

Carinal resection and reconstruction double-barrelled type for bronchogenic and metastatic carcinoma

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We report our experience with five carinal resections and double-barrelled type reconstructions for primary bronchogenic and metastatic cancer (two squamous carcinomas, two adenoid cystic carcinomas and one metastatic breast carcinoma). In three cases we accomplished total reversed-Y-shaped reconstruction of the carina, and in two, the operation included right upper bilobectomy. One patient died on the 6-th postoperative day of massive pulmonary embolism, and the other four are well 40, 30, 12 and 8 months after the operation, respectively.

Key words: carcinoma, bronchogenic; lung neoplasms-surgery

chogenic tumor, which requires highly skilled surgery. Moreover, some of the leading authorities in this field believe that such surgical treatments cause dehiscence of the anastomosis due to interference with circulation, and can be alleviated by means of vital tissue wrapping of the anastomosis.

The purpose of this paper is to give evidence of our deep belief that surgical treatment of bronchogenic carcinoma could be successful (and consequently, carinal involvement in bronchogenic cancer should be included in stage III-A classification), and that such patients should undergo the operation, especially in cases in which tumor infiltration of vital surrounding structures is not present.

Case reports

Our first patient was a 49-year old man with squamous cell carcinoma originating on the

certainly the notoriously difficult area of bron-

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UDC: 616.24-006.6-089

posterior wall of the trachea just above the carina and partially obstructing the left stem bronchus, while the right stem bronchus was nearly totally obstructed. The distal parts of both stem bronchi were free of tumor as were the mediastinal lymph nodes.

The second patient was a 52-year old woman with adenoid cystic carcinoma originating from the lateral wall of the trachea and the proximal part of the left stem bronchus.

The third patient, a 57-year old man had squamous cell carcinoma located on the carina. All patients underwent resection of the carina and the terminal part of the trachea. Repair was achieved by double-barrelled type reconstruction without pulmonary resection (Figure 1). The lymph nodes and resection margins were free of tumor. Two months after the operation in our first patient, granulation tissue was noted at the tracheal anastomosis. It was successfully treated with neodymium-YAG laser. Several following bronchoscopies were done afterwards without evidence of recurrence of stricture. Now, all three patients are well 40, 12 and 8 months after the operation, respectively.

In the other two cases the extent of tumor required a right upper bilobectomy (Figure 2). Our fourth patient, a 42-year old woman, had adenoid cystic carcinoma which involved the lower trachea, right main and intermediate bronchi until the orifice of the middle lobar bronchus. The tumor extended across the carina to the left stem bronchus. Resection included lower trachea, the proximal part of the left main bronchus, and a right upper bilobectomy. Resection margins were negative but two subcarinal lymph nodes were positive. She was irradiated postoperatively. The last follow-up 30 months later, showed the patient was well and without any evidence of disease. The fifth patient was a 62-year old woman whose metastatic breast carcinoma involved the lower trachea, the carina and both stem bronchi. On the right the tumor involved the intermediate bronchus and the orifice of the middle lobar bronchus. Resection and carinal resection was performed in the same way as in the preceding patient.

The first five postoperative days were uneventful. On the 6-th the patient died of massive pulmonary embolism.

Operative technique

All the patients were intubated with a standard endotracheal tube. We used right sided posterolateral thoracotomy through the IV-th intercostal space. After division of the azygos vein, the mediastinal pleura was incised vertically, and the distal trachea, carina, left and right main bronchi were mobilised. All mediastinal lymph nodes were sampled. The left main bronchus was transversally incised, and ventilation was provided through cuffed endotracheal tube inserted from the operative field. The endotracheal tube was withdrawn above the site of the future anastomosis. The distal part of the trachea was resected circumferentially and the margins of the resection were checked by frozen section. This was followed by circumferential resection of the right main and left main bronchi above the site of tube insertion.

In the case of resection involving the carina, intermediate and middle lobar bronchi, arterial branches for upper and middle lobe and superior pulmonary vein were ligated and divided. This was followed by circumferential resection of the distal trachea and the distal part of the intermediate bronchus, together with right upper bilobectomy.

In the first case, repair was accomplished by reconstructing the carina by side-to-side approximation of distal parts of the right and left main bronchi (Figure 1). In the second one, by approximation of the right lower and left main bronchi (Figure 2) with five inverting interrupted sutures, followed by moving the neocarina proximally and by end-to-end anastomosis of the neocarina and the remaining intrathoracic trachea. No added procedures were needed to lessen tension on the anastomosis. Anastomoses were done by using the technique of full-layer sutures with 3.0 Vycril poliglactin 910 (Ethicon, Inc., Somerville, N. J.). The stiches were tied outside. The endotracheal tube was advanced

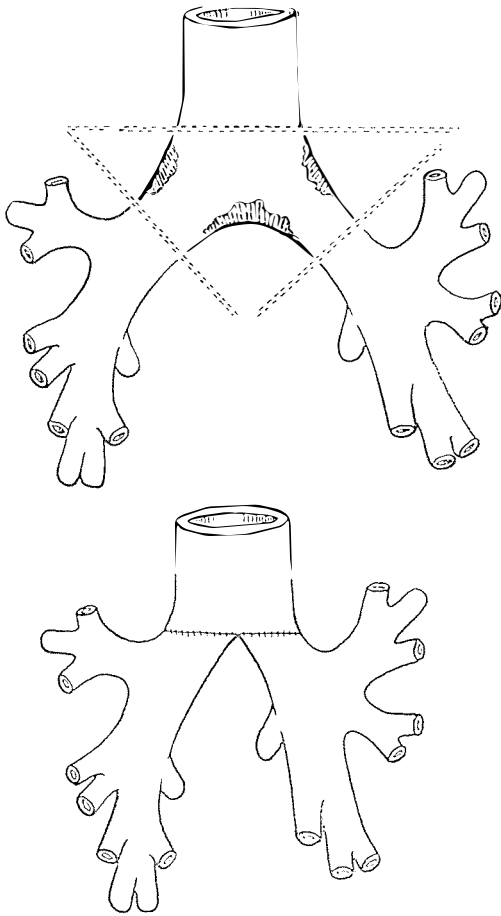


Figure 1. Double-barrelled type carinal reconstruction with both stem bronchi (without pulmonary resection).

more distally, the other one in the left stem bronchus was removed, and anastomosis completed.

Discussion

As it has already been asserted, most lung cancers invading the carina are diagnosed at a stage at which curative resection is no longer possible and other palliative procedures such as laser recanalisation or tracheobronchial intubation are known to have their own limitations.¹ Although the evolution of tracheobronchial reconstructive surgery over the past 25 years has

nowadays resulted in offering various modes of carinal resection and reconstruction,²⁻⁴ a great number of surgeons are reluctant to perform such demanding operations since the results of carinal resection are usually unpredictable and the degree of surgical risks of carinal resection is very high, as it is indicated by a reported 8%–31% operative mortality.⁴⁻⁸

In spite of the above mentioned difficulties, we consider such operations worth performing, as our presented results prove. We deeply believe that consideration should be given to include carinal involvement in bronchogenic cancer in stage III-A classification. Double-barrelled type reconstruction is possible even in cases in which tumor involves not only the carina but the large bronchi as well.

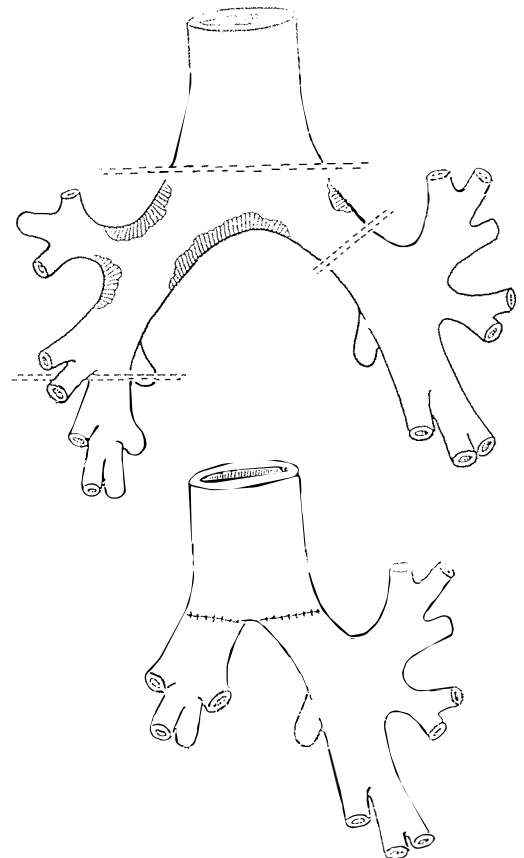


Figure 2. Double-barrelled type carinal reconstruction with right lower and left stem bronchus (in combination with right upper bilobectomy).

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