Lung Abscess

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Injury/Disease Demographics

- Lung abscess is defined as a circumscribed area of pus or necrotic debris in lung parenchyma that can lead to a cavity.
- Lung abscesses are most commonly associated with aspiration of oropharyngeal contents, complication of severe pneumonia, and less commonly related directly to traumatic events.
- They can either be primary or secondary to underlying conditions such as malignancies, bronchial obstruction or surgical procedures.
- Precipitating factors for lung abscesses include alcoholism, esophageal obstruction, seizure disorders and dental surgery. Diabetic or immunocompromised patients are more predisposed to developing lung abscesses than the average population.
- Lung abscesses associated with trauma are usually due to perforation of the esophagus by sharp food items (e.g. fish bone) or aspiration of teeth during a traumatic event.

Clinical Presentation

- Patients present with either acute (< 1 month) or chronic (> 1 month) symptoms.
- Symptoms include: cough, fever, hemoptysis, pleuritic chest pain, and weight loss. Cough productive of putrid smelling sputum is typical.
- Patients may be febrile on physical examination, and may have poor dentition and amphoric breath sounds.

Evaluation/Diagnostics/Imaging

- Patients that present as emergencies (e.g. massive hemoptysis) require rapid evaluation to determine the best definitive treatment strategy.
- An air fluid level is seen within the cavity after formation of a bronchopleural fistula.
- Chest radiography classically demonstrates a thick-walled cavity with air-fluid levels.
- Chest computed tomography (CT) is more sensitive in identifying small abscesses and differentiating abscesses from empyema.
- The disease is usually polymicrobial. Common causative organisms are anaerobes such as *Peptostreptococcus, Bacteroides, Fusobacterium* and *Prevotella*. Classic presentations can be treated without microbiological confirmation.
- Sputum culture is necessary in resistant or atypical cases to identify aerobic bacteria, parasites or mycobacteria.
- Bronchoscopy may be used to identify the exact location of abscesses or associated lesions but should be done in atypical cases only.

Role of Nonoperative Management and Associated Considerations

- Antibiotic therapy is successful in resolving more than 80% of lung abscesses.
- Standard treatment consists of clindamycin 600mg IV 8 hourly initially, followed by 150 – 300 mg orally 4 times daily for 6 – 8 weeks.
- Postural drainage combined with percussion of the lung zone may be beneficial in increasing drainage.
- Hypercaloric diets may be considered, and correction of fluid and electrolyte imbalances is necessary for many patients.
- Bronchoscopic drainage may be necessary for centrally located abscesses.
- In patients undergoing radiation to the chest wall or in those with distorted lung parenchyma, bronchoscopic argon plasma coagulation has been used successfully.
- CT guided percutaneous tube drainage is frequently used as a definitive therapy in a large proportion of cases of failed medical management, with success rates of up to 90%.
- Nonoperative treatment may fail if the patient has a large abscess cavity (> 6 cm), compromised immunity, neoplasm, advanced age, reduced level of consciousness, or infection with certain aerobic pathogens (*Klebsiella pneumoniae, Pseudomonas aeruginosa*, *Staphylococcus aureus*).

Indications for Operative Intervention

- Abscesses with large cavities (more than 8cm in diameter) that are not amenable to percutaneous tube drainage.
- Prolonged fever and sepsis (> 6 weeks) not responsive to appropriate antibiotic therapy.
- Debilitated patients that cannot produce enough effort to facilitate spontaneous drainage during coughing.
- Massive hemoptysis, if uncontrolled is an emergency indication.
- Rupture of abscess into pleural space causing empyema or pyopneumothorax.

Pre-operative Preparation

- Double lumen tube endotracheal intubation should be utilized to ensure that contents from the affected lung do not spread to the unaffected lung.

Operative Techniques

- Video-assisted thoracoscopy (VATS) can be utilized for peripherally located abscesses.
- For large or centrally-placed abscesses, lobectomy is the procedure of choice.
- A posterolateral thoracotomy incision provides the optimal exposure for open cases
- Care must be taking when placing tube thoracostomy or performing parenchymal resections not to spill infected/necrotic material into the pleural space.

Postoperative Management/Complications

- Treat underlying or precipitating conditions such as malignancy, diabetes or alcoholism to prevent early recurrence.
- Prolonged chest tube drainage (2 weeks) is often necessary for patients that are managed with percutaneous tube drainage only, as it often takes more than a week to completely drain the abscess using this modality.
- Monitor for air leaks and treat as needed.
- Spillage of necrotic detritus can lead to empyema, pyopneumothorax, bronchopleural fistulas or hemothorax and there should be a low index of suspicion for these complications.
- Post-procedural pneumonia is a complication of argon plasma coagulation.

Considerations for Special Populations

- Vacuum-assisted Closure (VAC) can be used for patients with peripherally located abscesses who have abscesses resistant to conventional therapy and who cannot tolerate surgery.

Suggested Readings

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