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Comparison of Clinical Outcome and Cost-effectiveness after Various Preoperative Biliary Drainage in Periapillary Cancer with Obstructive Jaundice

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Background: The clinical benefit of preoperative biliary drainage (BD) in periampullary cancer with obstructive jaundice is not well established yet, which includes PTBD, ERBD, or ENBD. There is no comparative study comparing these BD methods, and therefore, selection of preoperative BD method depends on clinicians' preference or hospital facility without strong evidence. The aim of this study is to compare the clinical outcome and cost-effectiveness of these preoperative BD methods in periampullary cancer, and to suggest guidelines for selecting the appropriate preoperative BD method.

Methods: Between October 2004 and August 2010, 211 patients underwent pancreatoduodenectomy (Whipple's operation or pylorus preserving pancreaticoduodenectomy) after preoperative BD due to periampullary cancer with obstructive jaundice in Seoul National University Hospital. Clinical outcome and cost-effectiveness of each preoperative BD methods were compared according to its final drainage method or by following the intention-to-treat analysis. ERBD and ENBD were considered as endoscopic BD group.

Results: Preoperative BD was performed in 211 patients, which include 107 PTBD (50.7%), 53 ERBD (25.1%), and 51 ENBD (24.2%) according to their final status. Considering tumor location, PTBD was more frequently performed in pancreas cancer (43.9% vs. 29.8%) while ENBD or ERBD was more frequently performed in distal CBD or ampulla of Vater cancer (70.2% vs. 50.4%; $p=0.001$). There was no difference in drainage duration between PTBD and endoscopic BD groups (14.2 vs. 16.6 days, $p=0.121$) but daily diminution of serum bilirubin level was higher in PTBD group (0.7 vs. 0.6 [mg/dL]/day, $p=.041$). Among endoscopic BDs, ERBD group had longer drainage duration than ENBD group (19.0 vs. 14.1 days; $p=0.029$) but

daily diminution of serum bilirubin was comparable (0.5 vs. 0.6 [mg/dL]/day, $p=.339$). Concerning procedure related complications, pancreatitis occurred more frequently in endoscopic BD than PTBD group (16.3% vs. 2.8%; $p=0.001$). Postoperative complication rate was comparable between PTBD and endoscopic BD group (43.0% vs. 46.2%, $p=.644$). Thirty-nine patients who were initially subjected to endoscopic BD switched to PTBD due to procedure failure (94.9 %) or ineffective biliary drainage (5.1%). Performing intention-to-treat analysis, drainage duration was shorter (13.2 vs. 16.5 days; $p=0.049$), daily diminution of serum bilirubin level was higher (0.7 vs. 0.6 mg/dL; $p=0.041$), and admission cost was lower (15.3 vs. 16.9×106 won; $p=0.040$) in PTBD group than endoscopic BD group.

Conclusion: With intention-to-treat analysis, PTBD group revealed rapid serum bilirubin decline with shorter drainage duration and lower admission cost. Although the role of preoperative BD is still controversial, preoperative BD is needed in some situation. When selecting the method of BD, PTBD is more cost-effective and safe method compared to endoscopic BD.

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20-Years Experience of Ampulla of Vater Cancer

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Research Purpose: Ampulla of Vater cancer has been reported to have most favorable prognosis in periampullary cancers. Moreover, superb prognosis of early ampullary cancer expanded its indication for ampullectomy. However, few studies have offered adequate pathologic details and long term outcome of ampullary cancers. The objective of this study is to investigate long-term outcome of ampulla of Vater cancer, and to explore predictive factors of lymph node metastasis in early ampullary cancers.

Materials and Methods: Data were collected from patients who underwent surgery at Seoul National University Hospital from 1990 to 2010 (median follow up: 34.5 m). Clinicopathologic characteristics of 391 patients with surgical biopsy proven ampulla of Vater

cancer were analyzed.

Results: The study subjects were at mean age of 59.8 years, and male to female ratio was 1.2 to 1. Fifty-five percent of all patients had jaundice at presentation. Tumors had polypoid gross morphology in 68.3%, and mean tumor size was 2.3 cm. Curative intended resection was performed in 95.7% including 361 pancreatoduodenectomies, and 95.1% of all 391 patients achieved R0 resection. Lymph node metastasis rate was 32.0%. Distribution of pathologic stage according to AJCC 7th edition were as follows; stage 0 (n=5, 1.3%), stage I (n=180, 46.0%), stage II (n=180, 46.0%), stage III (n=11, 2.8%), and stage IV (n=15, 3.8%). Overall 5-year survival rate (5YSR) was 73.1% in stage I, 46.4% in stage II, 36.0% in stage III and 7.3% in stage IV. Curative resection significantly increased overall survival rate than palliative operation (5YSR 59.3% vs. 6.4%, $p<.001$). Overall 5- and 10-year survival rate after curative resection was 59.3% and 45.3%, respectively. T4 cancers had comparable survival outcome with T3 cancers (5YSR 46.9% vs. 44.1%, $p=.823$). After curative resection, elevated serum CEA ($p=.009$) or CA 19-9 ($p=.031$), poor histologic differ-

entiation ($p=.007$), and microscopic venous invasion ($p=.001$) were independent prognostic factors of overall survival. Of 235 patients with T1 or T2 cancer, jaundice at presentation ($p=.002$), elevated serum CA19-9 ($p<.001$), tumor size larger than 1cm ($p=.053$), advanced T stage ($p<.001$), endolymphatic invasion ($p<.001$), and poor histologic differentiation ($p=.002$) were significant factors related with lymph node metastasis. Of these, jaundice at presentation ($p=.085$), elevated serum CA19-9 ($p=.009$), and stage T2 ($p=.045$) were preoperative assessable independent predictors of lymph node metastasis in early ampulla of Vater cancer.

Conclusions: Ampulla of Vater cancer has curative resection rate of 95.7% and overall 5YSR is 59.3% after curative resection. Current AJCC staging of T4 should be reconsidered. Besides in cases with suspected local extension, T1 or T2 ampulla of Vater cancer with preoperative jaundice or elevated serum CA 19-9 has higher risk of lymph node metastasis. Preoperative endoscopic ampullectomy should be avoided in these cases.