



Staging laparoscopy in patients scheduled for pancreaticoduodenectomy minimizes hospitalization in the remaining life time when metastatic carcinoma is found

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Accepted 19 December 2013

Available online 8 February 2014

Abstract

Objective: To compare the burden of total hospitalization as a ratio of survival of staging laparoscopy versus prophylactic bypass surgery in patients with unresectable periampullary adenocarcinoma.

Background: Periampullary adenocarcinoma is an aggressive cancer with up to 35% of the patients at surgery found to be unresectable. Palliative prophylactic surgical bypass versus endoscopic stenting has been addressed by randomized controlled trials, but none reported on the burden of hospitalization.

Methods: From a prospective database all patients with periampullary adenocarcinomas with a preoperative patent biliary stent and absent gastric outlet obstruction, but found unresectable during surgery, were analysed. They underwent a staging laparoscopy only versus prophylactic palliative bypass surgery. In-hospital days of the initial admission as well as all consecutive admission days during the remaining life span were compared both in absolute numbers and as relative impact.

Results: The inclusion criteria were met by 205 patients. Of these 131 patients underwent a staging laparoscopy detecting metastases in 21 patients. In 184 laparotomies 54 patients underwent prophylactic palliative bypass surgery for unresectable disease. Median total in-hospital-stay in the Laparoscopy Group was 3 days versus 11 days in the Palliative Bypass Group ($p = 0.0003$). Patients with metastatic disease found during laparoscopy stayed 3.5% of the remaining life time in hospital vs. 10.0% ($p = 0.029$) in patients with metastatic disease who underwent bypass surgery.

Conclusions: Staging laparoscopy and early discharge in patients with metastatic peri-ampullary carcinoma resulted in reduced hospitalization, both in absolute number of days and as a rate of survival time.

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Keywords: Pancreatic cancer; Palliative surgery; Jaundice; Gastric outlet obstruction; Survival

Introduction

Periampullary adenocarcinoma is an aggressive cancer with a high mortality rate which nearly equals the incidence.¹ It is estimated that 75–85% of patients present with incurable disease due to vascular encasement or metastasis.^{2–5} For the same reasons a resection will be abandoned in 25–35% of patients proceeding to surgery.^{6,7}

A proper palliative strategy is therefore of utmost importance. Over 80% of the patients will present with jaundice.

Gastric outlet obstruction (GOO) is expected to occur in 20% of patients.^{6,8–10} Both can lead to complications like pruritis, cholangitis or decreased food intake, leading to a lower quality of life and diminished life expectancy.^{11–13} Therefore the aim of palliation is to treat or prevent jaundice and GOO. This can be achieved by surgical bypass or endoscopic stenting. The most appropriate method remains a matter of debate.

So far only five randomized controlled trials (RCT) have addressed the issue of prophylactic palliative bypass surgery; comparing biliary bypass surgery versus endoscopic stenting^{14–16} or the addition of a prophylactic gastric bypass to a routine biliary bypass.^{6,10} Only one RCT

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addressed the issue of in hospital time consumed due to re-admissions, which favoured endoscopic stenting.¹⁴ None of the RCTs reported on the burden of in hospital stay caused by the combined initial admission and all readmissions as a percentage of the remaining life span.

It is our opinion that reducing the length of hospital stay is part of optimizing the palliative treatment, so patients can be at home at a stage when they are still in a reasonable physical condition.¹⁷ We hypothesize that refraining from prophylactic bypass surgery in selected patients with periampullary cancer in whom staging laparoscopy reveals metastatic disease will have a longer period at home as compared to patients in whom prophylactic bypasses are performed.

We extracted from our prospective database all patients with unresectable or incurable periampullary adenocarcinomas without preoperative persistent jaundice or GOO who underwent either a staging laparoscopy only versus palliative bypass surgery and compared their total in hospital stay, including readmissions, as a percentage of their survival time.

Patients and methods

From our prospective database all patients with a histologically proven diagnosis of a periampullary adenocarcinoma (pancreatic head, ampulla of Vater, distal bile duct and duodenum) and complete pre-operative staging were identified. Included were patients with a patent biliary stent and no signs of GOO.

Staging investigations included an ultrasound of the abdomen, CT-scan of chest/abdomen and Endoscopic Retrograde Cholangio-Pancreatography (ERCP). During ERCP a plastic biliary stent was placed to relieve jaundice. Brush cytology, histology or FNA by Endoscopic Ultrasound was taken if possible, but not mandatory to proceed to surgery. Patients with clear unresectable or metastatic disease at pre-operative staging were declined surgery.

We perform staging laparoscopy in the majority of patients with a presumed pre-operative diagnosis of pancreatic head cancer. In patients with a history of multiple laparotomies or severe lung disease not tolerating a pneumoperitoneum, laparoscopy was contraindicated. In some patients the final diagnosis of pancreatic head cancer -based on the resection specimen- was not in accordance with the presumed pre-operative diagnosis of non-pancreatic head cancer. In patients with a clear cut preoperative diagnosis of cancer of the ampulla of Vater, the duodenum or the distal bile duct staging laparoscopy was only indicated if indeterminate intra-abdominal lesions were detected on pre-operative imaging.

Staging laparoscopy was aimed at detecting metastatic disease missed during preoperative staging. Laparoscopy consisted of visual inspection of the peritoneum in all quadrants, the liver surface and omentum and a laparoscopic ultrasound of the liver. Suspicious lesions were biopsied and

further surgery was abandoned if metastatic disease was confirmed; otherwise the procedure continued with a laparotomy. If during the laparotomy locally advanced or metastatic disease was discovered prophylactic bypass surgery was performed.

Metastatic disease was defined as histological proven liver, peritoneal and/or omental metastasis. Locally advanced disease was defined as histological proven lymph node metastasis above the celiac trunk (station 16S) or in the region below the left renal vein and between inferior cava vein and aorta (station 16M)¹⁸ or invasion or encasement of celiac axis, hepatic artery or superior mesenteric artery. Involvement of locoregional lymph nodes and/or involvement of the portal vein were no contraindication for resection.

Patients with metastatic disease on staging laparoscopy were discharged the following day after arranging home support and follow up appointments. Readmissions depended on occurrence of symptoms. These patients formed the Laparoscopy Group. Patients who had locally advanced or metastatic disease at laparotomy and prophylactic bypasses performed, formed the Palliative Bypass Group; they were discharged when physical condition and social circumstances allowed.

We scored the overall length of survival, the number of re-endoscopies (gastroscopy and/or ERCP), re-operations, the total amount of in-hospital days and procedure related mortality. The total in-hospital days included all direct post operative days as well as disease related readmissions, irrespective of the reason. Day case procedures were counted as one in-hospital day. Survival was counted from the day of staging laparoscopy or laparotomy until death. The relative admission rate was the total number of in-hospital days divided by the total number of days of survival. In hospital mortality was defined as any death during the primary admission.

Statistical analysis was performed using StatView[®] 5.0.1 (SAS[®] Institute Inc.). For continuous data the Mann–Whitney *U* test and for categorical data the Chi-square test and Fisher exact test were used. Survival was compared using the log-rank test and presented as a Kaplan–Meier curve. A *p*-value of <0.05 was considered significant. Median values are presented with interquartile range (IQR). During follow up all patients had succumbed to their disease and therefore survival analysis was based on actual data.

Results

Since January 1995 a resection or an attempt for resection for a presumed periampullary malignancy was performed in 336 patients. Excluded were patients with diagnoses other than primary periampullary adenocarcinoma or incomplete staging (*n* = 78) or that presented with biliary stent failure or GOO (*n* = 53) (Fig. 1).

The remaining 205 patients had a histological proven diagnosis of periampullary adenocarcinoma, complete

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