Journal of Clinical Imaging Science

Editor-in-Chief: Vikram S. Dogra, MD
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CASE REPORT

Non-Azygos Accessory Fissure in Right Upper Lobe Associated with Superior and Inferior Accessory Fissures in Right Lower Lobe

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Received : 23-10-2012
Accepted : 12-11-2012
Published : 27-12-2012

ABSTRACT

Accessory fissures in the lungs are common congenital variations, usually detected as incidental findings in radiographs or CT scan. Accessory fissures can act as an anatomic barrier to the spread of inflammatory or neoplastic disease, as well as due to the variant anatomy, mimic lesions. It is important to recognize the presence of accessory fissures, as they affect surgical planning of pulmonary lobectomy and segmentectomy. Accessory fissure in the right upper lobe other than due to the anomalous course of azygos vein is very rare. We report a case of non-azygos accessory fissure, between the apical and the anterior segments of right upper lobe, along with superior and inferior accessory fissures in the right lower lobe.

Key words: Accessory fissures, bronchopulmonary segments, congenital variations, fissures, pleura

INTRODUCTION

Accessory fissures in the lungs are common congenital variations, which occur due to lack of obliteration of fissures separating individual bronchopulmonary segments during the development. Presence of accessory fissures should be documented in the radiological report as they affect the surgical planning, especially in pulmonary malignancies. We report a case of non-azygos accessory fissure between the apical and the anterior segments of the right upper lobe, associated with inferior and superior accessory fissures in the right lower lobe, which was detected in the CT-portion of Positron Emission Tomography-Computed Tomography (PET-CT).

Access this article online	
Quick Response Code:	Website: www.clinicalimagingscience.org
	DOI: 10.4103/2156-7514.105133

CASE REPORT

A 40-year-old woman with a known diagnosis of extra-nodal (bone marrow, spleen, and pleural fluid) stage IV diffuse large B-cell lymphoma was referred for baseline PET-CT scan before the initiation of treatment. PET-CT scan showed diffuse increased fluorodeoxyglucose uptake in the marrow consistent with known marrow involvement by lymphoma, in addition to splenomegaly. Incidentally noted in the CT portion of the PET-CT was an accessory fissure in the right upper lobe. Prior dedicated CT scan

This article may be cited as:
Muttikkal TJ, Deng C. Non-azygos accessory fissure in right upper lobe associated with superior and inferior accessory fissures in right lower lobe. J Clin Imaging Sci 2012;2:79.
Available FREE in open access from: http://www.clinicalimagingscience.org/text.asp?2012/2/1/79/105133

of the chest was reviewed. The dedicated CT scan of the chest demonstrated the fissure better than the CT portion of the PET-CT, due to lack of breathing artifact and the accentuation caused by the pleural effusion. The accessory fissure was between the apical and anterior segments of the right upper lobe [Figures 1 and 2]. The contrast-enhanced CT scan showed normal location and course of the azygos vein [Figure 1]. In addition, the patient also had inferior and superior accessory fissures in the right lower lobe [Figures 3 and 4].

DISCUSSION

Accessory fissures are common congenital variations. Accessory fissures generally occur between bronchopulmonary segments, as a cleft of varying depth lined by visceral pleura.

They are more common in fetal and neonatal lung specimens than in adult lung specimens.[1] During the development, the lung tissue grows as multiple bronchopulmonary buds with fissures separating individual bronchopulmonary segments. Later, the fissures separating individual bronchopulmonary segments become obliterated except the major (oblique) and minor (horizontal) fissures in a fully developed lung.[2] Accessory fissure results from non-obliteration of spaces, which are normally obliterated.

The accessory fissures are not well demonstrated in conventional CT examinations, due to thick slices and orientation of the fissures relative to the scan plane. High-Resolution Computed Tomography (HRCT) demonstrates the accessory fissures at a higher frequency compared to conventional CT scan with thicker sections due to better spatial resolution as a result of narrow collimation and high-spatial resolution reconstruction algorithm.[3,4] Multi-Detector Computed Tomography (MDCT) has even higher sensitivity for detection of accessory fissures, with incidence of accessory fissures being similar to anatomical studies due to further thin cuts, faster speed, and volumetric acquisition.[5] Common accessory fissures include the inferior accessory fissure (demarcates the medial basal segment of the lower lobe), left minor fissure (demarcates the lingula), and superior accessory fissure (demarcates the superior segment of lower lobes).[2,5] Less common accessory fissures include the fissures between medial and lateral segments of middle lobe, between superior and inferior segments of lingula, between anterobasal and laterobasal segments of lower lobes, between apicoposterior and anterior segments of left upper lobe, and azygos fissure (resulting from the abnormal course of the azygos vein).[5] In a retrospective study of 150 cases by Cronin et al.,[4] using MDCT, the incidence of accessory fissures was found to be: Superior accessory fissure 6%, inferior accessory fissure 12.7%, left minor fissure 16%, fissure between medial and lateral segments of middle lobe 5.3%, fissure between superior and inferior segment of lingula 2.7%, fissure between anterobasal and laterobasal segment 3.3%, and azygos fissure 0.7%. Our patient had an accessory fissure between the apical and the anterior segments of the right upper lobe. Accessory fissure in the right upper lobe other than due to the anomalous course of azygos vein is very rare.[6] Gowrinath et al., reported a case of non-azygos accessory fissure between the apical and the posterior segments of right upper lobe.[6] Tüzün

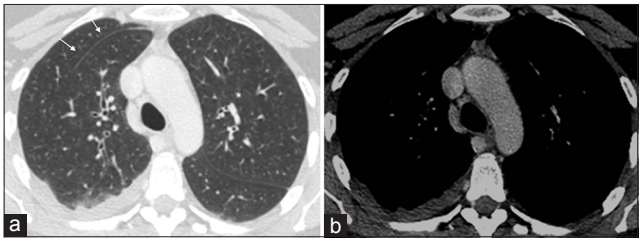

Figure 1: (a) Axial CT image shows the non-azygos accessory fissure in the right upper lobe (arrows), (b) Contrast-enhanced axial CT scan shows the normal location of the azygos vein.

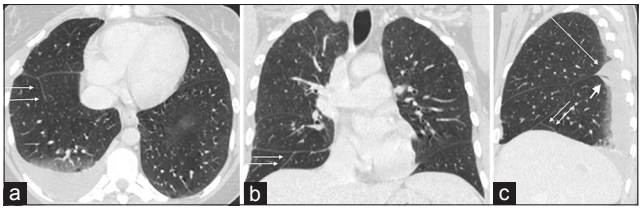

Figure 3: (a) Axial, (b) Coronal reformatted and (c) Sagittal reformatted images show the inferior accessory fissure in the right lower lobe (double arrows). Extension of pleuraleffusion in to major fissure (long arrow), and superior accessory fissure (short thick arrow) is revealed in the sagittal reformatted image.

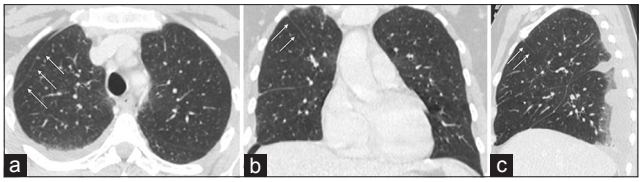

Figure 2: (a) Axial, (b) Coronal reformatted and (c) Sagittal reformatted images show the non-azygos accessory fissure in the right upper lobe (arrows), between the apical and anterior segments. Right pleural effusion is seen extending into the posterior portion of the major fissure in the sagittal reformatted image.

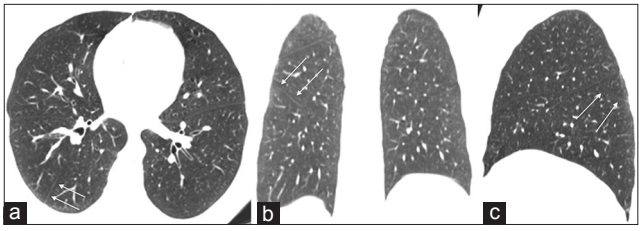

Figure 4: (a) Axial, (b) Coronal reformatted and (c) Sagittal reformatted images of the follow-up CT scan after the resolution of pleural effusion show the superior accessory fissure in the right lower lobe (arrows).

et al., described double accessory fissures in the upper lobe of the right lung which are likely variation of an azygos fissure (double azygos fissures), since their configurations and locations were similar.[7] Our patient also had superior and inferior accessory fissures in the right lower lobe. To the best of our knowledge, non-azygos accessory fissure between the apical and the anterior segments of right upper lobe, associated with superior and inferior accessory fissures of the right lower lobe has not been described in the literature.

The pleural fissures can act as an anatomic barrier to the spread of inflammatory or neoplastic disease. Accessory fissure may cause diagnostic confusion as it can limit the spread of disease within the lung, mimicking atelectasis, scar, mass, or loculated pleural effusion in radiographs.[8] Recognition of the accessory fissures provides additional information in segmental localization of lesions.[9] Accessory fissures are important in the planning of pulmonary lobectomy and segmentectomy.[10]

CONCLUSION

Although the accessory fissures are incidental findings detected on radiographs or CT scan, they are important as they present an anatomic barrier to the spread of inflammatory or neoplastic disease as well as mimic lesions. Recognition of the accessory fissures provides additional information for segmental localization of pulmonary lesions, as well as help in surgical planning.

REFERENCES

1. Godwin JD, Tarver RD. Accessory fissures of the lung. AJR Am J Roentgenol 1985;144:39-47.
2. Larsen WJ. Human Embryology. New York: Churchill Livingstone, 1993. p. 111-30.
3. Yildiz A, Gölpinar F, Calikoğlu M, Duce MN, Ozer C, Apaydin FD. HRCT evaluation of the accessory fissures of the lung. Eur J Radiol 2004;49:245-9.
4. Mayo JR, Webb WR, Gould R, Stein MG, Bass I, Gamsu G, et al. High-resolution CT of the lungs: An optimal approach. Radiology 1987;163:507-10.
5. Cronin P, Gross BH, Kelly AM, Patel S, Kazerooni EA, Carlos RC. Normal and accessory fissures of the lung: Evaluation with contiguous volumetric thin-section multidetector CT. Eur J Radiol 2010;75:e1-8.
6. Gowrinath K, Magazine R, Shetty CM, Desai P. An unusual accessory fissure in the right upper lobe. Res Med CME 2010;3:101-2.
7. Tüzün M, Hekimoğlu B. Double accessory fissures in the upper lobe of the right lung (double azygos fissures?): High resolution computed tomography appearance. Acta Radiol 2004;45:109-10.
8. Rigler LG, Ericksen LG. The inferior accessory lobe of the lung. AJR Am J Roentgenol 1933;29:384-92.
9. Berkmen T, Berkmen YM, Austin JH. Accessory fissures of the upper lobe of the left lung: CT and plain film appearance. AJR Am J Roentgenol 1994;162:1287-93.
10. Ariyürek OM, Gülsün M, Demirkazik FB. Accessory fissures of the lung: Evaluation by high-resolution computed tomography. Eur Radiol 2001;11:2449-53.

Source of Support: Nil, **Conflict of Interest:** None declared.