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Laparoscopic Liver Resection for Malignant Liver tumors; Early Results in Yeungnam University Hospital

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Research Purpose: The precise role of laparoscopic liver resection for liver malignancies remains controversial despite an increasing number of publications reporting laparoscopic resection of benign liver tumors. This study was performed to assess the feasibility, safety, and outcome of laparoscopic liver resection for malignant liver tumors.

Materials and Methods: This is a retrospective review of patient's profiles, pathology, surgery and outcome which was performed on 42 patients with laparoscopic liver resection for liver malignancies between January 2004 and December 2009.

Results: Among 42 patiens, 23 patients had HCC, 16 patients had liver metastasis from colorectal cancer, 2 patients had cholangiocellular carcinoma, 2 patients had cystadenocarcinoma. The mean tumor size was 3.4±3.0 cm (Mean±SD). Tumors located at segment number 2 to 8. The resection include 2 right hepatectomies, 2 left hepatectomies, 2 right posterior sectionectomies, 5 segmentectomies, 15 wedge resections. Mean surgical time was 239.0±112.5 minutes. There was one operation related death because of ARDS after bleeding. Postopertative complication occurred in 8 patients (19%) including acute renal failure, wound infection, pleural effusion, etc. There were 2 conversion to laparotomy (5%) because of tumor rupture and bleeding. Mean post operative hospital stay was 9.3±4.5 days. Blood transfusion needed in 10 patients (24%). Mean follow up period was 23.3±11.1 months. The 1-year disease-free survival rate was 86% for patients with HCC (19/22), 100% for patients having liver metastasis from colorectal cancer (16/16). But the 2-year disease-free survival rate was 66% for patients with HCC (13/19), 90% for patients having liver metastasis from colorectal cancer (9/10).

Conclusions: Even though laparoscopic liver resection needs learning curve, it is feasible with minimal surgical trauma even in patients who had malignant liver tumor. This study provides evidence to support further investigation and establishment of laparoscopic liver resection for malignant liver tumors.

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Short-term Results after Robotic Liver Resection

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Background: Since the minimally invasive surgery has been developed in all surgical fields, laparoscopic liver resection has been more frequently performed by many surgeons. However, the laparoscopy has the limitations such as 2-dimensional imaging and restricted instrument motion. The da Vinci Robotic system provides 3-dimensional images and EndoWrist with a 360-degree range of motion. In this study, we reviewed single surgeon's experience of robotic liver resections.

Methods: From November 2008 to February 2011, twenty-seven patients underwent robot-assisted liver resection in Yonsei University Health System. We analyzed perioperative and short-term outcomes after robotic liver resection.

Results: The mean age was 52.6 years (range: 32-71) and 12 (44.4%) patients were male. There were 18 malignant tumors (12 hepatocellular carcinoma, 2 cholangiocellullar carcinomas and 4 liver metastases from GI tract) and 9 benign lesions (7 intrahepatic stones, 1 recurrent liver cyst and 1 schwannoma). Right hepatectomy was performed in 6 patients, left hepatectomy in 13 patients, left lateral sectionectomy in 4 patients, segmentectomy in 1 patients and wedge resection in 2 patients. Five patients underwent combined procedures such as colon resection, stomach resection and radiofrequency ablation. The average operating times of right and left hepatectomy were 724 minutes (range: 648-812) and 520 minutes (range: 315-763), respectively. The average estimated blood loss of right and left hepatectomy were 629 cc (range: 100-1500) and 322 cc (range: 150-900), respectively. Four patients (14.8%) received perioperative transfusion. There were 2 conversions to open surgery (1 in

right hepatectomy and 1 in left hepatectomy). The overall complication rate was 44.4% according to the Modified Clavien System. However, the grade lII complication including bile leakage and incisional hernia occurred in only four patients (14.8%). The median days of hospitalization were 9 days (range: 5-46). Twelve patients with hepatocellular carcinoma did not develop any recurrence after liver resection during 9 months of median follow up (range: 1-24).

Conclusions: From our experiences, robotic liver resection seems to be a feasible and safe procedure. We think that the robotic surgery can be the new technical option for minimally invasive liver surgery.

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Laparoscopic Right Anterior Secionectomy by the Glissonian Approach

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Introduction: A right anterior sectionectomy is to resect segments 5 and 8 of the liver. This is a technically demanding operation because it requires two transection planes. Until now, the laparoscopic approach for this operative procedure has been rarely attempted. We report here on 2 cases of a totally laparoscopic anterior sectionectomy using the Glissonian approach in patients with hepatocellular carcinoma.

Patients and Methods

Case 1: A 54-year-old female was admitted for a hepatic mass that was incidentally found on a health screening test. She was a hepatitis B carrier. The laboratory studies show a normal level of alpha-fetoprotein (AFP) level. The preoperative liver function was Child-Pugh class A and the retention rate, at 15 minutes after an intravenous (i.v.) injection of indocyanine green (ICG R15), was 4.8%. Abdominal computed tomography (CT) revealed a 2.7 cm sized mass that was located in segment 5-8.

Case 2: A 64-year-old female was admitted for a hepatic mass that was incidentally detected by screening ultrasonograpy in a community hospital. She was a hepatitis C carrier. The level of AFP level was 7.9 IUml. The preoperative liver function was Child-Pugh class A and ICG R15 was 12.6%. CT scan revealed a 3.0 cm sized mass that was located in segment 5-8 and 1.0 cm sized mass that was located in segment 8. For both patients, preoperative diagnosis was HCC and laparoscopic anterior sectionectomy was performed.

Results: Operative times were 500 and 550 minutes respectively. Estimated blood loss during operations was about 450 ml and 550 ml respectively and transfusion was not necessary in both patients. The patients were discharged on the 8th and 9th postoperative days respectively without any complication. The postoperative pathology confirmed a 2.0×2.3×2.2 cm sized HCC.

Conclusion: These cases show the feasibility of performing laparoscopic anatomical anterior sectionectomy in selected patients.

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Video for the Hepatectomy using Glissonian Pedicle Transection Method

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Background: The unique technique of Glissonean pedicle transection was reported that it had excellent surgical outcomes in patients with hepatocellular carcinoma and metastatic liver cancer. The portal triad continues from the hepatoduodenal ligament to the intrahepatic portion as the Glissonean pedicle. The artery, portal vein and bile duct, together with connective tissue, are sheathed by the peritoneum to form a fibroid bundle. The entire length of the primary branches of the Glissonean pedicle and the origin of the secondary branches are located outside the liver and the trunks of the secondary and more peripheral branches run inside the liver. The ramification pattern of the tertiary branches which branch out from each secondary branch is different from patient to patient. The liver is nourished by the secondary branches of the Glissonean pedicle. Each secondary