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Case Study

Sleeve, Semi-sleeve Lobectomy, Segment Pyramidobasalectomy in Patients with Preoperative Contraindications for Pneumonectomy

Healthcare

Keywords: sleeve lobectomy, semisleve, carcinoid, pyramid basal segmentectomy.

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Abstract

Background: Sleeve and semisleeve lobectomy and segment pyramydobasalectomy is a parenchyma-sparing procedure that is particularly valuable in patients with cardiac or pulmonary contraindications to pneumonectomy. The purpose of this study is to report our experience with sleeve lobectomy for bronchogenic cancer and carcinoid , and to investigate factors associated with long-term survival. Methods: Retrospective descriptive study among January 2006 to November 2014,in the Service of Thoracic Surgery in the University Hospital"Shefqet Ndroqi" in patients treated for lung cancer.
Results: Patients underwent sleeve lobectomy for non-small-cell lung cancer (n = 3) one patient underwent double sleeve lobectomy or carcinoid tumor (n = 15), including 5 patients underwent sleeve lobectomy (atipic carcinoid) and 10 patients underwent semisleeve lobectomy (tipic carcinoid) with a preoperative contraindication to pneumonectomy. Mean age was 52 ± 14 years (range, 19 to 79 years). Vascular sleeve resection was performed in 1 patient and segmentbasalectomy on the right lung. Major bronchial anastomotic complications occurred in 2 (13%) patient: One was fatal postoperatively (double sleeve bronchial and vasculare) two weeks after intervent ,because was massive hemoptisia , and one after pyramidbazalectomy 6-th day after intervent, because nosocomial difusse pneumonia in the rest lung (shock septic) was installed. In the non-small-cell lung cancer group, operative mortality was 13% (2 of 15), and overall 5-year and 10-year survival rates were 60% . By multivariate analysis, two factors significantly and independently influenced survival: nodal status (N0 or N1 versus N2; p = 0.01) and microscopic invasion of the bronchial stump (p = 0.02). In the carcinoid tumor group, there were no operative deaths, and overall 5-year and 10-year survival rates were 100% (Typic carcinoid) and 95% (atipic carcinoid). Conclusions: Sleeve lobectomy was performed for the first time in Albania, in April 2006. Long-term survival is excellent for carcinoid tumors. For patients with non-small-cell lung cancer, N2 disease or incomplete resection is associated with a worse prognosis; outcome is not affected by presence of a preoperative contraindication to pneumonectomy.Sleeve lobectomy facilitated the maintenance of residual lung function without serious perioperative complications.

Introduction

The incidence of lung cancer has steadily increased over the last century. Each year more than 1.3 million people will be diagnosed with lung cancer, making it the world's most common malignancy (1).

Approximately 85% of lung cancers are nonsmall cell lung cancers (NSCLCs) and only 25–30% of these are eventually suitable for surgical resection with a curative intent. (2)

Pulmonary resections vary widely in the amount of airway and parenchyma surgically removed. Among the most extensive pulmonary resections is the pneumonectomy. The first documented pneumonectomy was completed in multiple stages in 1895 by Macewen for a patient with tuberculous empyema. (3)

A one–stage pneumonectomy was not successfully completed until 1933, when Graham and Singer completed a left en bloc pneumonectomy for a patient with lung cancer(4).Sleeve lobectomy is most commonly indicated for lesions involving main or lobar bronchi (5). These lesions typically are benign to low–grade malignant neoplasms and stenoses. (5) Carcinoid tumors account for more than 80% of the lowgrade neoplasms, followed by mucoepidermoid tumors, fibrous histiocytomas, hamartomas and adenoid cystic carinomas. (5)

Sleeve lobectomy is also indicated for patients with impaired cardiopulmonary function. (6) Patients with advanced lung cancer, specifically T4 disease are typically poor candidates for sleeve lobectomy.

Involvement of the pleura, superior vena cava, atria, or transverse aortic arch are contraindications. (7) Relative contraindications include invasion of the pericardium phrenic nerve, vagus nerve, and diaphragm. (7) The presence of N2 does not contraindicate sleeve lobectomy, but significantly impairs long term outcomes due to systemic recurrences (8–10).

Study Purpose

The purpose of this study is to report our experience with sleeve lobectomy for bronchogenic cancer and carcinoid , and to investigate factors associated with long-term survival.

Materials and Methods

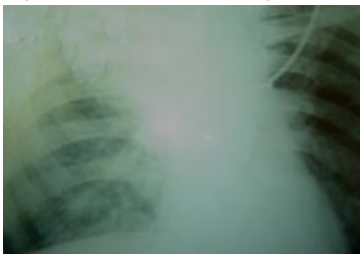
This was a descriptive retrospective study. We analised the medical records of all patients, treated with sleeve resection for lung tumors, in the Service of Thoracic Surgery in the University Hospital "Shefqet Ndroqi" between January 2006 to November 2014.

Sleeve resection was successfully applied for the first time in our service in April 2006.After this this time has started a new area of treating lung cancer.

Results

There were 34 patients treated with sleeve or semisleeve resection. Mean age was 52 ± 14 years (range, 19 to 79 years). Male to female reatio was 9:1 (n=29 males /5 females). Sleeve lobectomy was performed on the upper right lobe in 78 % of patients and on the upper left lobe in 22 %; Mean age was 52 ± 14 years (range, 19 to 79 years). Patients underwent sleeve lobectomy for non-small-cell lung cancer (n = 3) one patient underwent double sleeve lobectomy or carcinoid tumor (n = 15), including 5 patients underwent sleeve lobectomy (atipic carcinoid) and 10 patients underwent semisleeve lobectomy (tipic carcinois) with a preoperative contraindication to pneumonectomy.

Vascular sleeve resection was performed in 1 patient and segmentbasalectomy on the right lung. Major bronchial anastomotic complications occurred in 2 (13%) patient: One was fatal postoperatively (double sleeve bronchial and vasculare) two weeks after intervent, because was massive hemoptisia, and one after pyramidbazalectomy 6-th day after intervent because nosocomial difusse pneumonia in the rest lung(shock septic). In the non-small-cell lung cancer group, operative mortality was 13% (2 of 15), and overall 5-year and 10-year survival rates were 60%. By multivariate analysis, two factors significantly and independently influenced survival: nodal status (N0 or N1 versus N2; p = 0.01) and microscopic invasion of the bronchial stump (p = 0.02). In the carcinoid tumor group, there were no operative deaths, and overall 5-year and 10-year survival rates were 100% and 95%, respectively. First time of performing sleeve resection in oour hospital was April 2006.it was a 28 years old male patients hospitalized with histopathologic diagnosis: Atypical carcinoid of superior right lobe of lung. We performed right posterolateral thoracotomy and sleeve right superior lobektomia with mediastinal lymphnodes dissection. The final diagnosis was Atypical carcinoid with positive lymphnodes right station 10, 11 (Figure 1, a, b, c). After surgery he underwent chemotherapy (Figure 2).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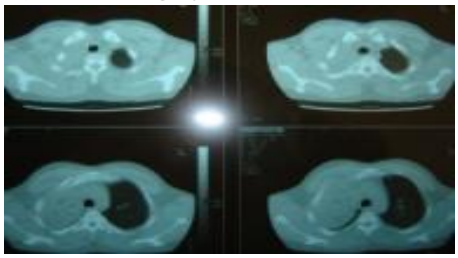
b


Figure a-X-ray chest, b-CT-Scan, c-sleeve resection

Figure 2. After surgery

Discussion

Masses located in the proximal airway remain a challenge for the thoracic surgeon. Also,masses located at the level of the carina would be unresectable without a tracheoplastic procedure to restore airway patency. The presence of such complicated problems resulted in the creation of specialized surgical procedures, pioneered first by Price-Thomas in 1947(11)[-] to meet the need of a right main bronchus carcinoid mass, and further advanced and popularized by Mathey(12) [-] then Paulson and Shaw (13).

Sleeve lobectomy was performed on the upper right lobe in 78 % of patients and on the upper left lobe in 22 %; similar percentages have been described by other authors(14)

The primary indication for bronchial or carinal sleeve resection is lung cancer, with full preoperative workup indicating that the patient is both suitable from a medical standpoint for surgery and that surgical resection is indicated.

The preservation of functional lung tissue and, consequently, functional reserve, offers improved survival, perhaps because the preserved lung capacity reduces morbidity and mortality. Perhaps the most important factor to consider in our population (mean age, 52 ± 14 years) is the impact that loss of function has on medium term survival. According to the classifications of the Global Initiative for Asthma, a FEV_1 below 50% indicates severe chronic obstructive pulmonary disease, and published evidence demonstrates that FEV_1 is an independent predictor of mortality--regardless of the cause of death--in the general population (15).

Conclusions

Sleeve resection was performed for the first time in Albania and has evolved from a compromise to pneumonectomy in those with compromised pulmonary function, to first line intervention for centrally located lesions of all grades. Although more challenging than pneumonectomy, outcome and cost-effective measures favor sleeve lobectomy. The use of sleeve lobectomy has been expanded for locally advanced disease, and results remain superior to alternative procedures.
Patients receiving sleeve lobectomy may have less loss of function and better quality of life than patients receiving pneumonectomy, but more evidence is required.

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