
간담췌 PL-1

The duodenum is not a small intestine: A validation of AJCC cancer staging system on duodenal cancer based on combined results from two centers

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(Purpose) Duodenal cancer (DC) represents about 1% of all gastrointestinal malignancies, and 6% of peri-ampullary cancer. The low incidence perhaps resulted in partial neglect of DC which is currently incorporated within small intestine cancer staging system. There are only a limited number of studies examining the prognostic factors and outcome of DC. The aim is to conduct survival analysis of DC to find prognostic factors and to validate AJCC cancer staging system of DC. **(Methods)** A retrospective review of prospectively collected database was done on patients who have undergone curative intent operations for DC between 1984 and 2011 at Seoul National University Hospital and Johns Hopkins Medical Institution. 223 patients were identified. Demographics, operative data, pathologic findings, and survival data were obtained. Univariate (Kaplan-Meier method and Log-rank test) and multivariate (Cox regression) analyses were done to identify prognostic factors and to validate AJCC staging system. **(Results)** The mean age was 63.7 years and male was more frequently manifested (59.2%). Pylorus preserving pancreaticoduodenectomy was most frequently performed (112) followed by classic Whipple's operation (109). R0 resection was achieved in 94.2%. The percentages of well, moderately, and poorly differentiated tumors were 7.8%, 61.8%, and 30.4%, respectively. The mean

size of the tumor was 4.0 cm and the lymph node (LN) metastasis was identified in 59.2%. The AJCC stage distribution was as following: stage 0 (2, 0.9%), I (20, 9.0%), II (66, 29.6%), III (123, 55.2%), and IV (12, 5.4%). The median survival was 54 months, and the 3- and 5-year survival rates were respectively 58.2% and 48.8%. In univariate survival analysis, age over 60 years ($p=0.004$), size less than 4 cm ($p=0.050$), poorly differentiated tumor ($p=0.028$), LN metastasis ($p<0.001$), and distant metastasis ($p<0.001$) predicted worse outcome. In multivariate analysis, age over 60 years (HR 1.810, 95% CI 1.174-2.792, $p=0.007$), LN metastasis (HR 1.619, 95% CI 1.052-2.490, $p=0.028$ for N1; HR 2.437, 95% CI 1.508-3.938, $p<0.001$ for N2), and distant metastasis (HR 2.023, 95% CI 1.000-4.090, $p=0.050$) were independent prognostic factors. The survival curves of T classification was insignificant ($p=0.524$), and difference was not found between any T classifications. Although the overall survival stratification was statistically significant ($p<0.001$), it was only significant for only IIIB (N2) and IV (M1). **(Conclusion)** Age, LN status, and distant metastasis were independent prognostic factors. The current study with the largest cohort of DC in the world found that the T classification and AJCC staging of small intestine cancer is not adequate for DC. Therefore, a new staging system needs to be devised for DC, may it be relatively infrequent.

간담췌 PL-2

Long-term survivors after pancreatectomy in pancreatic cancer

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(Purpose) Despite of improvement of diagnostic

techniques and treatment modalities for pancreatic cancer, the oncologic outcome after surgical resection has been still poor compared to other malignancies. The aim of this study is to evaluate the clinicopathologic characteristics of long-term survivors after pancreatectomy for pancreatic cancer compared with short-term survivors. **(Methods)** Among 320 patients who were underwent pancreatectomy for pancreatic cancer from October 1990 to December 2012, thirty-five long-term survivors who survived more than 5 years after surgery and 110 short-term survivors who died within 2 years following operation were identified. The clinicopathologic features including demographics, perioperative outcomes, pathologic examination, and postoperative complications were compared between long-term and short-term survivors. **(Results)** There was no significant difference between two groups concerning demographics and perioperative factors including neoadjuvant and adjuvant treatment. In clinicopathologic features, TNM stage (Long-term vs Short-term survivor; stage IA 11.8% vs 0%, IB 8.8% vs 2.8%, IIA 38.2% vs 42.6%, IIB 35.3% vs 51.9%, III 5.9% vs 0%, IV 0% vs 2.8%, $p<0.001$) was significant prognostic factor and perineural invasion (26.5% vs 43.1%, $p=0.082$) showed marginally significant value. More frequent postoperative complication rates were observed in short-term survivors with marginally statistical significance (31.4% vs 49.1%, $p=0.067$). In multivariate overall survival analysis, the presence of postoperative complication showed significant higher hazard ratio (Exp (B)=1.782, 95% CI: 1.193-2.660, $p=0.005$). **(Conclusion)** Postoperative complications may influence the oncologic survival outcome of patients who underwent curative pancreatectomy for pancreatic cancer.

간담채 PL-3

Analysis of survival and recurrence patterns after curative resection in T2 gallbladder cancer according to the tumor location (liver side vs serosa side)

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(Purpose) Extended cholecystectomy (EC) is generally recommended for T2 gallbladder (GB) cancer. However, lymphatic and venous drainage may be different according to anatomic area of GB cancer. Especially there is rare evidence to support liver bed resection is needed for serosa side GB cancer over T2. The aim of this study is to clarify the role of EC in T2 GB cancer according to tumor location. **(Methods)** Clinicopathologic features, extents of resection, survival rates, and recurrence patterns of 102 pathologically confirmed T2 GB cancer patients were retrospectively investigated. **(Results)** The mean age was 64.9 years, 58.8% were female and 23 patients underwent simple cholecystectomy (SC) and 79 underwent EC. The 5-year disease free survival rate (5DFS) of resected T2 GB cancer patients was 74.4%. SC showed significantly poorer survival rate than EC (5DFS, 55.1% vs. 79.5%; $p=0.012$). LN metastasis was also associated with poor outcome (5DFS, 56.5% vs. 87.4%; $p<0.001$). In multivariate analysis, SC (95% CI, 1.074-9.868; $p=0.037$), and LN metastasis (95% CI, 1.497-10.560; $p=0.006$) were independent risk factors of poor survival. The clinicopathologic features (including resection extents and LN metastasis) according to tumor location were not different. The survival rates were not associated with tumor location (5DFS, 76.7% (liver

side) vs. 69.2% (serosa side); $p=0.697$). SC group in serosa side tumor showed particularly lower survival than EC group (5DFS, 22.2% vs. 79.5%; $p=0.001$). The recurrence rate according to tumor location was not different but SC group in serosa side tumor showed higher recurrence rate (57.1% vs. 17.4%; $p=0.060$) **(Conclusion)** LN metastasis and SC group showed significantly poorer survival rate in T2 GB cancer. The location of tumor was not associated with survival and recurrence rate. But, SC for serosa side tumor showed significantly lower survival and higher recurrence tendency. In conclusion, EC is recommended for T2 GB cancer patients regardless of tumor location.

간담체 PL-4

Recent advancements and perspectives of donor operation in living donor liver transplantation: Single-center experience of 886 patients in 13 years

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(Purpose) Despite the recent advancement of LDLT, donor safety remains a concern. We investigate the past, present, and future of donor surgery for living donor liver transplantation (LDLT). **(Methods)** A total of 886 donor hepatectomies between January 1999 and December 2012 at a single center were investigated. Three groups were divided: the initial period (1999-2004, $n=239$); the primary usage of right liver with middle hepatic vein reconstruction (2005-2010, $n=422$); and a standardized protocol using right liver exclusively with localized heparin washout, pre-operative magnetic resonance spectroscopy, and chol-

angiography; no central vein catheterization, and incremental application of minimal incisions (2011-2012, $n=225$). The selection of donors and clinical outcomes were compared. **(Results)** The proportion of patients older than 50 years increased (2.5% vs. 4.7% vs. 8.9%), whereas a remnant liver volume $\leq 30\%$ (6.5% vs. 13.9% vs. 6.3%) and macrosteatosis $\geq 10\%$ (7.9% vs. 11.1% vs. 4.4%) decreased in recent period. Operative time (292.7 vs. 290.0 vs. 272.8, mins), hospital stay (12.4 vs. 11.2 vs. 8.5, days), and overall morbidity rate (26.4% vs. 13.3% vs. 5.8%) including major complications, more than grade III (1.7% vs. 1.9% vs. 0.9%) and biliary complications (7.9% vs. 5.0% vs. 0.9%) were markedly reduced recently. No patient required intraoperative transfusion, and there were no mortalities. **(Conclusion)** Recently, donor surgery has been standardized with a large volume of experience, and it has a minimal risk. However, a constant evaluation of our experience is critical to our preparedness for any unavoidable crisis.

간담체 PL-5

Surgical outcome of HCC greater than 10 cm: Single-center experience of 471 cases

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(Purpose) Tumor recurrence is common after hepatic resection of hepatocellular carcinoma (HCC) greater than 10 cm in diameter. This study evaluated the outcome of patients with such large HCC after primary resection and treatment of recurrent lesions. **(Methods)** A retrospective review was undertaken of clinical data for 471 patients with huge HCC who underwent liver resection from January

2000 to April 2012. **(Results)** Mean tumor diameter was 13.3 ± 3.0 cm (range: 10-26 cm); 93% were single lesions. Systematic and non-systematic resections were performed in 91% and 9% of patients respectively, with tumor-free resection was achieved in 89%. Satellite nodules were detected in 17%. Micro- and macrovascular invasions were identified in 56% and 10%, respectively. More than 90% patients with recurrence underwent active tumor treatment. Multivariate analysis revealed that presence of satellite nodules, poor tumor differentiation and microvascular invasion were independent risk factors for patient survival. Extensive tumor necrosis >90% after preoperative transarterial chemoembolization was not a prognostic factor. Overall 1-, 3-, 5- and 10-year survival rates were 69%, 47%, 36% and 19%, respectively. When confining to patients underwent intrahepatic metastasis on 1-month protocol transarterial chemoinfusion (TACI), univariate analyses on patient survival revealed that intrahepatic metastasis on 1-month protocol TACI was the only significant risk factor ($p=0.002$). **(Conclusion)** In patients with large HCC >10 cm, hepatic resection combined with active treatment for recurrence including 1-month protocol TACI resulted in longer-term survival. Frequent protocol-based follow-up appears to be beneficial for the early detection and timely treatment of recurrence.

간담채 PL-6

Impact of hepatic resection for hepatocellular carcinoma invading the hepatic vein

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(Purpose) Hepatic venous invasion (HVI) of hep-

atocellular carcinoma (HCC) is not common but representing advanced tumor stage. Hepatic resection (HR) is considered as a curative modality, but there is limited data on the outcome after HR. The current study is conducted to evaluate the outcomes of HR for HCC with HVI, and prognostic significance of HCC with HVI on outcomes after HR. **(Methods)** We retrospectively studied 27 patients with HCC with HVI who underwent HR between 1994 and 2011. Surgical outcome and prognostic factor after HR for this condition were analyzed. **(Results)** Mean size of main tumor was 8.7 (± 4.4) cm, and mean level of serum alpha-feto-protein was 9822 (± 19212) ng/mL. Patients who had HCC with HVI demonstrated a median disease-free survival of 5.5 months and 1-year survival rate of 60.5% after HR. The extent of tumor thrombus in hepatic vein did not significantly correlated with oncological outcomes. However, in patients without portal vein tumor thrombus (PVTT) at pre-operative radiologic studies ($n=14$, group A), the disease-free survival was significantly higher in patients with PVTT ($n=13$, group B) ($p=0.013$). All of thirteen patients in group B had tumor relapse within 1 year after HR. The overall 5 year survival rate in group A was 69.2%, which was comparable to that in group B (33.8%). **(Conclusion)** The results of HR for HCC with HVI remain poor, but are better than what is reported in similar patients with medical therapy. Concomitant PVTT affect the surgical outcome, so HR is justified in selected patients with HVI, especially without concomitant PVTT.