Laparoscopic liver resection has now been performed in more than 3,000 patients worldwide with excellent results (1). Most early laparoscopic cases were non-anatomic hepatic resections for peripherally located, benign lesions. Now, ~50% of minimally invasive liver resections are performed for malignancy, with lobectomies and extended resections being performed in specialized centers. Nguyen et al. analyzed the comparative benefits of laparoscopic liver resection (LLR) versus open liver resection (OLR) in 31 case-cohort matched studies which accounted for 2,473 patients (2). Comparing LLR to OLR, there was significantly less blood loss, less transfusion, fewer postoperative days of narcotic medication, quicker resumption of diet, decreased time to ambulation, and shorter length of stay for LLR. The majority of studies reported comparable morbidity rates, while seven studies showed significantly lower complication rates with LLR. There were no differences in operative time or mortality. Acknowledging the inherent limitation to any retrospective analysis of case-cohort matched patients, this study supports that LLR results in patient benefits compared to OLR.

With regards to cancer outcomes, 5-year overall survival data now exists for both hepatocellular carcinoma (HCC) and colorectal cancer (CRC) metastases showing comparable survival between LLR and OLR (1–4). Zhou et al. (3) performed a meta-analysis comparing oncologic outcomes following LLR or OLR for HCC. Ten nonrandomized controlled studies with 494 patients (213 LLR and 281 OLR) were included. Compared with perioperative results of OLR, LLR had advantageous outcomes related to blood loss, transfusion requirements, postoperative morbidity, and LOS. There were statistically significantly lower rates of cirrhotic decompensation/ascites than a trend towards lower rates of postoperative liver failure following LLR. There was no statistical difference in operative time or postoperative mortality. For oncologic outcomes, there were no differences in pathologic resection margin, or 3- and 5-year overall or disease-free survival. There were no reported cases of port-site recurrences or peritoneal dissemination.

This meta-analysis suggests that LLR is comparable, and in some parameters superior, to OLR for resection of HCC. Several series have reported the safety, feasibility, and oncologic integrity of LLR for CRC metastases (1, 2). Castaing et al. reported the only prospective matched comparison in patients undergoing resection of CRC liver metastases via laparoscopic (n=60) and open (n=60) approaches (4). LLR was comparable to, and in some cases superior to, OLR in terms of oncologic outcomes. Specifically, the margin-free resection rate was greater in LLR versus OLR, while there was no significant difference in overall and disease-free 3- and 5-year survival.

Hence, the data for nearly 3,000 reported LLR cases indicate that it is safe, feasible, and cost-effective with demonstrable short-term benefits and no negative impact on long-term outcomes. LLR should only be performed by surgeons acquainted with open and minimally invasive techniques. A randomized prospective trial would be optimal to validate these results, and a multi-center clinical trial has been proposed (clinicaltrials.gov).

References

(Profile)
David A. Geller, M.D. — Narrative Biosketch
Dr. Geller is the Richard L. Simmons Professor of Surgery at the University of Pittsburgh School of Medicine. He serves as Chief of the Division of Hepatobiliary and Pancreatic Surgery, and Co-Director of the UPMC Liver Cancer Center. His clinical focus is the evaluation and management of patients with liver cancers. He specializes in laparoscopic liver resection surgery, and has performed more than 300 of these surgical cases in patients with liver cancer or benign liver lesions. His research interests include molecular mechanisms of hepatic injury, and liver cancer cell biology. Dr. Geller is a member of many professional societies including the Society of University Surgeons (President 2009-2010), Society of Surgical Oncology, American Society of Transplant Surgeons, American Surgical Association, AHPBA, HIPBA, and the American Society of Clinical Investigation. Dr. Geller has published 250 scientific papers and chapters, and has presented at more than 350 meetings or seminars. He has active research grants from the NIH, and is also the Principal Investigator on Industry-sponsored clinical trials for liver cancer.
Patient-oriented Surgery for Gastric Cancer: Experience in Taiwan
Professor of Surgery and Vice-superintendent of National Taiwan University Hospital
Ming-Tsai Lin

Gastric cancer remains one of the most frequent and lethal malignancy worldwide, and surgery is still the main treatment. However, gastrointestinal (GI) surgery, especially in cancer patients, frequently develop malnutrition before operation, which is associated with higher morbidity and mortality. In addition, traditional laparotomy may result in delayed recovery of GI function, more wound pain, and late ambulation. National Taiwan University Hospital (NTUH) is the leading medical center in Taiwan, that does many innovative and well-designed instrument and devices to alleviate the surgical stress and enhance the recovery.

We developed a Lin-system of gasless equipment for laparoscopic surgery, and applied it to more than five hundred total or subtotal gastrectomy. Comparing to open surgery, our gasless setting provides earlier recovery, less pain, and better cosmetic result. Besides, it prevents limitations of laparoscopy, with merits of three dimensional sensation, tactile sensation preservation, use of high-pressure irrigation and vigorous suction, and application of traditional and laparoscopic instruments. On the other hand, gas-filling laparoscopy with intracorporeal anastomosis was also performed for patients of fair cardiopulmonary function or obesity. For different patients of gastric cancer, we provide personalized minimal invasive surgery (gaseous MIS, totally laparoscopic surgery, or single-incisional laparoscopic surgery) to improve postoperative recovery. For patients diagnosed with gastrointestinal stromal tumors, single-incisional laparoscopic surgery may be another alternative option of MIS. We also design one single-port device to fasten the operation with lower medical cost. With the development of new technology, robotic gastric surgery has been performed at NTUH since 2011, which makes intracorporeal sutures easier if surgeons are not familiar with the laparoscopic method.

To enhance the recovery of surgical patients, peri-operative nutrition regimen would also be taken into consideration. Our studies revealed glutamine supplementation with TPN enhanced postoperative immune response and improved nitrogen balance. In addition, parenteral N-3 fatty acid was also approved to modulate postoperative inflammatory and immune response. Furthermore, our clinical project showed parenteral glutamine supplement has synergetic effects for patients after minimally invasive surgery of subtotal gastrectomy, that contributed to shorter interval to flatus and oral intake, less SIRS response and discomfort. For cases with malnutrition or advanced gastric cancer, feeding jejunostomy may be considered to resume early enteral feeding.

With less physical impacts from personalized minimal invasive surgery and better metabolic support by appropriate nutrition, patients of gastric cancer could gain quicker recovery and live with better quality of postoperative life (maximal healing surgery).

(Profile)

EDUCATION:
1980-1987  M.D.
National Taiwan University College of Medicine
1992-1997  Ph.D.
Post Graduate School, National Tokyo University, Japan

PRESENT POSITION:
2011-Now Vice-Superintendent
National Taiwan University Hospital
2007-Now Professor
Department of Surgery, National Taiwan University Hospital
Department of Primary Care Medicine, National Taiwan University College Medicine

RESIDENCY & EXPERIENCE:
1987-1992 Resident, Chief Resident
National Taiwan University Hospital
1997- Fellow, National Cancer Center Hospital
1997-1998 Fellow, Kyorin University
1997-2002 Associate Professor
Department of Surgery, National Taiwan University Hospital
Department of Primary Care Medicine, National Taiwan University College Medicine
2002-2007.7 Associate Professor
Department of Surgery, National Taiwan University Hospital
Department of Primary Care Medicine, National Taiwan University College Medicine
2007-2009 Chairman of Medical Affairs Office, National Taiwan University Hospital
2005-2011 Chief of General Surgery, National Taiwan University Hospital

SPECIALTY:
1. General Surgery
2. GI Surgery
3. Surgical Nutrition
4. Minimally Invasive Surgery

MEMBERSHIP OF SOCIETY:
1991-Now Taiwan Surgical Association
2001-2003 General Secretary, Taiwan Surgical Association
1992-Now Taiwan Surgical Society of Gastroenterology
1998-2000 General Secretary, Taiwan Surgical Society of Gastroenterology
2004-Now Director, Taiwan Surgical Society of Gastroenterology
1997-Now Taiwan Society for Parenteral and Enteral Nutrition
2001-2003 Director, Taiwan Society for Parenteral and Enteral Nutrition
2010-Now Director, Taiwan Society for Parenteral and Enteral Nutrition
2008-Now Director, Taiwran Society for Parenteral and Enteral Nutrition
2008-Now Director, Taiwan Society for Parenteral and Enteral Nutrition
2008-Now Director, Taiwan Society for Parenteral and Enteral Nutrition
2008-Now Director, Taiwan Society for Parenteral and Enteral Nutrition

AWARDS:
1. ESPEN Travel Fellowship Scholarship (European Society of Parenteral and Enteral Nutrition) 1996, Geneva, Swiss.
2. ASPEN Harry M. Vars Research Award (Candidate) (American Society of Parenteral and Enteral Nutrition) 1997.1 San Francisco.
Minimally Invasive Surgery in Pancreas
Department of Surgery, Seoul National University College of Medicine, Seoul National University Bundang Hospital, Korea, Ho-Seong Han

Since the introduction of laparoscopy, application on laparoscopic surgery for pancreas is increasing these days. There are several kinds of laparoscopic surgical procedure including distal pancreatectomy, pancreaticoduodenectomy, central pancreatectomy, enucleation, etc. Although, laparoscopic pancreaticoduodenectomy is still controversial due to its difficult techniques, laparoscopic distal pancreatectomy is frequently used as an optional treatment method for the lesions in body and tail of pancreas, when the lesion is considered benign or premalignant. Laparoscopic enucleation is also a good treatment modality when the lesion is presumed to be benign and small such as insulinoma. Central pancreatectomy is moderately difficult in terms of technique, and it is occasionally used for the lesion in the neck to preserve the volume of the pancreas as much as possible. The application of laparoscopic technique to malignancy is still contraindicated and still there are few reports on this disease entity.

We retrospectively analyzed of the clinical outcome of 143 patients who underwent laparoscopic pancreas surgery from June 2004 to August 2012. As regards to the technique of distal pancreatectomy, preservation of splenic vessels and spleen was tried unless the tumor was very close to splenic hilum or malignancy was suspected in preoperative radiologic studies. For pancreaticoduodenectomy, both laparoscopy assisted method and totally laparoscopic method have been used. Operation types were 115 cases of distal pancreatectomy, 6 cases of central pancreatectomy, 4 cases of enucleation and 3 other operations. Among 112 patients operated on distal pancreatectomy, there were 10 patients who were diagnosed as pancreatic malignancy. Eight patients are still alive without recurrence of tumor at mean follow-up period of 30 months. One patient with recurrence is alive for 60 months postoperatively and one remaining patient has expired due to liver metastasis. Our experiences show that laparoscopic pancreas surgery is becoming attractive option for pancreas disease.

〈Profile〉
EDUCATION & DEGREES:
1978-1984 M. D., Seoul National University College of Medicine
POSITIONS
1984-1989 Intern, Resident, Department of Surgery
Seoul National University Hospital
2003- Present Director of Comprehensive Cancer Center
Professor of Department of Surgery
Director of Future Strategy Bureau
Seoul National University Bundang Hospital
Seoul National University College of Medicine

MEMBERSHIP:
President, Korean Study Group of Laparoscopic Liver Surgery (2008-Present)
President, Korean Study Group of Pancreatic Surgery (2012-Present)

EDITORIAL BOARD:
Associate Editor, Hepatogastroenterology (2010-Present)
Scientific Advisory Board (Asian Pacific Region), Annals of Surgical Oncology (2011-Present)
Minimally invasive esophagectomy for cancer of the esophagus and esophagogastric junction

Department of General and Minimally Invasive Surgery, Humanities Clinical and Research Center/Department of Surgery, University of Milan

Riccardo Rosati

The incidence of cancer of the esophagus and esophagogastric junction has been increasing over the past three decades and, in western countries, this has been due to an increase in the incidence of adenocarcinoma of the esophagus.

Esophagectomy is a primary curative modality for localized esophageal cancer. However, this is one of the most challenging and morbid surgical procedures, and its morbidity associated with esophagectomy has raised concerns about the procedure and the approach which involves two and sometimes three corporeal districts: the abdomen, the chest, and sometimes the neck. Recent application of minimally invasive surgery to this surgical field has gained popularity as demonstrated by the increasing number of series published in the literature: our group was performing thoracoscopic esophagectomy in the early 90’s and then stopped following the disagreement to this procedure expressed at the consensus conference on treatment of the esophageal cancer at the 1995 world congress of the ISDE. A variety of techniques have then been proposed, varying from completely minimally invasive surgery to the use of combined open and laparoscopic or thoracoscopic approaches. The pure minimally invasive techniques are: transthiatal which utilizes laparoscopy and cervicotomy; the McKeown (also known as the three-hole esophagectomy) performed through laparoscopy, thoracopy, and cervical esophagogastric reconstruction; and more recently the Ivor–Lewis technique through laparoscopy and thoracopy. The most widespread technique is the hybrid approach which combines laparoscopic gastrolysis and lymphadenectomy with thoracotomy. This is also our preferred approach.

In the period 2000-2012, 296 patients were submitted to an esophagectomy (257 transthoracic resections and 39 transthiatal resections). Adenocarcinoma was the most common type of tumor. We performed open gastrolysis in 112 patients and laparoscopic gastrolysis in 184 patients. In the laparoscopic group, we performed 16 totally minimally invasive transthoracic esophagectomies (laparoscopy and thoracopy), 115 transthoracic esophagectomies with open thoracotomy, and 18 transthiatal esophagectomies. The conversion rate was 5.4%. The comparison between open and laparoscopic approach revealed splenic lesion as the only statistically significant difference (open group 8.0%, laparoscopic group 0.5%; p: 0.0005). Open and laparoscopic esophagectomies were comparable in terms of intraoperative and postoperative complications, in-hospital mortality (4.7%), length of hospital stay, readmission, number of lymph nodes harvested, and oncologic outcome.

Our experience and results from literature show that minimally invasive esophagectomy can be performed safely in a high-volume hospital with an acceptable morbidity and mortality, similar to open surgery. This approach may reduce postoperative respiratory complications. From the oncologic point of view, minimally invasive esophagectomy allows to perform adequate lymphadenectomy, with medium/long-term results similar to open surgery. Prospective randomized trials are needed to define the exact role of the procedure.
Robotic-assisted Thoracic Surgery
Jens C Rückert, Marc Swierzy, Jan Gregor, Harun Badakhshi, Jens Neudecker, Mahmoud Ismail
Jens C. Rückert

Introduction: Two decades ago the era of minimally invasive surgery began. The basis of this development had been a technological progress resulting in new equipment. Since then all surgical disciplines have developed minimally invasive variations of traditional surgical approaches. During the first decade of the Nineties the question of "what can be operated minimally-invasively?" was answered almost completely. The next decade had to address a different question: which of the new techniques would be efficient to replace the traditional approach? Independently, the further technological development led to new suggestions such as "single incision surgery" or "natural orifice transluminal surgery". One of the latest steps is robotic surgery representing quite a new quality of surgical work by principle. Most of all narrow and remote operation fields benefit from the different technical advantages, such as the use of 3-dimensional view for the surgeon, articulated instrument tips, and the stable camera position conducted by the surgeon. Other general aspects are smallest movements at the trocar entrance sites leading to lowest pain and best cosmesis for the patient. Furthermore, robotic surgery permits highest ergonomic standards even with unusual trocar or patient positions by the technique of master-slave system with the surgeon's console. For any new surgical technology the aspects of learning and training as well as the degree of dexterity are important. Robotic assistance has repeatedly shown to result in a faster learning curve in prospective randomized trials comparing non-robotic and robotic surgical work. In addition, less experience in minimally-invasive surgery was a lower barrier for learning robotic surgery. The dexterity to be obtained with this technology meets highest requirements. Of course, there are challenges like the high costs of robotic surgery.

The spectrum of robotic thoracic surgery is wide, and almost every kind of thoracic surgical intervention has been described with robotic assistance.

Methods: The literature and the role of scientific societies like ISMICS, CRSAS, MIRA, ITMIG and others have been analysed to clarify the development and actual state of robotic thoracic surgery. The evaluation was divided into mediastinal, lung, and chest wall robotic surgery and included the main principles of the robotic operation techniques. Personal experience with building up a robotic centre and international transfer of robotic surgical experience were described. The long term results of a single-centre series of 300 mediastinal operations were analysed. For robotic thymectomy due to myasthenia gravis the improvement of the disease was evaluated according to the MGFA classification system. Robotic resection of mediastinal tumours was developed due to the principles of oncoligic resection. A comparison of different robotic surgical techniques was made.

Results: There is a small but rising number of publications on robotic thoracic surgery in the high-ranking journals. Meanwhile robotic surgery is integrated into all important surgical societies.

Different robotic techniques for lung resection and mediastinal surgery contribute to the sharp increase of minimally-invasive lobectomies and thymectomies worldwide. The largest single-centre series of robotic thymectomy in a mixed population with myasthenia gravis and/or thymoma had a very low exclusion rate. The operation time was between 1 and 3 hours with conversion of below 3%. There was no operative mortality and a morbidity rate of 1.7%. The cumulative rate of complete remission of myasthenia gravis was 45%. For thymoma no recurrence was found until now in a single-centre series. There was no thymoma-related mortality. The international European combined experience had very similar results.

Conclusions: With different degree of approval robotic thoracoscopic surgery actually seems to be the premium approach for mediastinal surgery. The results of robotic lung and esophageal surgery are promising.
The changing face of lung cancer
Thoracic Surgery, Yale University
School of Medicine, USA
Frank C. Detterbeck

Lung cancer remains the leading cause of cancer deaths by far. It is also a field in which many changes are occurring, and in some ways the fundamental nature of the disease is changing. Better clinical staging has resulted in stage migration, so that the nature of patients within a stage group is different. Lung cancers exhibit a wide spectrum of aggressiveness, and we now identify very well-behaving lung cancers—raising the question of how aggressive our treatment of these should be. There is an increasing appreciation of lung cancers that are multifocal or occur in non-smokers, challenging our traditional understanding of the cause of lung cancer. Insight into the genetic signature of lung cancers raises questions about our classification of histologic types of lung cancer. Rudimentary insight into the process of metastasis undermines our traditional understanding of localized and disseminated disease. Although many questions are being raised and the answers are not clear, it is important for surgeons to appreciate the changing nature of the disease.

Profile
1991–92: Fellowship in Thoracic Transplantation, University of North Carolina, Chapel Hill, NC
1988–91: Residency in Cardiothoracic Surgery, University of North Carolina, Chapel Hill, NC
1973–76: Cell Biology, University of Michigan, Ann Arbor, Michigan; B.S. with Honors, 1976

Professor & Chief of Thoracic Surgery, Yale University School of Medicine 2005–present
International Thymic Malignancies Interest Group: President
International Staging Committee (IASLC): Methodology Committee, Thymic domain (chair)
Associate Editor: J of Thoracic Oncology
Editorial Board: J of Thoracic and Cardiovascular Surgery, Chest

Books/Editorial Activities:
ACC (American College of Chest Physicians) Lung Cancer Guidelines, 3rd Edition, Vice-Chair
Detterbeck FC, Huang, J (eds) ITMIG Standard Definitions and Policies J Thor Oncol. 2011; 6 (Suppl)

Author/Co-author of approximately 50 book chapters and 150 peer-reviewed papers