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Editorial office of *Mini-invasive Surgery*

Contact us:

Jane Lee

Managing Editor

jane@misjournal.net

editorialoffice@misjournal.net

Mini-invasive Surgery

Content

Mini-invasive Surgery

HPB surgery

1. Review

Diagnosis and treatment of biliary malignancies: biopsy, cytology, cholangioscopy and stenting

HTML PDF

Cite this article: Chandrasekar VT, Faigel D. Diagnosis and treatment of biliary malignancies: biopsy, cytology, cholangioscopy and stenting. *Mini-invasive Surg* 2021;5:33. http://dx.doi.org/10.20517/2574-1225.2021.12

Abstract

Biliary tract malignancies include cancers of the intra-hepatic and extra-hepatic bile ducts. Cholangiocarcinoma is the predominant biliary tract malignancy with nearly 60% of them occurring in the peri-hilar region. They can present with biliary strictures causing jaundice but can be insidious and present late in their clinical course. Recent advances in imaging and other diagnostic modalities help in the earlier identification of these tumors. Diagnosis should be suspected in anyone presenting with jaundice with evidence of biliary ductal dilatation or in patients with primary sclerosing cholangitis with worsening clinical status. The diagnostic approach consists of obtaining tumor markers, mainly CA 19-9, imaging modalities which include computed tomography and/or magnetic resonance imaging to establish the level of biliary obstruction and presence or absence of mass. Tissue sampling is performed with endoscopic retrograde cholangiopancreatography (ERCP) guided cytology and biopsies and with endoscopic ultrasound (EUS) if a mass is visible on imaging. Indeterminate strictures after initial biopsies could be further evaluated by cholangioscopy directed biopsies. Treatment for resectable and distal bile duct cancers involves surgical referral, but palliative biliary drainage is the key for unresectable cancers. Metal stents are generally preferred for distal cancers and plastic stents for proximal cancers. EUS guided biliary drainage can be an alternative

approach in patients with failed ERCP.

2. Editorial

What role does hand-assistance have in minimally invasive pancreatic surgery?

HTML PDF

Cite This Article: Donisi G, Zerbi A. What role does hand-assistance have in minimally invasive pancreatic surgery?. *Mini-invasive Surg* 2021;5:38. http://dx.doi.org/10.20517/2574-1225.2021.55

3. Perspective

Minimally invasive liver resection in Japan: is the robot necessary?

HTML PDF

Cite this article: Ishizawa T, Hasegawa K. Minimally invasive liver resection in Japan: is the robot necessary?. *Mini-invasive Surg* 2021;5:52. http://dx.doi.org/10.20517/2574-1225.2021.81

Abstract

Robot-assisted hepatectomy (RAH) is rarely indicated in Japan because of the lack of reimbursement from the national health insurance system. Instead, laparoscopic hepatectomy has been approved for all hepatectomy procedures except resections requiring biliary reconstruction. An obvious advantage of RAH over laparoscopic hepatectomy is the fact that surgeons can use multi-articulated surgical devices, which may facilitate resection of superior/posterior hepatic regions, hilar dissection, biliary reconstruction, and hepatic segmentation by fluorescence imaging. With the accumulation of evidence supporting the use of robotic surgical devices in particular situations of hepatectomy, RAH will become more commonly indicated in Japan under the existing nationwide reporting system and board certification systems to assure surgical safety.

4. Review

Minimally invasive surgery for gallbladder cancer at an expert center

HTML PDF

Cite this article: Lee JS, Han HS, Yoon YS, Cho JY, Lee HW, Lee B, Kim M, Jo Y. Minimally invasive surgery for gallbladder cancer at an expert center. *Mini-invasive Surg* 2021;5:57. http://dx.doi.org/10.20517/2574-1225.2021.139

Abstract

In this article, we reviewed the techniques and outcomes of minimally invasive surgery for gallbladder cancer performed at an expert center. The techniques of laparoscopic extended cholecystectomy with the short- and long-term outcomes at our center were described. The short- and long-term survival outcomes of laparoscopic extended cholecystectomy are comparable to open surgery. Laparoscopic surgery is a safe, effective alternative for open surgery in the treatment of gallbladder cancer. The benefits of robotic surgery should be proven with further research.

5. Case Report

Clostridium difficile infection secondary to ileostomy closure

HTML PDF

Cite this article:Chouillard E, Chouillard MA, El Kary N, De Simone B, Gumbs AA. Clostridium difficile infection secondary to ileostomy closure. *Mini-invasive Surg* 2021;5:9. http://dx.doi.org/10.20517/2574-1225.2020.108

Abstract

Protective ileostomy may be a risk factor for the development of Clostridium difficile (CD) infection (CDI). In the postoperative period signs of CDI may be particularly difficult to differentiate from intra-abdominal sepsis. Presented here are 2 cases that developed CDI after ileostomy reversal. Two patients who underwent low anterior resections after neoadjuvant chemoradiation with protective ileostomy developed

fever, leukocytosis and elevated serum C-reactive protein (CRP) levels. The first patient also had negative CD stool toxins and his signs were so severe that he underwent a negative diagnostic laparoscopy and re-creation of ileostomy. The second patient who presented in a similar fashion was more fortunate in that her CD stool toxin was positive and she was treated successfully with oral vancomycin. CDI after ileostomy reversal after low anterior resection can be difficult to diagnose. In the first patient, the situation was so misleading that diagnostic laparoscopy was required. Outcome was eventually favorable in both cases. CDI must be high on the list of differential diagnoses for febrile patients with a leukocytosis and elevated CRP level even in the setting of negative CD stool toxins. Prophylactic intravenous metronidazole and/or vancomycin enemas should be considered prior to colorectal surgery when a protective ileostomy is likely.

6. Case Report

Laparoscopic cholecystectomy with indocyanine green fluorescence in patient with situs inversus totalis

HTML PDF VIDEO

Cite this article: Tirelli F, Grieco M, Biondi A, Belia F, Persiani R. Laparoscopic cholecystectomy with indocyanine green fluorescence in patient with situs inversus totalis. *Mini-invasive Surg* 2021;5:15. http://dx.doi.org/10.20517/2574-1225.2021.04

Abstract

Situs Viscerum Inversus (SVI) is a rare autosomal recessive disease. Because of this particular anatomy, it could be challenging for the surgeon to perform any abdominal procedure, including laparoscopic cholecystectomy. In these situations, indocyanine green fluorescence cholangiography can be essential. A 29-year-old female with documented situs viscerum inversus totalis underwent laparoscopic cholecystectomy with a four-trocar technique. Switching the vision to the near-infrared camera, which elicited the indocyanine green molecules, the surgeon could easily identify the

common bile duct and the cystic duct. Switching back to the normal vision, the operator completed the dissection. The described procedure is still challenging due to the “mirror effect” and the uncommon position of the surgical instruments, especially for right-handed surgeons. Indocyanine green fluorescence angiography can help the surgeon identify the structures in cases of non-regular anatomy such as this.

7. Editorial

Forward: A new kind of endoscopists for advanced therapeutic endoscopy

HTML PDF

Cite this article: Rey JF. Forward: A new kind of endoscopists for advanced therapeutic endoscopy. *Mini-invasive Surg* 2021;5:21. http://dx.doi.org/10.20517/2574-1225.2021.14

8. Review

Therapeutic EUS

HTML PDF

Cite this article: Cho SH, Oh D, Seo DW. Therapeutic EUS. *Mini-invasive Surg* 2021;5:20. http://dx.doi.org/10.20517/2574-1225.2021.11

Abstract

Currently, the standard treatment for pancreatic neoplasms is surgical resection. However, pancreatic surgical resection is associated with high morbidity and mortality. Patients unfit for surgery are undergoing regular cross-sectional imaging surveillance. Controversy surrounds the optimal surveillance of patients with pancreatic neoplasms, underlying the need for minimally invasive treatment modalities as an alternative to surgical treatment. To date, endoscopic ultrasound-guided radiofrequency ablation (EUS-RFA) is an emerging minimally invasive therapeutic alternative to surgical resection for various pancreatic neoplasms. We review evaluations of EUS-RFA for various pancreatic neoplasms to better

understand its effectiveness and safety.

9. Review

Prevention and management of ERCP-related complications

HTML **PDF**

Cite this article: Okano N, Ito K, Takuma K, Hara S, Igarashi Y. Prevention and management of ERCP-related complications. *Mini-invasive Surg* 2021;5:29. http://dx.doi.org/10.20517/2574-1225.2021.15

Abstract

Endoscopic retrograde cholangiopancreatography (ERCP) and its related procedures are established as necessary and indispensable techniques in the diagnosis and treatment of bilio-pancreatic diseases. However, these procedures are associated with a high risk of complications, and caution is needed as the complications may occasionally follow a fatal course. The primary complications are pancreatitis, bleeding, perforation, and issues associated with biliary stents and lithiasis treatment. Endoscopists must perform ERCP with a strong understanding of the mechanisms of each of these complications and should be familiar with the prevention and countermeasures.

10. Review

How to access the common bile duct

HTML **PDF**

Cite this article: Aabakken L, Bhat P. How to access the common bile duct. *Mini-invasive Surg* 2021;5:25. http://dx.doi.org/10.20517/2574-1225.2021.09

Abstract

Biliary access is a prerequisite to all endoscopic interventions in the biliary tract. Successful cannulation of the papilla of Vater is the predominant challenge for the

majority of endoscopists training in endoscopic retrograde cholangiopancreaticography (ERCP), and the skills required for success differ substantially from those of regular luminal endoscopy. This paper reviews some of the key elements to successful biliary cannulation, a range of options for problem-solving when cannulation is difficult, and some tips and tricks in select special situations as well. The techniques are described, and available evidence is reviewed.

11. Review

Robotic liver surgery: literature review and current evidence

HTML PDF

Cite this article: Ruzzenente A, Alaimo L, Conci S, Bagante F, Campagnaro T, Pedrazzani C, Guglielmi A. Robotic liver surgery: literature review and current evidence. *Mini-invasive Surg* 2020;4:91.
http://dx.doi.org/10.20517/2574-1225.2020.90

Abstract

In the field of minimally invasive surgery, robotic surgery (RS) was introduced to overcome drawbacks in laparoscopic surgery. However, its clinical application in hepatobiliary surgery is not yet standardized. This review analyzed the results of RS to clarify the benefits of robotic liver surgery in comparison with standard laparoscopy. Among 112 publications found in the literature, the 72 most relevant were selected and the following data were extracted: patients characteristics, operative procedures, histopathology, short-term and long-term outcomes, and costs. Twenty-nine articles on robotic liver resections, published in the last five years (2015-2020) and including 1831 patients, were analyzed. Twenty-five comparative studies between robotic and laparoscopic surgery were evaluated to underline the differences in operative outcomes. Eventually, 4 sub-group analyses were conducted on hepatocellular carcinoma, gallbladder cancer, hilar cholangiocarcinoma, and

colorectal liver metastases. Almost all the authors reported data on safety, feasibility and oncologic effectiveness of RS reaching comparable results with laparoscopy. However, even if robotic surgery showed longer operative time and higher costs, in selected cases it allowed to increase the rate of minimally invasive approach when compared with laparoscopy. Thus, both open and minimally invasive surgery should be provided in a modern hepatobiliary center, including the robotic approach particularly to complex cases, otherwise very demanding by laparoscopy. In conclusion, different techniques should be tailored to each patient, choosing the minimally invasive approach when possible, enhancing patients' recovery after surgery, especially in cirrhotic livers and in the context of liver transplantation. Although many centers experienced robotic liver surgery, more and larger studies are necessary to define its real benefits relative to laparoscopy, in order to standardize patient selection criteria and techniques.

12. Original Article

Parenchymal transection in robotic liver resection: results of 70 resections using the Vessel Sealer

HTML PDF

Cite this article: Nota CL, Molenaar IQ, te Riele WW, van Santvoort HC, Rinkes IHMB, Hagendoorn J. Parenchymal transection in robotic liver resection: results of 70 resections using the Vessel Sealer. *Mini-invasive Surg* 2020;4:74.
http://dx.doi.org/10.20517/2574-1225.2020.57

Abstract

Aim: There is no standard technique for transection of the hepatic parenchyma during robotic liver resection. The aim of this study was to describe the outcomes of robotic liver resections using the Vessel Sealer for parenchymal transection.

Methods: This is a post hoc analysis of a prospective database. All consecutive patients who underwent robotic liver resection in the Regional Academic Cancer

Centre, Utrecht, Netherlands, between August 2015 and January 2019 were included.

Results: A total of 70 robotic liver resections were performed, including 60 minor resections (86%) and ten hemihepatectomies (14%). Five procedures (7%) were converted. Mean parenchymal transection time was 43 ± 26 min. Median blood loss was 150 mL (interquartile range 40-300). Ten patients (14%) suffered from a major complication, and three patients (4%) had bile leakage postoperatively. One patient died from post-hepatectomy liver failure.

Conclusion: Based on the results of this series, consisting of 60 minor liver resections and 10 hemihepatectomies, we conclude that the use of the Vessel Sealer during the parenchymal transection in liver resection is feasible and safe.

13. Original Article

Robotic surgery of gallbladder cancer

HTML PDF

Cite this article: Belli A, Patrone R, Albino V, Leongito M, Piccirillo M, Granata V, Pasta G, Palaia R, Izzo F. Robotic surgery of gallbladder cancer. *Mini-invasive Surg* 2020;4:77. http://dx.doi.org/10.20517/2574-1225.2020.70

Abstract

Aim: The aim of this study was to describe our technique for the surgical treatment of clinically suspected or incidentally diagnosed gallbladder cancer (GBC) and to report the outcomes of our experience.

Methods: This is a retrospective observational study including consecutive patients operated by a robotic approach for the surgical treatment of clinically suspected or incidentally diagnosed GBC (with the intent of radical re-resection after index cholecystectomy) performed between January 2017 and December 2019. Clinical outcomes and technical details related to the robotic approach were analyzed.

Results: During the study period, 8 patients underwent robotic radical cholecystectomy with lymphadenectomy and atypical resection of segments IVb-V.

No conversion or major complications occurred intraoperatively. All patients underwent a radical resection. There were one Clavien-Dindo grade II and one grade IIIb complication. Median hospital stay was 6 days (range 5-11). At a median follow-up of 17.5 months (range 29.3-7.3), all patients are alive and free from disease except one who had peritoneal recurrence and underwent chemotherapy. No trocar site recurrence was observed.

Conclusion: The present study describes a standardized step-by-step robotic technique for the surgical treatment of GBC and demonstrates the feasibility and safety of the robotic approach. More data and multicentre series are needed to confirm our results and to assess the oncologic outcomes of the robotic approach.

14. Review

Robotic pancreaticoduodenectomy and splenopancreatectomy: technical aspects and review of literature

HTML PDF

Cite this article: Tschuor C, Nagarkatti SS, Salibi PN, Vrochides D, Martinie JB. Robotic pancreaticoduodenectomy and splenopancreatectomy: technical aspects and review of literature. *Mini-invasive Surg* 2020;4:72.

http://dx.doi.org/10.20517/2574-1225.2020.39

Abstract

Robotic pancreatic surgery provides several advantages. Since the first report of a robotic-assisted distal pancreatectomy in 2001, total pancreatectomies, pancreatic tumor enucleations, pancreaticoduodenectomy, central pancreatectomy and Appleby procedures have been performed, indicating a promising future. The aim of this article is to describe our experience of robotic pancreatic surgery including technical aspects for pancreaticoduodenectomy and distal pancreatectomy. The current literature on feasibility, safety and early postoperative outcomes will be discussed.

15. Review

Robotic vs. laparoscopic major hepatectomy

HTML PDF

Cite this article: Ziogas IA, Tohme S, Geller DA. Robotic vs. laparoscopic major hepatectomy. *Mini-invasive Surg* 2020;4:69.

http://dx.doi.org/10.20517/2574-1225.2020.63

Abstract

The introduction of laparoscopic technology and surgical robots in hepatobiliary surgery in the 1990s and 2000s, respectively, has dramatically revolutionized the field. Even though laparoscopic and robotic major hepatectomy was slower to adopt compared to minimally-invasive minor hepatectomy, the number of major hepatectomies performed with both approaches worldwide has significantly increased and is still rising. Despite the few comparative studies between laparoscopic and robotic major hepatectomy, most studies are focused on describing the procedures or reporting the outcomes of each method, either separately, or mixed with minor hepatectomies. Based on the available data, the direct comparison between the two techniques has shown that when robotic major hepatectomy is performed by experienced hepatobiliary surgeons in high-volume centers, it can lead to similar operating times, estimated blood loss, hospital length of stay, complication and mortality rates compared to its laparoscopic counterpart. The likelihood of achieving a margin-negative resection in cancer patients, as well as long-term disease-free and overall-survival are comparable between the groups. However, broader adoption of the robotic approach might be a hurdle in low-volume centers due to the high fixed capital and annual maintenance cost of the surgical robot.

16. Systematic Review

Minimally invasive pancreaticoduodenectomy with venous resection: results of a systematic review

Mini-invasive Surgery

HTML PDF

Cite this article: Addeo P. Minimally invasive pancreaticoduodenectomy with venous resection: results of a systematic review. *Mini-invasive Surg* 2020;4:64.

http://dx.doi.org/10.20517/2574-1225.2020.47

Abstract

Aim: Growing experience with minimally invasive pancreaticoduodenectomy (PD) has led surgeons to expand the indications for this approach. We systematically reviewed the literature on minimally invasive PD with venous resection.

Methods: The EMBASE, MEDLINE, and Cochrane central databases were systematically searched for articles from January 2010 to January 2020 describing cases of PD with venous resection. The search was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. The primary outcomes were feasibility and conversion rate. Secondary outcomes were morbidity, mortality, blood loss and 1-year survival.

Results: The literature search found 9 studies reporting 140 patients undergoing PD with venous resection. Sixty-six PDs were performed robotically (47.1%). The conversion rate ranged from 0% to 55%, blood loss ranged from 200 to 842 mL, and operative time ranged from 397 to 518 min. There were 82 lateral (58.5%) and 18 segmental (12.8%) PDs with venous resection. One patient had an associated arterial resection (0.7%). A graft was used for venous reconstruction in 28 patients (20%). Eight deaths (5.7%) were reported postoperatively.

Conclusion: Minimally invasive pancreatectomies with synchronous lateral venous resections are increasingly reported by highly experienced surgeons in high-volume institutions. Further experience is needed to validate this approach and prove its advantages over open surgery.

17. Original Article

Robot-assisted spleen preserving distal pancreatectomy (RA-SPDP): a single center experience

HTML PDF

Cite this article: Kauffmann EF, Napoli N, Menonna F, Genovese V, Cacace C, Gianfaldoni C, Vistoli F, Amorese G, Boggi U. Robot-assisted spleen preserving distal pancreatectomy (RA-SPDP): a single center experience. *Mini-invasive Surg* 2020;4:54. http://dx.doi.org/10.20517/2574-1225.2020.46

Abstract

Aim: To define the outcome of robot-assisted spleen preserving distal pancreatectomy (RA-SPDP) in a high-volume center.

Methods: A retrospective analysis of a prospectively maintained database was performed to identify RA-SPDP performed at our Center between April 2008 to October 2017.

Results: During the study period, RA-SPDP was attempted in 54 patients. The spleen was preserved, always along with the splenic vessels (Kimura procedure), in 52 patients (96.3%). There were no conversions to open or laparoscopic surgery. Mean operative time was 260 min (231.3-360.0). Grade B post-operative pancreatic fistula (POPF) occurred in 19 patients (35.2%). There were no grade C POPF. Two patients required repeat surgery because of postoperative bleeding and splenic infarction, respectively. There were no post-operative deaths at 90 days. Excluding one patient with known diagnosis of metastasis from renal cell carcinoma, malignancy was eventually identified in 7 of 53 patients (13.2%).

Conclusion: In the hands of dedicated pancreatic surgeons, robotic assistance results in a high rate of spleen preservation with good clinical outcomes. Despite careful preoperative selection, several patients can be found to have a malignant tumor. Taken altogether these results suggest that patients requiring these procedures should be preferentially referred to specialized centers.

18. Editorial

New trends in minimally invasive management of liver tumors

HTML PDF

Cite this article: Alvarez FA. New trends in minimally invasive management of liver tumors. *Mini-invasive Surg* 2019;3:14. http://dx.doi.org/10.20517/2574-1225.2019.11

19. Review

Laparoscopic resection of liver tumors

HTML PDF

Cite this article: Golhar A, Nikam V, Rao P, Mohanka R. Laparoscopic resection of liver tumors. *Mini-invasive Surg* 2019;3:9.
http://dx.doi.org/10.20517/2574-1225.2018.58

Abstract

Laparoscopic liver resection is technically challenging compared to open liver surgery and has a steep learning curve. Tumors located in the posterior sector, centrally, in proximity of major vascular pedicles or in a background of liver cirrhosis are surgically more complex with a higher risk of blood loss. There is emerging consensus about indications for laparoscopic liver resection. While laparoscopic approach is considered standard for left lateral sectionectomy and minor laparoscopic liver resections in antero-lateral segments, with increasing experience, major resections, parenchyma sparing resections and even donor hepatectomies are being performed laparoscopically with good outcomes. Laparoscopic liver surgery is feasible and safe for well selected patients by well-trained surgeons with short-term advantages and non-inferior long-term oncologic outcomes.

20. Review

Minimally-invasive liver resection for liver tumors in children: a snapshot of the current landscape

HTML PDF

Cite this article: Cortes-Cerisuelo M, Berger M. Minimally-invasive liver resection for liver tumors in children: a snapshot of the current landscape. *Mini-invasive Surg* 2019;3:1. http://dx.doi.org/10.20517/2574-1225.2018.60

Abstract

Minimally-invasive liver resection (MILR) is a promising approach and has become a standard therapy option for a variety of indications, including liver tumors, in adults. Although minimally-invasive techniques are common practices in children, the usage and literature regarding MILR in children is scarce. In this article, we give an update on the current literature, share some of our own experience and give a future outlook of the potential benefits and shortcomings regarding MILR in children.