Intrapulmonary bronchogenic cyst mimicking primary lung cancer with atypical radiological findings

Toru Nakamura, Shouichi Takayama, Tomonari Oki, Yoshiro Otsuki, Kazuhito Funai, Futoru Toyoda

ABSTRACT

Introduction: Bronchogenic cyst is a congenital disease secondary to abnormal budding of the bronchial tree during embryonic development. It usually develops in the mediastinum and is rarely seen in the lung parenchyma. A diagnosis is often made before surgery because of its typical cystic appearance in computed tomography scan and magnetic resonance imaging scan.

Case Report: A 71-year-old female presented with an abnormal shadow in her right lung on a chest radiograph. She underwent right upper lobectomy, under the suspicion that the nodule was primary lung cancer. Pathological examination showed an intrapulmonary bronchogenic cyst with a thickened cyst wall containing hyalinized fibrous tissue and lymphocyte infiltration.

Conclusion: Even an asymptomatic bronchogenic cyst might have been affected by an infectious event in the past, and could reveal a variety of atypical radiological findings.
Intrapulmonary bronchogenic cyst mimicking primary lung cancer with atypical radiological findings

Toru Nakamura, Shouichi Takayama, Tomonari Oki, Yoshiro Otsuki, Kazuhito Funai, Futoru Toyoda

ABSTRACT

Introduction: Bronchogenic cyst is a congenital disease secondary to abnormal budding of the bronchial tree during embryonic development. It usually develops in the mediastinum and is rarely seen in the lung parenchyma. A diagnosis is often made before surgery because of its typical cystic appearance in computed tomography (CT) scan and magnetic resonance imaging (MRI) scan. We herein report a case of intrapulmonary bronchogenic cyst mimicking primary lung cancer with unusual radiological findings.

CASE REPORT

A 71-year-old female demonstrated an abnormal shadow in the right lung on a chest X-ray. She had no symptoms or remarkable history. Enhanced chest CT scan revealed an irregular nodule in the right upper lobe with a pleural indentation-like appearance and a heterogeneous enhancement suggesting the primary lung cancer but benign cyst (Figure 1). Positron emission tomography (PET) scan was not available then. MRI scan of brain and abdominal CT scan revealed no metastatic lesions. Although a transbronchial biopsy could not
yield a histological diagnosis, we strongly suspected the lesion was non-small cell lung cancer (T2aN0M0 stage I B) and planned surgery with diagnostic and therapeutic intent. She underwent right upper lobectomy without needle aspiration to avoid bleeding or air embolism because the lesion located close to the hilar structures. The cut surface of the surgical specimen revealed a cystic appearance circumscribed by a thickened wall and intraoperative frozen examination showed no malignancy. The postoperative course was uneventful and she was discharged on the seventh postoperative day.

Histological examination revealed that the cyst wall contained cartilage, smooth muscle, and glandular tissue, confirming a diagnosis of intrapulmonary bronchogenic cyst (Figure 2A). The cyst wall also contained hyalinized fiber and mild lymphocyte infiltration, suggesting a past infection that might have caused the irregular radiological findings (Figure 2B).

**DISCUSSION**

Bronchogenic cyst is one of the bronchopulmonary malformations that result from an abnormal budding of the tracheobronchial tree [1]. It usually develops in the mediastinum and is rarely seen in the lung. Its typical cystic appearance can be visualized on CT scan and MRI scan [2]. However, we misdiagnosed the present case as primary lung cancer because of its distribution in the lung and the radiological findings suggested malignancy rather than a benign cyst due to an irregular shape and a heterogeneous enhancement. Histological examination revealed hyalinized fibrous tissue and lymphocyte infiltration along the cyst wall. Although the present patient had no remarkable history of pneumonia, a latent infection in the past might have caused these histological changes and resulted in the unusual radiological findings mimicking lung cancer.

Surgical resection is required both in stage I non-small cell lung cancer and bronchogenic cyst [2, 3]. Although the present patient underwent lobectomy, we could have chosen a lung-sparing approach based on a preoperative diagnosis of the cyst [4]. We should have performed chest MRI scan in this case because it is useful not only in detecting a cyst but also in differentiating malignancy from benign tumors as PET scan was not available [5].

**CONCLUSION**

Even an asymptomatic bronchogenic cyst might have been affected by an infectious event in the past, and could reveal a variety of atypical radiological findings. Therefore, bronchogenic cyst should be raised as a differential diagnosis for an undiagnosed lung lesion.

****

**Acknowledgements**

We thank Mr. Ohta, a staff of academic and public relations office of Seirei Hamamatsu General Hospital, for converting the radiological films into the file formats.

**Author Contributions**

Toru Nakamura – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Shouichi Takayama – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Tomonari Oki – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Yoshiro Otsuki – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Kazuhito Funai – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Futoru Toyoda – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published
Guarantor
The corresponding author is the guarantor of submission.

Conflict of Interest
Authors declare no conflict of interest.

Copyright
© 2015 Toru Nakamura et al. This article is distributed under the terms of Creative Commons Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original publisher are properly credited. Please see the copyright policy on the journal website for more information.

REFERENCES

1. O'Rahilly R, Müller F. Chevalier Jackson lecture. Chevalier Jackson lecture. Respiratory and alimentary relations in staged human embryos. New embryological data and congenital anomalies. Ann Otol Rhinol Laryngol 1984 Sep-Oct;93(5 Pt 1):421–9.
2. McAdams HP, Kirejczyk WM, Rosado-de-Christenson ML, Matsumoto S. Bronchogenic cyst: imaging features with clinical and histopathologic correlation. Radiology 2000 Nov;217(2):441–6.
3. Patel SR, Meeker DP, Biscotti CV, Kirby TJ, Rice TW. Presentation and management of bronchogenic cysts in the adult. Chest 1994 Jul;106(1):79–85.
4. Criscione A, Scamporlino A, Calvo D, Migliore M. Lung-sparing approach for an intrapulmonary bronchogenic cyst involving the right upper and middle lobes. BMJ Case Rep 2013 Oct 16;2013.
5. Bartoletti R, Meliani E, Bongini A, Magno C, Cai T. Fluorodeoxyglucose positron emission tomography may aid the diagnosis of aggressive primary prostate cancer: A case series study. Oncol Lett 2014 Feb;7(2):381–6.
Edorium Journals: An introduction

Edorium Journals Team

About Edorium Journals
Edorium Journals is a publisher of high-quality, open access, international scholarly journals covering subjects in basic sciences and clinical specialties and subspecialties.

Invitation for article submission
We sincerely invite you to submit your valuable research for publication to Edorium Journals.

But why should you publish with Edorium Journals?
In less than 10 words - we give you what no one does.

Vision of being the best
We have the vision of making our journals the best and the most authoritative journals in their respective specialties. We are working towards this goal every day of every week of every month of every year.

Exceptional services
We care for you, your work and your time. Our efficient, personalized and courteous services are a testimony to this.

Editorial Review
All manuscripts submitted to Edorium Journals undergo pre-processing review, first editorial review, peer review, second editorial review and finally third editorial review.

Peer Review
All manuscripts submitted to Edorium Journals undergo anonymous, double-blind, external peer review.

Early View version
Early View version of your manuscript will be published in the journal within 72 hours of final acceptance.

Manuscript status
From submission to publication of your article you will get regular updates (minimum six times) about status of your manuscripts directly in your email.

Our Commitment

Six weeks
You will get first decision on your manuscript within six weeks (42 days) of submission. If we fail to honor this by even one day, we will publish your manuscript free of charge.

Four weeks
After we receive page proofs, your manuscript will be published in the journal within four weeks (31 days). If we fail to honor this by even one day, we will publish your manuscript free of charge and refund you the full article publication charges you paid for your manuscript.

Most Favored Author program
Join this program and publish any number of articles free of charge for one to five years.

Favored Author program
One email is all it takes to become our favored author. You will not only get fee waivers but also get information and insights about scholarly publishing.

Institutional Membership program
Join our Institutional Memberships program and help scholars from your institute make their research accessible to all and save thousands of dollars in fees make their research accessible to all.

Our presence
We have some of the best designed publication formats. Our websites are very user friendly and enable you to do your work very easily with no hassle.

Something more...
We request you to have a look at our website to know more about us and our services.

We welcome you to interact with us, share with us, join us and of course publish with us.