
간담췌 O-IV-1

Verification of the Effect of the Mesh after Pancreaticojejunostomy: Does Mesh Prevent Pancreatic Fistula?

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(Purpose) The pancreaticojejunostomy remains the most challenging aspect of the pancreatoduodenectomy. The method to prevent postoperative pancreatic fistula (POPF) is a major concern that lacks consensus. Recently, some studies reported synthetic mesh decreases the rate of POPF. Therefore, prospective cohort study was performed to investigate the effectiveness of the mesh around pancreaticojejunostomy to prevent POPF. **(Methods)** From January 2009 to June 2013, total 180 patients underwent pancreatoduodenectomy by one experienced surgeon in Seoul National University Hospital. Neoveil[®] (polyglycolic acid, GUNZE, Japan) was applied around pancreaticojejunostomy in the synthetic mesh group (n=90). Control group (n=90) with no mesh was compared with the synthetic mesh group. End-to-side, duct-to-mucosal pancreaticojejunostomy was reinforced with out-layer continuous monofilament suture and external stent (5- to 8-Fr Silastic tube) was placed in all subjects. **(Results)** Preoperative demographics of age, sex, body mass index (BMI), and nutritional risk index which was defined as $15.9 \times \text{albumin} + 0.417 \times \text{body weight}$ were equivalent between the cohorts. The pathologic diagnosis, the texture of the pancreas and the pancreatic duct size on CT scan were also similar. The rate of the POPF according to the criteria of International Study Group of Pancreatic Fistula (B and C) (28.9% vs. 32.2%, respectively) and definition by Johns

Hopkins group (21.1% vs. 23.3%, respectively) showed no statistical difference between 2 groups. By the Clavien-Dindo classification, grade 2 and 3 POPF occurred in 11 (12.2%) and 17 (18.9%) patients among mesh group, whereas 15 (16.7%) and 11 (12.2%) patients had grade 2 and 3 POPF among control group, respectively. The differences in overall and abdominal complications such as abdominal fluid collection, early bleeding, and pseudoaneurysm were not observed (60.0% vs. 50.0%, $p=0.272$, 52.0% vs. 44.4%, $p=0.173$, respectively). Postoperative hospital stay was also similar (16.3 days vs. 16.7 days). There was one mortality case in each group. Factors influencing POPF were soft pancreas ($p=0.022$), high BMI (23.6 vs. 22.6, $p=0.044$), and small pancreatic duct (2.4 mm vs. 3.4mm, $p=0.003$). **(Conclusion)** The use of the mesh did not decrease the incidence or severity of the POPF after pancreatoduodenectomy. Soft pancreas, high BMI, and small pancreatic duct influenced the occurrence of POPF.

간담췌 O-IV-2

Division of the surgeon's workloads in pancreaticoduodenectomy

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(Purpose) Many authors have suggested factors that affect pancreatic leakage after pancreatoduodenectomy (PD), but there was little report for surgeon's factor to predominate in pancreatic fistula. This study was conducted to determine if surgeon's workload of PD could impact on postoperative pancreatic fistula (POPF). **(Methods)** We

retrospectively analyzed a total of 270 consecutive patients who underwent PD between January 2008 and June 2013 by an experienced single surgeon. These patients were divided into those underwent PD totally by a single operator (Group 1) and just reconstructions by other training surgeons (Group 2). Duct-to-mucosa pancreaticojejunostomy was performed on all patients. The POPF was defined by the International Study Group on Pancreatic Fistula criteria. **(Results)** There were 157 patients (58.1%) in Group 1 and 113 patients (41.9%) in Group 2. Postoperative morbidity rate was comparable between the two groups (55.4% vs. 52.2%; $P=0.603$), but clinical pancreatic fistula (grade B/C) rate was significantly different (10.8% vs. 2.7%; $P=0.011$). Postoperative mortality was one patient (0.4%) in all. A significant association with clinical pancreatic fistula was found for soft pancreas ($P=0.021$), preoperative serum albumin levels ≤ 3.5 g/dL ($P=0.012$), other pathologies except pancreatic cancer ($P=0.027$) and a single operator ($P=0.019$). A multivariate logistic regression analysis revealed that a single operator [odds ratio (OR) 4.2, $P=0.029$] was the significant predictive risk factor for clinical pancreatic fistula. **(Conclusion)** Division of the surgeon's workloads in PD is associated with a lower rate of pancreatic fistula.

간담채 O-IV-3

Clinical implication of CEA and CA19-9 for the prediction of malignancy in intraductal papillary mucinous neoplasm of pancreas

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(Purpose) To determine the treatment strategy, preoperative malignancy prediction of intraductal papillary mucinous neoplasm (IPMN) of the pancreas is important. Until now, several preoperative malignancy-predictors are suggested. However, little is known about the prognostic significance of serum carbohydrate antigen (CA) 19-9 and carcinoembryonic antigen (CEA). The authors investigated the correlation between malignant potential of IPMN and serum tumor markers (CEA and CA 19-9) and assessed the diagnostic accuracy of serum tumor markers for malignancy prediction. **(Methods)** We analyzed 375 surgical biopsy proven IPMN patients at Seoul National University Hospital, Seoul, Korea. Preoperative serum CEA and CA 19-9 were evaluated to predict malignancy and invasiveness, and its diagnostic performance such as sensitivity, specificity and accuracy was compared with other clinical variables including dilated main pancreatic duct (MPD) ($>5\text{mm}$) and mural nodule. **(Results)** Of the patients, 117 (31.1%) patients had malignant pathology (high grade dysplasia and IPMN with an

invasive carcinoma). Serum CEA was elevated (>5 ug/l) in 4.4%, and serum CA 19-9 was elevated (>37 U/ml) in 16.1% of the patients. Elevated serum CEA was not significantly different according to the degree of dysplasia, ductal type or cyst size. Serum CA 19-9 was significantly elevated in the malignant IPMN (34.2% vs. 7.6%, $p<0.001$) and main duct type IPMN (40.0% vs. 14.3%, $p=0.001$). Furthermore, IPMN with an invasive carcinoma had more frequently elevated serum CA 19-9 than high grade dysplasia (47.9% vs. 11.4%, $P<0.001$). Multivariate analysis revealed MPD over 5mm ($p=0.047$), presence of mural nodule ($p<0.001$), and elevated serum CA 19-9 ($p<0.001$) as an independent malignancy predictors. Compared with these independent malignancy predictors, sensitivity, specificity and accuracy of serum CA 19-9 for malignancy prediction were 67.8% (vs. 63.3% [MPD >5 mm] vs. 59.0% [mural nodule]), 75.0% (vs. 78.7% vs. 86.4%), and 73.8% (vs. 73.9% vs. 77.9%), respectively. **(Conclusion)** Unlike serum CEA, serum CA 19-9 level was significantly higher in malignant IPMN and main duct type IPMN. IPMN with an invasive carcinoma had more frequently elevated serum CA 19-9 than high grade dysplasia. Compared with previously known malignancy predictors, serum CA 19-9 had acceptable diagnostic power. Serum CA 19-9 level can be useful for pre-operative malignancy prediction of IPMN.

간담췌 O-IV-4

Comparison of postoperative fatty changes of liver after pylorus-preserving pancreaticoduodenectomy, distal pancreatectomy, and bile duct resection

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(Purpose) This study evaluates the incidence of fatty liver after pylorus-preserving pancreaticoduodenectomy (PPPD), distal pancreatectomy (DP) and bile duct resection (BDR) with reference on the ratio of liver-to-spleen (L/S) and Housefield unit (HU) on computed tomography (CT) scans. **(Methods)** We selected 114, 80 and 50 patients who underwent PPPD, DP or BDR during January 2008 to December 2009. Patients with heavy alcohol intake (>7 drinks/week for women and >14 drinks/week for men) and who are showing fatty liver before surgery were excluded. We investigated the serial postoperative fatty changes of liver. The L/S ratio HU was measured before Surgery, postoperative 1 year to 5 years by using non-enhanced abdomen computed tomography (CT) scans. The fatty changes of the liver were determined with L/S ratio <1.0 and liver attenuation <40 HU. **(Results)** Univariate analysis showed that patient sex, age, body mass index and pathology did not have a significant influence on the fatty changes of liver following PPPD, DP and BDR. Twenty seven patients (26.2%) showed fatty changes of liver after PPPD for 5 years. Among them, eleven patients (40.4%) showed that the occurrence of fatty liver was accompanied by recurrence of primary cancer within 3 month. **(Conclusion)** The results of this study support that the risk of fat-

ty changes of liver following pancreas resections significantly higher, thus those patients should be taken proper care for fatty liver.

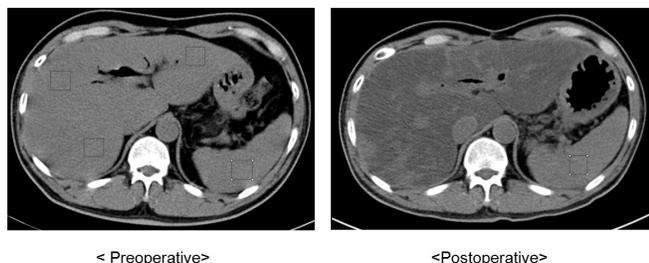


Fig. The measurement of liver and spleen Hounsfield unit density using a region of interest of size >100 mm²

간담채 O-IV-5

R1 pancreaticoduodenectomy followed by immediate postoperative adjuvant treatment competes with margin-negative resection in pancreatic head cancer

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(Purpose) Adjuvant therapy following margin-negative resection is essential for long-term survival in pancreatic cancer. However, there have been few researches concerning survival impact of adjuvant treatment after R1 resection. **(Methods)** From February 1990 to December 2012, 153 patients who underwent pancreaticoduodenectomy for pancreatic cancer were enrolled the study. The patients who were performed neoadjuvant chemoradiation therapy and combined organ resection including vascular resection, and R2 resection were excluded from this study. The clinicopathologic features in-

cluding demographics, perioperative outcomes, pathologic examination, and postoperative complications and survival data including disease-specific overall survival and disease-free survival were compared between R0 and R1 resection groups. **(Results)** Among 153 patients who were enrolled to the study, 129 patients (84.9%) was achieved R0 resection and 24 (15.2%) patients were classified R1 resection. There was no significant difference between two groups in terms of demographics of patients and perioperative and clinicopathologic factors, and postoperative complication. In survival analysis, there was no statistical difference between two groups regarding overall survival period (R0 vs R1 at 1 and 5 years; 80.8% and 21.6% vs 70.8% and 7.6%, p=0.149) and disease free survival period (52.3% and 24.8% vs 46.7% and 5.0%, p=0.335). In sub-group survival analysis, however, the group of R1 resection with no postoperative adjuvant treatment (PAT) showed significantly lower disease-free survival period compared to R0 resection with no PAT group (R0 vs R1 at 5 years, 33.8% vs 0.0% p=0.001). In contrast, the group of R1 resection followed by PAT demonstrated no significant difference with R0 resection group in terms of overall survival and disease-free survival period (33.8% vs 30.0%, p=0.574). **(Conclusion)** Immediate postoperative adjuvant treatment following R1 resection of pancreaticoduodenectomy for pancreatic cancer was not inferior to margin-negative resection in terms of oncologic survival outcomes.