A Rational but Reluctant Choice: An Interpretation of the 2018 US Malignant Pleural Effusion Management Guidelines (Postprint)

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Abstract

The Management Guidelines for Malignant Pleural Effusion, developed by the American Thoracic Society, Society of Thoracic Surgeons, and Society of Thoracic Radiology, were published in the American Journal of Respiratory and Critical Care Medicine on October 1, 2018. A multidisciplinary expert panel employed the GRADE methodology (Grading of Recommendations, Assessment, Development, and Evaluations) in a PICO [Population (patients), Intervention, Comparator, and Outcomes] format to formulate and address seven clinical questions regarding the management of malignant pleural effusion (MPE), along with their associated evidence, and developed recommendations to guide clinical practice. The new guideline recommendations are as follows: (1) Perform required procedures such as thoracentesis or pleural biopsy under ultrasound guidance; (2) Asymptomatic MPE of known etiology or highly suspected MPE does not require thoracentesis for fluid drainage; (3) For symptomatic MPE, perform a single large-volume thoracentesis to determine whether dyspnea can be relieved after substantial fluid drainage and whether lung expansion inability exists; (4) For symptomatic MPE of known etiology or highly suspected MPE without lung expansion inability and without prior MPE treatment, indwelling pleural catheter or pleurodesis should be selected as first-line thoracic intervention measures; (5) In symptomatic MPE patients undergoing talc pleurodesis, talc poudrage and talc slurry injection are equally effective, and either may be selected; (6) In symptomatic MPE patients with lung expansion inability, failed pleurodesis, or loculated effusion, indwelling pleural catheter drainage is recommended, as pleurodesis no longer has therapeutic value; (7) When infection related to indwelling pleural catheter occurs, catheter removal is not necessary and antibiotic treatment alone is sufficient.

Full Text

Rational and Helpless Choices: Interpretation of the 2018 ATS/STS/STR Management Guidelines for Malignant Pleural Effusion

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Abstract

Management of malignant pleural effusions (MPE), an official clinical practice guideline approved by the American Thoracic Society, the Society of Thoracic Surgeons, and the Society of Thoracic Radiology, was published in the *American Journal of Respiratory and Critical Care Medicine* on October 1, 2018. Using the GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) approach and the PICO (Population, Intervention, Comparator, and Outcomes) format, a multidisciplinary panel raised and answered seven questions on the clinical management of MPE. The relevant evidences were summarized and recommendations were developed for clinical practice. Based on the available evidence, the panel made the following recommendations: (1) ultrasound imaging should be used to guide pleural interventions in patients with known or suspected MPE; (2) therapeutic pleural interventions should not be performed in asymptomatic patients with known or suspected MPE; (3) either an indwelling pleural catheter (IPC) or chemical pleurodesis can be used in symptomatic patients with MPE and suspected expandable lung; (4) large-volume thoracentesis can be conducted to assess symptomatic response and lung expansion; (5) the use of either talc poudrage or talc slurry can be considered in patients with symptomatic MPE and expandable lung; (6) IPC should be used instead of pleurodesis in patients with nonexpandable lung or failed pleurodesis; and (7) antibiotics should be used in IPC-associated infections and there is no need to remove the catheter.

Keywords: malignant pleural effusions; guideline; interpretation

Introduction

Malignant pleural effusion (MPE) ranks as the second leading cause of death from exudative pleural effusions, surpassed only by parapneumonic effusion. In the United States, MPE accounts for approximately $1.25 billion in annual healthcare expenditures. Patients may be asymptomatic at disease onset, but the median survival time is merely 4–7 months, with most patients eventually

experiencing dyspnea even at rest. The therapeutic goal is to alleviate or eliminate dyspnea with minimal invasiveness.

Two primary treatment options are available: indwelling pleural catheter (IPC) drainage and talc pleurodesis. The American Thoracic Society published its first MPE management guideline in 2000, and the British Thoracic Society subsequently updated its guideline in 2010. However, fewer than 50% of European physicians follow these recommendations, and the earlier guidelines no longer reflect current clinical practice. On October 1, 2018, the American Thoracic Society, Society of Thoracic Surgeons, and Society of Thoracic Radiology jointly released a new guideline based on recent evidence, incorporating novel recommendations to address contemporary clinical challenges.

Guideline Development Methodology

The 2018 guideline employed the GRADE framework (Grading of Recommendations, Assessment, Development, and Evaluation) and the PICO format (Population, Intervention, Comparator, Outcomes) to formulate and answer seven critical clinical questions. The multidisciplinary panel systematically reviewed relevant evidence and developed evidence-based recommendations to guide clinical practice.

Key Recommendations by PICO Question

PICO Question 1: Should pleural procedures in patients with known or suspected MPE be performed under ultrasound guidance?

Recommendation: All necessary pleural interventions, including thoracentesis or pleural biopsy, should be performed under ultrasound guidance. Although no randomized controlled trials have demonstrated that ultrasound reduces pneumothorax or bleeding complications, ultrasound is harmless to patients and may improve procedural safety. This recommendation represents a significant advancement, as its implementation depends on physician experience, local resources, and ultrasound availability. Some physicians currently use IPC as the sole treatment for patients with expandable lungs, even when pleurodesis might be appropriate.

PICO Question 2: Should asymptomatic patients with known or suspected MPE undergo therapeutic thoracentesis?

Recommendation: Therapeutic thoracentesis is not indicated in asymptomatic patients with known or suspected MPE. No evidence suggests that drainage benefits this population unless clinically necessary for staging or molecular marker analysis.

PICO Question 3: Should symptomatic patients with known or suspected MPE undergo large-volume thoracentesis with pleural pressure measurement?

Recommendation: Symptomatic patients should undergo a single large-volume thoracentesis (1500 ml). This serves two purposes: first, to determine whether dyspnea improves with drainage; second, to assess for lung entrapment (nonexpandable lung). Accurately identifying lung entrapment is crucial for selecting subsequent interventions, such as chemical pleurodesis. Measuring pleural pressure or elastance is the most common method to evaluate lung expandability after drainage. If dyspnea fails to improve following large-volume thoracentesis, alternative etiologies should be investigated, and further pleural interventions are unwarranted.

PICO Question 4: In symptomatic patients with known or suspected MPE, without prior pleural interventions (excluding diagnostic thoracentesis), who demonstrate dyspnea relief and lung expandability after large-volume drainage, should IPC or pleurodesis be used as first-line therapy?

Recommendation: Either IPC or chemical pleurodesis is recommended as first-line therapy for symptomatic MPE patients with expandable lungs. Recent evidence published in 2018 has strengthened the role of chemical pleurodesis, reinforcing its therapeutic value.

PICO Question 5: In symptomatic MPE patients undergoing talc pleurodesis, should talc poudrage (insufflation) or talc slurry (injection) be used?

Recommendation: Both talc poudrage and talc slurry demonstrate equivalent efficacy, and either method may be selected. Studies comparing alternative sclerosing agents such as bleomycin, tetracycline, or bacterial preparations have shown inferior outcomes compared to talc.

Important Note on Talc Availability in China: Currently, no medical-grade talc for intrapleural administration is manufactured or sold in China; only topical-grade products are available. The author emphatically cautions against substituting topical talc for medical-grade talc in pleurodesis procedures. This limitation likely stems from talc' s low-tech nature and limited profit margins, resulting in no commercial incentive for production. Consequently, Chinese hospitals must reluctantly rely exclusively on IPC for MPE management.

PICO Question 6: In symptomatic MPE patients with lung entrapment, failed pleurodesis, or loculated effusions, should IPC be utilized?

Recommendation: In these scenarios, chemical pleurodesis is no longer therapeutically viable, and IPC placement is recommended.

PICO Question 7: In patients with IPC-associated infection, should antibiotics alone be used or should the catheter be removed?

Recommendation: IPC-related infections, including puncture site infections and empyema, should be managed with antibiotics alone; catheter removal is generally unnecessary. Only when antimicrobial therapy proves ineffective should catheter removal be considered.

Discussion: A Focus on Symptom Management

The 2018 MPE management guidelines concentrate exclusively on relieving dyspnea—the most distressing symptom for patients—without addressing primary tumor treatment. This narrow focus is both rational and 无奈 (helpless). It is rational because, in the absence of curative options for MPE, devoting additional healthcare resources is unwarranted. It is helpless because the guidelines must remain silent on primary cancer management, which should follow disease-specific protocols (e.g., targeted therapy for eligible lung adenocarcinoma, chemotherapy for small cell lung cancer). All therapeutic attention is appropriately directed toward palliating dyspnea.

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Note: Figure translations are in progress. See original paper for figures.