Case report

Azygos lobe: A rare cause of right paratracheal opacity

Jamal Akhtar a,⁎, Amos Lai b, Kevin B. Martin b, Joel Popkin a

a Department of Internal Medicine, Saint Vincent Hospital, Worcester, MA, USA
b Pulmonary Division, Reliant Medical Group, Worcester, MA, USA

ARTICLE INFO

Keywords:
Azygos lobe
Azygos fissure
Rare variant

ABSTRACT

A 55 year old male presented with a complaint of dyspnea and non productive cough. He was found to have right paratracheal opacity on Chest X ray. Chest CT scan revealed right sided azygos lobe. An azygos lobe is a rare congenital variant of the right lung, usually diagnosed as an incidental finding.

1. Introduction

An azygos lobe is a rare congenital variant usually of the right lung, not a true separate lobe. It is important to have a good understanding of the entity, as it can mimic certain pathological conditions like bullae, abscesses or lung masses. It is also important in preparation for surgical procedures.

2. Case report

A 55 year old male presented with a complaint of dry cough and dyspnea. A chest x ray revealed right paratracheal opacity (Fig. 1). The chest CT showed minor air space disease with an air bronchogram in the left lower lobe. There was also tree in bud nodularity with scattered subcentimeter ground glass nodules involving the left lower lobe. It also incidentally revealed an azygous fissure along with an azygos lobe on the right side (Fig. 2a and 2b). He was treated for pneumonia.

3. Discussion

An azygos lobe is a rare normal anatomic variant of the right upper lobe, first described by Heinrich Wrisberg in 1778 [1]. Its prevalence varies from 0.4% on chest radiograph to 1.2% on high resolution CT scans. It is usually diagnosed incidentally on imaging [2]. It is typically located in the apicominal portion of the right lung, separated from the rest of the right upper lobe by a visible fissure, termed an azygous fissure. The fissure can be identified as a fine, convex line on a chest radiograph in the para mediastinal portion of the right lung. The upper most part of the fissure is triangular shaped and known as “trigonum parietale” containing a small amount of areolar tissue between the parietal layers of pleura. The lower most portion of the azygous fissure is tear drop shaped and contains the azygos vein [3].

The azygos vein is normally formed by the union of the right subcostal vein and the right ascending lumbar vein at the level of the L1/L2 vertebrae. It enters through the diaphragmatic aortic hiatus into the thoracic cavity, ascends along the anterolateral surface of the thoracic vertebrae, takes a curve at T4 and then joins the superior vena cava. The azygos vein arch appears as a tear drop on x ray and is normally located at the caudal point of the right paratracheal stripe, at the right tracheobronchial angle. The azygos lobe is formed when the right posterior cardinal vein, which is one of the precursors of the azygos vein penetrates the right lung apex, rather than migrating over it. The cardinal vein carries both pleural layers with it, resulting in entrapment of a portion of the right upper lobe. The double folds of visceral and parietal pleura form a mesentry like structure, termed the mesoazygos or azygous fissure, containing the azygos vein arch in its lower most portion [4].

The azygos lobe is not truly a separate lobe, as it does not have its own bronchus and does not correspond to a specific bronchopulmonary segment. Embryologically the azygos lobe is a part of the right upper lobe and its bronchial and arterial supplies arise from the apical or posterior segments of the right upper lobe [5,6]. Left azygos lobe has been reported as well, but it is extremely rare [7,8].

Understanding the structure of the azygos lobe is important. It can mimic bullae, abscesses or a paratracheal opacity [9,10]. Sometimes the azygos vein located in the lower most part of azygous fissure can mimic a pulmonary nodule [3]. Consolidation of the azygos lobe can mimic a lung mass [3]. For thoracoscopic procedures, recognition of the azygos lobe is particularly important as partial obstruction of surgical site view during thoracoscopic sympathectomy has been reported by Smith et al. [11]. Two cases were reported by Bancroft et al. where the phrenic nerve was coursing within the azygos fissure [12]. The azygos fissure or pleural folds helps in preventing dissemination of the infection to the azygos lobe from adjacent parts of the lung. However, multiple cases of
spontaneous pneumothorax associated with an azygous lobe have been reported [13,14]. Recurrent hemoptysis, as a complication of an azygos lobe, has also been reported by Denega et al. [15]. An azygos vein aneurysm can also occur, which may present as a round or oval para-tracheal shadow [16,17].

Scars, walls of bullae and displaced fissures can mimic an azygos fissure, leading to misdiagnosis of an azygos lobe on chest radiograph. Identification of an azygos vein in its normal position at the angle between the trachea and right bronchus on a radiograph can be helpful to rule out an azygos lobe. Confirmation of the diagnosis can be done by CT [2]. Change in intrathoracic pressure can result in displacement of the azygos vein from the azygos fissure to the mediastinum, which is termed an empty or vanishing azygous fissure [18]. Betschart et al. reported an empty azygos fissure secondary to an iatrogenic pneumothorax [19].

Although the azygos lobe is an incidental finding and usually not important clinically, physicians and especially thoracic surgeons should be aware of this anomaly.

Fig. 1. Chest X ray (PA view) showing right paratracheal opacity.

Fig. 2. CT Chest showing azygos lobe in the apicomedial portion of the right lung, separated from rest of the lung by azygous fissure.

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.rmcr.2018.02.001.

References

[1] A. Ndiaye, N.B. Ndiaye, A. Ndiaye, M. Diop, J.M. Ndoye, A. Dia, The azygos lobe: an unusual anatomical observation with pathological and surgical implications, Anat. Sci. Int. 87 (3) (2012 Sep) 174–178.
[2] J. Mata, Caceres Jose, X. Alegret, P. Coscojuela, J.A. De Marcos, Imaging of the azygos lobe: normal anatomy and variations, AJR Am. J. Roentgenol. 156 (1991) 931–937.
[3] J. Caceres, J. Mata, J. Andreu, The azygos lobe: normal variants that may simulate disease, Eur. J. Radiol. 27 (1998) 15–20.
[4] A. Chabot-Naud, G. Rakovich, K. Chagnon, D. Ouellerre, G. Beauchamp, A curious lobe, Can Respir. J. 18 (2) (2011 Mar-Apr) 79–80.
[5] G. Pradhan, S. Sahoo, S. Mohankudo, Y. Dhanurdhar, S.K. Jagaty, Azygos lobe - a rare anatomical variant, J. Clin. Diagn. Res. 11 (3) (2017 Mar) TJ02.
[6] J. Wall, S.P. Stavicki, The azygos lobe, Int. J. Acad. Med. 3 (2017) 189–190.
[7] J.E. Takasugi, J.D. Godwin, Azygos lobe, Radiology 171 (1) (1989 Apr) 133–134.
[8] M.B. Lesser, Left azygos lobe. report of a case, Dis. Chest 46 (1964 Jul) 95–96.
[9] B. Felson, The azygos lobe: its variation in health and disease, Semin. Roentgenol. 24 (1989) 56–66.
[10] V.T. Salve, J.S. Attram, Y.V. Mhaske, Azygos lobe presenting as right para-tracheal shadow, Lung India 32 (1) (2015 Jan-Feb) 85–86.
[11] J. Smith, S. Karthik, J.A. Thorpe, Pulmonary azygous lobe: a potential obstacle during thoracoscopic sympathnectomy, Eur. J. Cardio. Thorac. Surg. 25 (2004) 137.
[12] A. Bancroft, R.E. Stephens, Course variability of the phrenic nerve in the presence of an azygos lobe: two case reports, Clin. Anat. 20 (2007) 982–983.
[13] K. Asai, N. Urabe, H. Takesichi, Spontaneous pneumothorax and a coexistent azygos lobe, Jpn. J. Thorac. Cardiovasc. Surg. 53 (2005) 604–606.
[14] A.F. Rakototiana, A.J. Rakotoniainina, F. Hounal, Y. Laborde, Spontaneous pneumothorax and azygos lobe in a child, Arch. Pediatr. 12 (2005) 1406.
[15] T. Denega, S. Aklad, E. Islam, R. Alalawi, Recurrent Hemothorax - a complication associated with an azygos lobe, Southwest Respir. Crit. Care Chronicles 3 (11) (2015).
[16] P. Icard, E. Fares, J.F. Regnard, P. Levasseur, Thrombosis of an idiopathic saccular azygos aneurysm, Eur. J. Cardio-Thorac. Surg. 15 (6) (1999) 870–872.
[17] S.F. Ko, C.-C. Huang, H.-I. Lu, C.-T. Kung, S.-H. Ng, Y.-L. Wan, H.-K. Yip, Imaging features and outcomes in 10 cases of idiopathic azygos vein aneurysm, Ann. Thorac. Surg. 97 (3) (2014) 873–878.
[18] V. Leznir, B. Kohler, X. Monier, The empty azygos fissure, J. Radiol. Case Rep. 7 (4) (2013) 10–15.
[19] T. Betschart, G.W. Goerres, Azygos lobe without azygos vein as a sign of previous iatrogenic pneumothorax: two case reports, Surg. Radiol. Anat. 31 (7) (2009 Aug) 559–562.