CHEST

Advances in Pleural Disease Management Including Updated Procedural Coding

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Over 1.5 million pleural effusions occur in the United States every year as a consequence of a variety of inflammatory, infectious, and malignant conditions. Although rarely fatal in isolation, pleural effusions are often a marker of a serious underlying medical condition and contribute to significant patient morbidity, quality-of-life reduction, and mortality. Pleural effusion management centers on pleural fluid drainage to relieve symptoms and to investigate pleural fluid accumulation etiology. Many recent studies have demonstrated important advances in pleural disease management approaches for a variety of pleural fluid etiologies, including malignant pleural effusion, complicated parapneumonic effusion and empyema, and chest tube size. The last decade has seen greater implementation of real-time imaging assistance for pleural effusion management and increasing use of smaller bore percutaneous chest tubes. This article will briefly review recent pleural effusion management literature and update the latest changes in common procedural terminology billing codes as reflected in the changing landscape of imaging use and percutaneous approaches to pleural disease management.

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ABBREVIATIONS: CPT = common procedural terminology; DNase = deoxyribonuclease; MIST = Multicenter Intrapleural Sepsis Trial; MPE = malignant pleural effusion; RVU = relative value unit; tPA = tissue plasminogen activator; TPC = tunneled pleural catheter

Pleural disease represents a substantial burden to patients and respiratory physicians. Over 1.5 million pleural effusions occur in the United States annually and create troubling dyspnea, chest discomfort, functional limitation, and quality-of-life reduction. In most clinical scenarios, initial pleural effusion etiology evaluation begins with a diagnostic thoracentesis. Depending on the pleural effusion etiology, subsequent chest tube drainage may be required for appropriate management. The development and expanding physical and economic access to handheld portable ultrasound devices has improved noninvasive initial pleural disease evaluation and safety of pleural procedures. This article will briefly review developments in pleural disease management including an update on common procedural terminology (CPT) coding as a result of a shift toward minimally invasive percutaneous pleural procedures and increasing access to ultrasound utilization for pleural procedures.

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Pleural Ultrasound

Ultrasound utilization in pleural disease management allows an operator to assess the pleural lining, the pleural fluid characteristics (anechoic, isoechoic, or hyperechoic), and the complexity of the pleural space. This initial noninvasive information may guide the clinician's differential diagnosis and his/her diagnostic and/or therapeutic decisions. More importantly, ultrasound permits the clinician to locate a safe access site for pleural intervention, thereby reducing the pneumothorax rate, and can also facilitate rapid postprocedural evaluation for pneumothorax. A recent large observational cohort review of a large hospital claims database demonstrated that ultrasound guidance reduced the rate of pneumothorax by 19%, which reduced overall cost and hospital length of stay.[1] Moreover, ultrasound guidance for optimal small-bore pigtail chest tube placement has also been shown to effectively manage multiple pleural effusion etiologies.[2] Due to a large body of literature to support ultrasound as a vital tool to garner information regarding pleural disease management, the new CPT codes bundle ultrasound into the procedural code rather than have a separate reportable event (see Assignment of New CPT Codes for Pleural Procedures section).

Pleurodesis Agent and Mode of Pleurodesis

Talc remains the primary pleurodesing agent in clinical practice today with doxycycline and bleomycin used in some scenarios, although many clinical trials have investigated novel pleurodesing agents such as silver nitrate, iodine solutions, blood, and bacterial superantigens. A review of this topic is beyond the scope of this article, but most pleural experts recognize that pleurodesing agents should not only accomplish successful control of pleural effusion reaccumulation, but also possibly serve as a platform for novel therapeutic approaches.[3]

Malignant Pleural Effusion

Malignant pleural effusions (MPEs) herald advanced-stage malignancy, impact patient quality of life, and portend a poor prognosis with median survival of 6 months. Initial management is often simple ultrasound-guided thoracentesis to ascertain malignant status and simultaneously to relieve associated symptoms and to assess symptom improvement. Upon confirmation of malignant pleural disease, one therapeutic option is to drain the effusion completely and to initiate systemic therapy if the patient is treatment naive, or to alter systemic therapy if the patient has progressed on current treatment. Unfortunately, these approaches often do not control malignant effusion recurrence and a definitive procedure is required.

Several approaches are available to manage MPEs: (1) thoracoscopy/pleuroscopy with pleurodesis; (2) tube thoracostomy with pleurodesis; and (3) indwelling, tunneled pleural catheters (TPCs) (Fig 1). Historically, either tube thoracostomy or thoracoscopy with pleurodesis was the standard approach, and a large randomized trial failed to demonstrate a significant difference in pleurodesis success rate between these two approaches.[4] With TPC development, there has been increasing use of this approach to MPE, and several trials have investigated TPC compared with traditional approaches. In a retrospective review, Hunt et al[5] reported that patients who had TPCs placed had shorter overall and postprocedure hospital stays and fewer ipsilateral reinterventions for fluid recurrence. Two small randomized prospective trials corroborated these findings, reporting that TPC compared with chest tube with talc pleurodesis resulted in shorter hospital stays, fewer repeat procedures, and improved 30-day survival with effusion control.[6,7] The largest trial randomized patients with MPE to either TPC or small-bore chest tube with talc slurry pleurodesis. At 6 weeks, there was no difference in dyspnea scores, but at 6 months, TPC had statistically improved dyspnea compared with talc slurry. Similar to the prior reports, the TPC group had shorter hospital stay (0 days vs 4 days) and less need for further interventions (6% vs 22%), but did have a higher adverse event rate (40% vs 13%) when compared with the talc slurry group.[8] Interestingly, in a cost-effectiveness decision analysis comparing thoracentesis, TPC, chest tube with pleurodesis, and thoracoscopic pleurodesis at 3-month and 12-month survival time points, TPC was more cost-effective with shorter life expectancy, while chest tube pleurodesis was better for longer life expectancy.[9] The current data are not overwhelmingly convincing that one route is superior to another, so the "best" choice for any given patient with MPE must incorporate several factors–anticipated life expectancy, performance status, lung reexpansion, and patient preference after an informed discussion about the risks/benefits of each approach.

Parapneumonic Effusion and Empyema

The inflammatory and/or infectious processes associated with pneumonia can result in pleural fluid development which can be simple exudative fluid, complex