected to have a synergistic effect with liver transplantation medicine. Regarding topic 2, we are carrying out a unified clinical trial for pancreatic cancer at the 4 Jikei University hospitals. Furthermore, at The Jikei University Hospital, we have started translational research by combination chemotherapy with gemcitabine and a naive protease inhibitor, FUT-175, which has dual function of NF κ -B inhibition and apoptosis induction in pancreatic cancer cell lines. Research into topics 3, 4, 5, and 6 are in progress after approval was obtained from the Ethics Committee of our university.

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