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Conversion to thoracotomy during VATS segmentectomy for treatment of symptomatic endobronchial hamartoma

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ABSTRACT

INTRODUCTION: Most hamartomas are located peripherally in the lung parenchyma and are rarely identified as an endobronchial lesion. Clinically patients with an endobronchial hamartoma are often symptomatic and may present with various symptoms including: fever, wheezing, hemoptysis and obstructive pneumonia.
CASE PRESENTATION: A 68-year-old man presented with complaints of fever and cough for 1 month. Chest X-ray revealed a right infrahilar density, which on chest CT was found to be a lesion obstructing the superior segmental bronchus of the right lower lobe and extending outside of the bronchus. A round rubbery mass obstructing the same segmental bronchus was noticed during bronchoscopy and endoscopic biopsy yielded a pathological diagnosis of hamartoma.
DISCUSSION: Bronchoscopy is most helpful in diagnosis and management of endobronchial hamartomas but if the lung distal to the obstruction is irreversibly damaged or imaging studies suggest that tumor extends outside of the bronchus, pulmonary segmentectomy, lobar resection or even pneumonectomy may be indicated.
CONCLUSION: When a benign tumor of the lung, as endobronchial hamartoma, is located in a segmental bronchus and presents extrabronchial spread, we recommend to perform a parenchymal-sparing surgical resection. In this case surgical team, however, should keep in mind, due to difficult individual dissection of the segmental bronchovascular elements, the possibility of conversion from VATS (video-assisted thoracic surgery) to open thoracotomy.

1. Introduction

Endobronchial hamartomas (EHs) are benign lung tumors and account for 1,4–20% of all pulmonary hamartomas. They occur most frequently in middle-aged or elderly adults and the peak incidence is in the sixth or seventh decade of life [1]. Symptoms as fever, cough, pleural pain, respiratory distress or complications as lobar atelectasis and recurrent pneumonia can be found in patients with these benign lesions and are related to the obstruction of the tracheo-bronchial tree [2]. EHs appear as a polypoidal or pedunculated mass with a smooth, well-limited surface on bronchoscopic examination; on CT scan they are usually described as rounded soft tissue masses that commonly exhibit calcification and fat density for adipose tissue and may be associated to obstructive pneumonia or air entrapment within the lung [3]. For these endobronchial benign tumors, bronchoscopy (rigid or flexible) can be performed not only for diagnosis but also for definitive treatment. In some instances, however, surgical approach is still considered an effective therapy [4]. The work has been reported in line with the SCARE criteria [5].

2. Presentation of case

A 68-year-old man was admitted to our hospital with a 1-month history of fever and unexplained cough managed with unsuccessful antibiotic treatment. Chest X-ray revealed a prominent right hilum with an increased parenchymal density limited to the right infrahilar region. An endobronchial lesion containing calcification, associated with extramural invasion and parenchymal atelectasis, was detected at computerized tomography (CT) in the superior segmental bronchus (B6) of the right lower lobe (Fig. 1). Flexible bronchoscopy revealed a smooth round polypoid lesion occluding

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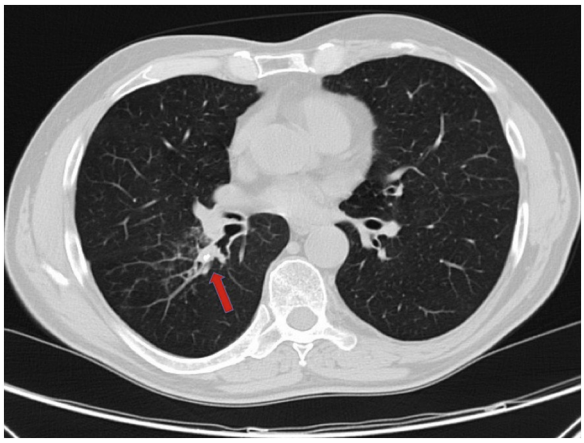

Fig. 1. CT scan of the chest shows a lesion within the superior segmental bronchus of the right lower lobe, associated with calcification (red arrow).

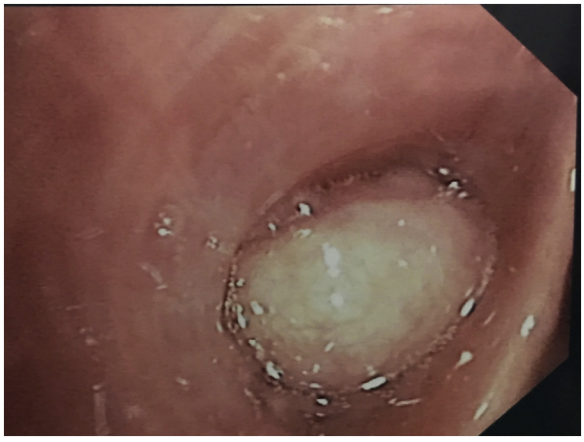

Fig. 2. Endoscopic appearance of endobronchial hamartoma. The wide sessile base polypoid lesion occludes the superior segmental bronchus of the right lower lobe.

the segmental bronchus above mentioned (Fig. 2). Biopsy performed during bronchoscopy yielded a pathological diagnosis of hamartoma. As a therapeutic treatment, the patient was scheduled for VATS (video-assisted thoracic surgery) right lower lobe superior segmentectomy. During this minimally invasive procedure, due to peribronchial calcification and absence of a cleavage plane between apical segmental bronchus and artery supplying the superior segment of the right lower lobe, surgical team opted for a planned conversion from VATS to thoracotomy, isolating the main pulmonary artery to gain control of the potential bleeding risk (*Video 1*). For the difficult individual dissection of the segmental bronchovascular elements, surgeons decided to perform a right lower lobectomy. The patient was discharged on the fifth postoperative day after an uneventful hospital stay. Final histology, performed in material from the complete surgical resection, confirmed the pre-operative diagnosis.

3. Discussion

Most authors argue that bronchoscopic resection, being less invasive, should be considered the treatment of choice for the management of symptomatic EHs [6,7]. Several reports have demonstrated successful endoscopic treatments including endobronchial resections by electrosurgical snare, electrocautery, argon plasma coagulation, cryotherapy and other methods [4,8]. When a tumor completely obstructs the bronchial lumen or there are difficulties to obtain a definitive diagnosis by bronchoscopic approach, surgical treatment is warranted and in presence of

a benign lesion of the bronchial airway, as endobronchial hamartoma, it is advisable a lung tissue- sparing operation performing sleeve or wedge bronchial resections without parenchymal resection. For the bronchoplastic procedures, however, it is needed to follow some principles: tumor confined within the bronchial cartilage; small basis of implant of the lesion and normal bronchial tree at its periphery [9–11]. Although many reports suggest that bronchoscopic treatments or parenchyma-sparing procedures are a good therapeutic choice for EHs, in some instances, as chronic post-obstructive lung injury or extension of tumor outside the cartilage, a more invasive surgical resection is recommended [12–14]. In these cases, segmental resection, pulmonary lobectomy or even pneumonectomy have been reported in the literature [3,13]. According to many experts, we argue that, whenever possible, it's always advisable, especially for benign lung tumors, to perform segmentectomy: the essence of this pulmonary parenchymal-sparing resection is to remove the lung disease without removing excess normal lung [15]. This surgical procedure offers better functional preservation compared with pulmonary lobectomy and, when performed in VATS, is associated with more excellent postoperative outcomes than open segmentectomy such as shorter duration of chest tube placement, less likely to require intensive care unit admission, reduced hospital stay [16,17]. In our case we planned a VATS right lower lobe superior segmentectomy but because, during the procedure, the extrabronchial spread of the lesion associated with calcification limited the correct overview of the anatomy, we performed a planned conversion to thoracotomy for potential vascular injury management through a pulmonary artery proximal control. Due to the fusion between the segmental bronchovascular elements, it was necessary to perform right lower lobectomy.

4. Conclusion

Sintomatic EHs that extend outside of the bronchus require surgical treatment. When they are located in the segmental bronchi, extrabronchial spread associated with calcification can make the individual dissection of the segmental bronchovascular elements difficult. In this case surgical team, planning a parenchymal-sparing resection through a minimally invasive technique, should always keep in mind the possibility of conversion to thoracotomy with unplanned additional anatomical resection.

Conflict of interests

There is no conflict of interest for any of the authors.

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Ethical approval

Ethical approval was not required from my Institution for this case report.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by Editor-in-Chief of this journal on request.

Author contribution

Dario Amore conceptualised the study, performed a literature review and drafted the manuscript.

Pasquale Imitazione and Albina Palma performed a literature review and drafted the manuscript.

Dino Casazza, Roberto Scaramuzzi and Davide Di Natale performed a literature review and collected data.

Carlo Curcio and Antonio Molino critically revised the article.

All authors approved submission of the final article.

Registration of research studies

Not applicable.

Guarantor

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Appendix A. Supplementary data

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