Endobronchial lipoma

Lakshitha Anbazhakan1, Asad Ullah1, Rohit Munagala1, Rabih Bechara1, Islam Elhelf1, Nikhil Patel1, Nagla Abdel Karim1

How to cite: Anbazhakan L, Ullah A, Munagala R, et al. Endobronchial lipoma. Autops Case Rep [Internet]. 2022;12:e2021377. https://doi.org/10.4322/acr.2021.377

ABSTRACT

Endobronchial lipomas are rare benign lung tumors that can cause bronchial obstruction and parenchymal damage. While an uncommon etiology, they are often misdiagnosed due to a clinical presentation similar to obstructive pulmonary pathologies such as COPD and asthma. Upon review of English-language literature, under 50 cases of endobronchial lipomas were documented in the prior 10 years (2011-2021). There are no clear guidelines regarding the management of this particular entity, but typically interventional debulking is the treatment of choice. Here we present another unique case of endobronchial lipoma along with our diagnostic and therapeutic methodology. The patient underwent bronchoscopic debulking via a cryotherapy probe. Based on the histopathologic analysis, a diagnosis of endobronchial lipoma was made. Endobronchial lipomas must remain in any clinician's differential when a patient presents with dyspnea. We report the unique location of this lipoma based on our literature review and the importance of investigating endobronchial lesions due to a possible diagnosis of endobronchial lipoma.

Keywords
Lipoma; Bronchoscopy; Airway Obstruction.

INTRODUCTION

Endobronchial lipomas are rare benign lung tumors that can cause bronchial obstruction and parenchymal damage. They can mimic chronic obstructive pulmonary disease (COPD) or asthma.1 Diagnosis is made by imaging studies, mainly computed tomography scan (CT scan), and then confirmed by a biopsy. Early diagnosis is essential to prevent possible bronchial obstruction or further complications. Bronchoscopic resection has now become the preferred mode of treatment versus surgical intervention.1

METHODS

A search on PubMed was conducted using the keywords “endobronchial lipoma.” Only articles between 2011-2021 were considered. At the time of search under these parameters, there were 48 results. Of the 48 results, 35 articles, including case reports or any mention of a patient with endobronchial lipoma, were used. Foreign articles were used only if the full article was written in English. Articles reporting myxomas or hamartomas without specifying endobronchial lipoma were excluded. One article was used that included 4 case reports, 2 of which were reported to be endobronchial lipoma.2 Any

1Augusta University, Medical College of Georgia, Augusta, Georgia, USA

Copyright © 2022 The Authors. This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.
RESULTS

We reviewed the literature between 2011-2021. Of the 32 articles that were encountered, there were a total of 35 reports of patients with endobronchial lipoma (Table 1).

Of the reported cases, 17 cases were of the left lung bronchi, and 20 were of the right lung bronchi (Table 2). One of the cases detailed an endobronchial lipoma at the bifurcation of the left upper and lower lobe bronchi. The majority of cases involved patients that were ≥ 60 years old (26 cases) and male (27 cases). One article did not identify the patient’s gender. Most were treated with bronchoscopic resection (electrocautery, laser). There were 3 articles that did not specify their method of treatment.

CASE REPORT

We present a 70-year-old male patient who had progressive dyspnea on exertion, chest pain, and lightheadedness 2 months after bicuspid aortic valve replacement surgery. He had routine imaging studies pre-operatively. His past medical history was significant for hypertension, atrial fibrillation, obstructive sleep apnea, hyperlipidemia, chronic diverticulitis, and sigmoid abscess post colectomy.

CT scan of the chest revealed a hypodense lesion in the right middle lobe bronchus with negative Hounsfield values consistent with the macroscopic fat component (Figure 1A). Subsequently, endobronchial ultrasound (EBUS) was indicated, where a right middle lobe mass was found with 99% obstruction (Figure 1B).

He underwent debulking using a cryotherapy probe followed by hemostasis control with an argon plasma coagulation probe; about 50% was resected. Histopathologic examination revealed ciliated bronchial epithelial lining underneath endobronchial glands and mature adipose tissue with no cartilaginous structure (Figure 2). Thus, the final diagnosis of endobronchial lipoma was rendered. On follow-up, no pulmonary nodules were noted.

DISCUSSION

Endobronchial lipomas are rare. They have an incidence of 0.1 to 0.5% of all lung tumors. Though benign, it can cause bronchial obstruction and subsequent complications, such as early-onset dyspnea and wheezing. Unfortunately, their ultimate diagnosis can be easily overlooked, as providers may initially investigate the diagnosis of other more common obstructive pathologies (i.e., COPD, asthma). They usually present insidiously, most commonly in older men. Further symptoms can include dyspnea, cough, fever, chest pain, hemoptyisis, and pneumonia. Management options can vary among cases of endobronchial lipomas, the most common and effective treatment being bronchoscopic resection. Among cases analyzed since 2010, according to one review, seventy three percent of endobronchial lipomas were resected bronchoscopically. Methods of bronchoscopic resection include cryotherapy, laser, electrosurgery, and mechanical debulking. According to case reports by Huismen et al., electrocautery can also be used as an effective treatment.

Upon review of 10 cases in this series, regardless of lipoma location, most of the diagnoses of endobronchial lipoma were secondary to presenting symptoms such as non-specific throat pain, shortness of breath upon exertion, and/or cough. These symptoms showed gradual resolution when the lipoma was resected. While an incidental diagnosis of endobronchial lipomas has been made, this is rather rare; diagnosis typically only occurs after the patient presents with relevant respiratory symptoms.

Similar to the cases seen in the literature review, our patient also presented with initial symptoms of labored breathing and chest pain. Unique to our case is the specific location of the mass. While the majority of cases presented in the right main or right lower lobe bronchi (Table 2), ours was located in the right middle lobe bronchus.

Our patient underwent debulking and cauterization, similarly following the trend of the other reported bronchoscopic mass resections seen in the case review. More invasive procedures, like lobectomies, were reserved for cases in which there was irreversible parenchymal damage, suspicion of diagnosis, or if bronchoscopic resection was not

meta-analysis or clinicopathological reviews were also excluded from Table 1.
### Table 1. Review of Other Cases of Endobronchial Lipoma

| ref | Age (Y) / Gender | Location                                                                 | Treatment                                                                 |
|-----|------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1   | 71/M             | Left upper lobe bronchus                                                 | Flexible bronchoscope with electrocautery snare                           |
| 2   | 63/M             | Left main bronchus                                                       | Snare electrocautery, tumor debulking, and argon plasma coagulation       |
| 3   | 63/F             | Left lower lobe bronchus                                                | Not mentioned                                                             |
| 4   | 56/M             | Left lobe main bronchus                                                 | Bronchoscopic excision                                                    |
| 5   | 63/M             | Left main bronchus                                                       | Flexible bronchoscopy with snare electrocautery, bronchoalveolar lavage   |
| 6   | 64/M             | Entrance of Right upper lobe                                            | Thoracotomy with upper right lobectomy and lymphadenectomy               |
| 7   | 63/M             | Distal lateral wall of the bronchus intermedius and superior segment of  | Rigid bronchoscopy with forceps, scissors, and snare electrocautery       |
| 8   | 61/M             | the right lower lobe                                                    | Electrocautery snare followed by argon plasma coagulation at the base of  |
| 9   | 82/M             | Right main bronchus                                                     | Limited bronchoscopic resection, further mass resection, mediastinal       |
| 10  | 63/M             | Left lower lobe bronchus                                                | Left lower lobectomy                                                      |
| 11  | 74/M             | Right main bronchus                                                     | Bronchoscopic mass resection                                              |
| 12  | 44/F             | Right inferior lobe basal trunk bronchus                                 | Right inferior lobe resection                                             |
| 13  | 43/F             | Right lower bronchus                                                    | Not mentioned                                                             |
| 14  | 63/M             | Left main bronchus                                                      | Laser resection                                                           |
| 15  | 83/M             | Right main bronchus                                                     | Flexible bronchoscope with electrocautery snare                          |
| 16  | 83/M             | Right lower lobe bronchus                                               | Electrocautery snare                                                      |
| 17  | 67/M             | Right lower lobe - superior segmental bronchi                           | Not mentioned                                                             |
| 18  | 60/M             | Right lower lobe - upper segment                                        | Cryorecanalization                                                       |
| 19  | 65/M             | Right upper bronchus                                                    | Right lower lobe upper-segmentectomy with hilar and mediastinal lymphadenectomy |
| 20  | 48/F             | Right main bronchus                                                     | Right thoracotomy, right upper lobe resection                            |
| 21  | 52/M             | Left main stem bronchi and left upper lobe bronchus                     | Initially flexible bronchoscope excision, then extraction with rigid bronchoesopic forceps |
| 22  | 72/M             | Subsegment of the left posterior basal segment                          | Electrocautery snare and argon plasma coagulation                         |
| 23  | 66/F             | Lateral segmental bronchus of the right lower lobe                       | Bronchoscopic resection was proposed during initial endoscopic procedure, but it was denied by the patient |
| 24  | 63/M             | Basal segmental bronchi of the left lower lobe                          | Uniportal thoracoscopic right basal segmentectomy                         |
| 25  | 60/M             | Left upper lobe bronchus                                                | Endobronchial resection by laser and cryotherapy                         |
| 26  | 54/M             | Right main bronchus                                                     | Limited surgical resection                                                |
| 27  | 52/M             | Left main bronchus and the superior segment of the left lower lobe      | Pneumonectomy                                                            |
| 28  | 68/F             | Right-lower-lobe segment                                                | Electrosurgical snare, cryotherapy, and electrocautery                   |
| 29  | 62/M             | Left upper lobe bronchus                                                | Right-lower lobectomy                                                     |
| 30  | 39/M             | Posterior segment of the left lower lobe                                | Flexible bronchoscopy electrosurgical snare, additional coagulation using snare tip |
| 31  | 78/F             | Right lower lobe bronchus                                               | Flexible bronchoscope, a polypectomy snare, and electrocautery            |
| 32  | 69/M             | Right intermediary bronchus                                             | Flexible bronchoscope, a polypectomy snare, and electrocautery            |
| 33  | 39/M             | Anterior segmental bronchus of the right upper lobe                     | Resection via Percutaneous Gastrostomy Snare Device                      |
| 34  | 70/F             | Bifurcation of the left-upper and lower lobe bronchi                   | Resection via flexible bronchoscopy and cryotherapy probe                 |

Ref = reference
Endobronchial lipoma

Even though endobronchial lipoma is rare, it can mimic malignancy and lead to significant complications such as progressive dyspnea and subsequent lung infections related to endobronchial

Table 2. Location of Endobronchial Lipoma

| Location                        | # Of Cases | Location                        | # Of Cases |
|---------------------------------|------------|---------------------------------|------------|
| Right main bronchus             | 6          | Left main bronchus              | 6          |
| Right upper bronchi             | 3          | Left upper bronchi              | 4          |
| Right intermediary bronchus     | 2          | Left lower bronchus             | 7          |
| Right middle bronchi            | 0          |                                 |            |
| Right lower bronchus            | 9          |                                 |            |
| **Total**                       | **20**     | **Total**                       | **17**     |

# = number.

Figure 1. CT scan of the chest with IV contrast (A) Axial image shows a proximal right middle lobe bronchus hypodense lesion (arrow). (B) The lesion displays negative Hounsfield units (-90 HU) consistent with fat component.

Figure 2. Pathology Report (A): H&E, 10X; Ciliated bronchial epithelium (arrow) with endobronchial glands and interspersed adipocytes. (B): H&E, 20X; Mature adipocytes, endobronchial glands and endobronchial vessels (arrow).
obstruction. There is a significant need to investigate endobronchial lesions as endobronchial lipoma should remain in the differential diagnosis.

REFERENCES

1. Griffith EM, Whitson B, Huard D, Brown BR. Endobronchial lipoma: case report and literature review. Am J Med Sci. 2021;361(1):111-7. http://dx.doi.org/10.1016/j.amjms.2020.07.010. PMid:32807376.

2. Rodrigues AJ, Coelho D, Dias SA Jr, Jacomelli M, Scordamaglio PR, Figueiredo VR. Minimally invasive bronchoscopic resection of benign tumors of the bronchi. J Bras Pneumol. 2011;37(6):796-800. http://dx.doi.org/10.1590/S1806-37132011000600014. PMid:2241038.

3. Dy RV, Patel S, Harris K, Mador MJ. Endobronchial lipoma causing progressive dyspnea. Respir Med Case Rep. 2017;22:95-7. http://dx.doi.org/10.1016/j.rmcr.2017.07.002. PMid:28736696.

4. Liew CJ, Tham KY, Poh AC, Tee A. Endobronchial lipoma. Singapore Med J. 2017;58(8):510-1. http://dx.doi.org/10.11622/smedj.2017015. PMid:28261742.

5. Eren F, Candan T, Eren B, Comunoglu N, Comunoglu C. Endobronchial lipoma. J Pak Med Assoc. 2013;63(6):784-5. PMid:23901688.

6. Leichtle SW, McCabe V, Gupta A. Obstructing endobronchial lipoma. Ann Thorac Surg. 2014;97(2):714. http://dx.doi.org/10.1016/j.athoracsur.2013.06.095. PMid:24484822.

7. Guelbenzu Zazpe JJ, Ramírez Gil E, Vilá Mayo E. Talking about endobronchial lipoma. Arch Bronconeumol. 2015;51(5):251-2. http://dx.doi.org/10.1016/j.arbes.2014.06.002. PMid:25059588.

8. Harris K, Dhillon S, Huang M, Kumar A, Qiu J. Endobronchial lipoma: bronchoscopy, imaging and pathology. Ther Adv Respir Dis. 2014;8(5):162-4. http://dx.doi.org/10.1177/1753465814548190. PMid:25234277.

9. Sivapalan P, Gottlieb M, Christensen M, Clementsen PF. An obstructing endobronchial lipoma simulating COPD. Eur Clin Respir J. 2014;1(1):25664. http://dx.doi.org/10.3402/ecrj.v1.25664.

10. Azhar W, Zaidi F, Hannon A. Whistling lipoma: bronchial obstruction caused by a lipoma. Cureus. 2020;12(3):e7167. http://dx.doi.org/10.7759/cureus.7167. PMid:32257709.

11. Triviño A, Mora-Cabezás M, Vallejo-Benitez A, García-Escudero A, González-Cámpora R. Endobronchial lipoma: a rare cause of bronchial occlusion. Arch Bronconeumol. 2013;49(11):494-6. http://dx.doi.org/10.1016/j.arbr.2013.09.007. PMid:23680317.

12. Cao D, Sun Y, Yang S. Endobronchial lipoma: an unusual cause of bronchial obstruction. Case Rep Med. 2011;2011:939808. http://dx.doi.org/10.1155/2011/939808. PMid:21969834.

13. Sacristán Bou L, Fernández Robledo E, Peña Blas F. Endobronchial lipoma: an unusual cause of bronchial obstruction. Arch Bronconeumol. 2014;50(2):78-9. http://dx.doi.org/10.1016/j.arbr.2014.01.009. PMid:24119688.

14. Rooijakkers M, Wynants J, Aumann J. Endobronchial lipoma, an extremely rare benign tumour of the lung, mimicking asthma bronchiale. Acta Clin Belg. 2014;69(1):74-5. http://dx.doi.org/10.1179/001551132000000010. PMid:24635404.

15. Shinohara S, Hanagiri T, Takenaka M, et al. An endobronchial lipoma successfully resected by high-frequency electric snare: a report of 2 cases. J Bronchology Interv Pulmonol. 2012;19(1):68-71. http://dx.doi.org/10.1097/LBR.0b013e31823fa944. PMid:23207269.

16. Alves GRT, Pasquali M, de Silva RV, Haygert CJP. An infrequent cause of persistent cough: endobronchial lipoma. Ann Saudi Med. 2013;33(6):636-7. http://dx.doi.org/10.5144/0256-4947.2013.636. PMid:24413877.

17. Lamprecht B, Hutaurew G, Porsch P, Wegleitner B, Studnicka M. Successful bronchoscopic cryorecanalization in a case of endobronchial lipoma. Diagn Ther Endosc. 2011;2011:845686. http://dx.doi.org/10.1155/2011/845686. PMid:21789029.

18. Galvez C, Sesma J, Bolüfer S, et al. Single-incision video-assisted anatomical segmentectomy with handsewn bronchial closure for endobronchial lipoma. Ann Transl Med. 2016;4(15):284. http://dx.doi.org/10.21037/atm.2016.07.25. PMid:27570778.

19. Wang H, Du Z, Li A, Song J. Surgical treatment of an endobronchial lipoma obstructing the right upper bronchus: imaging features with pathological correlation. Pak J Med Sci. 2013;29(6):1447-9. http://dx.doi.org/10.12669/pjms.296.3708. PMid:24550972.

20. Madan K, Agarwal R, Bal A, Gupta D. Bronchoscopic management of a rare benign endobronchial tumor. Rev Port Pneumol. 2012;18(5):251-4. http://dx.doi.org/10.1016/j.rppneu.2012.02.003. PMid:22463875.

21. Chen H, Wang S, Zhou J, Liu S. Endobronchial lipoma presenting as recurrent pneumonia. QJM. 2020;113(11):834-5. http://dx.doi.org/10.1093/qjmed/hcaa087. PMid:32145027.

22. Pavlov PV, Kireyukhin AP, Puzakov KB, Rzayev RT, Derinov AA. Endobronchial lipoma: a rare cause of subsegmental bronchial obstruction. Respirol Case Rep. 2019;7(1):e00505. http://dx.doi.org/10.1002/rcr2.505. PMid:31788313.

23. Yazawa T, Igai H, Matsuura N, Ohsawa F, Kamiyoshitara M. Removal of an endobronchial lipoma via uniportal thoracoscopic right basal segmentectomy. Surg Case
Endobronchial lipoma

This study was carried out at the Medical College of Georgia, Augusta University.

Authors' contributions: Lakshitha Anbazhakan was the primary author and responsible for literature review and data collection. Asad Ullah was responsible for pathological interpretation of data. Rohit Munagala contributed to manuscript writing, revision, and the submission process. Rabih Bechara was responsible for interventional pulmonary debulking in case report. Islam Elhelf was responsible for radiological interpretation of case report. Nikhil Patel was the attending in histopathology for case report. Nagla Abdel Karim was the primary oncologist in case report and advisor for literature review. She also contributed to manuscript writing.

Ethics statement: Patient signed a blanket treatment consent form at the time of treatment at Augusta University which states that their case or information can be used for publication.

Conflict of interest: None

Financial support: None

Submitted on: November 22nd, 2021
Accepted on: April 7th, 2022

Correspondence
Nagla Abdel Karim
Augusta University, Medical College of Georgia
1120 15th Street, Augusta, GA 30912
Phone: 706-721-2505
nkarim@augusta.edu

Rep. 2020;6(1):212. http://dx.doi.org/10.1186/s40792-020-00973-z. PMid:32804314.

24. Lanotte S, Frognier R, Van Cutsem O, Mailleux P. Bronchial lipoma: an unusual cause of pleural empyema. JBR-BTR. 2015;98(2):88-90. http://dx.doi.org/10.5334/jbr-btr.773. PMid:30394415.

25. Bansal S, Utpat K, Desai U, Joshi JM. Endobronchial lipoma with tuberculosis: a solitary coetaneousness. Lung India. 2018;35(1):90-1. http://dx.doi.org/10.4103/lungindia.lungindia_319_17. PMid:29319046.

26. Wang Y, Teng Y, Li J, Lin T, Lu N, Yuan Y. Endobronchial lipoma with tracheobronchial aspergillosis: a case report. Medicine (Baltimore). 2021;100(11):e24381. http://dx.doi.org/10.1097/MD.0000000000024381. PMid:33725932.

27. Zhao S, Shui Y, Dai Z. Multiple endobronchial lipomas: rare benign lung tumors, two case reports. Intern Med. 2020;59(2):285-6. http://dx.doi.org/10.2169/internalmedicine.9289-17. PMid:32962678.

28. Nussbaumer-Ochsner Y, Rassouli F, Uhlmann F, Thurnheer R. Endobronchial lipoma mimicking bronchial carcinoid tumour. Thorax. 2015;70(8):809. http://dx.doi.org/10.1136/thoraxjnl-2015-206923. PMid:25828429.

29. Yun SC, Na MJ, Choi E, et al. Successful removal of endobronchial lipoma by flexible bronchoscopy using electrosurgical snare. Tuberc Respir Dis (Seoul). 2013;74(2):82-5. http://dx.doi.org/10.4046/trd.2013.74.2.82. PMid:23482342.

30. Flores-Franco RA, González-Calzadillas LF, Cota-Castro S. Successful endoscopic resection of an endobronchial lipoma using a percutaneous gastrostomy snare device. Arch Bronconeumol. 2018;54(4):235-6. http://dx.doi.org/10.1016/j.arbres.2017.10.004. PMid:29198487.

31. Jauretia Largo S, de Vega Sánchez B, Disdier Vicente C. Endobronchial lipoma excision by clyotherapy and flexible bronchoscopy. Exéresis mediante crioterapia y broncoscopia flexible de lipoma endobronquial. Arch Bronconeumol. 2019;55(9):490. http://dx.doi.org/10.1016/j.arbres.2019.02.008. PMid:30879877.

32. On R, Kushima H, Ishii H, Watanabe K. Endobronchial lipoma: the diagnostic benefit of computed tomography findings. Intern Med. 2018;57(2):285-6. http://dx.doi.org/10.2169/internalmedicine.9289-17. PMid:29033444.

33. Pollefiet C, Peters K, Janssens A, et al. Endobronchial lipomas: rare benign lung tumors, two case reports. J Thorac Oncol. 2009;4(5):658-60. http://dx.doi.org/10.1097/JTO.0b013e31819c9a59. PMid:19395910.

34. Huisman C, van Kralingen KW, Postmus PE, Sutedja TG. Endobronchial lipoma: a series of three cases and the role of electrocautery. Respiration. 2000;67(6):689-92. http://dx.doi.org/10.1159/000056302. PMid:11124655.