


CASE REPORT

Successful sleeve resection of bronchial carcinoid under veno-venous ECMO

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Thoracic Cancer **10** (2019) 2319–2321**Abstract**

Here, we report a case of a bronchial tumor in the proximal left mainstem bronchus in a 19-year-old male. Diagnosis of the tumor was typical carcinoid, which was established by bronchoscopic biopsy preoperatively. Under femoral veno-venous extracorporeal membrane oxygenation (ECMO), the patient underwent left mainstem bronchus sleeve resection through median sternotomy. The surgical resection margins were confirmed to be tumor-free on frozen section and all lymph nodes were free of tumor. This report describes a carcinoid in the proximal mainstem bronchus which was successfully resected without lobectomy or pneumonectomy and concludes that sleeve resection under extracorporeal membrane oxygenation should be considered in the surgical treatment of mainstem bronchial carcinoid.

Introduction

A bronchial carcinoid tumor is a neuroendocrine tumor of the lung which presents in approximately 2% of all primary lung carcinomas.¹ Although bronchial carcinoids usually follow a benign course, they can be locally invasive and arise in the central bronchi, causing severe obstruction. Surgical resection, especially sleeve resection, is important for the best outcome.² However, in the case of carcinoid in the proximal mainstem bronchus, a parenchyma-preserving sleeve resection is challenging using single-lung ventilation due to the possibility of disturbing the endotracheal tube during the procedure. In this situation, extracorporeal membrane oxygenation (ECMO) can be an attractive alternative. This report describes a case of bronchial carcinoid in the proximal left mainstem bronchus, which was treated by sleeve resection under femoral veno-venous ECMO.

Case report

A 19-year-old male presented to our clinic complaining of chest discomfort, and dyspnea of approximately six months

duration. A chest computed tomography (CT) scan revealed an endobronchial mass causing almost complete obstruction of the left mainstem bronchus (Fig 1a,b, arrow designating tumor). A lobulated polypoid mass was identified in the proximal left mainstem bronchus near the carina on bronchoscopy (Fig 1c,d). A bronchoscopic biopsy was performed and typical bronchial carcinoid was diagnosed. Surgical resection was planned and left mainstem bronchus sleeve resection was performed. Under femoral veno-venous ECMO, the patient underwent median sternotomy. The carina was approached through the space between the ascending aorta and superior vena cava. After dissection of the left mainstem bronchus, an en bloc resection was performed from the left mainstem bronchus opening to the distal mainstem bronchus (Fig 2a). The proximal and distal resection margins of the left mainstem bronchus were confirmed to be tumor-free on frozen section. The distal mainstem bronchus was then anastomosed to the mainstem bronchus opening using the interrupted suture technique. Mediastinal lymph node dissection was also carried out and there was no metastasis evident in the mediastinal lymph nodes. The anastomosis site was intact on follow-up bronchoscopy (Fig 2b). The patient had an uneventful postoperative course and was

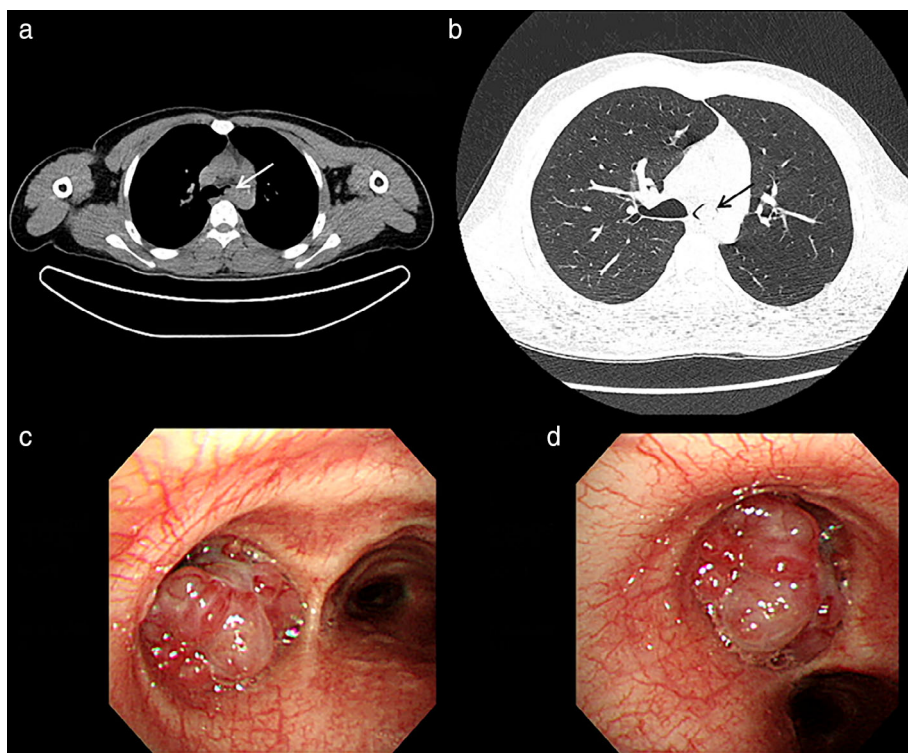


Figure 1 A computed tomography (CT) scan revealed a carcinoid causing obstruction of the left main bronchus (**a, b**, arrow designating tumor). The tumor was identified in the left main bronchus near the carina on bronchoscopy (**c, d**).

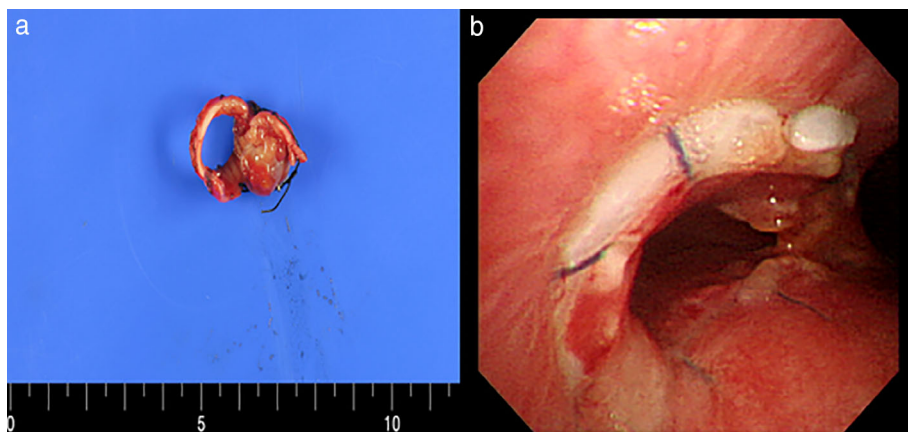


Figure 2 A resected bronchial carcinoid with left mainstem bronchial ostium (**a**). A follow-up bronchoscopy one week later shows the intact bronchial anastomosis site (**b**).

discharged on postoperative day 14. He remains free of recurrence on follow-up four years after diagnosis.

Discussion

Bronchial carcinoid tumors are classified as neuroendocrine neoplasms of the lung. They arise in the bronchial and bronchiolar epithelium and may derive from existing Kulchitsky cells, neuroepithelial bodies, or pluripotential bronchial epithelial stem cells.³ Bronchial carcinoids range from low-grade typical carcinoids to intermediate-grade atypical carcinoids and demonstrate a wide variety of clinical features.⁴ In general, bronchial carcinoids are usually

found in younger patients and are the most frequent primary pulmonary neoplasm in childhood.⁵ The histologic diagnosis is usually determined by bronchoscopic biopsy because most bronchial carcinoids are located in the bronchus. Surgical resection is the treatment of choice for a bronchial carcinoid. Surgical options range from radical resection such as lobectomy, pneumonectomy to conservative resection such as sleeve lobectomy, or bronchoplasty. Of these procedures, tracheobronchial sleeve resection has demonstrated an excellent outcome.² However, sleeve resection of the proximal mainstem carcinoid may be complex, or even impossible with conventional single-lung ventilation because of limited surgical exposure. ECMO is

a well-established alternative to conventional ventilation.⁶ As in our case, a sleeve resection under ECMO is a good choice for treatment in the endobronchial main bronchi tumors which are in the vicinity of the carina. When an anastomosis is not easy at the carinal level due to obstacles such as tight adhesions, supra-aortic sleeve resection could be an alternative method.⁷ Our report serves as a reminder that sleeve resection under ECMO should be considered in the surgical treatment of mainstem bronchial carcinoid.

Disclosure

No authors report any conflict of interest.

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