POSTOPERATIVE MORTALITY FOLLOWING LUNG CANCER SURGERY

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Background

We analysed the postoperative mortality rate for lung cancer surgery in Queensland and its variation across hospitals when adjusted for case mix.

Methods

Clinical and deaths data on 2,570 Queensland residents who underwent lobectomy, partial resection, or pneumonectomy to treat non-small cell lung cancers (NSCLC) diagnosed between 2001 and 2010 were derived from the Queensland Oncology Repository. Hospital rates of 30-day postoperative mortality were calculated and adjusted for age, sex, residence remoteness and socioeconomic categories, type of surgery, ASA physical status score, comorbidity, emergency admission, and hospital sector (public versus private).

Results

Fifteen hospitals across Queensland performed lung cancer surgery at annual rates ranging from 0.4 to 30 patients per year, with median hospital volume at 25 patients per year. The crude 30-day mortality rate was 1.8%. In the multivariate model, male gender (hazard ratio [HR] 3.0, 95% confidence interval [CI]: 1.5-6.0) and comorbidity (HR 2.6, CI: 1.3-5.1) significantly increased the risk of postoperative death. The observed postoperative mortality exceeded 95% confidence limits for the adjusted rate at only one hospital where the rate was 2.6 times higher than expected.

Conclusion

Postoperative mortality rates following lung cancer surgery in Queensland compare favourably with those reported in the literature, with variation across hospitals mostly within statistical bounds.

REFERENCES

J Thorac Cardiovasc Surg. 1983 Nov;86(5):654-8.

Modern thirty-day operative mortality for surgical resections in lung cancer.

Ginsberg RJ, Hill LD, Eagan RT, Thomas P, Mountain CF, Deslauriers J, Fry WA, Butz RO, Goldberg M, Waters PF, et al.

Abstract

Modern postoperative mortality rates for resectional operations for lung cancer are not readily available. In recent publications estimating the risk factors for surgical resection, mortality rates of 10% to 15% for pneumonectomy and 5% to 7% for lobectomy are frequently quoted. In order to determine modern operative mortality rates (up to 30 days postoperatively), the Lung Cancer Study Group (LCSG) analyzed the surgical mortality rates of the various participating centers during the years 1979 to 1981. A total of 2,200 resections for lung cancer were available for analysis. Of the 2,220 resections performed, 1,058 were lobectomies, 569 were pneumonectomies, and 143 were lesser resections (segmental or wedge). Eighty-one postoperative deaths occurred from among the 2,220 resections (3.7%). The mortality rate for pneumonectomy was 6.2% and for lobectomy, 2.9%. Lesser resections carried a 1.4% mortality rate, not statistically different from lobectomy. In patients under the age of 60 years, the mortality rate was 1.3%, 60 to 69 years, 4.1%, and over 70 years, 7.1%, all significantly different (p less than 0.01). The postoperative mortality rate for patients 70 years or older was 7.1% (pneumonectomy 5.9% and lobectomy 7.3%). It is obvious that greater care was taken in selection among the older pneumonectomy patients. The striking similarity of postoperative mortality rates for resectional operations for lung cancer among the various centers of the LCSG and among the various institutions within these centers suggest that these data are a reasonably accurate analysis of modern surgical mortality rates in the treatment of lung cancer.

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Recent results of postoperative mortality for surgical resections in lung cancer.

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Source

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Abstract

BACKGROUND:

Changes in the postoperative mortality rates and causes of death for lung cancer surgery at the specialized hospital for cancer in Tokyo, Japan during the last 16 years were investigated.

METHODS:

Data on 3,270 consecutive patients who underwent pulmonary resection for primary lung cancer between January 1987 and December 2002 at the National Cancer Center Hospital were retrospectively analyzed. The postoperative 30-day and in-hospital mortality rates and causes of death after pulmonary resection for lung cancer were investigated. Patients were divided into two period groups of almost equal number, the early (1,615 patients from 1987 to 1996) and the late (1,655 patients from 1997 to 2002) periods.

RESULTS:

Fifty-eight operative and postoperative deaths occurred during the last 16 years. Thirty-day and in-hospital mortality were 0.6% (21/3,270) and 1.6% (58/3,270), respectively. During the last 6-year period, 30-day and in-hospital mortality were 0.5% (8/1,655) and 0.8% (21/1,655), respectively. The difference was significant between the 30-day/in-hospital mortality for pneumonectomy (3.1%/5.9%) and lobectomy (0.3%/1.3%) ($p < 0.0001$/$p < 0.0001$). The difference in mortality between lobectomy and segmentectomy or a lesser resection was not significant. The 58 deaths were caused by pneumonia/acute respiratory distress syndrome (ARDS) (36%, n = 21), bronchopleural fistula (BPF)/empyema (33%, n = 19), cerebrovascular accident (10%, n = 6), cardiac-related event (7%, n = 4), and others (14%, n = 8). The most frequent cause of death in the early period was BPF/empyema (18/45, 40%), while that in the late period was pneumonia/ARDS (6/13, 46%). Among the pneumonia/ARDS deaths in the late period (n = 6), 5 (83%) were due to acute deterioration of interstitial lung disease after lobectomy.

CONCLUSIONS:

Recent postoperative mortality rates (30-day, 0.5%; in-hospital, 0.8%) in the treatment of lung cancer are quite acceptable. Special care must be taken for the patient after pneumonectomy, as reported by others. Furthermore, even after lobectomy, proper management of the patient with acute deterioration of interstitial lung disease will be required to improve the future outcome.

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Risk factors for 30-day mortality after resection of lung cancer and prediction of their magnitude.

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Abstract

BACKGROUND:

There is considerable variability in reported postoperative mortality and risk factors for mortality after surgery for lung cancer. Population-based data provide unbiased estimates and may aid in treatment selection.

METHODS:

All patients diagnosed with lung cancer in Norway from 1993 to the end of 2005 were reported to the Cancer Registry of Norway (n = 26 665). A total of 4395 patients underwent surgical resection and were included in the analysis. Data on demographics, tumour characteristics and treatment were registered. A subset of 1844 patients was scored according to the Charlson co-morbidity index. Potential factors influencing 30-day mortality were analysed by logistic regression.

RESULTS:

The overall postoperative mortality rate was 4.4% within 30 days with a declining trend in the period. Male sex (OR 1.76), older age (OR 3.38 for age band 70-79 years), right-sided tumours (OR 1.73) and extensive procedures (OR 4.54 for pneumonectomy) were identified as risk factors for postoperative mortality in multivariate analysis. Postoperative mortality at high-volume hospitals (> or = 20 procedures/year) was lower (OR 0.76, p = 0.076). Adjusted ORs for postoperative mortality at individual hospitals ranged from 0.32 to 2.28. The Charlson co-morbidity index was identified as an independent risk factor for postoperative mortality (p = 0.017). A prediction model for postoperative mortality is presented.

CONCLUSIONS:

Even though improvements in postoperative mortality have been observed in recent years, these findings indicate a further potential to optimise the surgical treatment of lung cancer. Hospital treatment results varied but a significant volume effect was not observed. Prognostic models may identify patients requiring intensive postoperative care.

Comment in

Risk and benefit: the eternal Yin and Yang of thoracic surgery. [Thorax. 2007]

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