Sleeve Right Lower Lobectomy: a Rarely Performed Extended Resection

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Abstract Sleeve resection is a valid option in the surgical treatment of lung tumors, avoiding large resection. To ensure a good functional result and avoid post-operative complications like recent broncho-pleural fistulas and long-term stenosis, anastomosis between bronchi must be well performed. We report two cases of sleeve resection of the right lower lobe and show how we managed caliber discrepancy between the middle lobe bronchus and the truncus intermedius.

Keywords Anastomosis · Lung · Resection · Tumor

Introduction

Surgery remains the best alternative for a radical treatment of broncho-pulmonary tumors. In some locations, minimally resection is difficult to achieve, the case of centrally located tumors. Sleeve resection is an option to avoid pneumonectomy in such cases. We report two cases of sleeve resection of the right lower lobe (RLL) with anastomosis between the middle lobe bronchus (ML) and the truncus intermedius (TIM), a type of extended lobectomy which is rarely performed.

Techniques

The first patient was a 36-year-old woman who was admitted for a suspect proximal mass of the RLL. The chest X-ray showed a right basal opacity. Bronchoscopy showed a bud at the origin of the RLL bronchus whose biopsy was not contributory. Computed tomography showed several sites of broncho-pulmonary infection of the RLL associated with atelectasis. Vital capacity (VC) and forced expiratory volume in 1 s (FEV1) were respectively 85 and 81 % of theoretical values. Through a posterolateral thoracotomy, exploration found that the bud was infiltrating the spur of RLL and ML. So, the resection was extended to the bronchial axis with the intention to preserve the ML. Termino-terminal anastomosis between the bronchus of the ML and TIM was performed with two continuous over-and-over suture using a 4/0 polydioxanone suture, after adjustment of the proximal bronchial stump by bending and suturing of the non cartilaginous posterior part of the bronchial wall (Fig. 1).

Bronchial limits were verified by an intraoperative frozen examination. A radical lymph node dissection was performed by the end of the procedure. The final histological diagnosis was a carcinoid tumor.

The second case was a 66-year-old smoker man, with the history of diabetes mellitus, who was referred to our department for a suspected mass of the RLL. No abnormalities were found on the bronchoscopy. Computed tomography of the chest showed an excavated proximal mass on the RLL. FEV1 and CV were respectively 65 and 86 %. Peroperatively, frozen examination of bronchial limits showed that it was infiltrated by a tumoral process, so the resection was extended to the bronchial axis. Caliber mismatch between ML and TIM was managed by the same technique as in the first case, and anastomosis was done by a continuous over-and-over suture with 4/0 PDS on the médiastinal side and with

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Fig. 1 Termino-terminal anastomosis between the bronchus of the ML and TIM was performed with two continuous over-and-over suture using a 4/0 polydioxanone suture

interrupted sutures with polyglactin 2/0 on the other half. The final pathological examination concluded to a large cell carcinoma.

For both cases, no intercostal or other type of flap was used.

Results

The post-operative period was uneventful, and patients were discharged after 8 and 11 days. A controlling bronchoscopy was performed for the second patient and showed a good result (Fig. 2). No tumoral recurrence was noted for our patients after a follow-up of 3 years and 6 months, respectively.

Sleeve lobectomy is an option to avoid large resection like bilobectomy or pneumonectomy in centrally located tumors. It preserves pulmonary parenchyma and so respiratory function. Sleeve resection of the RLL is rarely performed (In the series of Takeda et al., no sleeve resection of the RLL was performed from the whole 62 cases of sleeve resections) [1]. It seems that, when an extended resection is indicated, inferior bilobectomy is preferred to middle lobe conservation. This can be explained by the fact that the majority of surgeons believe that the ML gives a small contribution on the respiratory function. We think that the more conservative the resection is, the better is the post-operative respiratory function and quality of life. As a matter of fact, nowadays, segmentectomy can be performed as a radical treatment for early stage non-small cell lung cancer (NSCLC), instead of lobectomy [2]. It is true that sleeve resection was first presented as an alternative for patients with marginal lung function; nowadays, it is increasingly applied to patients with more normal function [3].

Several studies have showed the gain after sleeve resection [3–6]. In their study, Berthet and colleagues [4] found that this

Fig. 2 A controlling bronchoscopy was performed for the second patient and showed a good result

functional benefit is more important in right sided sleeve resections than in left ones.

To ensure a good functional result and avoid post-operative complications, anastomosis between bronchi must be well performed. We remind that the major technical difficulty is the caliber discrepancy between proximal and distal bronchi [1, 4]. Several techniques were described to resolve this problem like telescoped anastomosis, enlarging the circumference of the small bronchus with an oblique section, or reducing the caliber of the larger bronchus by crimping its posterior membrane, which was the case for our patients [1]. Morbidity after such resection ranges from 20 to 35 % [5]. Recent broncho-pleural fistulas and long-term stenosis are the most common complications, and they are clearly technical in nature. Some factors may favor post-operative complications like reduced cardio-pulmonary function, right sided resection and pedicular or mediastinal lymph node involvement [5]. Peri-operative mortality after sleeve resection ranges from 1.2 to 7.5 %, which is a lower rate compared to pneumonectomy (4.9 to 12 %) [6]. Local control of cancer after a sleeve lobectomy is satisfactory if frozen examination shows no malignant cells.

Conclusions

In the goal to preserve the contribution of the middle lobe in the respiratory function, sleeve right lower lobectomy can be performed with good results. This type of resection, hardly described in the literature, should not be exclusive to patients with marginal pulmonary function. In spite of caliber mismatch, several surgical techniques and tricks may lead to perform a good anastomosis with a low rate of complications.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

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