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EJSO
the Journal of Cancer Surgery
ELSEVIER
EJSO 33 (2007) 713–717
www.ejso.com

The influence of needle catheter jejunostomy on weight development after oesophageal cancer surgery in a population-based study☆

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Accepted 9 January 2007
Available online 22 February 2007

Abstract

Aims: We aimed to assess whether needle catheter jejunostomy (NCJ) influences the weight development or discharge from hospital after oesophageal cancer surgery in an unselected and prospectively collected series of patients.
Methods: Data regarding patients who underwent oesophageal cancer surgery between April 2001 and October 2004 and were followed up until April 2005 were collected from the Swedish Esophageal and Cardia Cancer Register. Details of patient characteristics, including preoperative body weight and length, tumour characteristics, surgical procedures, including NCJ insertion, complications and ward time were obtained. Six months postoperatively the patients responded to a questionnaire that gave information about postoperative weight development. Relative risks were estimated as odds ratios (ORs) calculated with 95% confidence intervals (CIs) using multinomial logistic regression, adjusted for patient and tumour characteristics, type of treatment, type of hospital and occurrence of complications.
Results: A total of 233 patients participated, among whom 48% received NCJ. Patients with NCJ had a 42% statistically non-significantly decreased risk of weight loss compared to those without NCJ after adjustment for covariates (OR 0.58; 95% CI 0.25–1.39). Patients with NCJ had a non-statistically significantly longer hospital stay than patients without NCJ, but were seemingly less often discharged to other care homes than their own home compare to the group without NCJ (OR 0.62; 95% CI 0.28–1.38).
Conclusion: Use of needle catheter jejunostomy might counteract weight loss and facilitate discharge to home after oesophageal cancer resection.

Keywords: Malnutrition; Neoplasm; Body mass index; Nutrition therapy; Cardia

Introduction

The relevance of nutritional needs is particularly high after oesophageal cancer resection, for a number of reasons: (1) the patient not rarely has a substantial weight loss preoperatively, (2) the surgical procedure is one of the most extensive and includes considerable reconstruction of the upper gastrointestinal tract, and (3) the surgery often entails severe acute and late complications.[1–3] There is support for the view that early nutrition is indicated after gastrointestinal surgery in general,[4] although such data is not available specific for oesophageal cancer surgery. To reduce the risk of infectious complications and anastomotic leakage, postoperative feeding via a needle catheter jejunostomy (NCJ) inserted distal to the anastomoses has been shown to be beneficial after abdominal surgery that includes organ resection.[5] However, the use of NCJ has not yet been generally adopted in routine clinical practice. Moreover, no studies have addressed the potential beneficial effects of NCJ in the long-term prevention of postoperative weight loss after oesophageal cancer surgery. The aims of the present study were therefore to determine whether the use of NCJ influences the weight development, hospital stay or destination of discharge from hospital in an unselected and prospectively collected series of patients. To avoid influence of cachexia due to recurrent malignancy or postoperative

☆ Funding was provided by the Swedish Cancer Society and the National Board of Health and Welfare, Sweden.
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doi:10.1016/j.ejso.2007.01.011

complications on weight development, the study was restricted to patients who were radically operated and the weight was assessed 6 months postoperatively, i.e. before tumour recurrences are to be expected.[6,7]

Patients and methods

Design

A nationwide, prospective, and population-based cohort study of the relation between NCJ and weight development until 6 months after oesophageal cancer surgery was conducted in Sweden during the period 2 April 2001 to 30 April 2005. All patients with oesophageal or cardia cancer who underwent both macroscopic and microscopic radical (R0) tumour resection in Sweden during the period 2 April 2001 to 30 October 2004 were eligible for the study.

Data collection

The data were collected through a nearly complete nationwide research register of oesophageal and cardia cancer surgery in Sweden, entitled the Swedish Esophageal and Cardia Cancer Register (SECC). This register is a continuous all-embracing network of contributions of hospital departments and clinicians involved in the management of patients with oesophageal or cardia cancer.[8] The organisation of the SECC has been presented in detail elsewhere.[1] In brief, patients throughout the country were identified shortly after the oesophageal or cardia cancer diagnosis was confirmed by the pathologists. The frequency of participation in the registry among hospital departments during the study period was 97% and the registration rate among all surgically treated patients in Sweden was 90%.[9] Through a review of each case record we obtained the number of days in hospital and the charts of surgical procedures provided information on the surgical approach, macroscopic surgical radicality, type of oesophageal substitute used, type of anastomosis performed, and the insertion of NCJ, while a review of the histopathological reports gave us information on the tumour location, histological type, tumour stage and microscopic radicality. The location of adenocarcinomas within the gastro-oesophageal junction was classified according to the Siewert definitions[10] and TNM classification was used to define the tumour stage according to the system of Union Internationale Contre le Cancer (UICC).[11]

Follow-up

The main outcome measure was body mass index (BMI), assessed 6 months after surgery. The registered patients responded to a written study-specific questionnaire concerning height and weight just before surgery and 6 months after. The weight development was measured as the difference in BMI between the time of tumour resection and 6 months postoperatively. BMI was calculated as body weight in kilograms divided by the square of body height in metres (kg/m^2). BMI development was categorised into six groups: stable or increased, $>1\%$ to $<5\%$, $\geq 5\%$ to $<10\%$, $\geq 10\%$ to $<15\%$, $\geq 15\%$ to $<20\%$, and $\geq 20\%$. On the basis of previous research, 6 months was chosen as the endpoint of the assessment of the outcomes in order to avoid any influence of acute postoperative complications and early tumour recurrences.[6,7] Secondary outcomes were number of postoperative days in the ward (classified into <15 days, 15–30 days, and more than 30 days), and destination of discharge (classified as own home or other).

Statistical analyses

Relative risks of a decrease in BMI (reference was stable or increased BMI), prolonged hospital stay (reference was <15 days), or destination of discharge (reference was own home) was estimated as odds ratios (ORs) calculated with 95% confidence intervals (CIs) using multinomial logistic regression. In a basic model, we included adjustments for age (categorised into four groups: <60, 60–69, 70–79, or >79 years), gender, and tumour stage (in four groups: 0–I, II, III, or IV). In a more extensive multivariable model, we further adjusted for histological type of cancer (categorised into three groups: cardia adenocarcinoma, oesophageal adenocarcinoma, or squamous cell carcinoma), preoperative oncological treatment (in two groups: yes or no), type of surgery (in four groups: oesophageal resection, cardia resection, total gastrectomy, or extended oesophageal resection with total gastrectomy), surgical approach (in two groups: thoracoabdominal or abdominal only), type of hospital (in two groups: university or non-university) and occurrence of severe and predefined complications (in three groups: none, 1–2 or >2).

Ethics

The ethics committee at Karolinska University Hospital, Karolinska Institutet, Sweden, approved the study.

Results

Patient characteristics and postoperative weight development

During the study period a total of 430 patients were entered in the SECC. Of these, 89 (21%) patients died before the six-month follow-up, 43 (10%) of the patients did not reply to the questionnaire and 27 (6%) did not receive the questionnaire in time for the follow-up because of delayed registration, 7 (2%) patients had undergone a palliative resection and 31 (7%) patients did not have an R0 resection. Thus, 233 (54%) patients remained for final analyses. Some characteristics of the participants and the tumours are presented in Table 1. Nearly half of the patients (48%) received an NCJ. The mean age at surgery was 65 years, and there was a male predominance. The frequency of