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ORIGINAL ARTICLE

Outcome of pancreaticoduodenectomy in octogenarians: Single institution's experience and review of the literature



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KEYWORDS

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Summary

Introduction: Pancreatic and perampullary neoplasms in patients aged 80 or older trouble the surgeons because of the risk of surgical treatment. We have reviewed our experience and literature's reports of pancreaticoduodenectomy in octogenarians, evaluating early results and long-term survival in pancreatic cancer group.

Methods: Three hundred eighty-five patients who underwent pancreaticoduodenectomy for neoplasms from 1998 to 2011 were included in the study, and were divided in two groups: group 1, patients younger than 80 years of age, and group 2, patients 80 years of age and older. Operative morbidity, mortality, disease-free and long-term survival were analysed. English literature was systematically searched for pancreatic resection's outcome in octogenarians.

Results: There were 385 pancreaticoduodenectomies: 362 patients were in group 1 and 23 patients in group 2. There was no significant difference regarding gender, and pathologic findings between the two groups. Complications' rate (40 vs. 43%), mortality rate (4% vs. 0%), and overall median survival for pancreatic cancer patients were not statistically different in the two groups (median 21 vs. 19 months). Literature's review showed 14 reports of pancreatic resection in octogenarians. Most of the studies (particularly in centres with high-volume pancreatic surgery) showed that outcome after pancreatectomy was not different in octogenarians or in younger patients.

Conclusion: Pancreaticoduodenectomy is an acceptable option for elderly patients. Age alone should not be considered a contraindication to major pancreatic resection, but a careful pre-operative evaluation and an accurate postoperative management are mandatory.

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Introduction

The elderly constitutes the fastest-growing segment of the society due to the increasing life expectancy [1], especially the age group of 80 years and older [2]. According to this, there is an increasing number of older patients with cancer, pancreatic cancer included. Pancreatic cancer is an

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aggressive malignancy with extremely poor prognosis: 5-year survival after resection ranges from 15% to 20% [3]. In the early 1990s, major pancreatic resections were rarely indicated in elderly patients due to the high postoperative complication and mortality rate, and to the limited survival time. During the last two decades, mortality rates after pancreatic resection dropped to less than 2% at experienced centers [4,5], and an acceptable morbidity rate was also reported. As pancreatic surgery became safer, many centers began reporting their results after pancreatic resection in old patients. However, few authors report on outcome after pancreatic resection in patients aged 80 years and older [6]. The purpose of this retrospective study was to analyze the outcome of octogenarian patients who underwent pancreaticoduodenectomy (PD) for pancreatic or periampullary tumor in our institution. Literature review on pancreatic resection in patients aged 80 years or older was also included.

Patients and methods

Data were obtained from a retrospective analysis of a prospectively collected database of 385 patients who underwent PD from January 1998 to December 2011 in our Department. They were divided into two groups: patients younger than 80 years of age (group 1), and patients 80 years of age and older (group 2). The two groups were compared in term of demographic features, comorbidities, surgical procedures, perioperative findings, tumor pathologic characteristics, perioperative outcomes, and survival. Preoperative comorbidities conditions included the presence of diabetes mellitus, history of chronic obstructive pulmonary disease, hypertension, arrhythmia, hyperlipoproteinemia, coronary artery disease, cardiac valve disease, and history of transient ischemic attack and stroke. Performance status was estimated by the American Society of Anesthesiologists (ASA) and divided in different physical status class (1, 2, 3 or 4). All patients underwent standardized preoperative assessments: routine blood tests and tumor markers CEA and CA 19.9 determination, abdominal computer assisted tomography (CT), and, when needed, magnetic resonance imaging (MRI) or 18-FDG positron emission tomography (PET). Resectability of neoplasm was evaluated by radiological investigation. Surgical technique included standardized lymph node dissection, pylorus-preserving pancreaticoduodenectomy (PD) for tumors of the head of the pancreas, and total pancreatectomy (TP) in selected patients. In patients with limited involvement of mesenteric-portal vein confluence, venous resection was associated with pancreatectomy. Curative resection was defined as tumor's resection with pathologically confirmed negative margins. Postoperative death and morbidities were examined and compared between the two groups. Perioperative mortality was defined as death within 30 days from operation, or during hospitalization. Pancreatic fistula was defined as the drainage of fluid with an elevated level of amylase, and graded according to the International Study Group of Pancreatic Fistula recommendations [7]. In patients with pancreatic cancer, disease-free and overall survival were calculated and compared in octogenarians, and in younger patients.

Literature search strategy

The published literature was systematically searched using PubMed and free text engines up to December 2013.

Bibliographies of articles retrieved were searched manually. Search terms included: pancreatectomy, pancreatic neoplasms, octogenarians, aged, 80 and over. The related articles function was used to broaden the search and all abstracts, studies, and citations retrieved were reviewed. Search limits were applied to include articles published in the English language, those with abstract and human studies only. In the case of sequential publications or duplicate publication of studies of the same institution were present the last one or the report with the most comprehensive information regarding the study population were selected. Only series concerning octogenarians' patients were included in this review. Studies were excluded from the analysis if:

- the outcomes and parameters of interest were not clearly reported;
- it was impossible to extract the data from the published results;
- they were case reports.

The following informations were extracted from each report: the first author, year of publication, number of patients who underwent PD, postoperative mortality and morbidity, mean length of hospital stay, long-term survival of patients with pancreatic cancer.

Statistical analysis

Clinicopathological factors and postoperative complications between the two groups were compared using the Chi² test or Fischer exact test. Survival curves were constructed with the Kaplan-Meier method and differences in survival curves were compared by univariate Log-rank test. Differences were considered significant at $P < 0.05$. Statistical analysis was performed using the SPSS statistical software package (version 16.0; SPSS Inc, Chicago, IL, USA).

Results

During the study period, 385 patients underwent pancreaticoduodenectomy in our Department: 362 patients were younger than 80 years of age (median 64.7, range 45–79, 159 males and 203 females) (group 1), and 23 patients were 80-year-old or older (median 82.6, range 80–86, 11 males and 12 females) (group 2). In the same period, other 8 patients aged 80 years and older were admitted for resectable pancreatic cancer: 5 patients were excluded for high cardiovascular risk, 2 for biliary sepsis requiring urgent decompressive stent, and 1 refused operation. The two groups were similar in term of demographic features, comorbidities and surgical resection (Table 1). The majority of patients undergoing standard pancreatic resection harbored an adenocarcinoma, with the remainder being neuroendocrine carcinomas: most of resected tumors in group 2 patients were pancreatic adenocarcinoma. The distribution of other tumor types was similar between age groups. Surgical procedures included: 362 PD and 8 TP in group 1, and 21 PD, and 2 TP in group 2. One patient in group 2 underwent multivisceral resection: 1 PD with right colon resection ($n = 1$). Sixty-nine patients in group 1 underwent associated vascular resection vs. 2 patients in group 2. There was no difference regarding gender, and pathologic findings between the two groups. No difference was noted in complications rate (40% vs. 43%) and mortality rate (4% vs. 0%) between the two groups of patients (Table 2). The most frequent complication in both groups was pancreatic fistula,

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