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MULTIMEDIA ARTICLE

Hybrid Laparoscopic and Robotic Hepatopancreaticoduodenectomy for Cholangiocarcinoma

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Abstract

Introduction Combined hepatic resection and pancreaticoduodenectomy is the treatment of choice for patient with extensive horizontal-spreading cholangiocarcinoma involving both the perihilar bile duct and the intrapancreatic distal bile duct.[1–3] This surgical procedure is extremely complex, and incurs a high risk of postoperative morbidity and mortality.[4] However, in recent years, this complicated high-risk operation can be safely performed in well-selected patients.[5] However, as we know, none of these operations have been reported as minimally invasive surgery.

Patient and Methods A 73-year-old female presented with jaundice and was diagnosed with cholangiocarcinoma. The preoperative image studies revealed a 4.3-cm-long diffuse, infiltrative cholangiocarcinoma from the hilar bile duct to the intrapancreatic bile duct without major vascular invasion. The patient was scheduled to undergo left hepatectomy with caudate lobectomy and pancreaticoduodenectomy to obtain a free resection margin. In order to maximize the efficiency of each surgical modality, we designed a hybrid method of laparoscopic resection and robotic reconstruction for this complicated surgery with a long operation time. A 12-mm port was placed at the subxiphoid area, which was utilized for laparoscopic CUSA during the liver resection. Three 12-mm ports around the umbilicus and an 8-mm robotic port at the right flank were placed. In the resection phase, pancreaticoduodenectomy was performed first, followed by hilar dissection and liver resection in en bloc manner. Here, a hanging maneuver was helpful for the complete resection of the caudate lobe in environment with the large specimen attached. In reconstruction phase, the right flank 8-mm port and the left side 12-mm port (using the double docking technique) were used for docking of two robotic working arms.

Results The total operation time was 510 min, and the estimated blood loss was 350 mL without transfusion. The patient's postoperative recovery was smooth, except for a mild fever due to cystitis, and she was discharged on the 16th postoperative day. Permanent pathologic examination revealed a disease-free proximal bile duct margin, but a metastasis was discovered in one regional lymph node metastasis from 18 retrieved lymph nodes. The patient is receiving adjuvant gemcitabine chemotherapy and regular surveillance. We performed two consecutive cases and the perioperative outcomes were summarized in the attached video.

Conclusion Hepatopancreaticoduodenectomy has a long operative time, involves complicated anatomical structures and difficulty of R0 resection, and it is a remaining frontier of minimally invasive surgery. However, we expect that highly selected patients can carefully undergo minimally invasive surgery if the advantages of the currently available surgical methods are well utilized.

Keywords Hepatopancreaticoduodenectomy · Cholangiocarcinoma · Minimally invasive · Robotic · Laparoscopic

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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