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Here is a collection of abstracts of published papers related to Gastroesophageal surgery in the journal *Mini-invasive Surgery* ([www.misjournal.net](http://www.misjournal.net)) from Jan 2019 to present, including paper types, titles, full-text links, DOI, abstracts and keywords, which are more convenient for you by clicking the titles in Table of Contents/entering keywords in look-up function to quickly search papers you want to read. We hope this collection is a good assistant for you. Your recommendation of this collection to your friends or colleagues is highly appreciated. If you have any questions in using this collection, please feel free to contact our editorial office.

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## Gastroesophageal surgery

### 1. Review

#### **Stapler vs. hand-sewn intrathoracic esophagogastric anastomosis: which anastomotic method renders better results?**

[Full-Text PDF](#)

**Copy here to cite this article:** Kolokotronis T, Galanis M. Stapler vs. hand-sewn intrathoracic esophagogastric anastomosis: which anastomotic method renders better results?. *Mini-invasive Surg* 2021;5:19.

<http://dx.doi.org/10.20517/2574-1225.2021.07>

#### Abstract

**Aim:** We investigated the impact of the anastomotic method in the frame of open abdominothoracic esophageal resection (hand-sewn vs. stapler anastomosis) in patients with carcinoma submitted to surgery in the University Clinic of Saarland over a 14-year period.

**Methods:** In total, 176 patients underwent an abdominothoracic resection with intrathoracic anastomosis and conventional gastric conduit formation; two groups of patients were analyzed: end-to-end, hand-sewn anastomosis (Group 1) and end-to-side, circular stapler anastomosis (Group 2). Both groups were compared regarding anastomotic leaks and strictures, postoperative morbidity, 90-day mortality and survival.

**Results:** The rates of anastomotic leak and stricture in the stapler group were reduced in comparison to hand-sewn group, however without reaching statistical significance (8% vs. 13.5%,  $P = 0.22$ , and 6% vs. 13.5%,  $P = 0.1$ , respectively). In contrast, the rates of redo surgery (34.1% vs. 8%,  $P = 0.001$ ) and 90-day mortality (11.9% vs. 2%,  $P = 0.02$ ) were significantly higher in the hand-sewn anastomosis group.

**Conclusion:** The management of anastomotic leak (stent insertion vs. reoperation)

combined with the use of stapler to perform intrathoracic esophagogastric anastomosis improved the postoperative outcome after abdominothoracic esophageal resection.

## 2. Technical Note

### **Robotic Ivor Lewis esophagectomy**

[Full-Text PDF](#)

**Copy here to cite this article:** Ackerman JM, Luketich JD, Sarkaria IS. Robotic Ivor Lewis esophagectomy. *Mini-invasive Surg* 2021;5:14. <http://dx.doi.org/10.20517/2574-1225.2021.02>

#### Abstract

The addition of robotic-assistance is the latest evolution of minimally invasive esophageal resection and reconstruction. Despite the improved visualization, the addition of wristed instrumentation, and improved ergonomics, there remains a significant learning curve for complex procedures like esophagectomy. In experienced, high-volume centers, robotic-assisted minimally invasive esophagectomy (RAMIE) has demonstrated outcomes equivalent to traditional laparoscopic and thoracoscopic minimally invasive esophagectomy. Herein, the RAMIE procedure is described in detail in key steps. This approach has been established as safe and effective for esophagectomy.

## 3. Review

### **Large hiatal hernia: minimizing early and long-term complications after minimally invasive repair**

[Full-Text PDF](#)

**Copy here to cite this article:** Ugliono E, Rebecchi F, Seno E, Morino M. Large hiatal hernia: minimizing early and long-term complications after minimally invasive repair. *Mini-invasive Surg* 2021;5:2. <http://dx.doi.org/10.20517/2574-1225.2020.93>

## Abstract

Paraesophageal Hernia (PEH) is the protrusion of the stomach and/or other abdominal viscera into the mediastinum due to an enlargement of the diaphragmatic hiatus. The treatment of PEH is challenging: On the one hand, watchful waiting carries the risk of developing acute life-threatening complications requiring an emergency operation. On the other hand, elective repair of PEH has non-negligible morbidity and mortality rates, also due to the characteristics of PEH affected patients, who are generally elder and frail. A review of the literature is presented to highlight strategies that can be adopted to minimize early and long-term complications after PEH surgical repair. The laparoscopic approach has been shown to provide reduced hospital stay, postoperative morbidity and mortality, and overall costs compared to traditional open surgery, and it is currently considered the standard approach both to elective and emergency operations. The evidence suggests that strict adherence to surgical principles, such as hernia sac excision, extended mediastinal dissection of the esophagus, and tension-free crural repair with or without mesh are mandatory to achieve optimal surgical outcomes and reduce PEH recurrence rate. Different shapes, materials, and techniques of prosthetic repair and the use of relaxing incisions have been proposed, but long-term data are lacking, and no conclusions can be drawn regarding the ideal method of crural closure. When a short esophagus is recognized despite extensive mediastinal dissection, esophageal lengthening procedures are indicated. Systematic addition of a fundoplication is strongly encouraged, for either treating gastroesophageal reflux or reducing recurrence rate.

## 4. Review

### **Trends in the evolution to robot-assisted minimally invasive thoracoscopic esophagectomy**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Liu J, Motoyama S, Sato Y, Wakita A, Kawakita Y, Nagaki Y, Fujita H, Imai K, Minamiya Y. Trends in the evolution to robot-assisted minimally invasive thoracoscopic esophagectomy. *Mini-invasive Surg* 2020;4:44.  
<http://dx.doi.org/10.20517/2574-1225.2020.20>

#### Abstract

Much effort has been made to improve outcomes and/or minimize the invasiveness of esophagectomy for thoracic esophageal cancer. This has led to the evolution from open esophagectomy to thoracoscopic minimally invasive esophagectomy (MIE), and from MIE to robot-assisted minimally invasive esophagectomy (RAMIE). RAMIE is being applied clinically to overcome the limitations of MIE. In this article, we review the trends in the evolution from thoracoscopic MIE to RAMIE. It has now been demonstrated that RAMIE is both safe and feasible, and may decrease morbidity and mortality rates associated with esophagectomy and improve oncological outcomes. On the other hand, there are still many problems that need to be solved.

#### 5. Review

##### **Robot-assisted minimally invasive esophagectomy: systematic review on surgical and oncological outcomes**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Bongiolatti S, Farronato A, Di Marino M, Anecchiarico M, Coratti F, Cianchi F, Coratti A, Voltolini L. Robot-assisted minimally invasive esophagectomy: systematic review on surgical and oncological outcomes. *Mini-invasive Surg* 2020;4:41.  
<http://dx.doi.org/10.20517/2574-1225.2020.28>

#### Abstract

**Aim:** Esophagectomy is associated with several post-operative complications (50%-70%) due to surgical trauma. Minimally invasive techniques have therefore been applied to decrease mortality and morbidity. Robot-assisted minimally-invasive esophagectomy (RAMIE) was developed to overcome the drawbacks of the thoraco-laparoscopic approach. The objective of this systematic review is to report some recent experiences and to compare RAMIE with other approaches to esophagectomy, focusing on technical and oncological aspects.

**Methods:** Pubmed, Embase and Scopus databases were searched for “robot-assisted esophagectomy”, “minimally invasive esophagectomy” and “robotic esophagectomy” in January 2020. The study was focused on original papers on totally endoscopic RAMIE in the English language. No statistical procedures (meta-analysis) were performed.

**Results:** Three hundred and twenty studies were identified across the database and after screening and reviewing, 14 were included for final analysis. The overall 90-day post-operative mortality after trans-thoracic esophagectomy ranged from 0% to 9% and did not differ between approaches. Post-operative complications ranged between 24% and 60.9%: respiratory (6.25% to 65%), cardiac (0.8% to 32%), anastomotic leak (3.1% and 37.5%) and vocal cord palsy (9.1%-35%) were the most frequent. The evidence for long-term outcomes is weak, with no significant differences in overall survival, disease-free survival and recurrence identified in comparison with other approaches. The selected papers showed that RAMIE had comparable outcomes between the open and thoraco-laparoscopic approaches within a multimodal treatment pathway.

**Conclusion:** RAMIE also seems to be associated with better lymph node dissection, nerve sparing and quality of life, but larger studies are needed to obtain more evidence.



## 6. Original article

### **Standardization of bilateral upper mediastinal lymph node dissection using microanatomical concepts in minimally invasive esophagectomy**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Shirakawa Y, Noma K, Maeda N, Tanabe S, Sakurama K, Fujiwara T. Standardization of bilateral upper mediastinal lymph node dissection using microanatomical concepts in minimally invasive esophagectomy. *Mini-invasive Surg* 2020;4:33. <http://dx.doi.org/10.20517/2574-1225.2020.30>

#### Abstract

**Aim:** We have recently standardized upper mediastinal lymph node dissection (UMLND) based on microanatomical concepts in minimally invasive esophagectomy using a 4K ultra-high-definition (HD) system. In this study, the aim was to investigate the outcomes of microanatomy-based standardization using 4K ultra-HD for UMLND with the main focus on thoracoscopic operative time.

**Methods:** We have performed more than 500 cases of thoracoscopic esophagectomy in the prone position as minimally invasive esophagectomy. After about 400 cases of thoracoscopic esophagectomy in the prone position, we established the microanatomy-based standardization of UMLND using a 4K ultra-HD system. Two groups were analyzed: a pre-standardization group (n = 100) and a post-standardization group (n = 100). Furthermore, the change in our thoracoscopic operative time for all cases was analyzed using the moving average method.

**Results:** In the post-standardization group, the rate of surgeries performed by operators with less than 20 years' experience was significantly higher (P < 0.001). There were no significant differences in the number of mediastinal lymph nodes dissected, intraoperative blood loss and total postoperative morbidity rates between the two groups. The rate of recurrent laryngeal nerve palsy decreased to less than half (19.8% to 9.6%) (P = 0.061) and the thoracoscopic operative time decreased [232.0

(202.8-264.0) min to 209.0 (176.0-235.0) min] significantly ( $P < 0.001$ ) after standardization. The moving average showed a marked decrease of thoracoscopic operative time during the standardization phase.

Conclusion: Microanatomy-based standardization enabled quicker and more precise UMLD despite an increase in the number of surgeries performed by less experienced operators.

## 7. Original article

### **Cause of recurrent laryngeal nerve paralysis following esophageal cancer surgery and preventive surgical technique along the left recurrent laryngeal nerve**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Kobayashi H, Kondo M, Kita R, Hashida H, Shiokawa K, Iwaki K, Kambe H, Mizuno R, Kawarabayashi T, Sumi T, Kaihara S, Hosotani R. Cause of recurrent laryngeal nerve paralysis following esophageal cancer surgery and preventive surgical technique along the left recurrent laryngeal nerve. *Mini-invasive Surg* 2020;4:30. <http://dx.doi.org/10.20517/2574-1225.2020.12>

#### Abstract

**Aim:** Recurrent laryngeal nerve paralysis (RLNP) after esophageal cancer surgery, especially on the left, is a major clinical challenge. We believe that the use of intra-operative neural monitoring can help us to learn and identify surgical maneuvers that can cause RLNP, so as to improve the postoperative course for patients. Thus, the aim of this study was to determine the causes of RLNP and to devise a preventive surgical technique.

**Methods:** Radical esophageal cancer surgery was performed with intra-operative

neural monitoring at our institution from July 2015 to January 2019. The cause(s) of RLNP was investigated by video analysis, which enabled a preventive technique to be developed and introduced. Short-term surgical outcomes of the modified and conventional surgical methods were compared.

Results: RLNP occurred in 10/57 (17.5%) of cases. The causes of paralysis were traction (n = 5), compression (n = 3), thermal injury (n = 1), and compression in cervical procedure (n = 1). Subsequently, 20 surgeries were performed between February and December 2019 using the modified technique and there was only one case (5%) of RLNP.

Conclusion: The main causes of RLNP are compression and traction. Our modified technique for esophageal cancer surgery substantially decreases the incidence of RLNP post-operatively.

## 8. Technical Note

### **Mediastinoscopic esophagectomy with lymph node dissection using a bilateral transcervical and transhiatal pneumomediastinal approach**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Tokairin Y, Nakajima Y, Kawad K, Hoshin A, Okada T, Matsui T, Yamaguchi K, Nagai K, Kinugasa Y. Mediastinoscopic esophagectomy with lymph node dissection using a bilateral transcervical and transhiatal pneumomediastinal approach. *Mini-invasive Surg* 2020;4:32. <http://dx.doi.org/10.20517/2574-1225.2020.23>

#### Abstract

We developed a method for mediastinoscopic esophagectomy via a bilateral transcervical and transhiatal approach under pneumomediastinum as a less-invasive radical operation. The right recurrent nerve is first identified using an open approach, and the right cervical paraesophageal lymph nodes and part of the right recurrent

nerve lymph nodes are dissected, after which pneumomediastinum is initiated. The upper thoracic paraesophageal lymph nodes and right recurrent nerve lymph nodes are dissected along the right vagus nerve. The dorsal side of the esophagus is dissected along the visceral sheath taking care to avoid thoracic duct injury and is then dissected along the vascular sheath in front of the descending aorta. The esophagus is dissected from the trachea at the caudal side of the aortic arch, and then dissected along the ventral side of the left main bronchus, reaching the pulmonary artery. Finally, the right recurrent nerve lymph nodes around the right subclavian artery are completely retrieved. The left cervical approach is almost the same as that via the right side. The dorsal side of the esophagus is almost dissected along the visceral sheath with a right transcervical approach. The subaortic arch to the left tracheobronchial lymph nodes are dissected using the crossover technique. These lymph nodes are easily dissected by cutting the left and ventral side of the lymph nodes because the caudal side is already dissected in the right transcervical approach. A bilateral (especially right trans-cervico-pneumomediastinal) approach is useful for bilateral upper mediastinal lymph node dissection and esophagectomy.

## **9. Technical Note**

### **Advances and understanding pitfalls of laparoscopic transhiatal esophagectomy with en bloc mediastinal lymph node dissection**

#### **Full-Text PDF**

**Copy here to cite this article:** Shiozaki A, Fujiwara H, Konishi H, Shimizu H, Kudou M, Arita T, Kosuga T, Morimura R, Kuriu Y, Ikoma H, Kubota T, Okamoto K, Otsuji E. Advances and understanding pitfalls of laparoscopic transhiatal esophagectomy with en bloc mediastinal lymph node dissection. *Mini-invasive Surg* 2020;4:50. <http://dx.doi.org/10.20517/2574-1225.2020.31>

#### Abstract

We began performing mediastinal lymph node dissection using the laparoscopic

transhiatal approach in 2009. Following the initiation of the single-port mediastinoscopic cervical approach in 2014, we developed a technique for transmediastinal radical esophagectomy without a thoracic approach. We herein describe our surgical procedures for *en bloc* mediastinal lymph node dissection by the laparoscopic transhiatal approach with a focus on pitfalls. We opened the esophageal hiatus and the working space was secured using long retractors. During division of the right crus of the diaphragm, we made efforts to avoid damaging the left hepatic vein and inferior vena cava. Dissection of the posterior plane of the pericardium was extended to the cranial side, and the bilateral inferior pulmonary veins were identified. To avoid misorientation, the posterior plane was initially extended along the long axis of the esophagus. The anterior and posterior sides of the posterior mediastinal lymph nodes were then both dissected. These lymph nodes were lifted in a sheet-like form and then cut along the borderline of the left mediastinal pleura. The right side of the mediastinal lymph nodes was then dissected. To avoid damaging the arch of the azygos vein, it was identified at the dorsal side of the right main bronchus prior to lymph node dissection. This procedure decreased the total operative time, total operative bleeding, and postoperative respiratory complications without reducing the quality of lymphadenectomy. In conclusion, the procedure described herein resulted in a good surgical view and safe *en bloc* mediastinal lymph node dissection. A detailed understanding of mediastinal 3D anatomy and specific pitfalls is crucial for the successful use of this approach.

## 10. Technical Note

### **Minimizing complications after minimally invasive surgery for epiphrenic diverticula of the esophagus: technical tips**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Herbella FAM, Patti MG. Minimizing complications after minimally invasive surgery for epiphrenic diverticula of the esophagus: technical tips. *Mini-invasive Surg* 2020;4:82. <http://dx.doi.org/10.20517/2574-1225.2020.84>

## Abstract

Epiphrenic diverticula occur within the distal 10 cm of the esophagus. Because they are secondary to an underlying esophageal motility disorder, the surgical treatment of these diverticula must include a myotomy in addition to the resection of the diverticulum. In selected cases, the diverticulum can be left in place, performing only the myotomy and the partial fundoplication. Most patients will eventually become asymptomatic and the diverticulum can be left in place. Overall, it is a challenging operation that may be associated to significant morbidity. In this review, we illustrate the key technical elements and how to troubleshoot eventual problems.

## 11. Original Article

### **Robotic lateral heller myotomy without fundoplication for achalasia**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Gharagozloo F, Atituzzman N, Atiquzzman B. Robotic lateral heller myotomy without fundoplication for achalasia. *Mini-invasive Surg* 2020;4:22. <http://dx.doi.org/10.20517/2574-1225.2019.61>

## Abstract

**Aim:** Laparoscopic anterior esophageal myotomy with a Dor anterior fundoplication is the most commonly performed surgical myotomy procedure. A lateral esophageal myotomy without an antireflux procedure performed through a left thoracotomy has been associated with the lowest rate of postoperative gastroesophageal reflux and the highest rate for relief of dysphagia. The surgical robot allows for the lateral myotomy procedure to be performed by laparoscopy rather than thoracotomy. We studied our experience with Robotic Lateral Heller Myotomy Without Fundoplication (RLHM) for achalasia.

**Methods:** A retrospective review was conducted of the patients with achalasia who underwent RLHM. All patients completed a subjective dysphagia score questionnaire, received an Eckardt Score, and underwent manometry and pH testing preoperatively,

as well as at 6 and 12 months following the myotomy procedure.

Results: Forty-eight patients underwent RLHM. The median operating room time was 85 min (range 60-132 min). There was no conversion to a laparotomy. Median hospitalization was 2 days (range 2-3 days). There were no mucosal perforations, complications, or deaths. Following RLHM, the Lower Esophageal pressure decreased from 35 mmHg (range 18-120 mmHg) to 13.2 mmHg (range 9.8-16.6 mmHg) ( $P < 0.0001$ ). The length of the Lower Esophageal high-pressure zone decreased from 5.5 cm (range 4-9 cm) to 2.2 cm (range 1.5-2.8 cm) ( $P < 0.0001$ ). Two patients (2/48) (4.2%) had pathologic gastroesophageal reflux. The median acid exposure in all patients was 0.4% (range 0%-17.8%), and the median Demeester score was 7.5 (range 2-125). The Eckardt score decreased from  $6.3 \pm 1.8$  to  $0.8 \pm 1.8$  at 1 month ( $P < 0.0001$ ), and  $0.8 \pm 1.1$  at 12 months ( $P < 0.0001$ ).

Conclusion: RLHM is associated with excellent relief of dysphagia and a low incidence of new gastroesophageal reflux.

## 12. Review

### **Robotic esophagectomy: the evolution of open esophagectomy to current techniques and a review of the literature**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Hasson RM, Fay KA, Phillips JD, Millington TM, Finley DJ. Robotic esophagectomy: the evolution of open esophagectomy to current techniques and a review of the literature. *Mini-invasive Surg* 2020;4:46. <http://dx.doi.org/10.20517/2574-1225.2020.10>

#### Abstract

Esophageal cancer persists as one of the most common causes of cancer-related death and 5-year survival remains poor at 20%. Surgical resection is the gold standard for treatment and cure, and the development of minimally invasive surgery has increased the popularity of robotic-assisted minimally-invasive esophagectomy. The benefits described include less morbidity and greater patient satisfaction compared to open

techniques. Nevertheless, institution capabilities and surgeon experience are strong determinants of whether a robotic program will be adopted for oncologic esophageal care. Thus, we review the available literature regarding the history of esophagectomy, evolution to minimally invasive approaches, the introduction of robotic-assisted esophagectomy including its respective outcomes in comparison to open and minimally invasive approaches, and future directions.

### **13. Review**

#### **Robotic esophagectomy: how I do it?**

##### **Full-Text PDF**

**Copy here to cite this article:** Khaitan PG, Lazar JF, Margolis M, Henderson HR, Watson TJ. Robotic esophagectomy: how I do it? *Miniinvasive Surg* 2020;4:51. <http://dx.doi.org/10.20517/2574-1225.2020.34>

##### Abstract

Compared to the open approach, minimally invasive esophagectomy (MIE) offers several advantages including smaller incisions with decreased pain, improved cosmesis, and earlier return of the patient to baseline function. Robotic-assisted minimally invasive esophagectomy (RAMIE) builds on standard MIE by offering three-dimensional visualization, better instrument articulation, tremor filtration, and superior ergonomics, all of which facilitate technical precision and surgeon comfort. An evolving literature demonstrates that when performed by experienced surgeons, RAMIE leads to improved perioperative outcomes with long-term oncologic equivalency to open approaches, and may offer advantages compared to traditional MIE. This review focuses on the key steps of performing 3-field McKeown, 2-field Ivor Lewis, and transhiatal robotic esophagectomies, data regarding the short- and long-term outcomes, and a brief overview of upcoming trials comparing RAMIE with MIE.



## 14. Technical Note

### Robotic Heller myotomy

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Sollie ZW, Jiwani AZ, Wei B. Robotic Heller myotomy. *Mini-invasive Surg* 2020;4:80.

<http://dx.doi.org/10.20517/2574-1225.2020.81>

#### Abstract

Achalasia is a neurodegenerative disorder of the esophagus of unknown etiology, which affects motility, causing symptoms such as progressive dysphagia with liquids then solids, heartburn, regurgitation, odynophagia, weight loss, nocturnal cough, and chest pain. Evaluation will show a characteristic “bird’s beak” appearance on barium esophagram and diagnosis is confirmed with esophageal manometry. Durable relief from the symptoms of achalasia can be achieved with pneumatic dilation, per-oral endoscopic myotomy, or surgical myotomy. Laparoscopic Heller myotomy with Dor (or Toupet) fundoplication for many years had been considered the gold standard for therapy. Since its development in 2001, the robotic Heller myotomy (RHM) has gained increasing popularity. Studies have shown equivalent efficacy of relieving achalasia symptoms but decreased incidence of esophageal perforation with RHM. The higher cost of RHM remains the largest barrier. Our objective was to provide a brief review of the current literature related to RHM and provide a detailed description of how to perform the procedure.

## 15. Editorial

### Advances in the minimally invasive management of gastric and esophagogastric junction cancer

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Fukunaga T. Advances in the minimally invasive management of gastric and esophagogastric junction cancer. *Mini-invasive Surg* 2019;3:26. <http://dx.doi.org/10.20517/2574-1225.2019.32>

## 16. Perspective

**Minimally invasive surgery for non-achalasia primary esophageal motility disorders is currently underused**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Herbella FAM, Schlottmann F. Minimally invasive surgery for non-achalasia primary esophageal motility disorders is currently underused. *Mini-invasive Surg* 2019;3:24.

<http://dx.doi.org/10.20517/2574-1225.2019.20>

Abstract

Surgical treatment for non-achalasia primary esophageal motility disorders is reserved for few situations. Proper selection of patients brings good outcomes with low morbidity, which makes surgical therapy an adequate therapeutic option. High resolution manometry reclassifies esophageal motility disorders. Interestingly, literature is scarce on surgical therapy for this new classification with per oral endoscopic myotomy as the leading treatment.

## 17. Review

**Gastrectomy: the expanding role of minimally invasive surgery in gastric cancer**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** van den Berg JW, Shilton H, Cheong E. Gastrectomy: the expanding role of minimally invasive surgery in gastric cancer. *Mini-invasive Surg* 2019;3:23. <http://dx.doi.org/10.20517/2574-1225.2019.07>

Abstract

Gastric cancer remains one of the most frequent cancers worldwide. Currently the only potentially curative treatment is surgery, often in combination with perioperative chemotherapy. Gastric cancer surgery is associated with significant morbidity. However, over the last few decades several potential advances have been introduced to improve the treatment for gastric cancer patients. Introduction of laparoscopic gastric cancer surgery has shown promising results and therefore gained popularity worldwide. This review describes an overview of laparoscopic gastrectomy for gastric cancer patients. In general, the introduction of laparoscopic surgery has shown improvement in the short-term outcomes of gastric cancer treatment. Laparoscopic approach for gastric cancer is feasible, safe and should be performed in experienced high volume centres. However, results from randomised trials in advanced gastric cancer are awaited to further determine the effect of a laparoscopic gastrectomy on oncological and long-term outcomes.

## 18. Original Article

### **Thoraco-laparoscopic Ivor-Lewis esophagectomy: the most extensive Indian experience**

[Full-Text](#) [PDF](#)

Parthasarathi R, Gupta GHVR, Sabnis SC, Raj PP, Senthilnathan P, Rajapandian S, P alanivelu C. Thoraco-laparoscopic Ivor-Lewis esophagectomy: the most extensive Indian experience. *Mini-invasive Surg* 2019;3:20.

<http://dx.doi.org/10.20517/2574-1225.2019.10>

#### Abstract

Aim: The overall incidence of adenocarcinoma is on the rise, mainly in the western population. Minimally invasive thoracoscopic esophagectomy for adenocarcinoma of gastroesophageal junction tumors is being adopted worldwide,

albeit with a slower pace. This study is to share our experience and technical modifications over two decades.

Methods: This a retrospective data from 2009-2018 at a single center, including all the 143 cases of thora-colaparoscopic Ivor Lewis esophagectomies performed. There were no exclusions. The study objectives were to evaluate postoperative recovery, complications, and pathological completeness.

Results: In 11 years, we have performed 532 cases of minimally invasive esophagectomies for both malignant and benign etiologies. Out of which 143 cases were of Ivor Lewis esophagectomy. The mean age of patients was  $64.4 \pm 10.86$  years, and male to female ratio is 3:1. Out of these cases, 139 (97.20%) were performed for malignancy and 4 (2.79%) for benign cases, which include peptic stricture, sigmoid esophagus. The mean operative time is  $457.97 \pm 79.35$  min. The mean blood loss was  $138.08 \pm 29.3$ mL. Out of these cases, the hand-sewn anastomosis was performed in 72 (50.34%), circular stapler anastomosis in 46 (32.16%) and, linear stapled anastomosis in 25 (17.48%). The mean lymph node retrieval rate was  $22.68 \pm 9.49$  nodes. The average ICU stay in the postoperative period was  $4.68 \pm 3.95$  days, and overall hospital stay was  $13.48 \pm 7.43$  days. Among malignant cases (139), adenocarcinoma in 121 (87.05%), squamous cell carcinoma in 18 (12.94%). Among these cases T2, lesions in 56 (40.28%), T3 lesions in 77 (55.39%), T4 lesions in 6 (4.31%) The overall complication rate was 12.58% (pneumonia- 8.39%, RLN injury in 1.39%, anastomotic leak in 2.09%, chyle leak in 0.69%, anastomotic stricture in 12.58%). 3 (2.09%) cases had re-intervention in the form of combined endoscopic procedures (stenting) and re-thoracoscopic lavage in 3. Overall 30-day mortality in 1 case (0.69%).

Conclusion: Thoracolaparoscopic esophagectomy with intrathoracic Ivor Lewis anastomosis is an excellent option for selected patients, in experienced hands.

## 19. Original Article

### **Totally minimally invasive Ivor-Lewis esophagectomy: initial single center experience**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** de Pascale S, Ghidinelli F, Piccioli AN, Borin S, Romario UF. Totally minimally invasive Ivor-Lewis esophagectomy: initial single center experience. *Mini-invasive Surg* 2019;3:18. <http://dx.doi.org/10.20517/2574-1225.2019.04>

#### Abstract

**Aim:** Minimally invasive techniques for esophagectomy decrease cardiopulmonary complications and guarantee better quality of life (QoL) compared to open techniques, without compromising oncological radicality. This retrospective study compares the short-term and QoL outcomes of hybrid Ivor Lewis (HIL) and totally minimally invasive Ivor Lewis (TMIL).

**Methods:** Patients with cancer of the distal esophagus and esophagogastric junction were included into (HIL) and (TMIL) groups in the period January 2017-July 2018. General features, intraoperative and postoperative results were analyzed. The surgical radicality and number of resected nodes were also evaluated. QoL was determined preoperatively and at 7 and 90 days postoperatively with EORTC QLQ-C30 questionnaire.

**Results:** General features were similar in the TMIL and HIL groups, which contained 13 and 14 patients, respectively. Median intervention duration was 360 min (range: 240-420) for TMIL and 330 min (range: 240-400) for HIL ( $P = 0.0647$ ). Median blood losses were similar for TMIL and HIL at 100 mL (range: 50-400) and 175 mL (range: 50-350), respectively ( $P = 0.0831$ ); pulmonary complications were 15% and 14% ( $P = 1$ ) and leaks were 7% and 14% ( $P = 1$ ) for TMIL and HIL, respectively.

**Conclusion:** Our experience suggests that TMIL esophagectomy appears to give results similar to HIL and positively influences the QoL within 90 days after surgery.

Duration of surgery and anastomotic leaks are the key elements influencing the learning curve. Randomized controlled trials are necessary to confirm the good results obtained and to give recommendations to avoid a high rate of complications during the learning curve for this difficult technique.

## 20. Review

### **Minimally invasive approach for cancer of the esophagogastric junction**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Shibao K, Mitsuyoshi M, Matayoshi N, Inoue Y, Katsuki T, Sato N, Hirata K. Minimally invasive approach for cancer of the esophagogastric junction. *Mini-invasive Surg* 2019;3:16.

<http://dx.doi.org/10.20517/2574-1225.2019.01>

#### Abstract

The incidence of esophagogastric junction (EGJ) cancer is increasing in the world. EGJ cancer is traditionally classified by the Siewert classification, despite its limitations. The definition and classification of EGJ cancer is a controversial topic. Thus, the best available strategy for the surgical treatment of EGJ cancer remains controversial. This chapter reviews a minimally invasive approaches for EGJ cancer. Most operations for EGJ cancer that are performed by open surgery can be performed minimally invasively. A minimally invasive transthoracic approach (Ivor-Lewis or McKeown esophagectomy) is the optimal surgical approach for Siewert type I cancer. Mediastinoscope-assisted transhiatal esophagectomy, which was recently reported, may be a suitable surgical option, especially for frail patients with Siewert type I cancer. Generally, laparoscopic total or proximal gastrectomy is regarded as the standard for surgical method for Siewert type III cancer, while both laparoscopic gastrectomy (with lower esophagectomy) or a minimally invasive Ivor-Lewis approach are recommended for Siewert type II cancer. Minimally invasive surgery

(MIS) has the potential to shorten the length of hospitalization, reduce the risk of postoperative pulmonary complications, and improve quality of life with a similar margin status, nodal harvest, and survival rate to open techniques. However, as the existing literature is still limited, the choice of surgical method should be judged by the experienced surgeons, especially in MIS. This review reveals that further large clinical studies are needed to deepen our understanding of MIS for EGJ cancer.

## 21. Commentary

### **Siewert type II adenocarcinoma of esophagogastric junction: treatment status**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Li SC, Zang L. Siewert type II adenocarcinoma of esophagogastric junction: treatment status. *Mini-invasive Surg* 2019;3:15. <http://dx.doi.org/10.20517/2574-1225.2018.13>

#### Abstract

The incidence of adenocarcinoma of esophagogastric junction (AEG) has been increased continuously in the past decades, especially in western countries. Siewert type II is regarded as the true AEG because of its location, however, the treatment for Siewert type II AEG has not reached a consensus in the academic. According to published studies nowadays, this commentary will introduce the surgical strategies and put forward suggestions for Siewert type II AEG in several aspects as follows: (1) optimal surgical approach; (2) optimal extent of lymph node dissection; (3) reconstruction methods. With the development of minimally invasive surgery, many experienced surgeons perform esophagogastric resection via transhiatal approach. Moreover, many details during the surgery still need further research by cooperation between different departments and even countries.

## 22. Commentary

### Overview of gastroesophageal junction cancers

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Oo AM, Ahmed S. Overview of gastroesophageal junction cancers. *Mini-invasive Surg* 2019;3:13. <http://dx.doi.org/10.20517/2574-1225.2019.02>

#### Abstract

Oesophageal and gastroesophageal junction (GEJ) malignancy is the fastest growing cancer in the Western population. This together with the deadly nature of the disease has attracted increased attention from doctors and researchers alike. The increasing incidence has been primarily attributed to the increase in rates of obesity that in turn causes increased gastroesophageal reflux disease leading to Barrett's oesophagus and eventually adenocarcinoma of the oesophagus especially at the GEJ. We discuss the epidemiology, risk factors and the management of GEJ tumours.

## 23. Original Article

### Totally laparoscopic total gastrectomy: challenging but feasible: a single center case series

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Mazzola M, Gualtierotti M, De Martini P, Bertoglio CL, Morini L, Achilli P, Zirona A, Ferrari G. Totally laparoscopic total gastrectomy: challenging but feasible: a single center case series. *Mini-invasive Surg* 2019;3:12. <http://dx.doi.org/10.20517/2574-1225.2019.05>

#### Abstract

**Aim:** To report the initial monocentric experience of totally laparoscopic total



gastrectomy, assessing its feasibility and safety, especially relating to the challenging step of esophago-jejunal (E-J) reconstruction.

**Methods:** All consecutive patients, underwent laparoscopic total gastrectomy for gastric cancer with curative intent, between January 2017 and June 2018 at our institution, were considered. Data of the selected patients was retrieved from a prospectively collected database. Short and long term outcomes were analyzed.

**Results:** Ten patients underwent totally laparoscopic total gastrectomy with D2 lymphadenectomy and 4 of these had received preoperative chemotherapy; Two patients also received the lymphadenectomy of the station 10. E-J reconstruction consisted of hemi-double stapling technique with transorally inserted anvil in 1 case, side-to-side overlap anastomosis in 5 cases and end-to-side anastomosis in 4 cases. One patient experienced intraoperative complications needing conversion to laparotomy. Seven patients experienced postoperative complications, three of these were severe according to Dindo-Clavien classification. All the specimens had free proximal resection margins with R0 resection in all the cases. Average postoperative length of hospital stay was 10 days and no patients died during hospitalization. Median overall survival and disease-free survival were 15.5 and 12.5 months respectively.

**Conclusion:** Totally laparoscopic total gastrectomy is a feasible and safe option in the treatment of gastric cancer. The choice about the type of E-J reconstruction should be based on the single patient's features and on the dexterity of the surgeon who should be able to perform more than one option for a tailored approach.

## **24. Review**

### **Robotic surgery for gastric cancer**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Makuuchi R, Kamiya S, Tanizawa Y, Bando E, Terashima M. Robotic surgery for gastric cancer. *Mini-invasive Surg* 2019;3:11.

<http://dx.doi.org/10.20517/2574-1225.2019.03>

## Abstract

The number of robotic gastrectomy (RG) cases is increasing, especially in East Asia. The da Vinci Surgical System for RG allows surgeons to perform meticulous procedures using articulated devices and provides potential advantages over laparoscopic gastrectomy (LG). Meta-analyses including a large number of retrospective studies comparing RG and LG revealed only a limited advantage for RG over LG, such as lower blood loss, and the obvious disadvantage of longer operation times and higher medical cost. Specifically, a multicenter, prospective, single-arm study performed in Japan showed favorable short-term outcomes of RG over LG, while a non-randomized controlled trial in Korea showed similar postoperative complication rates for RG and LG, although the medical costs were significantly higher in RG. A well-designed randomized controlled trial is thus necessary to establish robust evidence comparing the two surgeries. In addition, further development of surgical robotics is expected for RG to be accepted more widely.

## 25. Review

### **Laparoscopic lymph nodes dissection for advanced gastric cancer: the current status and the perspective**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Shimada M, Amaya S, Munemoto Y, Mitsui T.

Laparoscopic lymph nodes dissection for advanced gastric cancer: the current status and the perspective. *Mini-invasive Surg* 2019;3:7.

<http://dx.doi.org/10.20517/2574-1225.2018.78>

## Abstract

The laparoscopic gastrectomy (LG) with D2 lymph node dissection (LND) for advanced gastric cancer (AGC) have been widely done. However, the applicability to more advanced disease is still under debate. Actually, there are a lot of technical demands against D2 LND for AGC, e.g., total omentectomy, splenic hilar node dissection, and the management for bulky lymph nodes, etc. Recently, extensive research has been gradually performed in the field of LG for AGC and demonstrated that LG for AGC is a safe and feasible procedure with better short-term outcomes compared with open gastrectomy. Also, large-scaled phase III trials are ongoing, and their long-term outcomes are awaited the publication in the near future. LG with D2 LND by expert surgeons under the cautious indications could be acceptable treatment for locally AGC. On the other hand, we should keep searching for solutions to the technical or oncological issues, and long-term outcome of phase III study should be warranted for standard treatment. Robotic surgery, LG following neoadjuvant chemotherapy, or conversion therapy using LG for several stage IV patients may help us clear the technical hurdles, and may show survival advantages in the future.

## 26. Original Article

### **Laparoscopic vs. open distal gastrectomy for advanced gastric cancer in elderly patients: a retrospective study**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Yuu K, Tsuchihashi K, Toyoda S, Kawasaki M, Kameyama M. Laparoscopic vs. open distal gastrectomy for advanced gastric cancer in elderly patients: a retrospective study. *Mini-invasive Surg* 2019;3:6. <http://dx.doi.org/10.20517/2574-1225.2018.73>

## Abstract

**Aim:** It is unclear whether elderly patients with advanced gastric cancer can benefit from laparoscopic gastrectomy. This study aimed to compare the surgical and early

postoperative outcomes of laparoscopic distal gastrectomy with those of open distal gastrectomy for advanced gastric cancer in elderly patients aged 75 years or older.

**Methods:** We retrospectively examined all elderly patients who underwent laparoscopic distal gastrectomy or open distal gastrectomy from October 2010 to October 2017 using prospectively collected data. Operative results, hospital courses, and survival rates were compared between the two groups.

**Results:** Distal gastrectomy was performed in 60 patients, laparoscopically in 20 and through open surgery in 40. The laparoscopic group had significantly lesser intraoperative blood loss (100 mL vs. 300 mL;  $P < 0.001$ ) and shorter mean postoperative hospital stays (12 days vs. 23 days;  $P < 0.001$ ). The overall 3-year survival rate was 50.1% in the laparoscopic group and 41.7% in the open group ( $P = 0.531$ ).

**Conclusion:** Laparoscopic distal gastrectomy led to a faster return to a full diet and a shorter postoperative hospital stay in our study, and it was well tolerated by elderly patients with advanced gastric cancer.

## 27. Original Article

### **Intracorporeal hemi-hand-sewn technique for Billroth-I gastroduodenostomy after laparoscopic distal gastrectomy: comparative analysis with laparoscopy-assisted distal gastrectomy**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Ohmura Y, Suzuki H, Kotani K, Teramoto A.

Intracorporeal hemi-hand-sewn technique for Billroth-I gastroduodenostomy after

laparoscopic distal gastrectomy: comparative analysis with laparoscopy-assisted distal gastrectomy. Mini-invasive Surg 2019;3:4. <http://dx.doi.org/10.20517/2574-1225.2018.69>

laparoscopic distal gastrectomy: comparative analysis with laparoscopy-assisted distal gastrectomy. Mini-invasive Surg 2019;3:4. <http://dx.doi.org/10.20517/2574-1225.2018.69>

Abstract

**Aim:** The purpose of this study was to evaluate the clinical feasibility and efficacy of the intracorporeal hemi-hand-sewn (IC-HHS) technique for Billroth-I gastroduodenostomy in comparison with extracorporeal total hand-sewn (EC-THS) anastomosis. We also examined the size of resected specimens in each procedure.

**Methods:** The number of enrolled cases of EC-THS and IC-HHS anastomosis groups were 85 and 110 cases, respectively. Perioperative data and the measured sizes of resected specimens were analyzed.

**Results:** Operation time in the IC-HHS group was significantly longer than the EC-THS group (234.8 min vs. 275.0 min,  $P < 0.01$ ), whereas intraoperative blood loss was less in the IC-HHS group (48.4 mL vs. 25.4 mL,  $P = 0.03$ ). There were no procedure-related complications in the IC-HHS group. The greater curvature of the EC-THS group was significantly shorter than the IC-HHS group (214.6 mm vs. 228.7 mm,  $P < 0.01$ ). There was no correlation between body mass index (BMI) and the length of the greater curvature in the IC-HHS group ( $r = 0.07$ ,  $P = 0.47$ ), but in the EC-THS group, the length of the greater curvature tends to shorten as BMI increases ( $r = -0.45$ ,  $P < 0.01$ ).

**Conclusion:** IC-HHS technique for Billroth-I gastroduodenostomy revealed feasible with acceptable operation time and postoperative outcome. Another advantage of total laparoscopic distal gastrectomy that intracorporeal transection can facilitate is to ensure an adequate proximal margin, especially in obese middle gastric cancer patients.

## **28. Review**

### **Current status of technique for Billroth-I anastomosis in totally laparoscopic distal gastrectomy for gastric cancer**

[Full-Text](#) [PDF](#)

**Copy here to cite this article:** Zhang S, Fukunaga T. Current status of technique for Billroth-I anastomosis in totally laparoscopic distal gastrectomy for gastric cancer. *Mini-invasive Surg* 2019;3:2. <http://dx.doi.org/10.20517/2574-1225.2018.64>

#### Abstract

Several reconstruction techniques are possible after totally laparoscopic distal radical gastrectomy. An optimal technique of digestive tract reconstruction after distal gastrectomy has not yet been established. The ideal reconstruction should be not only for doctors but also for patients. Alimentary intake, satisfactory nutritional status and easy performing should be all considered. The aim of the study was to describe the different Billroth-I reconstruction techniques that can be proposed after totally laparoscopic distal radical gastrectomy.