Clinics in Surgery

Case Report
Published: 14 Dec, 2021

Endobronchial Hamartoma in COVID-19 Woman: Radical Treatment with a Disposable Bronchoscope

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Abstract

Pulmonary hamartomas represent the most frequent family of benign lung tumors that typically involve the lung parenchyma and only rarely grow as endobronchial tumors. The elective treatment of endobronchial hamartoma is the bronchoscopic resection, and in those cases in which tumor extension and localization makes it not possible, surgical treatment must be evaluated. Patients with symptomatic COVID-19, hospitalized, frequently undergo a chest CT scan and in some cases, occasional findings may emerge, requiring diagnostic investigations such as bronchoscopy and interventional pulmonology procedures. In this article authors describe, for the first time in literature, a rare case of endobronchial hamartoma radically resected using a single use bronchoscope, in a young female patient hospitalized for symptomatic COVID-19.

Keywords: Endobronchial hamartoma; Disposable bronchoscope; COVID-19

Introduction

Pulmonary hamartomas represent the most frequent family of benign lung tumors with an incidence of 0.3%. Histologically characterized by fusion of different tissues originating from the embryonic mesoderm. Endobronchial hamartomas are rarer still, composing 1.4% of all pulmonary hamartomas [1]. The first choice in the treatment of endobronchial hamartoma is the bronchoscopic approach, preferably in rigid bronchoscopy. Surgical therapy, by bronchotomy or resection, should be reserved only for cases where the hamartoma cannot be approached through endoscopy, or when irreversible lung functional impairment occurred after prolonged airflow obstruction [2]. In patients with confirmed or suspected Coronavirus Disease (COVID19), procedures such as bronchoscopy should be avoided, since they generate aerosols and increase possibility of virus spreading [3]. However, if necessary, bronchoscopic procedures in COVID-19 patients should always be carried out following an organizational model and operating procedures including the use of disposable bronchoscopes, aimed at preventing contamination of endoscopic instruments and virus spreading to both patient and personnel involved [4,5]. Therefore, although the finding of an endobronchial hamartoma is a rather rare occurrence, in literature have been described endoscopic therapeutic approaches in flexible and rigid bronchoscopy in addition or in place of surgical resection, however, a radical endoscopic treatment using a disposable bronchoscope has never been reported.

Case Presentation

A 35-year-old non-smoking woman was transferred to COVID-19 the respiratory infectious disease unit from the infectious emergency unit. She was admitted with a COVID-19 positive nasopharyngeal swab complaining of fever, persistent cough, exertional dyspnea, unrelenting left-sided chest pain, and two episodes of hemoptysis reported in the preceding hours. Upon admission, arterial blood gas analysis and routine laboratory data were normal, as well as physical examination including lungs, heart, peripheral lymph nodes and abdomen. The patient underwent a high-resolution chest computed tomography scan and subsequently contrast-enhanced chest CT that in the right lung highlighted the presence of a neoformation, without contrast uptake, in the distal section of the intermediate bronchus with the implant base in the lower lobe bronchus (Figure 1A-1C) and downstream dysventilation phenomena, no abnormalities were found in the residual lung

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Received Date: *05 Nov 2021*
Accepted Date: *08 Dec 2021*
Published Date: *14 Dec 2021*

Citation:
Guarino C, Cesaro C, La Cerra G, Lucci R, Cesaro F, Zamparelli E, et al. Endobronchial Hamartoma in COVID-19 Woman: Radical Treatment with a Disposable Bronchoscope. Clin Surg. 2021; 6: 3382.

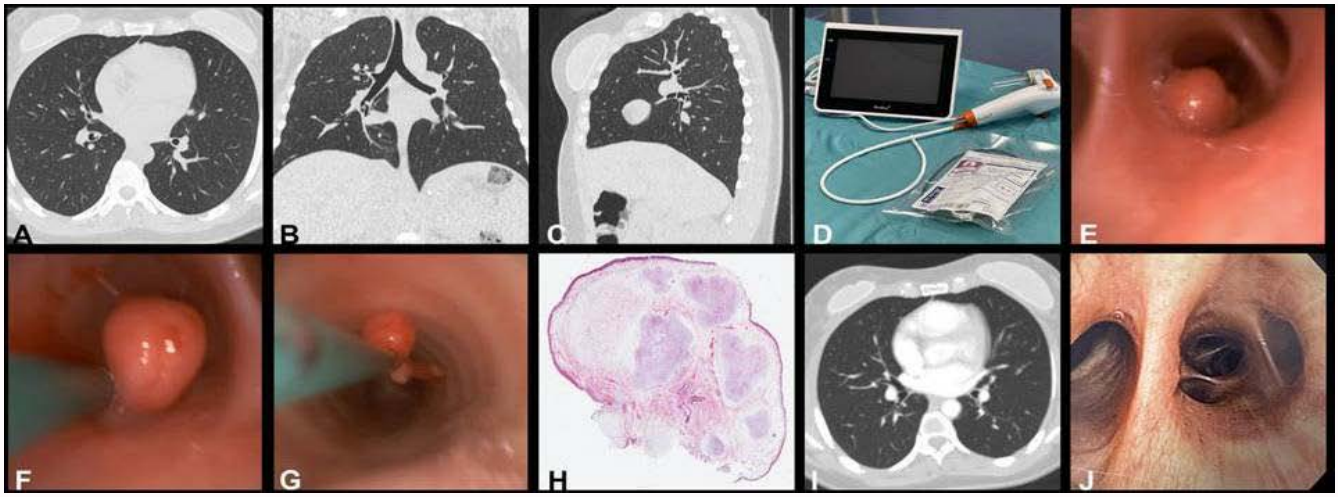

Figure 1: (A) Axial (B) Coronal (C) Sagittal images of a CT scan showing neoformation in intermediate-right lower lobe bronchus. (D) Single use bronchoscope (Ambu® aScope™) setting. (E) Image of smooth, reddish and pedunculated neoformation. (F-G) Total neoformation removal with implant base. (H) Hematoxylin/ Eosin 20x magnification image of "endobronchial hamartoma" well-circumscribed cartilage nodules, respiratory epithelium and fibrous tissue. (I) Axial Plan of contrast-enhanced CT scan 12 months after treatment, in which is highlighted the normal canalization of intermediate and right lower lobe bronchus. (J) Endoscopic image 12 months after treatment showing normal canalization and absence of disease recurrence.

parenchyma. Patient underwent bronchoscopy that was performed with a single use bronchoscope (Ambu® aScope™ Figure 1D), with a probe diameter of 5.8 mm and a 2.8 mm working channel connected to the suction circuit and equipped with a Ambua View dedicated monitor (Figure 1D) in an operating room dedicated for COVID-19 patient, strictly in negative pressure, with depressurization flow (Δ of 10 Pa) and unidirectional air exchange. Bronchoscopy, in the portion of the intermediate bronchus bordering the right lung lower lobar bronchus, revealed the presence of a pedunculated neoformation, characterized by a smooth, reddish, poorly vascularized surface with a hard elastic consistency (Figure 1E). Neoplasm inspection revealed the implantation base in the medial basal segmental branch of the lower lobe bronchus, well-circumscribed and without signs of submucosal infiltration. Using a Jaw Step single-use fenestrated crocodile biopsy forceps, the lesion was hooked and excised in its entirety including its implant base, obtaining macroscopic total removal (Figure 1F, 1G). Procedure lasted about 15 min which resulted in modest bleeding that was effectively resolved by mechanical tamponade with the disposable bronchoscope. Massive bleeding was considered as a possible major complication and therefore in the operating room setting there was a fogarty balloon blocking catheter, such as cold physiological solution (4°C), tranexamic acid and adrenaline to be used for loco-regional instillation but no immediate or late complications were recorded after procedure. The definitive histological diagnosis returned as "Bronchial Hamartoma" characterized by well-circumscribed, encapsulated nodule of cartilage, respiratory epithelium and cleft of fibrous tissue (Figure 1H). Contrasted chest CT scan (Figure 1I) and bronchoscopy (Figure 1J) 12 months after treatment showed no recurrence. The patient, furthermore, was included in a six-monthly follow-up program with chest CT scan and video bronchoscopy for at least 3 years to rule out the appearance of recurrence.

Discussion

The finding of an endobronchial hamartoma is a rare event that becomes even rarer as an occasional finding in a patient hospitalized for COVID-19. Bronchoscopy is necessary to obtain the differential diagnosis and endoscopic treatment represents the GOLD Standard in therapy [6]. Generally, the endoscopic approach is through rigid bronchoscopy, laser photocoagulation, and mechanical resection but also electrocautery through flexible bronchoscopy may prove just as simple and effective. Surgical treatment through thoracotomy and bronchotomy is indicated only in cases where endobronchial hamartoma cannot be approached *via* endoscopy, or when lung resection is indicated due to the irreversible parenchyma damage from long-lasting airway obstruction [7,8]. In this article, for the first time in literature, the use of a disposable bronchoscope in the radical treatment of an endobronchial hamartoma has been described. The experience acquired allows us to state that single-use bronchoscopes not only have the potential to create a safer work environment even in infectious diseases such as COVID-19, when bronchoscopy is unavoidable, and although they are currently mainly used in intensive care units for difficult intubation and to unblock bronchial secretions, they can also be considered a useful and effective tool that guarantees excellent operational functionality and a good quality of endoscopic view in the management of interventional pulmonology procedures, representing a valid alternative to multipurpose instrumentation, especially when, as in COVID-19, the use of reusable endoscopic equipment is contraindicated.

Statement of Ethics

The procedure performed and described was carried out in accordance with international guidelines and in accordance with the ethical standards of the Institutional Research Committee and the 1964 declaration of Helsinki and its later amendment. Written informed consent was obtained from patient for publication.

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