PALLIATIVE CARE TIPS

Issue # 35 Management of Dyspnea Associating Pleural Effusion

(Collect them all)

Original Contributors (November 2010): Gary Frank, RN; Liz Ross, RN; Vincent Thai, MD; Ron Damant, MD
Editor: Yoko Tarumi, MD, Palliative Care Program, Royal Alexandra Hospital

The Problem:

- Accumulation of fluid in the pleural space (pleural effusion) is a potential complication of a variety of disease states, e.g. cancers, congestive heart failure, pneumonia. Over three quarters of cancer-related pleural effusions are due to lymphomas or cancers of the breast, lung, and ovary. The average survival of patients with refractory cancer and pleural effusions is 4-6 months (1). Survival is considerably worse for patients with poor functional status due to progressive cancer. By impeding lung expansion and ventilation, pleural effusions can be the cause of significant dyspnea. Such dyspnea may respond to opioid therapy alone (see Tip #4) but it may also require other intervention (see below).

Assessment:

- Patients at risk for pleural effusion are often also at risk for other causes of dyspnea. Such causes include: congestive heart failure or infection without pleural effusion, chronic obstructive pulmonary disease, pulmonary emboli, pericardial effusions, parenchymal lung metastases, radiation lung injury, and others (see Tip #4).
- If dyspnea exists despite such causes being ruled out, pleural effusion may be a major contributing factor. The history (e.g. gradually increasing dyspnea) and physical exam (e.g. dullness to percussion, pleural rub, poor air entry, bronchial breath sounds) will often suggest this and a chest x-ray will confirm it or rule it out.

Treatment:

- Treatment of pleural effusion will depend on the underlying cause. Many acute effusions from causes such as cancer, infection, or congestive heart failure will resolve from drug therapy alone (e.g. chemotherapy, hormonal therapy, antibiotics, diuretics). If the underlying cause is unclear a diagnostic-therapeutic thoracentesis (send specimens but remove sufficient fluid for symptom relief) may be appropriate.
- Pleural effusions associated with advanced diseases (e.g. many cancers, but also severe heart failure) may not respond well to drug therapy alone. In these situations therapeutic pleural effusion drainage may be indicated for symptomatic relief.

Types of Therapeutic Pleural Effusion Drainage:

Note: The decision to proceed with drainage should be made after considering the overall goals of care, functional status, prognosis, and presence of co-morbid conditions. Guidelines suggest that no more than 1.5 L of fluid can be safely removed at any one time to prevent re-expansion edema, but some authors suggest that as much as 20ml/kg of fluid can be safely removed (2).

- **Repeated thoracenteses** is appropriate for patients with short prognoses (weeks). The re-accumulation rate is approximately 98% by 30 days (3). Problems associated with this

approach include the need for repeated procedures, pneumothorax, infection, and the development of loculation.

- **Chest tube drainage without pleurodesis** involves the use of a large-bore tube to drain the pleural cavity followed by the tube's removal, without sclerosis. This prevents re-accumulation in 11-40% of patients at 30 days follow-up (4).
- **Chest tube drainage with pleurodesis** requires chest tube insertion followed by instillation of a sclerosing agent. It has a success rate of 70-95% with no fluid re-accumulation at 1 month (if the pleural and parietal surfaces are apposed after drainage and pleural fluid drainage is less than 100 ml/day at the time of instillation) (5). Heavy tumor burden, reflected by low pleural pH (<7.2) or glucose concentration (< 3.3 mmol/L), is associated with a lower success rate and shorter survival (6). Talc is inexpensive and has the lowest re-accumulation rates (3-8% after 30 days), compared to doxycycline and bleomycin (1). Talc is rarely associated with ARDS and systemic embolization; more common side effects are pain and fever. Sclerosis requires a large-bore chest tube which often remains in place for 5-7 days – a major consideration in patients with a short prognosis. Thoracopic installation of talc is the most effective technique in highly selected patients, but it is more costly (7,8). Providing adequate pain management is crucial for chest tube insertion and any sclerosis technique.
- **Small-bore catheters** can be inserted radiologically in the ambulatory setting and connected to a drainage bag for intermittent drainage by nurses or family members at home. Chemosclerosis can be accomplished through the small catheter. When done in the inpatient setting, sclerosis via a small catheter has a success rate of 62 to 95%; outpatient chemosclerosis may be less efficacious but there has been no head-to-head comparison.
- **Tunnelled pleural catheters** (e.g. PleurX ™)are similar to small-bore catheters but involve a cuff which is tunneled under the skin to prevent infections. A Canadian retrospective study using an outpatient tunneled pleural catheter system showed symptom improvement in 96% of patients at 2 weeks post insertion; spontaneous pleurodesis was noted in 44% of all patients (9).

References

1. Belani CP, Pajeau TS, Bennett CL. Treating malignant pleural effusions cost consciously. Chest. 1998; 113:78S-85S.
2. Putnam JB,Jr. Malignant pleural effusions. Surg Clin North Am. 2002; 82:867-883.
3. Anderson CB, Philpott GW, Ferguson TB. The treatment of malignant pleural effusions. Cancer. 1974; 33:916-922.
4. Grodzin CJ, Balk RA. Indwelling small pleural catheter needle thoracentesis in the management of large pleural effusions. Chest. 1997; 111:981-988.
5. DeCamp MM,Jr, Mentzer SJ, Swanson SJ, Sugarbaker DJ. Malignant effusive disease of the pleura and pericardium. Chest. 1997; 112:291S-295S.
6. Heffner JE, Nietert PJ, Barbieri C. Pleural fluid pH as a predictor of pleurodesis failure: Analysis of primary data. Chest. 2000; 117:87-95.
7. Shaw P, Agarwal R. Pleurodesis for malignant pleural effusions. Cochrane Database of Systematic Reviews 2004, Issue 1. Art. No.: CD002916. DOI: 10.1002/14651858.CD002916.pub2.
8. Belani C, Einarson TR, Arikian SR, Doyle J. Cost-effectiveness analysis of pleurodesis in the management of malignant pleural effusion. J Oncology Management. 1995; Jan/Feb:24-34.
9. Tremblay A, Michaud G. Single-center experience with 250 tunnelled pleural catheter insertions for malignant pleural effusion. Chest. 2006; 129:362-368.