

and 10.5%, and 31.7% and 19.0%, respectively. No survival difference was shown between bypass surgery and palliative resection group. All other factors did not affect the outcomes.

Conclusions: Bypass surgery group with high dose RT showed similar survival outcome to palliatively resected group. These results might suggest that dose escalation after bypass surgery in unresectable extrahepatic bile duct cancer patients could achieve comparable survival to R2 resection.

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POSTER

Cardiopulmonary Exercise Testing (CPET) as a Predictor of Outcome in a Mixed Hepatobiliary Surgical Cohort

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Background: Cardiopulmonary exercise testing is a non-invasive method of quantifying a patients' level of fitness. Studies in mixed surgical populations have looked at the predictive value of CPET derived variables such as anaerobic threshold (AT). Anaerobic threshold has been shown to be useful in identifying patients at risk of increased post operative morbidity, mortality and those at risk of prolonged hospital stay. An AT <11 has been found to predict increased postoperative morbidity and mortality in series reporting on other types of major intra-abdominal surgery, but the predictive value of an AT < 11 in a hepatobiliary group of patients has not been identified.

Methods: We identified all patients who underwent preoperative CPET and subsequent hepatobiliary surgical intervention. Data recorded included demographic data, surgical procedure, postoperative length of stay (LOS), postoperative morbidity score (POMS) at day 5 and 8, incidence of elective critical care admission, reoperation, and readmission to critical care.

Results: 78 patients underwent CPET and Hepatobiliary surgical intervention between May 2008 and October 2010. Median age of patients was 70 (intra-quartile range (IQR) 63–75). 35 Liver Resection (Colorectal Liver metastasis), 16 Liver resection (Other malignant), 4 Liver resection (Benign), 6 radical cholecystectomy, 4 cholecystectomy, 3 open and close (irresectable), 2 other hepatobiliary. There was no statistically significant difference in the BMI or age of patients with an AT <11. Patients with AT <11 had a median LOS of 7 days (IQR 6–9), AT >11 median LOS 6 days (IQR 5–10) (p 0.432). Patients with an AT <11 had no increase in postoperative morbidity, elective critical care admission, readmission to critical care or reoperation. There was only one death within 90 days, due to malignant disease progression.

Conclusions: In a group of patients undergoing heterogeneous hepatobiliary surgical intervention, patients with an AT <11 have no significant increase in postoperative morbidity, elective critical care admission, readmission to critical care or reoperation. This highlights that the level of fitness patients require to undergo surgical intervention is procedure and patient specific, and that quantitative CPET data should be interpreted as such, rather than using arbitrary cut offs.

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POSTER

The Value of Cardiopulmonary Exercise Testing in Liver Resection

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Background: Liver resection is the treatment of choice for many liver lesions. Historically resection was associated with a mortality of >10%, now this is below 5%. Advances in patient selection, surgical technique and post-operative care have contributed to this improvement. Despite improved mortality rates, current literature suggests morbidity rates remain high, ranging from 23%–56%. Various methods are used pre-operatively to try to identify patients at higher perioperative risk; however debate remains regarding the most appropriate method.

Cardiopulmonary exercise testing (CPET) has been used in mixed surgical populations. CPET detected variables including anaerobic threshold (AT) have used to identify patients at higher risk of post-operative morbidity, mortality and prolonged hospital stay. The value of CPET in patients undergoing liver resection has not been studied.

Methods: We identified patients who underwent preoperative CPET and subsequent Liver resection in our unit between 1/5/2008 and 1/10/2010. Notes, hospital computer system and a prospectively maintained database were reviewed retrospectively. Data recorded included demographic data, surgical procedure, postoperative length of stay (LOS), postoperative

morbidity score (POMS) at day 5, reoperation, and readmission to critical care.

Results: Full datasets were obtained on 55 patients who underwent CPET and liver resection. 35 male, 20 female. Mean age 70 years. Resections were carried out for Colorectal Liver metastasis 35, cholangiocarcinoma 9, hepatocellular carcinoma 4, Other malignancy 2, Benign disease 5. Mean 11.9 ml/kg/min, Mean Vo2 peak 18.5 ml/kg/min. 17 patients had an AT <11. Those with AT <11 had a mean LOS of 13 days, compared to 10 days in those with AT 11+ (p = 0.46). Patients with an AT <11 were more likely to have a POMS of 1 or greater at day 5 (p = 0.03). There were no significant differences in the age, BMI, or critical care readmission in either group. There was no mortality. There was a trend towards higher reoperation in those with an AT < 11 (p = 0.08).

Conclusions: CPET can be used to identify patients at higher risk of postoperative complications when undergoing Liver resection. This was not due to increased age or increased BMI. This could be used to better allocate critical care bed utilisation. There appeared to be a trend towards longer LOS, and higher reoperation rates in those with an AT <11, in a larger series this may become statistically significant.

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POSTER

Predictors of Recurrence After Pancreaticoduodenectomy for Ampullary Carcinoma

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Introduction: The prognosis for patients with carcinoma of the ampulla of Vater (AVC) is improved relative to other periampullary neoplasms, but recurrence of disease remain possible. The overall 5-year survival after radical resection is 50%. The aim of this study was to determine the clinicopathologic factors that influence long-term survival and type and curability recurrence after pancreaticoduodenectomy.

Methods: We reviewed 34 patients who underwent pancreaticoduodenectomy (PD) between August 2003 and August 2010 for AVC. Demographic, clinical, and pathologic data, recurrence rate and treatment were collected. The correlation between clinicopathologic factors and survival of patients after resection was examined by the Kaplan–Meier method, the log-rank test, and Cox proportional hazards regression.

Results: The mean follow-up was 23 month. The overall actuarial survival rates at 1, 3, and 5 years were 73.2%, 63.1%, 62.1% respectively. Nine patients recurred (7 month to 42 month). Factors that significantly influenced survival were perineural invasion (P < 0.001), lymph node status (P < 0.001), and degree of differentiation (P < 0.001) on univariate analysis. On multivariate analysis, both perineural invasion and lymph node status were the independent determinants of survival after resection. Histologic type (pancreatobiliary vs intestinal-type of tumour) was not a statistically significant factor for recurrence (p > 0.1). 4 patients underwent R0/R1-R2 resection for recurrence, 5 – chemotherapy.

Conclusions: Perineural invasion and lymph node status is associated with recurrence after pancreaticoduodenectomy for AVC and may identify candidates for adjuvant therapy. Recurrence after surgery can occur late and long follow-up it is usefulness after PD for AVC. Some patients with recurrence, especially with isolated liver metastases may be candidate for surgical treatment.

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POSTER

Results of Surgical Treatment for Hepatocellular Carcinoma Invading the Major Portal Vein or Inferior Vena Cava

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Background: Patients with hepatocellular carcinoma invading the main trunk of the portal vein and the inferior vena cava have a dismal prognosis. The only hope for cure for such advanced cancer is an aggressive hepatectomy, but the best strategy for treatment is not well determined.

Methods: We retrospectively reviewed the medical records of 641 patients treated for hepatocellular carcinoma. In this series, 84 (13%) patients had hepatocellular carcinoma with a tumour thrombus invading the main trunk or the first-order branch of the portal vein, or the inferior vena cava. Thirty-four patients underwent hepatectomy and 50 patients underwent transcatheter arterial chemoembolization (TACE) alone. For time-to-event outcomes, the distribution of time to the first event were compared using the log-rank test, while the Kaplan–Meier method was used to estimate the absolute risk of each event for each group, and hazard ratios and 95% confidence intervals (CI) were estimated by the Cox proportional hazards model. To identify the baseline and clinical variables associated with the

overall survival time, a multivariate analysis was performed using the Cox proportional hazard model with a step-wise selection procedure.

Results: Preoperative TACE was performed in 15 patients among the 34 patients who underwent hepatic resection. In these patients, 6 patients were identified as having a tumour size reduction or necrosis of 50% or higher by preoperative TACE. The median operative time and blood loss during surgery were 355 min and 1983 ml, respectively. The postoperative morbidity and mortality rates were 44% and 2.9%. The proportional surviving rate (95% CI) for the 60 month time point was 0.20 (0.074–0.352), which was better than that of patients treated by TACE alone. The response after preoperative TACE (hazard ratio, 4.65; 95% CI, 1.39–15.5) and tumour diameter (hazard ratio, 2.78; 95% CI, 1.16–6.64) were identified as significant favorable preoperative prognostic factors for survival in the multivariate analysis. Patients with tumours smaller than 10 cm and significant effect of preoperative TACE had a more favorable survival than patients with tumours 10 cm or larger and who did not have a good effect of preoperative TACE.

Conclusion: A combination of aggressive surgical treatment and neoadjuvant treatment such as effective preoperative TACE treatment may prolong survival in selected patients with hepatocellular carcinoma invading the major vascular invasion.

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POSTER

Comparison of Two Gallbladder Cancer Treatment Strategies at a Chilean Cancer Center

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Background: Gallbladder cancer is the leading cause of cancer death in women in Chile. Even when present at a localized, resectable stage, prognosis is grim. Previous series have shown a survival benefit with an aggressive surgical approach. The objective of this study is to evaluate if the introduction of re-resection with hepatic segmentectomy and lymphadenectomy and the use of adjuvant treatments has improved overall survival for patients with gallbladder cancer treated at the Instituto Nacional del Cáncer, Santiago, Chile.

Material and Methods: We conducted a retrospective analysis of all patients with gallbladder cancer admitted to our institution between January 1983 and December 2002. Because of the implementation of an active treatment strategy after 1992, the series was divided into two treatment cohorts (TC): TC1 (1983–1992) where a conservative treatment approach was used, and TC2 (1993–2002), where a treatment plan including re-resection and adjuvant chemoradiation was offered to patients. Data was obtained from the medical charts. For patients lost for follow-up, date of death was obtained by death certificate. The sixth edition of the AJCC Staging system was used for TNM classification. Statistical analysis was performed using Epi Info™ Version 3.5.1.

n (%)	Total: 350 (100)	TC 1: 104 (100)	TC 2: 246 (100)
Age (years), mean (range)	57 (24–89)	58 (24–79)	57 (30–89)
Females, n (%)	286 (82%)	89 (86%)	197 (80%)
Stage			
Stage 0	1 (1%)	1 (1%)	0 (0%)
Stage I	83 (24%)	22 (21%)	61 (25%)
Stage II	82 (23%)	23 (22%)	59 (24%)
Stage III	54 (15%)	15 (15%)	39 (16%)
Stage IV	130 (37%)	43 (41%)	87 (35%)
Treatment ^a			
HS + LA	67 (19%)	1 (1%)	66 (27%)
CT (any indication)	42 (12%)	1 (1%)	41 (17%)
RT (curative)	40 (11%)	3 (3%)	37 (15%)
HS + LA + RT +/- CT	35 (10%)	0	35 (14%)
No curative treatment offered	305 (87%)	101 (97%)	204 (83%)

^aHS, Hepatic segmentectomy; LA, lymphadenectomy; CT, chemotherapy; RT, radiotherapy.

Results: A total number of 350 patients were identified: 104 in TC1 and 246 in TC2. Mean age at diagnosis was 57 years, and 82% of the patients were women. More than one third of the patients had stage IV disease at admission. The two groups were similar in terms of stage, age and gender. Treatment differed, with more radical surgeries performed, and radiation and chemotherapy administered in TC2 compared to TC1. Five and 10 year overall survival for TC1 was 10% and 7% respectively versus 15%

and 13% for TC2 (p = 0.014 and 0.009). When analyzed by stage, 5 year OS was 35% vs 49% for Stage I, 8% versus 12% for stage II, 1% versus 2% for stage III and 0 for stage IV. Multivariate analysis showed that re-resection (p = 0.03), radiation (p = 0.03) and chemotherapy (p = 0.007) were associated with longer survival.

Conclusions: Our series suggests that an active treatment approach with re-resection and adjuvant chemoradiation may increase survival of gallbladder cancer patients, although randomized trials are needed to establish a standard adjuvant treatment. Efforts towards prevention and early diagnosis are needed, as only a minority of patients are diagnosed at a stage where a curative treatment can be offered.

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POSTER

Fluorescence Angiography in Surgery of the Esophagus as a Tool in Reducing Rate of Anastomotic Leakage

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Introduction: Leakage at the anastomosis site is a very serious complication after esophageal resection, and can occur in up to 26% of patients. One of the factor involved in this complication is poor blood flow in the distal portion of the gastric tube. Fluorescence angiography using indocyanine green (ICG) was used as a method of determining the perfusion of the gastric conduit after esophagectomy. The effect on the rate of anastomotic complications was evaluated in a retrospective matched-pairs analysis.

Material and Methods: Analysis of 33 consecutive patients who underwent transhiatal esophagectomy (THE) due to cancer was done. In the first group in years 2008–2009 (15 patients) before performing the anastomosis, the blood flow in the area of the tube was evaluated using intravenous indocyanine green and observing its vascular flow with a camera equipped with an infrared laser. Patients with THE in years 2006–2007 (18 patients) without fluorescence angiography served as a control group. These two groups were matched for age, T-stage, anastomosis leakage, postoperative stay, emergency conditions, and body mass index.

Results: An overall reduction in the anastomotic leakage using fluorescence angiography was 21.1%. In the group without fluorescence angiography leakage was observed in 5 of 18 patients (27.8%). The fluorescence angiography showed vascular insufficiency of the distal gastric conduit in 4 patients – in all of these patients the anastomosis was performed end-to-side below the poor blood supply area and there was no subsequent leak. Leakage at the anastomosis site was observed only in 1 patient (6.66%) with good blood supply. The hospital stay was reduced from on average 23.7 days into average 11.7 days.

Conclusion: Fluorescence angiography is a simple tool in assessing the blood supply of the anastomotic side. In esophagus surgery it plays a big role and is associated with postoperative complications. This technique may significantly reduce not only the rate of severe complications but also the hospital length of stay.

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POSTER

Improved Lymph Node Retrieval in Gastric Cancer – Preliminary Positive Results of the DoCCS-study

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Background: The surgical treatment of gastric cancer consists of a gastric resection with a lymph node dissection. According to international guidelines, at least 15 lymph nodes should be harvested. Improved lymph node retrieval seems to be related to better survival. However, in the Netherlands, these goals are often not met.

In the Southern part of the Netherlands, therefore, a study is conducted to improve results by implementing a protocolized extended lymphadenectomy, the so called D1-extra lymphadenectomy. Goal is to harvest more lymph nodes without increasing morbidity and mortality.

Methods: In this phase II feasibility study 50 patients with curable gastric cancer are treated with 4 cycles of neoadjuvant chemotherapy consisting of docetaxel, cisplatin and capecitabine, followed by protocolized surgery and pathology. Surgery is performed by two surgeons from different hospitals. A (partial) gastric resection is performed and a lymph node dissection of stations 3–9 (Japanese classification) and according to location of the