Module: Thoracic Palliation

Learning Objectives

Attitudes

- Appreciate the importance of integrating palliative care early in the treatment of patients with advanced malignancies and end-stage lung disease
- Emphasize the patient-centered goal of improving quality of life through thoracic palliative interventions
- Recognize the need for a multidisciplinary approach in managing patients with advanced thoracic diseases
- Value the role of thoracic palliation in reducing symptom burden, emotional distress, and improving overall patient well-being

Knowledge

- Define the role of palliative surgery in thoracic conditions
- Recognize early referral to palliative care as essential for patients with advanced thoracic malignancies and end-stage lung disease
- Identify options for managing malignant pleural effusions
- Describe palliative approaches for esophageal cancer
- Understand the treatment modalities for tracheal and endobronchial disease
- Explain management strategies for malignant pericardial effusion
- Outline the therapeutic and palliative options for managing malignant chest wall tumors
- Analyze the interventions for superior vena cava syndrome caused by mediastinal malignancies
- Compare advanced surgical and procedural techniques for severe COPD and emphysema

Skills

- Apply appropriate palliative interventions to manage malignant pleural effusions based on clinical presentation
- Perform or coordinate palliative endoscopic procedures for advanced esophageal cancer
- Select and apply palliative surgical techniques tailored to patients with severe emphysema or COPD
- Conduct patient evaluations to determine suitability for palliative thoracic procedures
- Collaborate with a multidisciplinary team to develop individualized palliative care plans for patients with advanced thoracic diseases

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Introduction

Over recent decades, the importance of palliation in thoracic surgery has expanded significantly, particularly for patients with advanced malignancies experiencing progressive symptoms. A recent study by Freeman et al. reported that nearly 23% of thoracic surgical procedures are palliative. These interventions are generally low risk and expeditious to perform, with the primary aim of alleviating symptoms to improve quality of life. Thoracic surgeons are commonly involved in the multidisciplinary care of patients with advanced cancers of the lung, esophagus, pleura, mediastinum, and chest wall who benefit from palliative intervention. In addition, palliative thoracic surgery may relieve symptom burden for patients with end-stage benign lung diseases such as advanced COPD.

Lung Cancer and Malignant Pleural Effusion

Lung cancer is a global health-care problem, with metastatic lung cancer representing the leading cause of cancer-related deaths worldwide. This disease significantly impacts patients' quality of life due to severe symptoms -such as dyspnea- and associated management challenges. Unfortunately, by the time significant symptoms develop, most patients have advanced disease. Although development of multimodal treatment including targeted therapies and immunotherapy show promise, for many patients cure is not possible. Early referral to palliative care is increasingly advocated to effectively manage the debilitating symptom burden. A landmark study by Temel et al. demonstrated the advantages of combining early palliative care with standard oncologic treatment in patients with metastatic non-small cell lung cancer. The authors showed that patients receiving early palliative care experienced improved quality of life, reduced depression, and longer survival despite receiving less aggressive care at the end of life. These findings highlight the importance of integrating palliative care early in the treatment of lung cancer patients, challenging the outdated view that it should only be provided at the end of life.

One of the most common palliative clinical scenarios that a thoracic surgeon faces is the management of malignant pleural effusions (MPE). MPE can be linked to any type of cancer, including primary pleural malignancies like mesothelioma and secondary metastases from cancers such as lung, breast, and ovarian. Regardless of the chosen intervention, the immediate primary goal is to reduce dyspnea and pain associated with accumulation of pleural fluid. The secondary aim is to obliterate the pleural space to prevent recurrence or provide an easy and effective means of drainage if pleural space obliteration is not possible due to lung entrapment. Intervention for MPE can be performed at the bedside under local anesthesia or in the operating room under local anesthesia, monitored anesthesia or general anesthesia. Options for palliation include the following:

- Thoracentesis
- Chemical pleurodesis (doxycycline, tetracycline, bleomycin, doxorubicin, mitomycin or talc) performed bedside by instilling sclerosant through a chest tube, or in the operating room via thoracoscopy in the setting of adequate lung re-expansion after pleural fluid drainge
- Long-term indwelling catheter placement via ultrasound, CT, or thoracoscopy (PleurX catheter) in the setting of entrapped lung
- Palliative pleurectomy for malignant mesothelioma
- Palliative external beam radiation (EBRT)
- Palliative chemotherapy

Esophageal Cancer

Esophageal cancer is the sixth leading cause of cancer-related deaths globally; there are nearly 600,000 new cases each year, over 80% of which occur in developing countries. Despite some improvement in survival rates during the past decade, the overall prognosis remains poor, with a 5-year survival rate of 21% across all stages. While early-stage disease is associated with improved survival, fewer than half of esophageal cancer patients are eligible for potentially curative surgery at the time of diagnosis. Many patients present with symptoms like dysphagia and weight loss, making them candidates for palliative interventions to improve swallowing, support adequate oral intake, and reduce the risk of aspiration pneumonia. Effective palliative treatments should enable quick oral intake with minimal morbidity and short hospital stays.

A case-based approach is critical in the palliative management of patient with advanced esophageal cancer who may present with dysphagia, tracheoesophageal fistula, malnutrition, pain, and bleeding. Some of the treatment modalities available include the following:

- Flexible endoscopy with dilation
- Rigid endoscopy
- Esophageal stenting
- Gastrostomy tube placement
- External beam palliative radiotherapy
- Brachytherapy
- Cryotherapy
- Photodynamic therapy
- Angioembolization

Tracheal and Endobronchial Disease

Patients with tracheal and endobronchial disease can present with a variety of problems, including obstruction, bleeding, bronchopleural fistula, or tracheoesophageal fistula. Options available for intervention include the following:

- Rigid or flexible bronchoscopy with debridement/relief of obstruction
- Endobronchial stenting
- Endoluminal brachytherapy
- External beam radiation therapy
- Nd-YAG laser therapy
- Photodynamic therapy
- Endobronchial valves for prolonged air leak or bronchopleural fistula
- Bronchial artery embolization
- Tracheostomy
- Palliative lobectomy

Pericardial Effusion

Malignant pericardial effusion often presents with dyspnea, pain, orthopnea, tachycardia or signs and symptoms of cardiac tamponade. Echocardiography is crucial in determining the urgency of intervention. Depending on the patient's condition and comorbidities, options for intervention include the following:

- Percutaneous drainage under echocardiographic or fluoroscopic guidance
- Subxiphoid pericardial window
- Thoracoscopy with pericardial window
- Thoracotomy with pericardial window or pericardiectomy
- Sclerosis with talc, bleomycin, or doxycycline may be considered to prevent recurrence

Mediastinal Disease

Advanced mediastinal malignancies are the leading cause of superior vena cava (SVC) syndrome, primarily among which are small-cell bronchogenic carcinoma. However, lymphoma and metastatic tumors can also lead to SVC syndrome. When SVC obstruction is present, the following interventions should be considered:

- External beam radiation
- Endovascular stenting

Chest Wall Disease

Malignant chest wall tumors can represent primary lesions or sites of metastatic disease. These tumors can cause significant pain, bleeding, or infection. Radical surgical resection is the mainstay of treatment for most cases. However, appropriate patient selection is essential, and patients should undergo nutritional assessment and pulmonary function testing to demonstrate fitness to tolerate such extensive procedures. These operations can be palliative or therapeutic in nature and are often followed by chest wall reconstruction. Palliative radiation therapy for chest wall lesions is another option for those patients who are not surgical candidates due to metastatic disease or comorbidities.

End-stage Lung Disease

Advanced benign lung disease carries a high burden of morbidity and mortality, yet the need for palliative care is often associated solely with cancer. Lung failure, particularly due to emphysema, a subtype of chronic obstructive pulmonary disease (COPD), is a major health issue in the United States and globally. COPD is the fourth leading cause of death worldwide, with mortality rates increasing despite declines in deaths from conditions like heart disease and stroke. This progressive, incurable disease significantly impacts both healthcare costs and patient quality of life. While lung transplantation is an option for some, recipients often face end-of-life challenges due to chronic rejection. Reframing advanced non-cancerous

chronic lung disease as a condition requiring palliation underscores the importance of early integration of palliative care.

Palliative surgical approaches include bullectomy, which can often be performed in a minimally invasive fashion to remove a dominant bulla, as well as lung volume reduction surgery (LVRS). LVRS involves the removal of diseased, nonfunctioning lung tissue often in the upper lobes to promote ventilation of more functional parts of the lungs and improve respiratory mechanics. The landmark National Emphysema Treatment Trial (NETT) compared LVRS to medical therapy in patients with severe emphysema. While there was no survival benefit for the overall group, the study demonstrated a significant functional gain in terms of exercise capacity for patients who received surgery. However, due to the significant morbidity and mortality associated with LVRS, a less invasive approach using one-way endobronchial valves (EBVs) was developed and evaluated in the EBV for Emphysema Palliation Trial (VENT). Multiple randomized controlled trials have confirmed the effectiveness of EBVs for patients with severe emphysema. Consequently, endoscopic lung volume reduction has become an established, guideline-recommended treatment for patient with severe COPD.

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Pre/Post Test

Questions

1. What is the primary goal of palliative surgical interventions in thoracic diseases?
2. Why is early referral to palliative care important for patients with advanced malignancies?
3. What are two common symptoms of advanced lung cancer that palliative care aims to address?
4. What is a suitable palliative intervention for a patient with advanced esophageal cancer and dysphagia?
5. What is a palliative surgical option for patients with severe emphysema to improve respiratory mechanics?

Answers

1. To improve quality of life by alleviating symptoms
2. Early referral helps manage symptoms, improves quality of life, and may even extend survival for some patients with lung cancer
3. Dyspnea and pain
4. Esophageal stenting
5. Lung volume reduction surgery (LVRS) or endobronchial valve placement

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Objectives

1. Describe the role of thoracic palliation in advanced lung cancer
2. Describe the measures taken to ensure patient-centered communication and individualized decision-making

Teaching Points

- Understanding the role of palliative thoracic surgery in advanced lung cancer and its focus on symptom relief rather than curative intent.
- Individualized decision-making in thoracic palliative care is crucial with clear communication about the benefits, risks, and goals of each option ensures alignment with the patient's values and needs.

Case Scenario

J.L. is a 67-year-old male, presents to the thoracic surgery clinic with progressively worsening shortness of breath, persistent chest discomfort, and fatigue over the past month. He has a history of metastatic non-small cell lung cancer (NSCLC) diagnosed 18 months ago, with known metastases to the pleura and pleural effusion. Despite undergoing systemic chemotherapy and immunotherapy, his disease has progressed. His oncologist has recommended consultation with the thoracic surgery team to address his symptom burden. He asks if there are any surgical options to cure him or to at least let him breath normally again.

Questions

1. What are the primary goals of care for this patient, considering his advanced metastatic NSCLC and symptom burden?
2. What factors should be considered when deciding between pleural drainage with indwelling catheter placement versus talc pleurodesis for managing this patient's pleural effusion?
3. How would you explain the purpose and expected outcomes of palliative surgery to this patient, addressing his concerns about breathing normally again?
4. What are the potential risks and benefits of palliative surgical interventions for patients with advanced lung cancer and pleural effusion?