

خصوصيّات الجراحة عند المصابين بالأمراض الرئويّة المزمنة السّادة

COPD For Surgery

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المؤتمر السنوي للرابطة السورية لطب وجراحة الصدر – دمشق – 2023

The Global Burden Of COPD

- COPD Is the third common cause of death worldwide .
- The prevalence of COPD Is estimated to be ~ 1% across all ages rising steeply to > 10 % amongst those aged > 40 years.
- High economic costs .

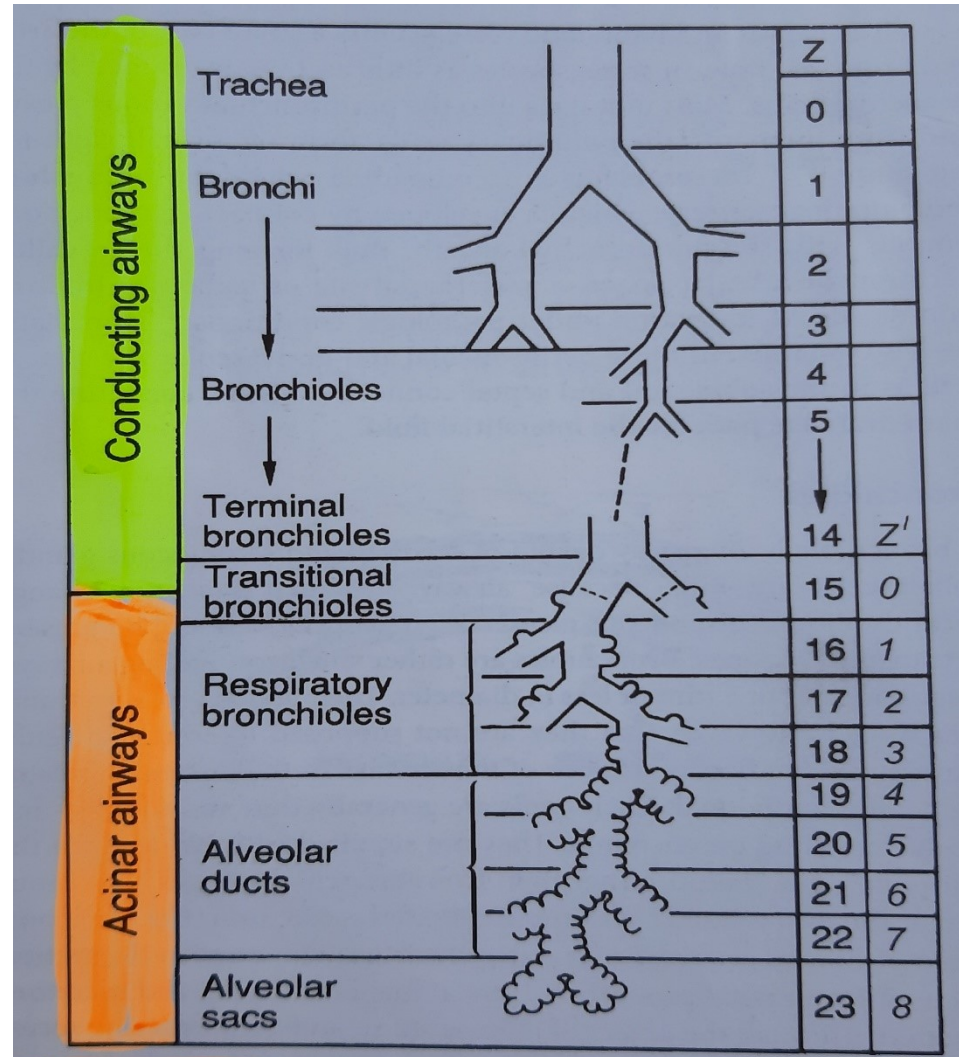
Definition of COPD

According To GOLD Guidelines – 2017

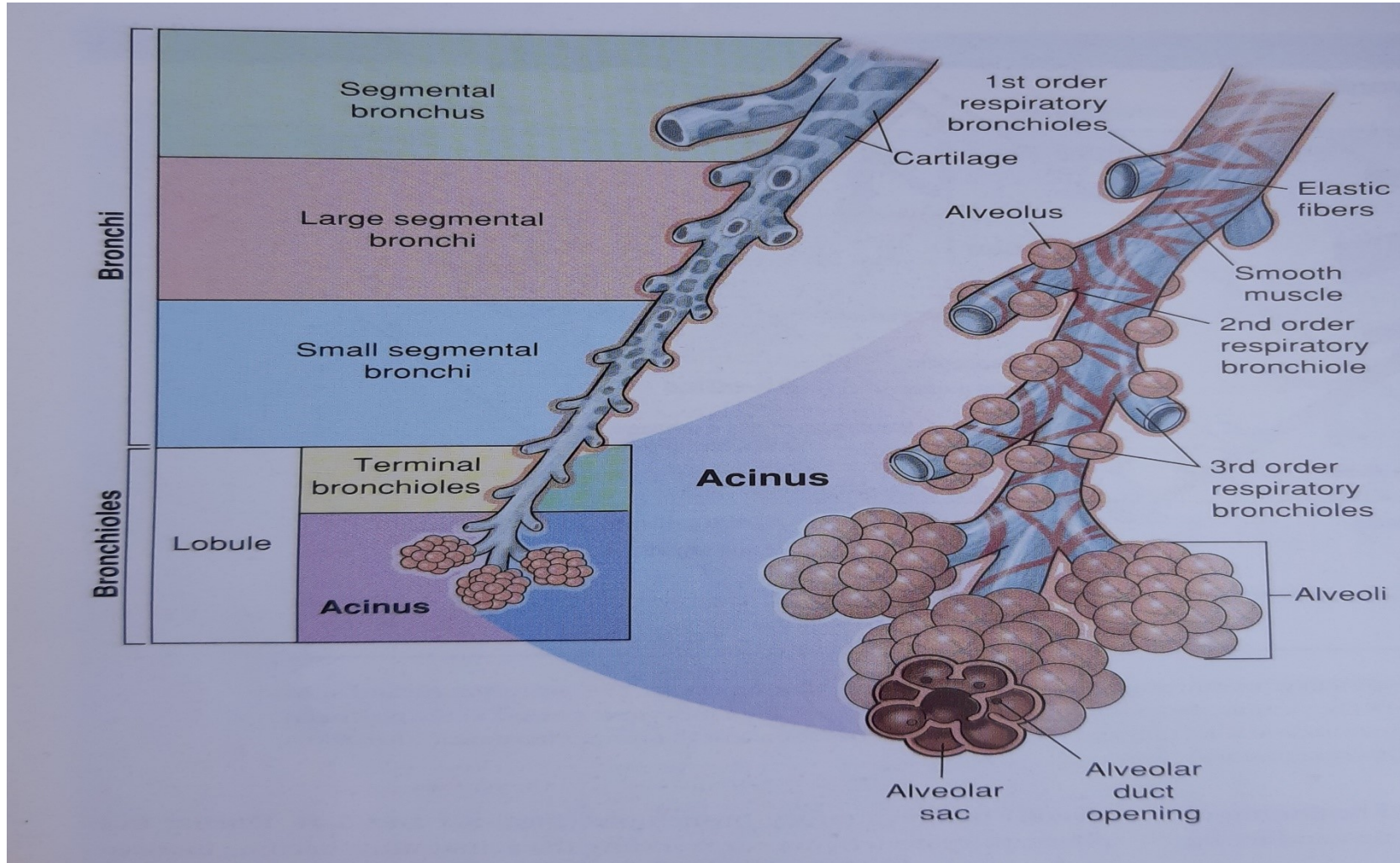
COPD Is a common , preventable and treatable disease that is characterized by **persistent respiratory symptoms and airflow limitation** due to airway and / or alveolar abnormalities usually caused by significant **exposure to noxious particles or gases** .

GOLD executive summary . Am J Respir Crit Med 2017 ; 195 (5): 557-582

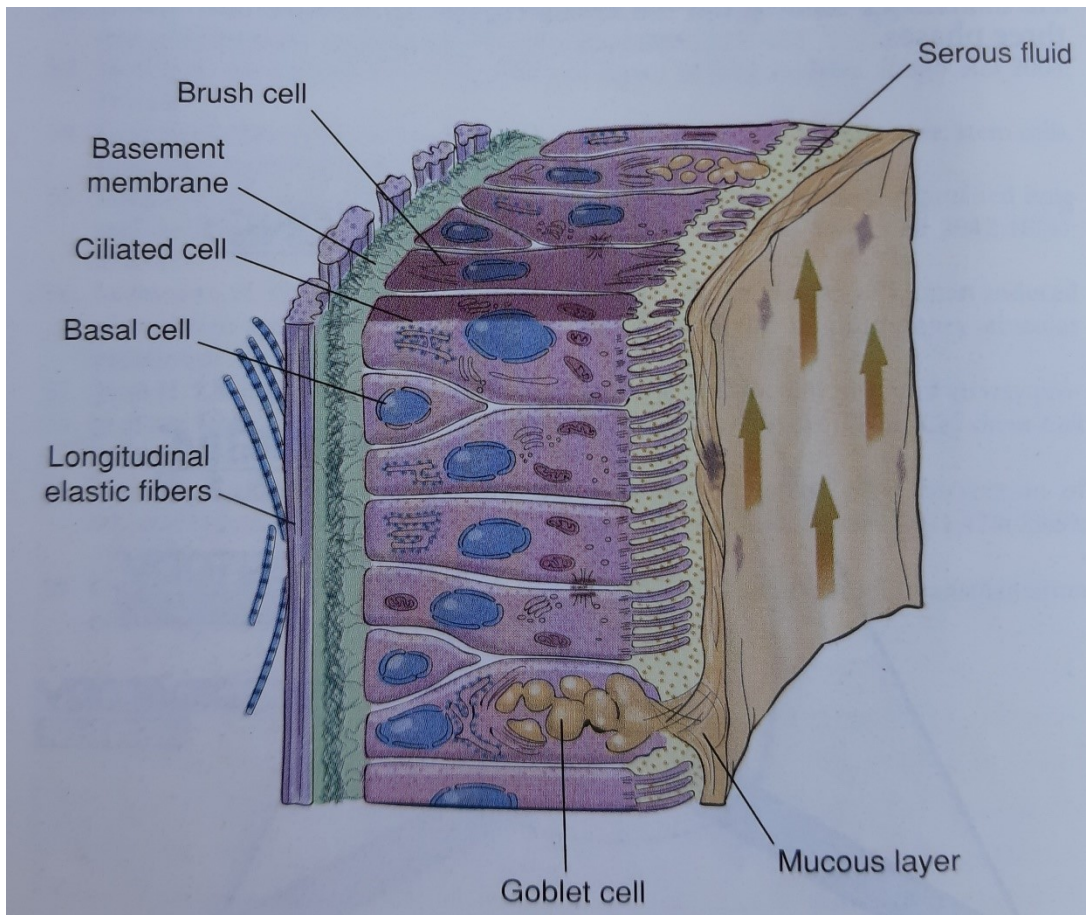
Structure Of Bronchi and Bronchioles



Structure Of Distal Airways

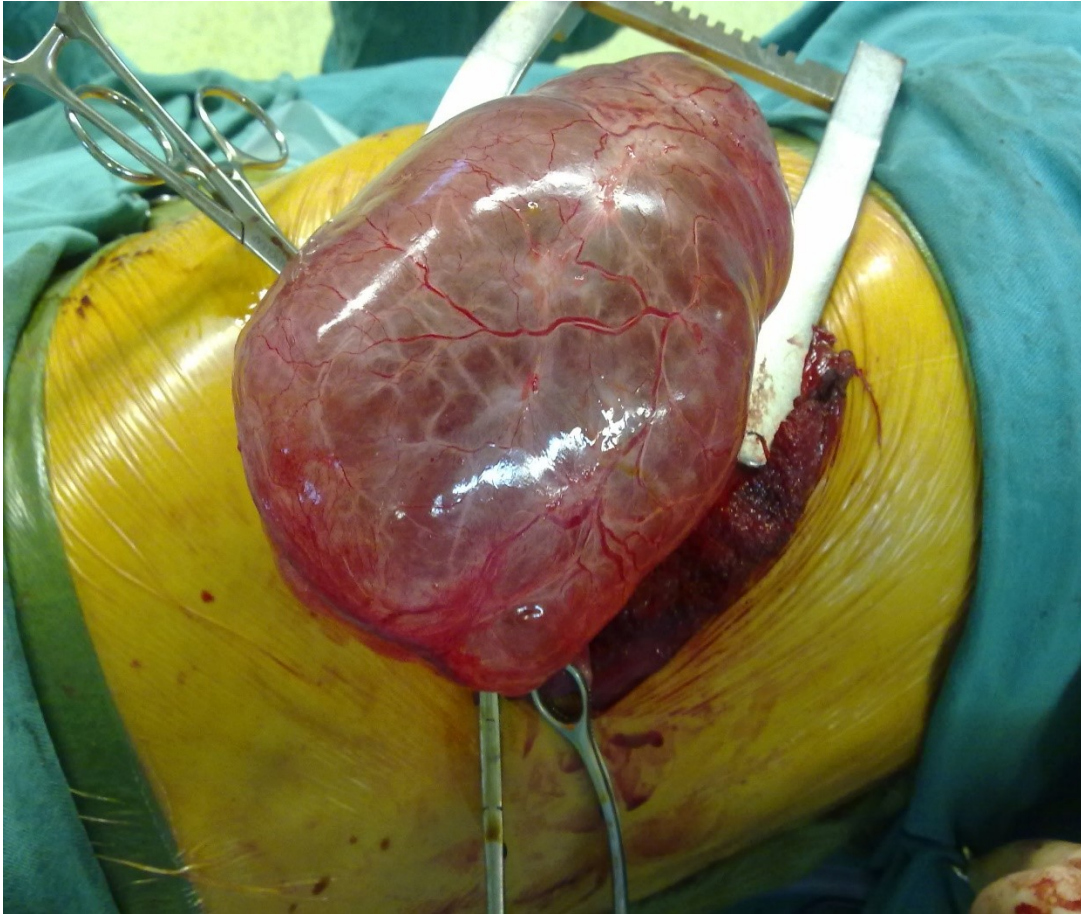


The Cellular Changes In Respiratory Epithelium In Chronic Bronchitis



- Goblet cell hyperplasia .
- Smooth-muscle hypertrophy .
- Luminal narrowing & Excess mucus .

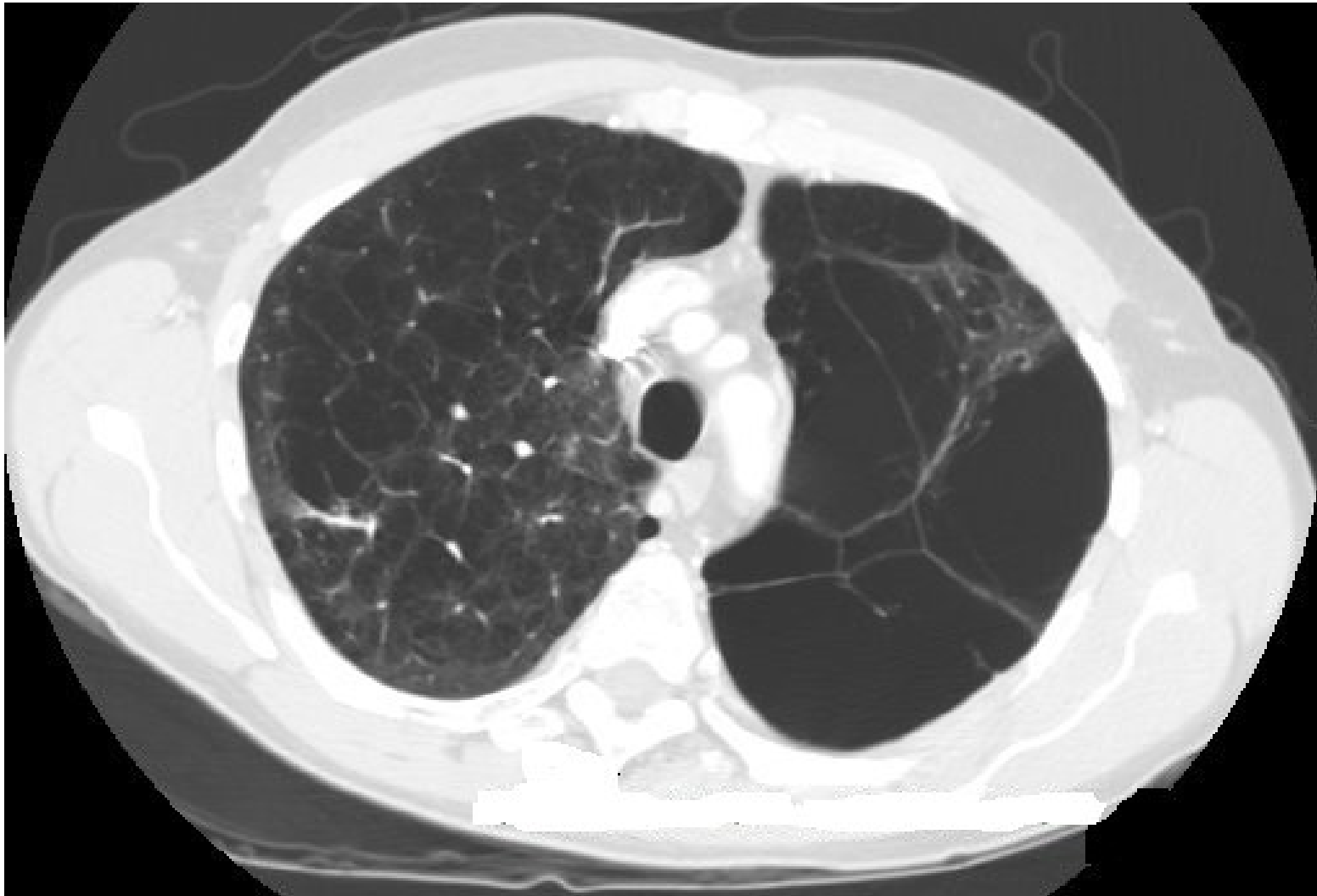
The Alveolar Changes In Lung Emphysema



- Permanent enlarged airspaces distal to the terminal bronchioles .
- Destruction of the alveolar wall .
- Avascular areas .
- No obvious fibrosis .

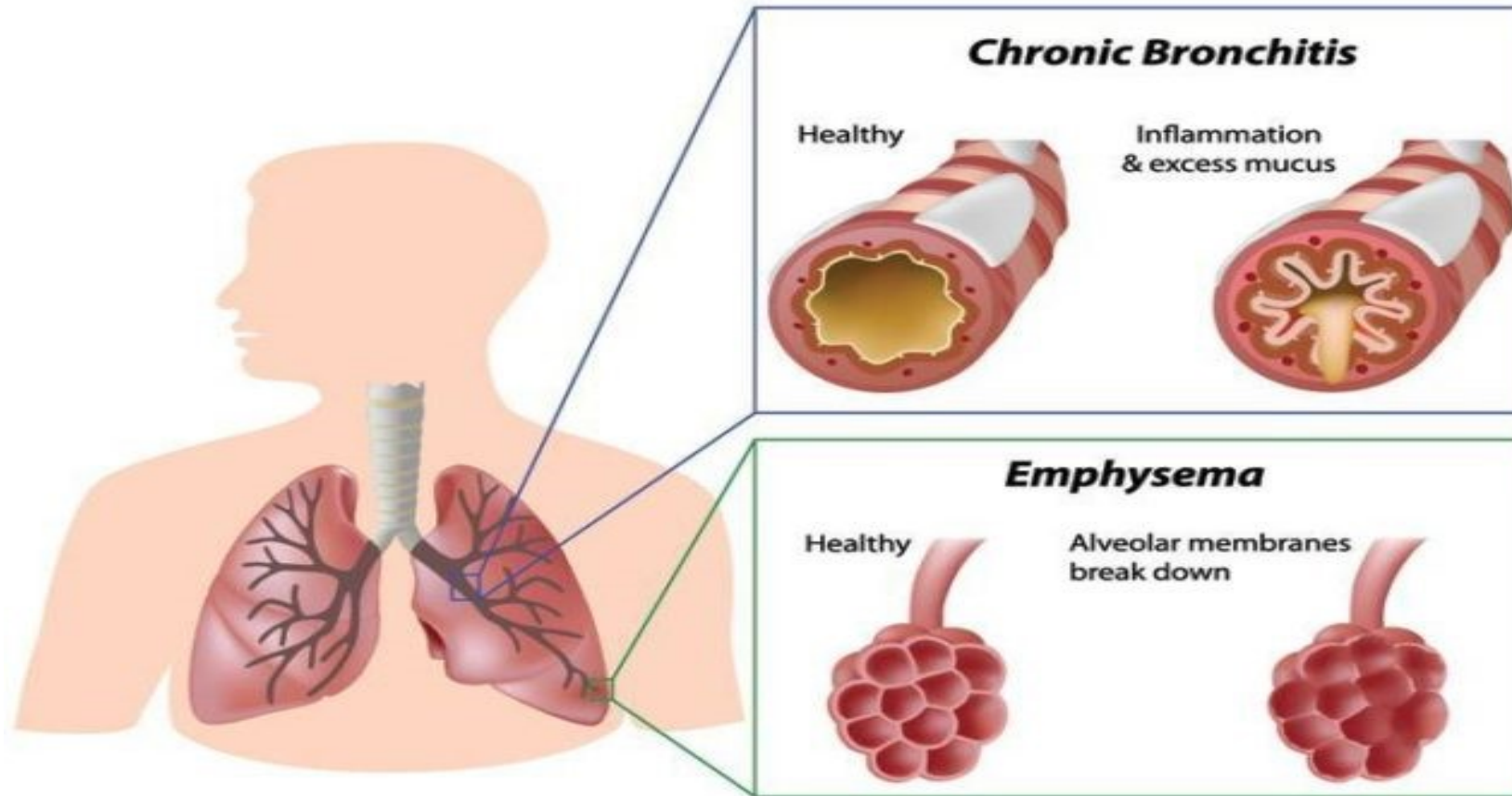
Chest CT scanning for Lung Emphysema

(enlarged airspaces & avascular areas)



Surgery For COPD

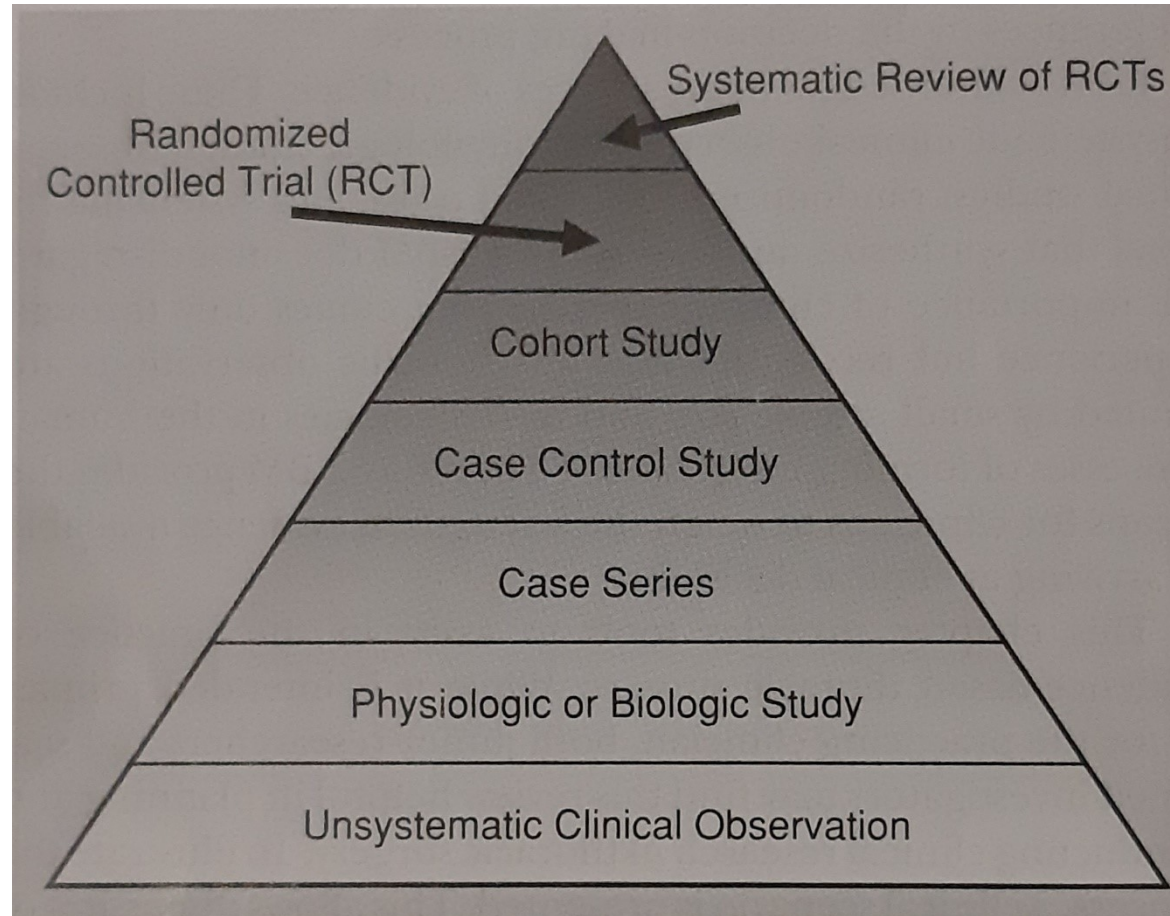
Chronic Obstructive Pulmonary Disease (COPD)



High Risk Factors For Surgery In COPD Patients

- Exacerbations of the disease .
- Respiratory failure .
- Associated comorbid disease : cardiovascular, pulmonary hypertension.....
- Smoking cessation .

Pyramid Of Evidence Based Medicine



Smoking Cessation Reduces Postoperative Complications

A Systematic Review and Meta - Analysis

(847) studies

The American Journal of Medicine (2011) 124, 144 – 154

Objective : We aimed to review randomized trials and observational evidence to establish the effect of preoperative smoking cessation on postoperative complications and to determine if an optimal cessation period before surgery.

Conclusion : Longer periods of smoking cessation decrease the incidence of postoperative complications.

Stopping Smoking Shortly Before Surgery and Postoperative Complications A Systematic Review and Meta – analysis

(1623) Articles

ARCH INTERN MED / VOL 171 (NO. 11),JUNE 13 2011

Objective: Smokers who stop smoking shortly before surgery (recent quitters) have reported to have worse surgical outcomes than early quitters.

Conclusion : Patients should be advised to stop smoking as early as possible , but there is no evidence to suggest that health professionals should not be advising smokers to quit at any time prior to surgery.

Preoperative Smoking Cessation Can Reduce Postoperative Complications In Gastric Cancer Surgery

Original article (1335) patients

The international Gastric Cancer Association and Japanese Gastric Cancer Association
published online : 20 August 2014

- **Conclusion :** Preoperative smoking cessation for at least 2 weeks will help to reduce the incidence of postoperative complications in gastric cancer surgery :
(12.3 vs. 5.2%)

خلاصة المراجعات المنهجية حول فوائد الإقلاع عن التدخين قبل الجراحة عند مرضى ال COPD

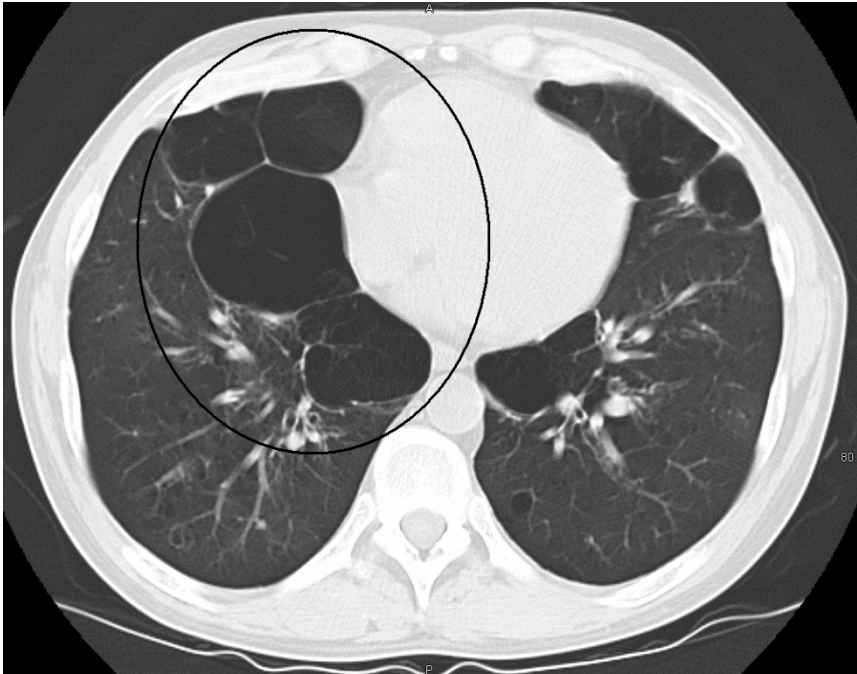
- يفيد الإقلاع عن التدخين قبل الجراحة في تحسين النتائج وتخفيض نسبة الاختلاطات والوفيات.
- تتناسب درجة التحسن وانخفاض نسبة الوفيات والاختلاطات طرداً مع طول فترة الانقطاع عن التدخين بحيث لا تقل عن أسبوعين .
- لا يوجد دليل علمي على خطورة الإقلاع عن التدخين بشكل مفاجئ قبل الجراحة .

Surgery For Lung Emphysema

- **Bullous Emphysema:**

single or multiple bullae

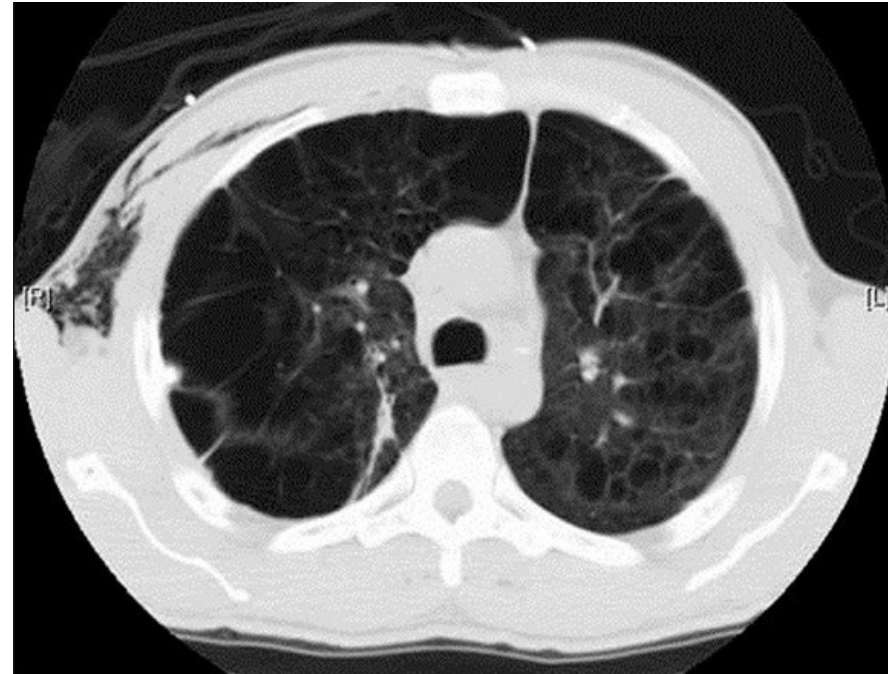
with normal underlying lung tissue.



- **Diffuse Emphysema:**

Multiple bullae

with diffuse lung emphysema (COPD).

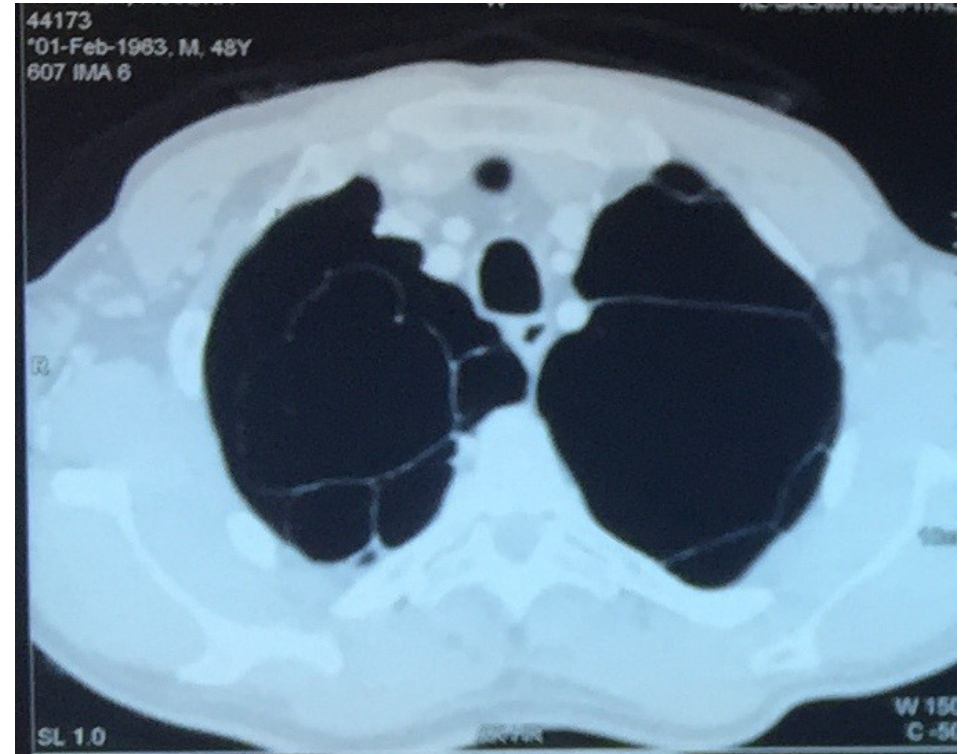


Surgical Procedures for lung Emphysema

- Bullectomy or lobectomy.
- Bronchoscopic treatment of emphysema
(*placement of one-way valves, airway coils*).
- Lung volume reduction (LVR).
- Lung transplantation.

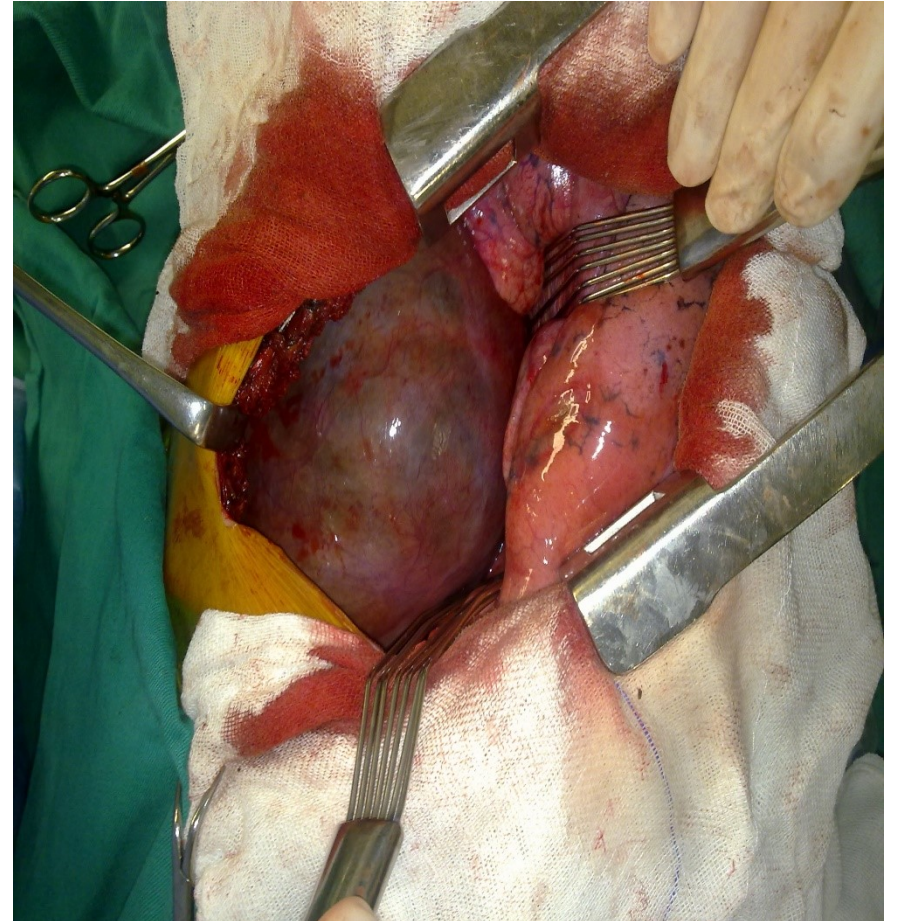
Indications for Surgical Management of Bullous Emphysema

1. Giant bullae more than 30% of lung volume with normal underlying parenchyma .
2. Lung cancer with emphysema.
3. Complications of bullae :
 - infection.
 - hemoptysis.
 - acute chest pain.
 - Pneumothorax.



Preoperative Evaluation For Bullous Emphysema

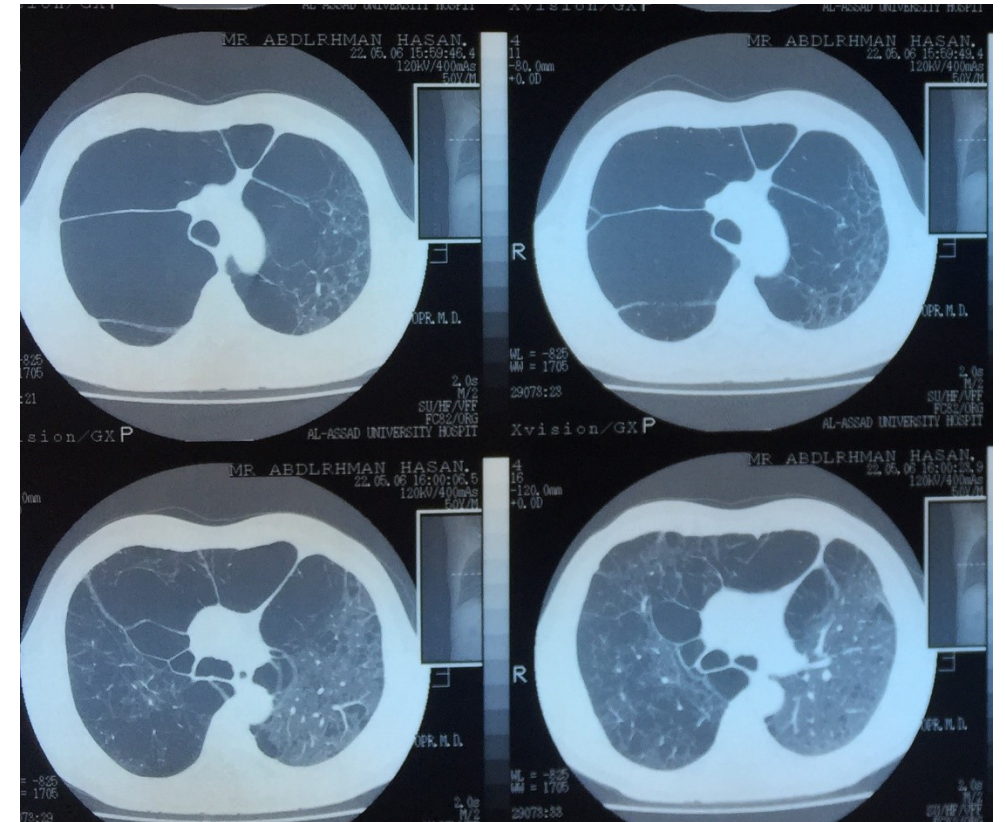
1. Pulmonary function testing spirometry ($FEV1 > 35\%$).
2. Multislice Computed Tomography of the Thorax (MSCT)
 - volume of the bullae.
 - underlying lung tissue.
3. Performance status of the patient.



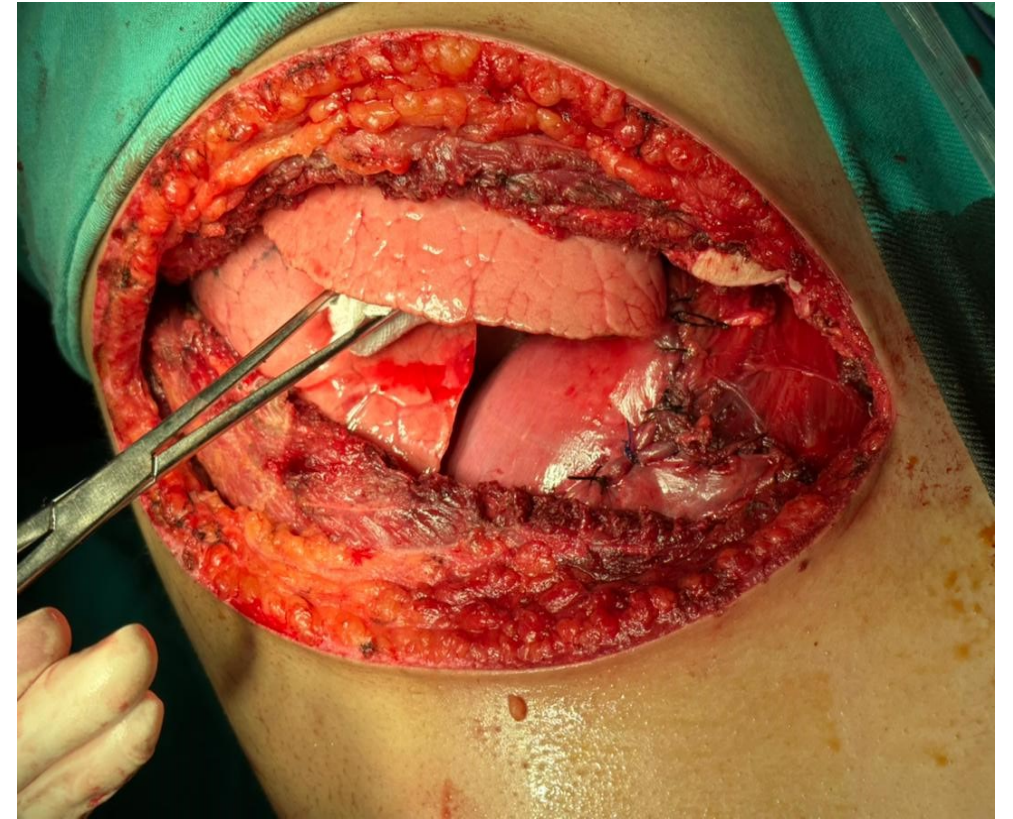
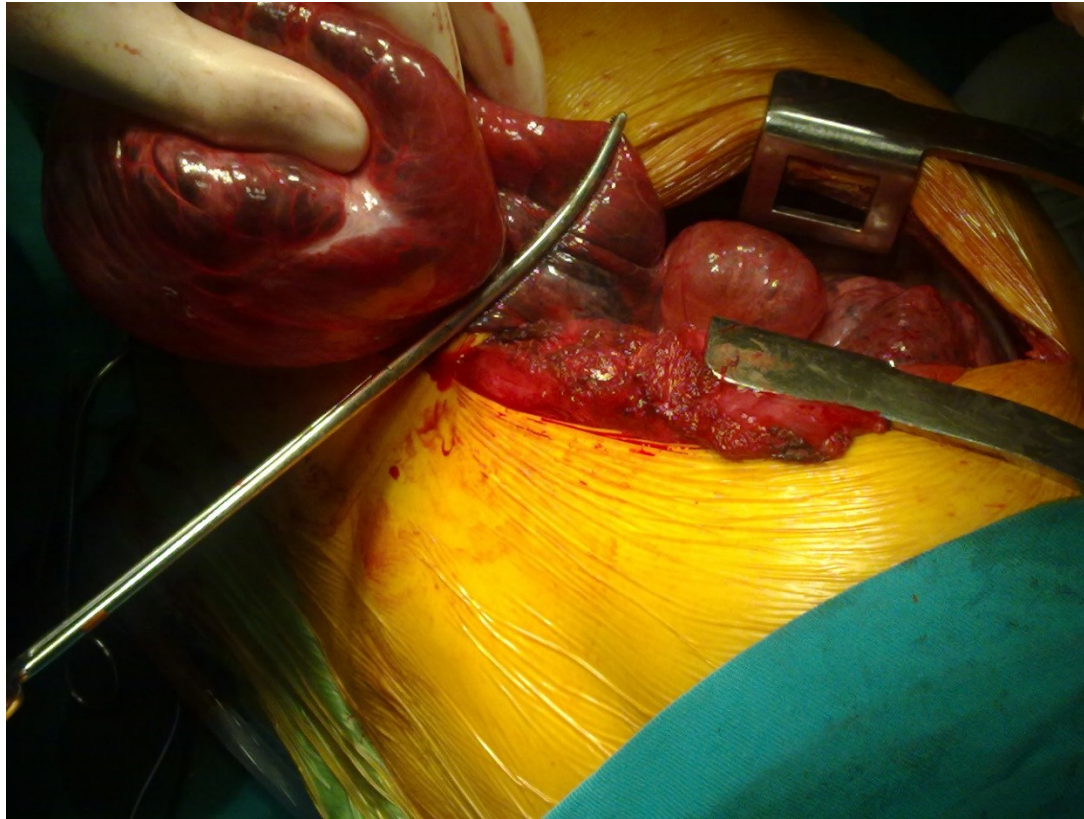
Clinical Case - 1

Bilateral Bullous Emphysema

- Asymptomatic bilateral bullous emphysema occupying $> 30\%$ of right hemithorax.
- Presence of healthy underlying lung tissue.
- FEV1 $> 35\%$

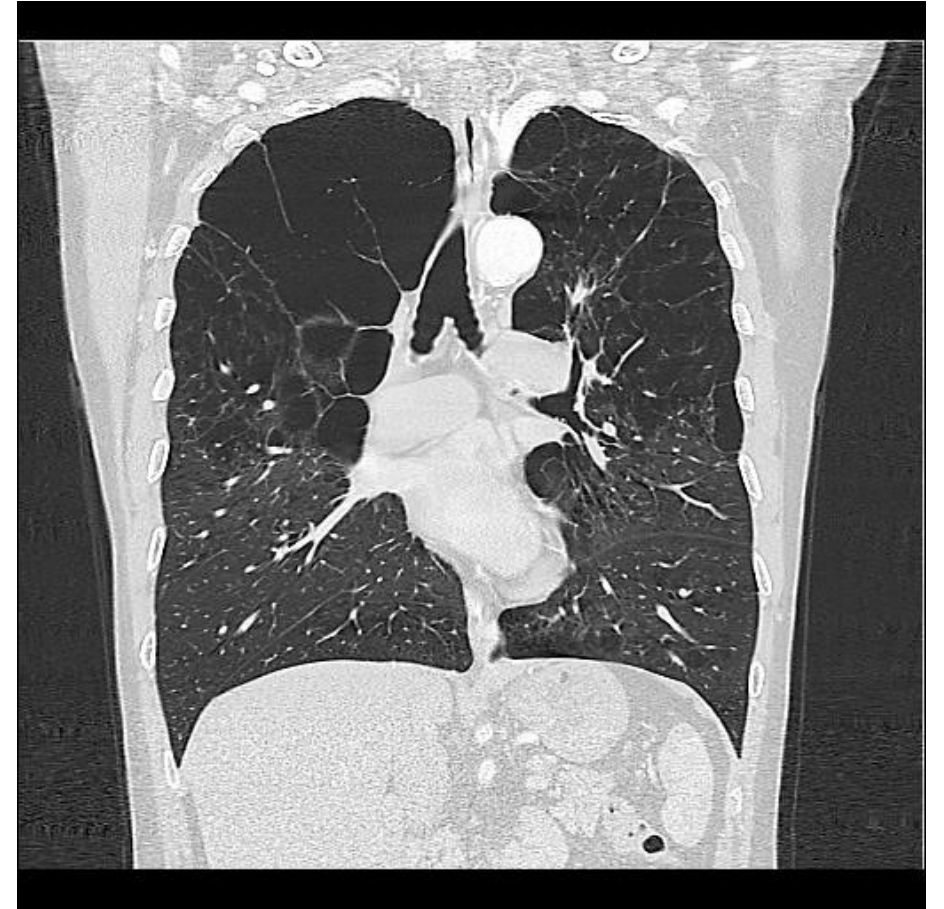
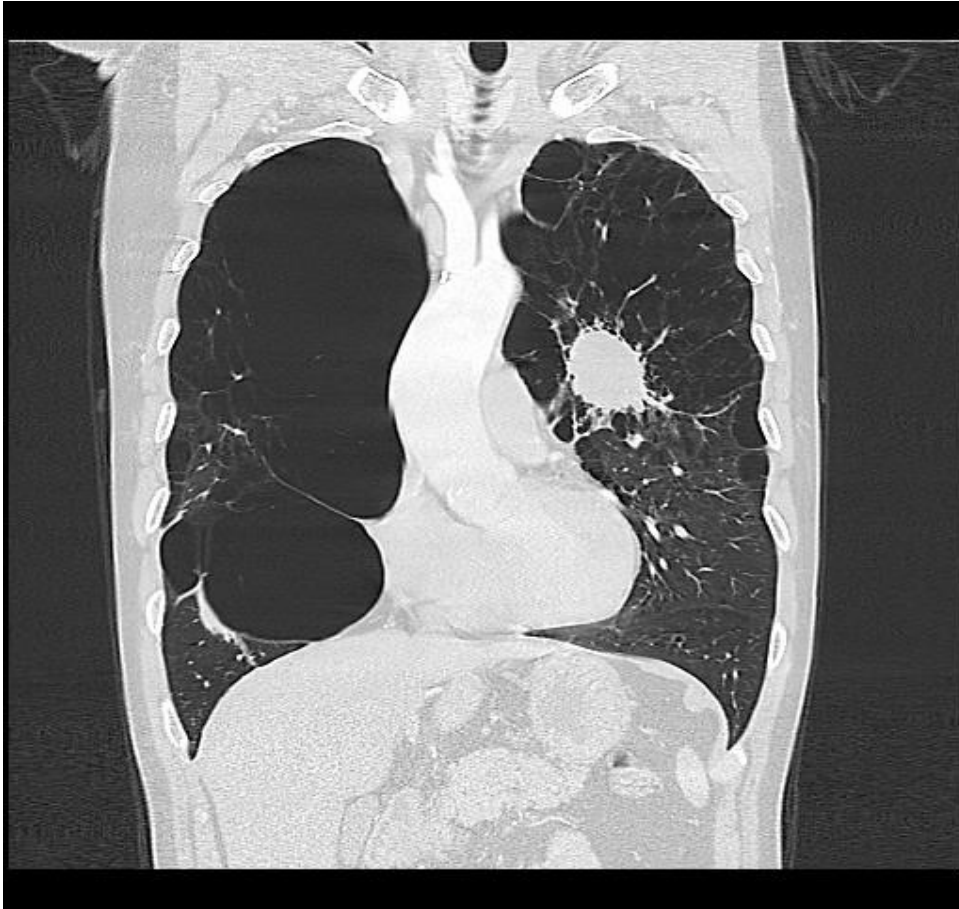


Resection of giant bullae



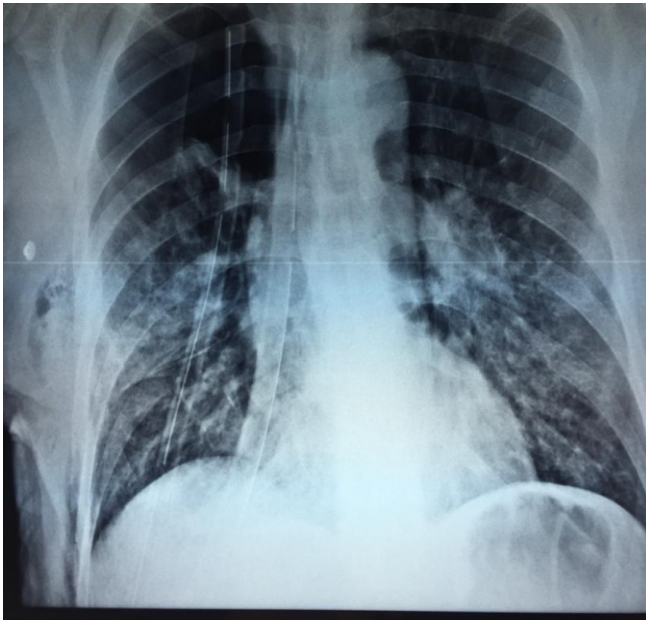
Clinical Case - 2

Lung Cancer Associated With Bullous Emphysema

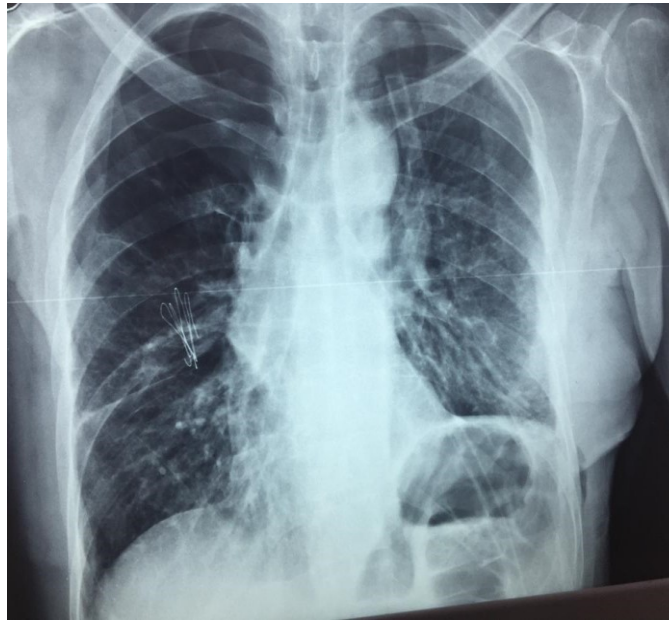


Right Bullectomy Plus Left Upper Lobectomy For Lung Cancer With Bullous Emphysema

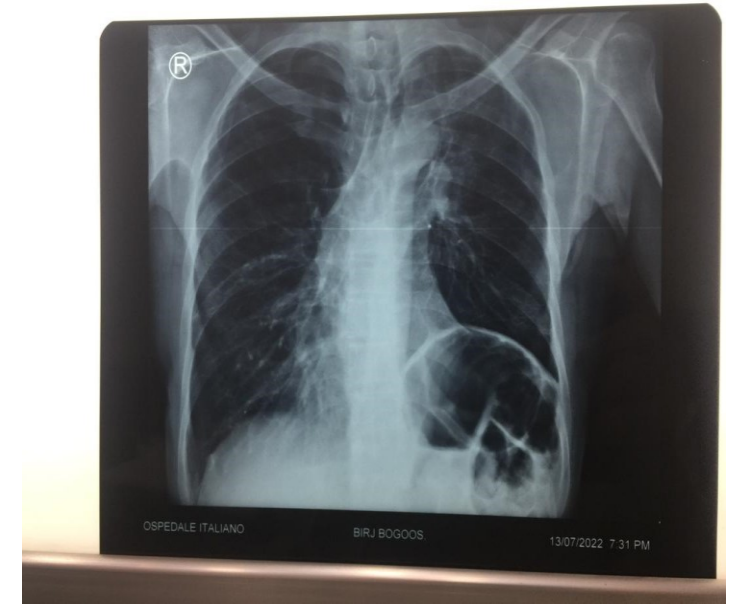
First operation



Second operation



Final CXR



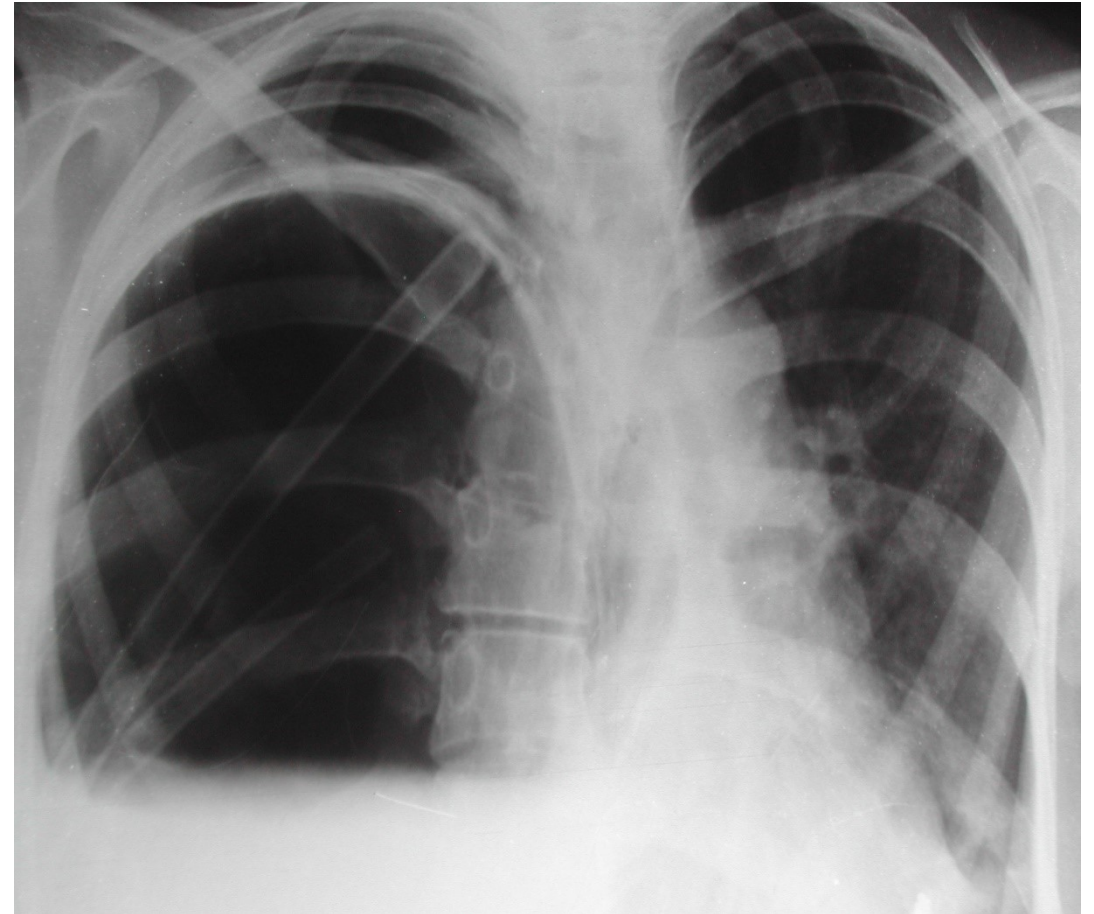
Upper Lobectomy With Tumor plus bullae



Clinical Case – 3

Bullous Emphysema Complicated With Infection

- Chest pain, air-fluid levels.
- Poor communication with bronchial tree.
- Medical treatment with Percutaneous drainage first.
- Surgical resection (failure to respond to medical treatment).

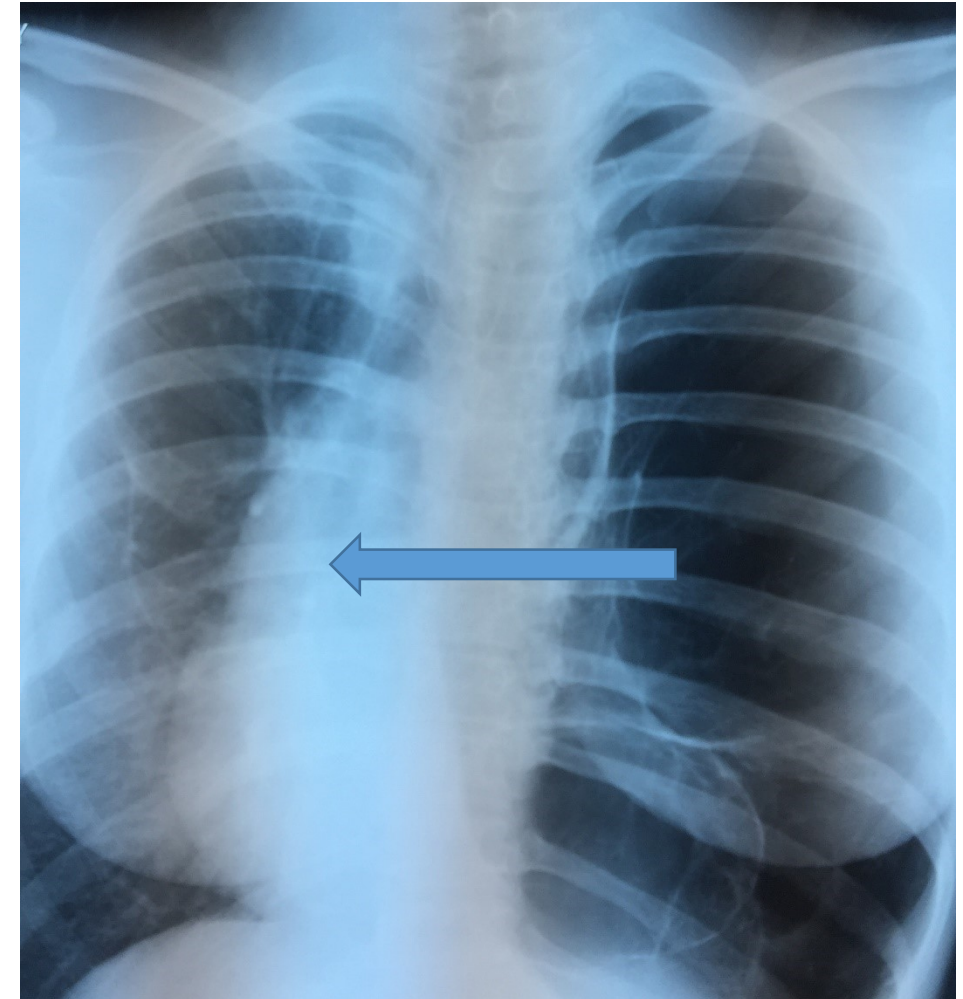


Infected Bulla



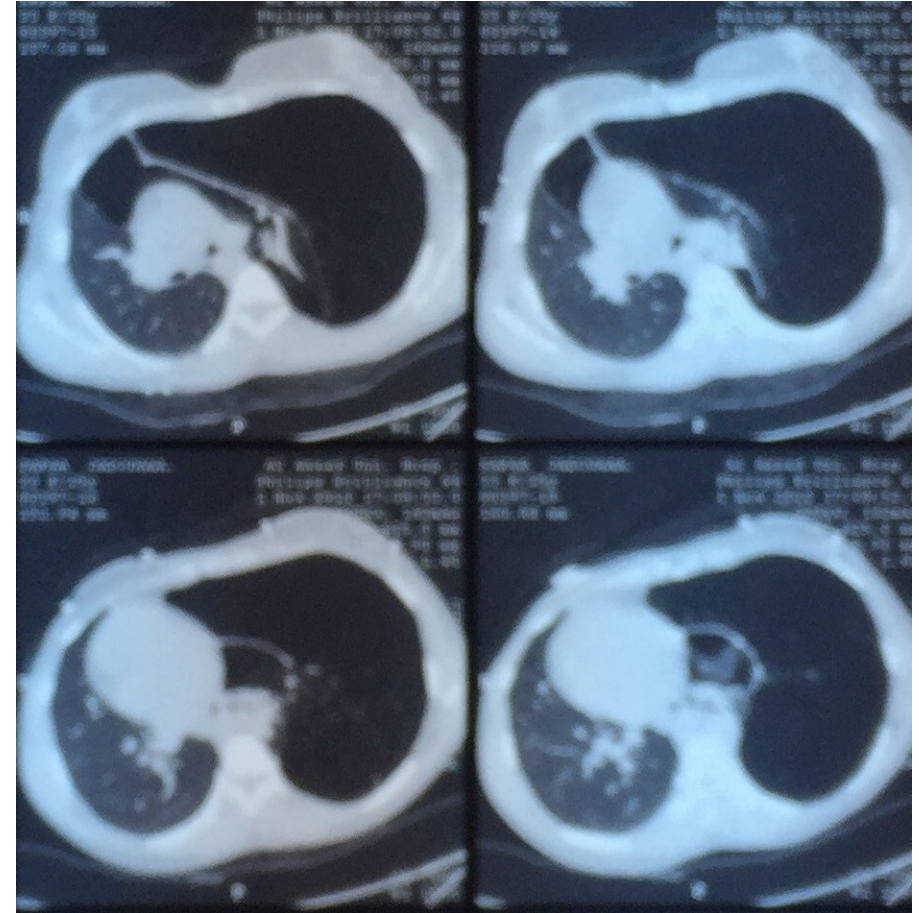
Bullous Emphysema Complicated with Tension Pneumothorax

- Emphysema is the most common cause of secondary spontaneous pneumothorax.
- Distention of giant bullae can be mistaken for a large pneumothorax.
- Acute severe retrosternal pain and dyspnea.
- Mediastinal shifting resulting in acute respiratory failure.
- Cardiac origins should be excluded.



The Approach For Bullous Emphysema Complicated With Tension Pneumothorax

- Chest tube is the first line of treatment.
- Indications for surgery :
 - persistent air leak.
 - giant bullae.
 - bilateral pneumothorax.
 - recurrent pneumothorax.



Resected Giant Bulla



Alternatives to Surgery For Bullous Emphysema

- Endobronchial one way valves (E B V) Or coins.
- Percutaneous placement of a drain inside bulla with injection of antibiotics or talc or fibrin glue in selected cases of an infected bulla or unsuitable patients for surgery.



Outcomes After Surgery For Bullous Emphysema

- Prolonged air leak (50% of patients).
- Gradually decline in pulmonary function :
 - Tobacco smoking.
 - Presence of diffuse emphysema.
 - A1-antitrypsin deficiency.

Conclusion

- The best candidates for surgical management of bullous emphysema are patients with an isolated bullae occupying more than 30% of the hemithorax with collapsed normal underlying lung.
- Surgery should be indicated for complications of the bullae such as: pneumothorax, infection, hemorrhage, chest pain and lung cancer.
- The operative goal is to remove the bulla but preserve the underlying lung as functional and ventilated.
- All patients can expect symptomatic and functional improvement.

Thank you
For your attention