

Pneumonectomy in Octogenarian Patients

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Recent decades have witnessed a progressive aging of the population and a resulting increase in the numbers of elderly patients seeking health care. Since age and pneumonectomy are independent predictors of perioperative morbidity and mortality, such surgery is not recommended for octogenarian patients.

We report the experience of 6 such patients who underwent pneumonectomy for squamous cell carcinoma in 5 cases and a typical carcinoid tumor in the sixth. There was no perioperative mortality; morbidity and survival rates were acceptable.

Key words: *Pneumonectomy. Octogenarian. Bronchogenic carcinoma.*

Introduction

Population aging, one of the characteristics of developed countries,¹ leads to an ever increasing need to make therapeutic decisions about older patients diagnosed with bronchogenic carcinoma. Surgery continues to be the first line of treatment for the early stages of bronchogenic carcinoma but is associated with morbidity and mortality rates that are considerable. They must always be borne in mind, but especially in the treatment of older patients, who are the group most clearly at high surgical risk. During the past 10 years numerous studies have reported the benefits of surgery for lung cancer in patients of advanced age,²⁻⁵ yet age and pneumonectomy are clearly independent predictors of perioperative morbidity and mortality.⁶⁻⁸ Accordingly there is consensus that pneumonectomy is not indicated for octogenarian patients,⁹ for whom such surgery is rare.^{3,10-12}

The objective of this study was to report our experience with 6 octogenarian patients treated by pneumonectomy.

Neumonectomía en pacientes octogenarios

En las últimas décadas hemos asistido a un progresivo envejecimiento de la población, por lo que cada vez es mayor el número de pacientes de edad avanzada que acuden a nuestras consultas. La edad y la práctica de una neumonectomía son factores predictivos independientes de morbimortalidad perioperatoria, por lo que no se aconseja realizar este tipo de cirugía en pacientes octogenarios.

Describimos la experiencia de 6 pacientes octogenarios a quienes se realizó una neumonectomía por carcinoma epidermoide en 5 casos y carcinóide típico en el restante, sin mortalidad perioperatoria, con una morbilidad asumible y una supervivencia aceptable.

Palabras clave: *Neumonectomía. Octogenario. Carcinoma broncogénico.*

Case Descriptions

We studied the cases of 6 patients, 80 years of age or older, who underwent pneumonectomy. Preoperative evaluation assessed the patients' general clinical condition (as expressed on the Eastern Cooperative Oncology Group Performance Status scale), body mass index (BMI), blood work-up, hemostasis, routine biochemistry, electrocardiogram, spirometry, arterial blood gas analysis, ventilation-perfusion scintigraphy, predicted postoperative forced expiratory volume in 1 second (FEV₁), and thoracoabdominal computed tomography. All patients were classified in clinical stage I. Surgical procedures included clamping the pulmonary artery of the lung to be excised for 10 minutes, during which time the patient was ventilated with an inspired oxygen fraction of 40% and, if no changes were detected in the usual monitoring parameters during maintenance of anesthesia, the lung was removed.

Clinical, anesthetic, and surgical characteristics and course are shown in Tables 1, 2, and 3. The mean (SD) age of the patients was 82.5 (2.6) years (range, 80.4-87.6 years) and the mean BMI was 25.8 (3.5) kg/m² (range, 23-31.8 kg/m²). Electrocardiograms were normal in all but 1 patient in whom isolated supraventricular extrasystoles were observed. Mean predicted postoperative FEV₁ was 1.56 (0.47) L (range, 1.1-2.4 L). Mean duration of stay in the postoperative recovery care unit was 1.1 (0.4) days (range, 1-2 days); and in hospital, 8 (1.1) days (range, 7-10 days). Two right and 4 left pneumonectomies were performed. Histology confirmed squamous cell carcinoma in 5 cases and a typical carcinoid tumor in the sixth. Five patients were classified in stage IB and the other in stage IIB owing to involvement of 3 hilar and 1 intraparenchymatous nodes.

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Manuscript received February 14, 2006. Accepted for publication March 7, 2006.

There were no perioperative deaths and only 1 patient (16.6%) developed atrial fibrillation, which reversed with amiodarone. Probability of survival at 1 year was 83.3%, and from 3 to 5 years, 50%—taking into account all causes of death (Figure). Two patients died of metastasizing bronchogenic carcinoma, 1 of sudden death, and 3 remained alive at 5 years.

Discussion

Surgical treatment of lung cancer in patients of advanced age is a challenge that presents ever more frequently owing to population aging. In Spain, life expectancy at 80 years of age is 7.3 years for men and 8.8 years for women.¹ Comorbidity associated with lung cancer is directly related to the age of the patient¹³ and, together with the invasive nature of surgery in general but especially of pneumonectomy, puts octogenarian patients in the high risk category.¹⁴

In a little over 20 years the situation for lung resection surgery has shifted from acceptance of an age limit of 70 years to the publication of reports of series of octogenarian patients with acceptable morbidity-mortality rates and long term outcomes similar to those of younger patients, provided a thorough preoperative evaluation has been made.

Perioperative morbidity in octogenarian patients is high at 38% to 60%, and mortality ranges from 0% to

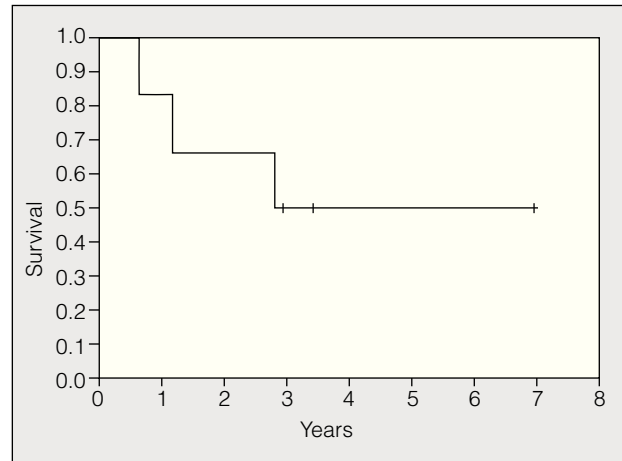


Figure. Probability of survival.

8.8%,^{3,10-12} although the accumulated experience includes patients who have undergone partial resection and the number of pneumonectomies is small, probably due to the belief that an octogenarian patient physically capable of withstanding removal of an entire lung is exceptional. None of the articles cited in this report discusses pneumonectomy as a factor in perioperative morbimortality.

TABLE 1
Demographic and Clinical Characteristics*

Case	Sex	Age, y	ECOG	Comorbidity	BMI, kg/m ²	ECG	FEV ₁ -PPO, L
1	Man	82	1	AHT, NIDDM	31.8	Normal	1.15
2	Man	87	1	AHT	23	Extrasystole	2.44
3	Man	80	1	—	25.5	Normal	1.65
4	Man	80	1	—	23	Normal	1.51
5	Man	82	1	AHT	23.7	Normal	1.42
6	Woman	81	1	AHT	28.3	Normal	1.18

*ECG indicates electrocardiogram; ECOG, Eastern Cooperative Oncology Group scale; NIDDM, non insulin dependent diabetes mellitus; FEV₁-PPO, predicted postoperative forced expiratory volume in 1 second; AHT, arterial hypertension; BMI, body mass index.

TABLE 2
Pneumonectomy: Location, Hospital Stays, and Perioperative Characteristics

	Pneumonectomy	Recovery Unit, d	Hospital, d	Perioperative Morbidity	Perioperative Mortality
1	Right	1	10	Atrial fibrillation	—
2	Left	1	8	—	—
3	Left	1	8	—	—
4	Right	2	7	—	—
5	Left	1	7	—	—
6	Left	1	8	—	—

TABLE 3
Tumor Histology, TNM, and Survival

Case	Histology	Pathologic TNM	Survival, y	Status	Cause of Death
1	Squamous cell carcinoma	T2 N0 M0	1.1	Dead	Metastasizing lung cancer
2	Squamous cell carcinoma	T2 N0 M0	0.6	Dead	Metastasizing lung cancer
3	Squamous cell carcinoma	T2 N0 M0	6.9	Alive	—
4	Squamous cell carcinoma	T2 N0 M0	3.4	Alive	—
5	Squamous cell carcinoma	T2 N1 M0	2.8	Dead	Sudden death
6	Carcinoid tumor	T2 N0 M0	2.9	Alive	—

Three studies on pneumonectomy in patients older than 70 years reported rates of perioperative complications and mortality that were significantly higher than those of younger patients. Au et al¹⁵ concluded that pneumonectomy, with a perioperative mortality of 21%, is justified in patients of advanced age but that a history of ischemic heart disease can be considered a relative contraindication for right pneumonectomy. Dyszkiewicz et al¹⁶ reported 78.9% morbidity and 16.6% mortality related to arterial hypertension, chronic obstructive pulmonary disease, and blood urea nitrogen levels higher than 45 mg/dL. Lastly, Mizushima et al,¹⁷ who reported 33% morbidity and 22.2% mortality, justified performing pneumonectomies in patients of advanced age based on finding no difference in survival compared with younger patients. In our limited experience with octogenarian patients, no perioperative deaths have occurred, only a single patient developed atrial fibrillation, hospital stay was approximately 1 week, and long term survival has been acceptable.

Although pneumonectomy is an independent predictor of perioperative morbidity and mortality, we consider such surgical treatment a therapeutic option for octogenarian patients, with acceptable perioperative risk levels, provided a detailed preoperative assessment is carried out.

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