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ORIGINAL ARTICLE

Discharge disposition after pancreatic resection for malignancy: analysis of national trends

Bhavin C. Shah[1], Lynette M. Smith[2], Fred Ullrich[3] & Chandrakanth Are[1,4]

[1]Division of Surgical Oncology, Department of Surgery, [2]Department of Biostatistics and Epidemiology, College of Public Health, University of Nebraska Medical Center, Omaha, NE, USA, [3]Department of Health Management and Policy, College of Public Health, University of Iowa, Iowa City, IA, USA, [4]Department of Genetics, Cell Biology and Anatomy, University of Nebraska Medical Center, Omaha, NE, USA

Abstract

Objectives: The aim of this study is to analyse national trends in discharge disposition following pancreatic resection for malignancy in the USA.

Methods: The Nationwide Inpatient Sample database was queried for 1993–2005 to identify patients who underwent pancreatic resection for malignancy. The status of patients at discharge (to home, home with home health care or to another facility) was noted.

Results: A weighted total of 51 866 patients who underwent pancreatectomy for malignant neoplasm of the pancreas were identified. Patients who died in the postoperative period and patients without a specified discharge disposition were excluded, leaving 43 603 patients for inclusion in the study. Overall mortality improved over the period of the study from 7.1% in 1993 to 5.2% in 2005. The number of patients discharged to another facility increased significantly from 5.5% in 1993 to 13.3% in 2005. Similarly, the number of patients discharged to home with home health assistance increased from 20.0% in 1993 to 33.0% in 2005. This corresponded with a statistically significant decrease in the number of patients discharged to home without assistance, from 74.5% in 1993 to 53.7% in 2005 ($P = 0.002$).

Conclusions: The results of our study demonstrate that following pancreatic resection for malignancy, nearly half the patients will require some assistance after discharge.

Keywords

pancreatic resection, malignancy, discharge disposition, factors, age, comorbidities

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Correspondence

Chandrakanth Are, Department of Surgery, Division of Surgical Oncology and Eppley Cancer Center, University of Nebraska Medical Center, 983280 Nebraska Medical Center, Omaha, NE 68198-3280, USA. Tel: + 1 402 559 2812. Fax: + 1 402 559 7900. E-mail: care@unmc.edu

Introduction

Pancreatic resection is increasingly performed in the USA for various neoplastic lesions involving the pancreas, particularly in elderly patients with multiple preoperative comorbidities.[1,2] Surgical resection is the only modality to offer any hope of prolonged survival and 5-year survival rates range from 18% to 41% in selected patients.[3–10] Although perioperative mortality[3–5] has significantly decreased over the years, considerable morbidity is associated with such resections.[2–8]

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The occurrence of postoperative morbidity determines the length of stay and the final discharge disposition. Studies of outcomes following pancreatic resection have traditionally focused on perioperative mortality and morbidity,[2–8] such as manifested by pancreatic fistula and delayed gastric emptying.[1–4,9] We have previously shown that, despite a declining mortality rate, the number of patients who are discharged to home following hepatic resection for malignancy has decreased.[11] Data on discharge disposition trends following pancreatic resection for malignancy are scarce. The aims of this study were to: (i) analyse national trends in discharge disposition following pancreatic resection for malignancy, and (ii) determine the factors that influence discharge disposition.

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Materials and methods

Data source

Data drawn from the Nationwide Inpatient Sample (NIS) were utilized to analyse trends in discharge status following pancreatic resection for malignancy. The NIS is a database developed as part of the Healthcare Cost and Utilization Project (HCUP), sponsored by the Agency for Healthcare Research and Quality (Rockville, MD, USA). The NIS is designed to approximate a 20% sample of US community hospitals. In 2005, NIS data included discharge data from 1054 hospitals located in 37 states.

The NIS database was queried for 1993–2005 to identify patients discharged with International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) procedure codes for pancreatectomy [5251 (proximal pancreatectomy), 5252 (distal pancreatectomy), 5253 (radical subtotal pancreatectomy), 5259 (other partial pancreatectomy), 526 (total pancreatectomy), 527 (radical pancreatectomy)] and diagnosis codes for malignant neoplasms of the pancreas [1570 (head of pancreas), 1571 (body of pancreas), 1572 (tail of pancreas), 1573 (pancreatic duct), 1578 (other specified pancreas sites), 1579 (pancreas, part unspecified)]. Patients who underwent pancreatic resection for benign conditions were excluded. Data on patient age, gender, race and income, admission type, hospital size and type, diagnosis, presence of preoperative comorbidities, extent of resection and length of stay were extracted from the database. Preoperative comorbid conditions were identified using the taxonomy published by Elixhauser *et al.*[12]

The status of patients at discharge was noted. 'Routine' or 'home' discharge was defined as discharge to the patient's home with no health care assistance. 'Home health care' discharge was defined as discharge to the patient's home with acknowledged need for the assistance of a visiting nurse or other skilled health care personnel. 'Other facility' discharge was defined as discharge or transfer to a skilled nursing, subacute care or nursing facility. For further analysis, 'Home health care' and 'Other facility' discharge were grouped within the category of 'Non-routine' discharge.

Statistical methods

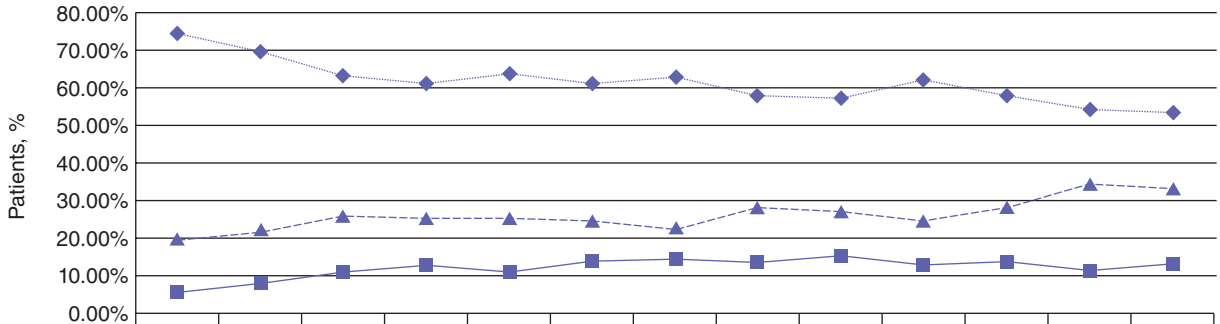
SAS version 9.2 (SAS Institute, Inc., NC, USA) and SUDAAN release 10.0 (Research Triangle Institute, Raleigh, NC, USA) were used for all statistical analyses to account for the complex sampling design of the NIS. Weighted sample estimates, standard errors and 95% confidence intervals (CIs) were calculated using the Taylor expansion method. All statistical tests were two-sided and *P*-values of <0.05 were considered to indicate statistical significance.

A Cochran–Mantel–Haenszel analysis of variance (ANOVA)-type test for trend was used to compare changes in discharge status over time. Chi-squared tests were used to compare patient characteristics by discharge status over the entire study period. Multivariate logistic regression analysis using backwards variable selection was conducted to find significant predictors of routine discharge.

Results

A weighted total of 51 866 patients underwent a primary procedure of pancreatectomy between 1993 and 2005 for malignant neoplasm of the pancreas. Patients who died in the postoperative period (n = 2999), patients who left against medical advice (n = 11) and patients for whom no post-hospital disposition was indicated (n = 5253) were excluded, leaving 43 603 patients for inclusion in the study. Overall mortality improved from 7.1% in 1993 to 5.2% in 2005.

Trends in discharge dispositions following pancreatic resection for malignancy are shown in Fig. 1. We noted a significant decrease in the number of patients discharged to home without



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Routine	74.50%	69.80%	63.60%	61.70%	63.90%	61.30%	63.10%	58.50%	57.60%	62.10%	58.05%	54.40%	53.70%
Other facility	5.50%	8.10%	10.90%	12.90%	11.00%	14.00%	14.30%	13.30%	15.40%	13.00%	13.60%	11.10%	13.30%
Home health care	20.00%	22.00%	25.50%	25.50%	25.10%	24.70%	22.60%	28.20%	27.00%	24.90%	28.40%	34.50%	33.00%

Figure 1 Patient discharge disposition over time after excluding mortality. 'Other facility' includes discharge to short-term hospitals, skilled nursing facilities, intermediate care facilities and other types of facility

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