
KAHBPS-PP-2-8

Donor safety and recipient liver function following right-lobe liver transplantation from donor with gilbert syndrome

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(Purpose) Donor safety is the most important point of living donor liver transplantation (LDLT). Gilbert syndrome is an autosomal recessive condition that is a common cause of non-hemolytic unconjugated hyperbilirubinemia, and its prevalence is not negligibly low in healthy population. Gilbert's syndrome can be classed as a minor inborn error of metabolism. This study intended to assess donor safety and recipient liver function following right-lobe LDLT from donor with Gilbert syndrome. **(Methods)** Among 2140 right-lobe graft donors performed between 2002 and 2011, we identified 12 donors (0.6%) who showed serum total bilirubin level >2 mg/dL. They were clinically diagnosed of Gilbert syndrome, but genetic mutation study was not performed **(Results)** Mean donor age was 24.6 years (range: 18-44) and 11 were male. All met the preoperative evaluation conditions of right liver donation except for unconjugated hyperbilirubinemia. Serum total bilirubin level of donors was 2.3 mg/dL (range: 2.0-2.5) before surgery and 2.2 mg/dL (range: 1.6-4.7) at 1 year after surgery. Preoperative direct bilirubin level was 0.4 mg/dL (range: 0.2-0.7). Preoperative indocyanine

green retention rate at 15 minutes was 8.3% (range: 0.2-15.8). All donors recovered uneventfully following right-lobe graft donation. All recipients recovered uneventfully and are alive to date with serum total bilirubin level of normal limit except one recipient. **(Conclusion)** LDLT with donors of Gilbert syndrome can be safely performed, but special attention should be paid for meticulous preoperative evaluation.

KAHBPS-PP-3-1

The significance of 2cm size and the value of imaging studies in determining the management of non-functioning pancreatic neuroendocrine tumor

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(Purpose) The enhanced accessibility of diagnostic imaging studies have led to an increase in the incidental detection of small non-functioning pancreatic neuroendocrine tumors (NF-pNETs). Currently, 2cm is a widely used reference in determining the need for more aggressive treatment. We aimed to re-analyze the implication of 2cm as reference and the value of imaging studies in determining the management plan of NF-pNET. **(Methods)** 172 consecutive NF-pNET patients who underwent surgery between 1995 and 2014 were identified. Clinical characteristics, imaging study results and outcome of these patients were retrospectively analyzed. **(Results)** Tumors with size ≥ 2 cm in preoperative imaging were associated with T3 (HR 9.5 (3.21~28.15), $p < 0.001$), and lymph node metastasis (HR 4.94 (1.63~14.95), $p = 0.002$). The distributions of

WHO grade in tumors <2cm were 79.7%, 20.3%, 0% for G1, G2, G3, respectively. In contrast, the distributions in tumors ≥2cm were 34.%, 53.4%, 12.6% for G1, G2, G3, respectively. The 5-year overall survival and disease free survival rates of NF-pNET <2cm were 94.0% and 89.3%, respectively. They were significantly higher than those with ≥2cm (80.7% and 68.%, respectively; p<0.001). In particular, there were no mortality or recurrence in 16 patients with tumors <1cm. The grossly measured size and the size evaluated by the imaging modalities (CT, MRI, EUS) showed excellent correlation (R=0.958, p<0.001). **(Conclusion)** 2cm remains to discriminate NF-pNETs with benign and malignant behavior fairly well. And the current imaging modalities seem to accurate in determining the size of NF-pNETs. Therefore, "Wait and See strategy" with short term follow up with imaging study may be applicable in well-selected patients, especially in patients with tumor <1cm.

Table1. Prognostic factors in association with Imaging size of NF-pNETs

Prognostic factors	Imaging Size (%)	Imaging Size (%)		HR	p value
		<2cm	≥2cm		
T stage	T1/2	65 (50)	65 (50)	9.5 (3.21~28.15)	P<0.001
	T3	4 (9.5)	38 (90.5)		
N stage	N0	65 (45.1)	79 (54.9)	4.94 (1.63~14.95)	P=0.002
	N1	4 (14.3)	24 (85.7)		
M stage	G1	55 (61.1)	35 (38.9)		P=0.000
	G2	14 (20.3)	55 (79.7)		
	G3	0 (0)	13 (100)		

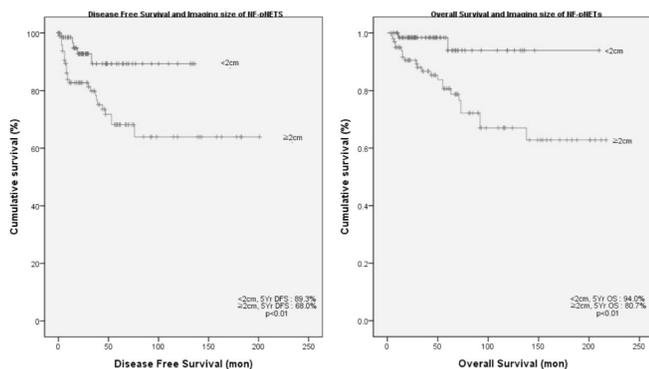


Fig. 1. OS and DFS of NF-pNETs

KAHBPS-PP-3-2

The utility of the preoperative neutrophil-to-lymphocyte ratio in predicting complicated cholecystitis: A retrospective cohort study

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(Purpose) To evaluate whether the neutrophil-to-lymphocyte ratio (NLR), as a prognostic indicator, in patients can differentiate between uncomplicated and complicated cholecystitis. **(Methods)** A database of 993 patients who underwent cholecystectomy due to cholecystitis during approximately a seven-year span in a single institution was evaluated. Complicated cholecystitis was defined when the cholecystitis was complicated by secondary changes, including hemorrhage, gangrene, emphysema, and perforation. The NLR was calculated as the absolute neutrophil count divided by the absolute lymphocyte count. We used receiver operating characteristic curve analysis to identify the optimal value for the NLR in relation to the severity of cholecystitis. Thereafter, the differences in clinical manifestations according to the NLR cut-off value were investigated. **(Results)** Our study population comprised 847 patients with uncomplicated cholecystitis (84.3%) and 156 patients with complicated cholecystitis (15.7%). The NLR of 3.0 could predict complicated cholecystitis with 67.5% specificity and 70.0% sensitivity. A higher NLR (≥3.0) was significantly associated with older age (p<0.001), male gender (p=0.004), admission via the emergency department (p<0.001), severity of presenting symptom, longer operation time (p<0.001), higher incidence of postoperative compli-

cations ($p=0.058$), and prolonged length of hospital stay (LOS) ($p<0.001$). Multivariate analysis found that patient age >50 years (odds ratio [OR]: 2.271, 95% confidence interval [CI]: 1.669-3.090, $p<0.001$), preoperative NLR >3.0 (OR: 1.515, 95% CI: 1.009-2.275, $p=0.045$), and admission via the emergency department (OR: 1.623, 95% CI: 1.185-2.222, $p=0.003$) were independent factors associated with prolonged LOS. **(Conclusion)** NLR ≥ 3.0 was significantly associated with complicated cholecystitis and prolonged LOS in patients undergoing cholecystectomy. Therefore, preoperative NLR in patients undergoing cholecystitis due to cholecystitis seemed to be a useful surrogate marker for complicated cholecystitis.

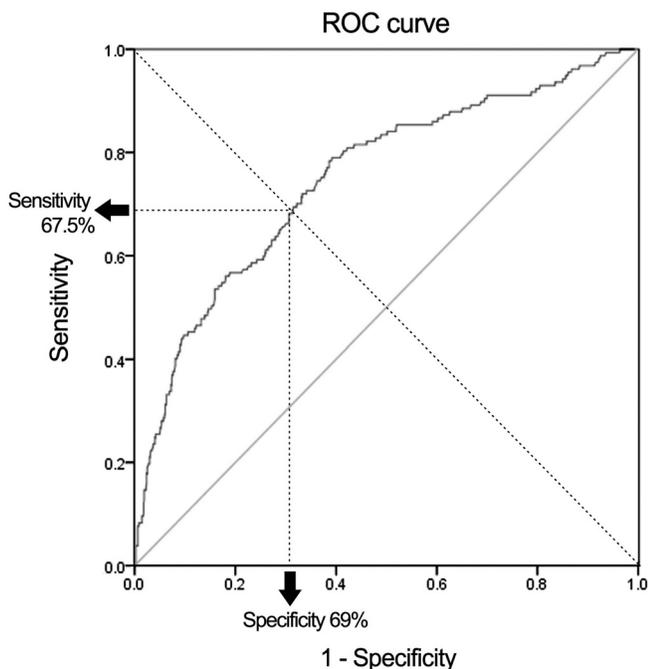


Fig. 1. Receiver operating characteristic (ROC) curve for uncomplicated and complicated cholecystitis. The area under ROC curve: 0.749. 95% CI 0.706-0.793; p -value <1

KAHBPS-PP-3-3

Analysis of recurrence pattern by lymph node metastasis (T3N0 vs. T3N1) after curative resection in pancreas cancer : LN is the checkpoint for systemic spreading

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(Purpose) Pancreatic ductal adenocarcinoma (PDAC), even when resectable, remains highly lethal. To improve the prognosis of patients with PDAC, the early diagnosis and optimized treatment were essential. Among various factors, lymph node metastasis is one of the most important prognostic factors. To evaluate the clinical significance of LN involvement, we compared the recurrent pattern according to LN metastasis after curative resection. **(Methods)** The patients undergoing surgical resection for pancreatic head/neck cancer between Oct 2003 and Dec 2009 were reviewed retrospectively. To analysis the recurrence pattern, a series of 240 patients with R0 resection and T3 stage were enrolled in this study. They were divided into two groups on the basis of the status of LN metastasis. (T3N0 vs. T3N1) Various analyses about recurrent time and site were performed to verify the clinical significance of LN metastasis. **(Results)** Among 240 patients, the T3N0 was 114 patients and the T3N1 was 126 patients. The status of LN metastasis correlated with the recurrence rate. (N0 : 85/114 (74.5%), N1 : 122/125 (97.6%)) First, the recurrent time was compared. In case of

T3N0, recurrent times within 6 months, 1yr and 2yrs were 34 (29.8%), 58 (50.8%) and 79 (69.2%). However, in case of T3N1, the recurrent times were 54 (43.2%), 105 (54%) and 119 (95.2%), respectively. (P<0.05) Second, we analyzed the accumulative recurrent site. In case of T3N0, the recurrent sites were 61 (locoregional), 38 (liver), 13 (lung & bone) and others (11). And single site was 45, multiple sites was 40. In the other hands, In case of T3N1, the recurrent sites were 95 (locoregional), 60 (liver), 15 (lung & bone) and others (17). Especially, there was statistically significant difference in locoregional and liver recurrence. (P<0.05) Additionally, the incidence of multiple recurrences was higher in LN positive. **(Conclusion)** We specifically analyzed the recurrent time and site according to LN metastasis in pancreas head/neck cancer. In the case of LN positive, the recurrence was faster and broader. For optimized treatment for these patients, the differentiated trials to block the spread of tumor cells will be needed.

KAHBPS-PP-3-4

An in vivo porcine training model for laparoscopic choledochojejunostomy

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(Purpose) Choledochojejunostomy (CJ) is an important procedure performed in many hepatobiliary operations. For the novice surgeon to acquire advanced techniques such as laparoscopic CJ, an adequate training model is required. The purpose of this study was to develop a porcine training model for laparoscopic CJ that can act as a bridge between simulation models and actual surgery for novice surgeons. The feasibility of this model was

evaluated. **(Methods)** Laparoscopic CJ using intracorporeal sutures was performed on ten animals. Eight animals were sacrificed upon completion of procedure, and the anastomoses were examined for leaks. In two animals, a survival model was evaluated for 14 days. All operations were performed by a surgical fellow with no experience in human laparoscopic CJ. A single layer of running sutures was placed in the posterior and anterior layers. 4-0 absorbable coated monofilament sutures were used. Jejunojejunostomy was performed using a linear stapler, and the jejunal opening was closed using absorbable unidirectional sutures (V-Loc 180[®]; Covidien, Mansfield, MA, USA). **(Results)** The average operation time was 131.3±36.4 minutes, and the CJ time was 57.5±18.4 minutes. Both the operation time and CJ time showed a steady decrease with an increasing number of cases. The average diameter of the CBD was 6.4±0.8 mm. Both animals evaluated as a survival model recovered completely and survived for 14 days, after which both animals were sacrificed. None of the animals exhibited any signs of bile leakage or anastomosis site stricture. **(Conclusion)** The porcine training model introduced in this paper is an adequate model for practicing laparoscopic CJ. Human tissue simulation is excellent.

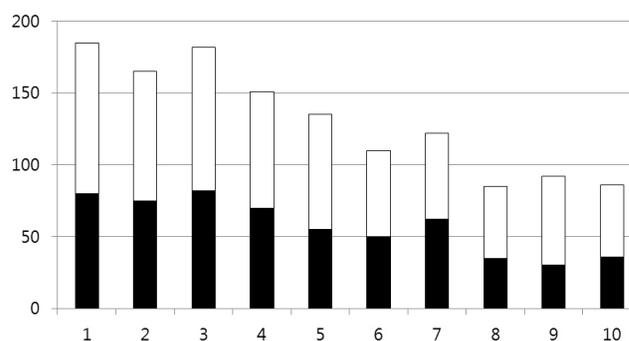


Fig. Operative time by case number. * Black bar: choledochojejunostomy time

KAHBPS-PP-3-5

Marked leukocytosis is a predictor of postoperative inflammatory complications after periampullary cancer surgery

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(Purpose) Predicting postoperative complications is important to decrease patient's complications and improve surgical outcomes after pancreaticoduodenectomy (PD) with high rate of complications. The aim of this study was to evaluate a white blood cell (WBC) count on Postoperative day (POD) 1 as a predictor of postoperative complications after PD by retrospective study. **(Methods)** 372 patients who underwent the scheduled PPPD or Whipple's operation for periampullary cancer between September 2003 and December 2013 were evaluated after excluding the patients with leukocytosis ($WBC \geq 10,00 \times 10^9/L$). Their WBC count on POD 1 and postoperative complications (Clavien-Dindo classification) during the admission or within POD 30 were reviewed. Patients was divided 2 groups; a marked WBC group ($\geq 20.00 \times 10^9/L$) and the other ($< 20.00 \times 10^9/L$). **(Results)** Postoperative complications with Grade IIIa, IIIb and IV, V in the marked Leukocytosis group were higher than the others group significantly ($OR=2.086$ $P=0.040$). Also Intra-abdominal complications with Grade IIIa or more in the marked Leukocytosis group were higher, for example intraabdominal fluid collection, bleeding, leakage. ($OR=1.473$ $P=0.028$) **(Conclusion)** While the Leukocytosis is common after PD, Marked leukocytosis ($WBC \geq 20.00 \times 10^9/L$) on POD 1 might be associated with the immediately postoperative severe complications. Marked WBC counts warrant further workup for complications.

Risk factor for WBC($\geq 20 \times 10^5/dl$)

	Univariate HR (95% CI)	Univariate p-value		Univariate HR (95% CI)	Univariate p-value
Age (60이상)	1.059 (-.010-.129)	.094	Op. 종류	1.033 (-.020-.085)	.220
Male:Female	1.002 (-.058-.058)	.952	P-duct dilatation	1.055 (-.012-.124)	.107
BMI (25이상)	1.041 (-.030-.112)	.259	Soft Pancreas	1.023 (-.042-.087)	.490
DM	1.010 (-.054-.074)	.765	T stage(3이상)	1.023 (-.043-.089)	.500
Jaundice	1.042 (-.018-.101)	.168	N stage(3이상)	1.023 (-.035-.082)	.434
Preop. Alb	1.056 (-.004-.016)	.128	Angiolymphitic invasion	1.005 (-.054-.064)	.872
Preop. Bil	1.003 (-.004-.009)	.384	Venous invasion	1.004 (-.078-.070)	.915
Tumor location	1.015 (-.017-.047)	.351	Perineural invasion	1.020 (-.044-.084)	.539
Preop. Drainage 여부	1.041 (-.018-.100)	.169	Resection margin	1.073 (-.005-.150)	.067
Op time	1.000 (.000-.000)	.270	complications	1.028 (-.031-.087)	.344
EBL	1.000 (.000-.000)	.152	Intra-abdominal complication	1.050 (-.016-.116)	.139
Transfusion	1.028 (-.042-.097)	.437	Cx IIIa	1.066 (.003-.129)	.040
HD	1.001 (.001-.003)	.346	Intra-abd IIIa	1.065 (-.005-.134)	.070

Fig. Risk factor of high WBC counts (in univariate regression)

KAHBPS-PP-3-6

Clinical characteristics of incidental or unsuspected gallbladder cancers diagnosed during or after cholecystectomy: A systematic review and meta-analysis

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(Purpose) To perform a systematic review of incidental or unsuspected gallbladder (GB) cancer diagnosed during or after cholecystectomy. **(Methods)** Data in PubMed, EMBASE, and Cochrane Library were reviewed and 26 publications were included in the meta-analysis. The inclusion criterion for incidental GB cancer was GB cancer diagnosed during or after cholecystectomy that was not suspected at a preoperative stage. Pooled proportions of the incidence, distribution of T stage, and revisional surgery of incidental GB cancer were analyzed. **(Results)** The final pooled population comprised

2145 patients with incidental GB cancers. Incidental GB cancers were found in 0.7% of cholecystectomies performed for benign gallbladder diseases on pre-operative diagnosis (95% CI: 0.004-0.012). Nearly 50% of the incidental GB cancers were stage T2 with a pooled proportion of 47.0% (95% CI: 0.421-0.519). T1 and T3 GB cancers were found at a similar frequency, with pooled proportions of 23.0% (95% CI: 0.178-0.291) and 25.1% (95% CI: 0.195-0.317), respectively. The pooled proportion that completed revisional surgery for curative intent was 40.9% (95% CI: 0.329-0.494). The proportion of patients with unresectable disease upon revisional surgery was 23.0% (95% CI: 0.177-0.294). **(Conclusion)** A large proportion of incidental GB cancers were T2 and T3 lesions. Revisional surgery for radical cholecystectomy is warranted in T2 and more advanced cancers.

KAHBPS-PP-3-7

Investigation of prognostic factors and management strategy of non-functioning pancreatic neuroendocrine tumors

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(Purpose) Various factors have been reported as prognostic factors of non-functioning pancreas neuroendocrine tumors (NF-pNETs) but controversies persist. Furthermore, consensus on management strategy have not been reached. We aimed to further investigate the prognostic factors using a large single-center cohort to help determine the management strategy of NF-pNET. **(Methods)** 172 consecutive NF-pNET patients who underwent surgery

between 1995 and 2014 were identified. These patients were retrospectively analyzed for clinical characteristics and outcomes. **(Results)** The 5-year overall survival (OS) and disease-free survival rates were 85.6% and 75.4%, respectively. In univariate analysis, Age<40 (p=0.047), asymptomatic tumor (p<0.001), T1/2 (p<0.001), no lymph node (LN) metastasis (p<0.001), no distant metastasis (p<0.001), size<2cm (p<0.001), lower WHO grade (p<0.001) were significantly associated with better OS. Through multivariate analysis, asymptomatic (HR 4.11 (1.38~12.28), p=0.011) and lower WHO grade (G2, HR 11.06 (1.44~84.99), p=0.021; G3, HR 125.09 (14.42~1085.43), p<0.001) were identified as independent prognostic factors for OS. Lower WHO grade was significantly associated with age<40 (p=0.003), distally located tumor (p=0.016), lower T stage (p<0.001), no LN metastasis (p<0.001), no distant metastasis (p=0.003), and size<2cm (p<0.001). **(Conclusion)** Asymptomatic tumor and lower WHO grade were found to be independent prognostic factors for OS in NF-pNET. But because WHO grade can be determined through pathologic examination, other factors associated with lower WHO grade may be used to predict lower grade. Therefore, young (age<40) asymptomatic patients with small NET (size<2cm) and without evidence of LN or distant metastasis on image study may be considered for observation rather than immediate surgical resection.

Table1. Prognostic factors in association with WHO classification of NF-pNETs

Prognostic factors		WHO classification			p value
		Grade1 (%)	Grade2 (%)	Grade3 (%)	
Location	Head	31 (40.3)	38 (49.4)	8 (10.4)	P=0.016
	Distal located	59 (52.3)	69 (40.1)	13 (7.6)	
Age	<40	59 (50.4)	54 (46.2)	4 (3.4)	P=0.003
	≥40	31 (56.4)	15 (27.3)	9 (16.4)	
T stage	T1/2	87 (66.9)	39 (30.0)	4 (3.4)	P=0.000
	T3	3 (7.1)	30 (71.4)	9 (21.4)	
N stage	N0	90 (62.5)	49 (34)	5 (3.5)	P=0.000
	N1	0 (0)	20 (71.4)	8 (28.6)	
M stage	M0	90 (54.5)	64 (38.8)	11 (6.7)	P=0.003
	M1	0 (0)	5 (71.4)	2 (28.6)	
Pathologic size	<2cm	59 (81.9)	13 (18.1)	0 (0)	P=0.000
	≥2cm	31 (31)	56 (56)	13 (13)	

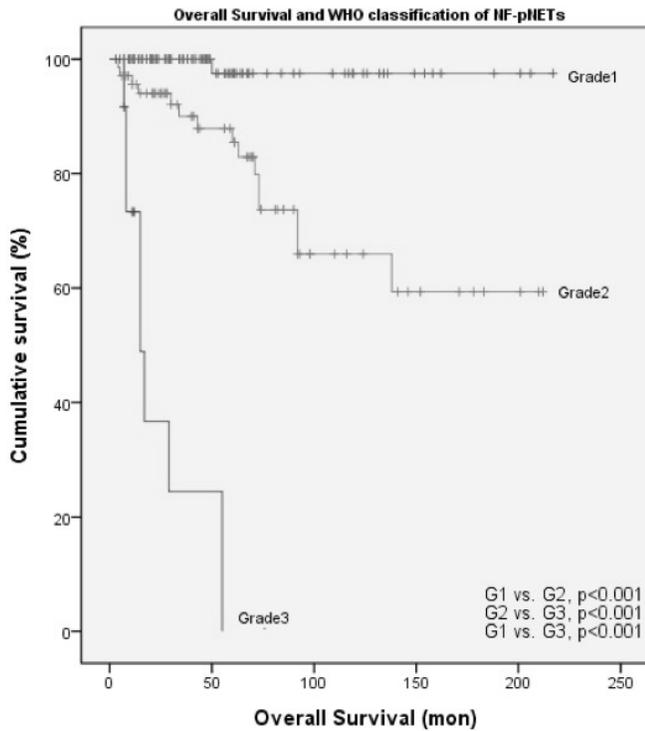


Fig. 1.

KAHBPS-PP-3-8

Prospective randomize control study of clinical usefulness of prophylactic antibiotics therapy in laparoscopic cholecystectomy: Preliminary result.

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(Purpose) Laparoscopic cholecystectomy (LCC) is the procedure of generating a low infection ratio, the role of Antibiotics prophylaxis is debatable. We evaluated the usefulness of prophylactic antibiotic during LCC performed. **(Methods)** The clinical fea-

tures of all patients performed LCC at Chonbuk National University Hospital between April and September 2014 were randomized studied by comparing them with antibiotic group (n=44, AG, cefotetan 1g, 1 dose/prophylactic) and non-antibiotic group (n=48, NAG) by table of random numbers. The clinical variables were pre- and post-operatively blood test, symptoms and imaging to evaluate whether the infection. **(Results)** There were no significant differences in clinical characteristics between the two groups. (M:F=35:57, mean age : 51.5±30, mean BMI 25.0±5.7) One of NAG (2%) was fever at 2nd post-operative day (POD). At 14th POD, Three of NAG (6.25%) had symptoms of RUQ pain, 1 patient had a subhepatic fluid collection but no growth in culture and the other 2 patients were just a pain caused by fecal impaction without such findings seem to suspect infection. And 1 patient in NAG (2%) had a serous wound discharge at 14th POD, also bacteria were not identified. There was no significant difference between the two groups in comparison of factors to suspect infection such as fever (≥ 38 °C), leukocytosis ($\geq 12,000/\text{mm}^3$), Elevation of ESR (>9 mm/hr) and CRP ($>5\text{mg/L}$). And there was no variable that affected factors to suspect infection in the multivariate analysis. **(Conclusion)** In our results, antibiotic prophylaxis is no significant differences in both groups. Therefore It is not necessary to use prophylactic antibiotics during elective laparoscopic cholecystectomy in patients of including criteria, but to confirm this result, further studies with more patients and large trials are required.

KAHBPS-PP-3-9

Clinical significance according to the precursor type of ampulla of vater cancer

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(Purpose) Although ampullary cancer are rare disease, it is considered to have a better prognosis than other periampullary cancer. According to a recent study, Intra-ampullary Papillary-Tubular Neoplasm (IAPN) is mass-forming preinvasive neoplasm that occur specifically within the ampulla. The aim of this study were to identify clinical outcome according to the precursor type (IAPN and flat dysplasia) of ampullary cancer. **(Methods)** Patients who underwent pancreatoduodenotomy for ampullary cancer between Dec. 1994 and Aug.2014. We retrospectively collected data on clinical records. 406 patients underwent curative resection. Among them, precursor type has been reported 77cases (IAPN 30 and flat dysplasia 47). **(Results)** The 3-, 5- and 10- year disease free survival rates of the 406 cases were 62.5%, 60.1% and 56.4%, respectively, and overall survival rates were 62.5%, 60.1% and 49.9%, respectively. Multivariate analysis showed that advanced T stage ($P=0.052$) and CA19-9 ($37U/ml \leq$, $P=0.005$) were significantly increased the risk of recurrence. Flat dysplasia was higher recurrent rate than IAPN ($P=0.025$) in negative node metastasis (N0). **(Conclusion)** Advanced T stage and higher CA19-9 were found to be independent predictors of recurrence after curative resection ampullary cancer. Although negative node metastasis was good prognostic factor, it was be expectation that flat dysplasia of precursor type

was bad prognostic factor. However, It is considered that furthermore study is needed.

KAHBPS-PP-4-1

Should we have interval between ERCP and laparoscopic cholecystectomy?

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(Purpose) The gold standard of care for gallbladder calculi and isolated common bile duct stones is represented by laparoscopic cholecystectomy and endoscopic retrograde cholangiopancreatography, respectively, while a debate still exists regarding how to treat the two diseases at the same time. The aim of this study is to investigate whether we should have time gap between ERCP and laparoscopic cholecystectomy. **(Methods)** The current retrospective study was conducted in 143 patients who underwent laparoscopic cholecystectomy following a preoperative ERCP at Hanyang University Kuri Hospital during a 3-year period from January of 2011 to December of 2013. Basic characteristics, BMI, interval between ERCP and operation, severity of cholangitis, previous major abdominal operation histories and histologic type of cholecystitis were collected. Complications of ERCP including bleeding, perforation and post-ERCP pancreatitis were investigated. We analyzed whether each factors was influenced to operation time, complications and additional increase of hospital stay due to post ERCP pancreatitis and bleeding. Multiple regression analysis was used for statistical study. **(Results)** Conversions to open surgery were done in three cases. Only two factors in-