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Pancreatectomy for adenocarcinoma in elderly patients: Postoperative outcomes and long term results
A study of the French Surgical Association

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Abstract

Aim: To determine the benefit of surgery for resectable pancreatic adenocarcinomas (PAs) in elderly patients.
Methods: From 2004 to 2009, 932 patients with resectable PAs underwent pancreatectomies without neoadjuvant treatment in 37 institutions. The patients were divided into three groups according to age: <70 years (control group; $n = 580$); 70–79 years (70s group, $n = 288$), and ≥80 years (80s group; $n = 64$). Preoperative, intraoperative, postoperative, and histological data were recorded to assess the postoperative course and survival.
Results: Preoperative or intraoperative characteristics, and the histological findings were comparable in the three groups. Postoperative mortality and morbidity rates did not differ in the three groups. Adjuvant therapies were more frequently used in younger patients than in elderly patients ($p < 0.01$). The overall 1-year, 3-year, and 5-year survival rates of control group/70's group/80's group were 82.2%/75.7%/75.7%, 49.9%/41.8%/31%, and 38.7%/33.2%/0%, respectively ($p = 0.16$). The median survival of the control, 70s, and 80s groups was 24 months, 35.3 months, and 30 months, respectively. Four independent prognostic indicators were identified by multivariate analysis: venous invasion (hazard ratio (HR) = 2.12), arterial invasion (HR = 2.96), positive lymph nodes (HR = 2.25), and adjuvant treatment (HR = 0.65).
Conclusions: Fit elderly patients with resectable PAs should not be excluded from surgical resection of PA solely because of their real age. Moreover, elderly patients seem to obtain similar advantages from pancreatectomies than younger patients.

Keywords: Elderly; Pancreatic adenocarcinoma; Pancreatectomy

Introduction

The world population is ageing. In the year 2050, there will be nearly six fold as many octogenarians as in the year 2000.[1] Thus, pancreatic surgeons will increasingly face the decision of whether to perform a pancreatectomy in elderly individuals. In 2003, the average life expectancy of 75-year-old individuals in the United States was 11.8 years.[2] In 2004, the probability of survival for an 80-year-old person in Germany was 7.9 years.[3] The estimations for other Western countries and Japan are comparable.[4] Taken together with the dismal prognosis of

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unresected pancreatic cancer, these results suggest that the life-limiting factor for people age 75 years or older with resectable pancreatic adenocarcinoma (PA) is cancer rather than age. Several reports have demonstrated that pancreaticoduodenectomy (PD), which is the most complex pancreatectomy, in elderly patients is safe; however, PD may be associated with higher morbidity because of underlying comorbidities in the elderly population.[5–12] Furthermore, the cost of aggressive treatments such as PD, not debated for younger patients, may be argued to be unwarranted for elderly patients due to a limited expected benefit for the individual and society.[13] The aim of the present study was to determine retrospectively the benefit of a pancreatectomy for PAs in elderly patients by analysing the perioperative outcomes and long-term survival in a large multi-institutional series.

Methods

Patient selection

From January 1, 2004 to December 31, 2009, 1670 patients underwent a pancreatectomy for PA in 37 institutions. The standardised clinical data on consecutive patients from each of the 37 institutions (France, 34 institutions; Belgium, 1 institution; Monaco, 1 institution; Switzerland: 1 institution) were received and entered into the central database of this retrospective study. One institution included 200 patients, two included more than 100 patients, eight included between 50 and 100 patients, and the others included fewer than 50 patients. Institutions including more than 50 patients were considered as high volume centres. Three experienced pancreatic surgeons (F.P., P.B., J.R.D.) reviewed all of the data sheets before their transfer into the database to get a uniform interpretation of the retrospective data. The patients with unclear histology ($n = 585$) or with metastatic disease ($n = 17$) and those who had received neoadjuvant treatment ($n = 136$) were excluded. A total of 932 patients were deemed eligible for the present study. Because of various available thresholds in literature defining elderly patients were divided into 3 groups according to age: <70 years (control group; $n = 580$), 70–79 years (70s group, $n = 288$), and ≥80 years (80s group; $n = 64$).

Data forms

A standard form was created to retrieve information regarding several areas. *Preoperative data* were collected, which included age, sex, jaundice, weight loss, pain, body mass index (BMI), diabetes, tobacco use, hepatic disease (steatosis and cirrhosis), American Society of Anaesthesiologists ASA score,[14] CA 19-9 and CEA serum levels (UI/ml), and biliary stenting. *Intraoperative data* were also collected, such as the type of pancreatectomy [i.e., PD, left pancreatectomy (LP; with or without splenectomy), and total pancreatectomy (TP)], vascular resection [i.e., portal or superior mesenteric vein (PV/SMV) resection, arterial resection (superior mesenteric artery (SMA), hepatic artery, and coeliac trunk)], blood loss (ml), and the duration of surgery (min). *Several postoperative data* were assessed, such as mortality (death within 30 days after surgery or before hospital discharge); morbidity, with individualisation of postoperative pancreatic fistula (POPF according to the International Study Group of Pancreatic Fistula (ISGPF) scoring system[15]); haemorrhage; reintervention; and length of hospital stay (days). *Histological data* were collected including maximal tumour size (cm) defined as the maximum diameter at pathological analysis, histological differentiation (well, moderate, or poor), resection margin defined as positive (R1 or R2 resection) or negative (R0 resection), nodal stage (positive lymph nodes and number of examined lymph nodes), and perineural and/or vascular invasion. Tumour classification was achieved according to the TNM classification of the American Joint Committee on Cancer.[16] In an effort to have a homogenous cohort, the margins that were assessed always included the pancreatic resection margin, the biliary margin, the portal vein margin, the retroperitoneal margin, and the mesenteric margin in all 932 patients. A positive margin was defined as tumour cells present within the first 1.5 mm of the resection margins.[17]

Follow-up data included overall and disease free survival data and cause of death (disease recurrence or another cause).

Statistical analysis

The categorical variables are described in terms of frequencies and percentages. The distributions of continuous variables are described as mean ± the standard error or median and range. The influences of the patients' status, diseases and treatment's characteristics on the risks of postoperative morbidity and mortality were studied using univariate and multivariate analyses. The statistical associations between the categorical factors were assessed using Fisher's exact test. Statistical significance was set at $p < 0.05$. Kaplan–Meier overall survival estimates were calculated from the date of the pancreatectomy and compared using the log-rank test. SAS statistical software for Windows (version 9.1; SAS Institute, Inc., Cary, NC) was used for all of the analyses.

Results

Patients' characteristics

The patients' characteristics are listed in Table 1. The control group included more smokers ($p < 0.01$). The preoperative biliary stenting rate was higher ($p < 0.01$) in the elderly patients (i.e., in the 70s and 80s groups). The control group included more patients who were classified