

Department of Surgery

Division of Digestive Surgery

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General Summary

The presentation of study results at annual scientific meetings is not the goal of surgical research. Many abstracts accepted for oral or poster presentations at scientific meetings will go unread and uncited, calling into question the value of the research. Research activities are measured by the quantity and quality of international publications. The impact factor is a surrogate marker for the quality of a journal, and the citation index, which is the number of times an article has been cited, has been used as a marker of its influence in a medical specialty. According to a recent survey in the United Kingdom, only a quarter of abstracts presented at the annual scientific meeting of the British Association of Surgery resulted in peer-reviewed publication with an average impact factor of 1.65 for basic science papers and with an average impact factor of 0.65 for clinical subjects. This survey also indicates that unpublished studies 2 years after presentation will never be published. The number of our abstracts accepted for presentation at Japanese and international medical congresses is increasing, but the number of our publications is not increasing at the same rate. We are encouraged to enhance achievements in academic surgery by improving scientific writing skills.

Research Activities

Upper gastrointestinal surgery

We evaluated the pathogenesis of primary esophageal motor functional disorders, especially achalasia, gastroesophageal reflux disease, and reflux esophagitis, using manometry and multichannel intraluminal impedance pH monitoring. We have performed many laparoscopic surgeries and obtained good results. Recently, we began to use a mesh for crural repair in patients with intractable gastroesophageal reflux disease. We aimed to investigate the significance of the expression of small ubiquitin-like modifier 1 as a prognostic molecular marker of esophageal cancer. We continue to assess the viability of the gastric tube using an intraoperative thermal imaging system during esophagectomy to

investigate the correlation between suitable graft reconstruction and postoperative complications. We also continue to examine intraoperative recurrent nerve monitoring to prevent postoperative recurrent nerve palsies and to predict the degree of paralysis after surgery.

We are attempting to optimize the treatment of gastric malignant tumors, such as gastric cancer and gastrointestinal stromal tumor. Our treatment strategies for gastric cancers include intra-abdominal chemotherapy for advanced gastric cancer with possible peritoneal metastasis and sentinel navigation surgery with infrared endoscopy for early gastric cancer. Herceptin was recently approved for the treatment of human epidermal growth factor receptor 2 (HER2)-positive gastric cancer. Because the incidence of HER2-positive gastric cancer has not been extensively studied in Japan, we are studying the positivity rate both retrospectively and prospectively. We have treated 3 patients with recurrence after laparoscopic gastric cancer resection, but the overall long-term prognosis after laparoscopic resection is good.

Postgastrectomy syndrome comprises specific symptoms after gastrectomy and is a target for treatment. The severity of postgastrectomy syndrome is mainly related to the extent of gastric resection and the reconstruction procedures. Postgastrectomy syndrome is a clinical obstacle, because it impairs patients' quality of life. To decrease the incidence and severity of postgastrectomy syndrome and to maximize residual gastric function, several types of limited gastric resection with refined techniques of reconstruction have been attempted. In addition, multiple postoperative gastrointestinal function tests are applied to patients who have undergone gastrectomy to evaluate various gastrectomy procedures and to inform the patients of the appropriate management.

Colorectal surgery

To improve the quality of laparoscopic operations, we are evaluating the effect of laboratory training with a virtual reality surgical simulator for laparoscopic colectomy. A comparative evaluation of surgical stress between open and laparoscopic colorectal procedures is in progress. In the forthcoming era of robotic surgery for colorectal disease, we are preparing to develop safer and less invasive surgical procedures. In chemotherapy, we are actively participating in national multi-center trials to send new evidence to the world. Moreover, an original regimen are developed in collaboration with the Division of Oncology/Hematology, Department of Internal Medicine, and the characteristic early tumor shrinkage with this regimen has been reported at domestic and foreign congresses. There have been no breakthroughs in basic research on various antibodies in relation to cancer. However, indoleamine 2,3-dioxygenase (an enzyme that mediates cancer immunotolerance) has been reported to be a useful marker for predicting recurrence of early colorectal cancer. In collaboration with the Department of Urology, we are developing a proteomic method to identify cancer-associated proteins (colorectal, esophageal, gastric, pancreatic, and liver cancers). We have started to characterize a novel, targeted, nanobiopolymeric conjugate based on biodegradable, nontoxic, and nonimmunogenic poly(β -L-malic acid).

Treatment with aluminum potassium sulfate and tannic acid has been added to support the treatment of anorectal diseases. Functional analysis of the anorectum with defecography

and stationary 3-dimensional manometry have been introduced to help us to better understand anorectal function and to improve treatment strategies in patients with anorectal functional disorders.

Hepatobiliary and pancreatic surgery

The outlines of our main research activities are as follows.

1. Living donor liver transplantation (LDLT) and regenerative medicine
2. Treatment of hepatocellular carcinoma (HCC) and control of recurrence
3. Chemotherapy for pancreatic and biliary cancers
4. Expansion of surgical indications for multiple hepatic tumors
5. Laparoscopic surgery for the liver, biliary tree, pancreas, and spleen
6. Navigation surgery for hepatobiliary and pancreatic surgery
7. Nutritional therapy for patients with cancer
8. Surgical site infection control
9. Effect of preoperative treatment with eltrombopag on splenectomy for idiopathic thrombocytopenic purpura
10. Genome-wide association study of donors and recipients in LDLT
11. Molecularly targeted therapy for advanced HCC
12. Analyses of new biological tumor markers for HCC

The first LDLT was successfully performed for a patient with postnecrotic cirrhosis and HCC on February 9, 2007. Our 10th LDLT was performed on March 16, 2012, for a patient with recurrent primary sclerosing cholangitis who had previously undergone LDLT for primary sclerosing cholangitis at our hospital in October 2009. All 10 recipients were discharged on postoperative days 15 to 46 in good condition, and all donors were discharged on postoperative days 8 to 13 and have returned to their preoperative status. We are planning to extend the indications of LDLT to ABO-incompatible cases and to acute hepatic failure. We have conducted translational research on combination chemotherapy with gemcitabine and a novel protease inhibitor, FUT-175, which is associated with both nuclear factor κ -B inhibition and apoptosis induction in pancreatic cancer cell lines. Navigation surgery for liver surgery was adopted by the national health insurance system as of April 1, 2012, and biliary and pancreatic navigation surgery is performed with the Institute for High Dimensional Medical Imaging Research Center. Other clinical and experimental trials on the treatment of hepatic tumors, laparoscopic surgery, nutritional therapy, surgical site infections, and eltrombopag as a pretreatment for laparoscopic splenectomy for idiopathic thrombocytopenic purpura, are ongoing. Also, we are participating in multicenter studies of genome-wide association, molecularly targeted therapies for advanced HCC, and new biological tumor markers for HCC.

Publications

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