

Chronic Obstructive Pulmonary Diseases: Journal of the COPD Foundation



Images in COPD

Images in COPD: Giant Bullous Emphysema

Parag Desai, MD¹ Robert Steiner, MD^{1,2}

Abbreviations: giant bullous emphysema, GBE

Funding Support: None

Date of Acceptance: January 15, 2016

Citation: Desai P, Steiner R. Images in COPD: Giant bullous emphysema. *Chronic Obstr Pulm Dis (Miami)*. 2016; 3(3): 698-701. doi: <http://dx.doi.org/10.15326/jcopdf.3.3.2016.0154>

1 Thoracic Medicine and Surgery, Temple University Health System, Philadelphia, Pennsylvania

2 Department of Radiology, Temple University Health System, Philadelphia, Pennsylvania

Address correspondence to:

Parag Desai, MD
3401 N. Broad Street
Suite 710-C
Philadelphia, PA 19140
Parag.desai@tuhs.temple.edu

Keywords:

giant bullous emphysema; COPD; chronic obstructive pulmonary disease; images; video-assisted thoracoscopy

Case Description

A 51 year-old white male with a 55 pack year history of tobacco use presented to the pulmonary clinic for evaluation of dyspnea. Pulmonary function testing revealed moderate obstructive airflow disease with significant bronchodilator response and measurement of lung volumes revealed significant hyperinflation and air trapping. The diffusion lung capacity for carbon monoxide was normal. A computed tomography of the chest showed a large bulla in the left upper lobe contiguous with the anterior mediastinum measuring 15.7x17.9x9.16cm. Also noted, was a light mass effect on the anterior mediastinum with shift to the right. A small bulla at the right apex measuring 3.4x1.5cm. was also seen. There was no interstitial lung disease or bronchiectasis noted. Minimal centrilobular emphysema was present bilaterally. There was no lymphadenopathy. There were surgical clips on the right hemidiaphragm

with minimal postoperative pleural thickening along the right costophrenic recess (prior surgery from bullet wound). He underwent robotic-assisted left apical bullectomy with pleurodesis with improvement of air trapping and hyperinflation and overall improvement in his dyspnea and functional status. (See Figures 1a, 1b, 2a, 2b, 2c)

Discussion

Giant bullous emphysema (GBE) was first described in 1937 by Burke in a young male cigarette smoker with a large bullae in the upper lobe associated with paraseptal emphysema in 1937.¹ Fifty years later Roberts provided

Figure 1a. Left Upper Lobe Bulla on Posterior-Anterior Film



Figure 1b. Left Upper Lobe Bulla as Seen From Lateral Film

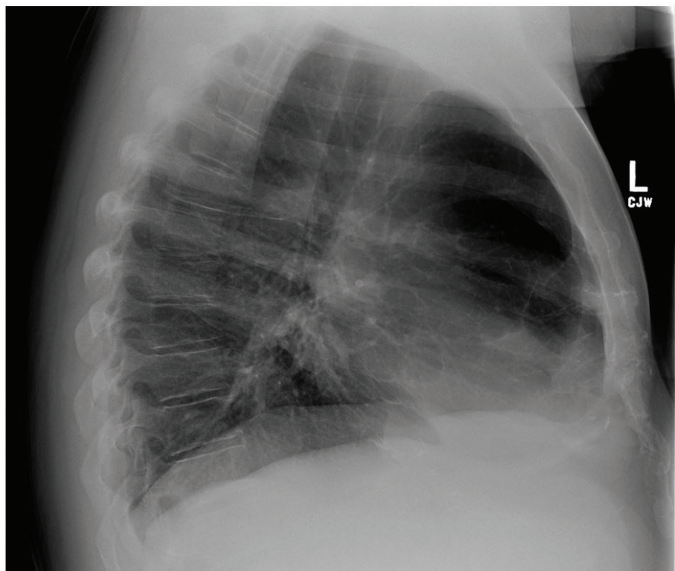


Figure 2a. Left Bulla on Computed Tomography of Chest



Figure 2b. Left Bulla on Computed Tomography of Chest

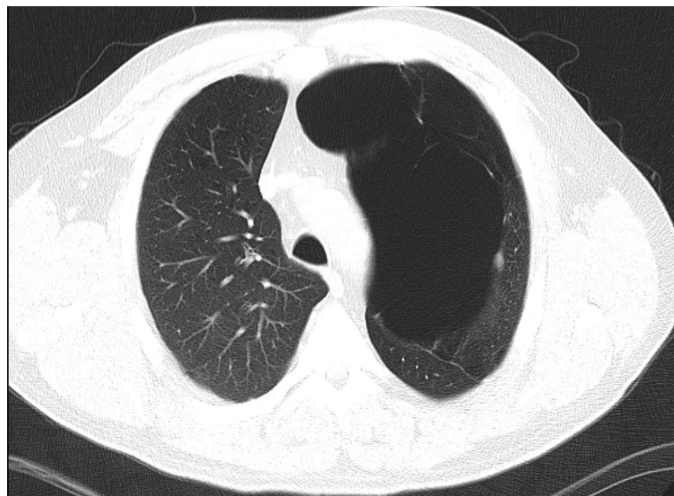
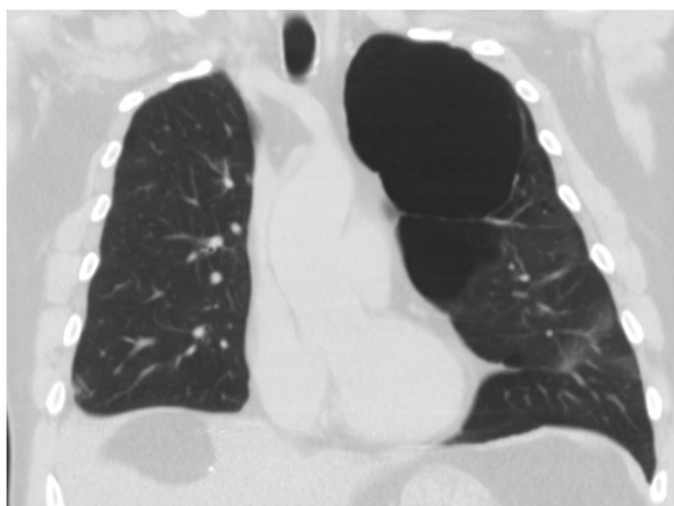


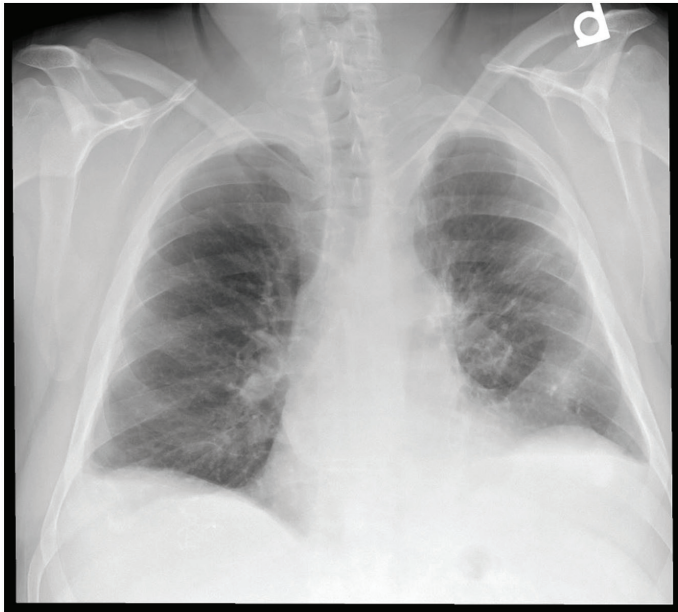
Figure 2c. Left Bulla on Computed Tomography of Chest



radiographic criteria for GBE: presence of giant bulla in one or more upper lobes (mostly unilateral), often asymmetrical, occupying at least one-third of the hemithorax and compressing surrounding normal lung parenchyma.² High resolution computed tomography is the best imaging modality to characterize the extent of bullous disease; it also helps to identify and characterize co-existing pathologies (centrilobular emphysema, cysts, bronchiectasis, pulmonary artery enlargement).^{3,4} Surgery is often a treatment option; either preventative (when GBE occupies >1/3 of hemithorax) or to treat complications from GBE (mediastinal compression,

cardiovascular compromise, or temporal increase in size of GBE).^{5,6} Video-assisted thoracoscopy is a safe and effective approach and can lead to improvement in quality of life (Figure 3).⁷ Bronchoscopic placement of endobronchial valves has also been reported as a treatment option.⁸

Figure 3. Post Video-Assisted Thoracoscopy Chest X-Ray



References

1. Burke RM. Vanishing lungs: a case report of bullous emphysema. *Radiology*. 1937;28(3):367-371. doi: <http://dx.doi.org/10.1148/28.3.367>
2. Roberts L, Putman CE, Chen JTT, Goodman LR, Ravin CE. Vanishing lung syndrome: upper lobe bullous pneumopath. *Rev Interam Radiol*. 1987; 12:349-255.
3. Morgan MDL, Strickland B. Computed tomography in the assessment of bullous lung disease. *Br J Dis Chest*. 1984; 78(1): 10-25. doi: [http://dx.doi.org/10.1016/0007-0971\(84\)90093-7](http://dx.doi.org/10.1016/0007-0971(84)90093-7)
4. Sharma N, Justaniah A, Kanne JP, Gurney JW, Mohammed TLH. Vanishing lung syndrome (giant bullous emphysema): CT findings in 7 patients and a literature review. *J Thorac Imaging*. 2009; 24(3); 227-230. doi: <http://dx.doi.org/10.1097/RTI.0b013e31819b9f2a>
5. Greenberg JA, Singhal S, Kaiser LR: Giant bullous lung disease: evaluation, selection, techniques and outcomes. *Chest Surg Clinic N Am*. 2003;13 (4):631-649. doi: [http://dx.doi.org/10.1016/S1052-3359\(03\)00095-4](http://dx.doi.org/10.1016/S1052-3359(03)00095-4)
6. Palla A, Desideri MT, Rossi G, Bardi G, Mazzantini D, Mussi AF, et al. Elective surgery for giant bullous emphysema - A 5 year clinical and functional follow-up. *Chest*. 2005;128(4):2043-2050. doi: <http://dx.doi.org/10.1378/chest.128.4.2043>
7. Menconi GF, Melfi FMA, Mussi A, Pallan A, Ambrogi MC, Angelleti CA. Treatment by VATS of giant bullous emphysema: results. *Eur J Cardio-Thorac Surg*. 1998; 13(1):66-70. doi: [http://dx.doi.org/10.1016/S1010-7940\(97\)00294-7](http://dx.doi.org/10.1016/S1010-7940(97)00294-7)
8. Noppen M, Tellings J-C, Dekenkeleire T, Dieriks B, Hanson S, et al. Successful treatment of giant emphysematous bulla by bronchoscopic placement of endobronchial valves. *Chest*. 2006; 130(5): 1563-1565. doi: <http://dx.doi.org/10.1378/chest.130.5.1563>