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## FAST FACTS AND CONCEPTS #209

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**Introduction** Malignant pericardial effusions (MPEs) are a rare complication of advanced cancer, but are associated with high morbidity and mortality. This Fast Fact discusses the diagnosis and management of MPEs.

**Epidemiology and Prognosis** Approximately 10% of patients with cancer develop cardiac metastases, with ~75% of these affecting the epicardium (1, 2). Only a third of these, however, will develop clinically significant MPEs (1). Lung and breast cancers are the most common causes. MPEs are associated with a poor prognosis. Studies suggest a median survival of 2-3 months after a MPE is diagnosed, with a mean survival of 5 months for solid tumors and 20 months for hematologic malignancies (3, 4).

**Physiology and Symptoms** The pericardial space is normally filled with <50 ml of serous fluid. As this volume increases due to epicardial or pericardial metastases or lymphatic obstruction, both right and left ventricular failure can occur due to inadequate filling. Signs and symptoms include peripheral and pulmonary edema, chest discomfort, cough, shortness of breath, and orthopnea. Severity of symptoms depends on the volume of the MPE as well as the rapidity of its accumulation; severe cases can present with cardiac tamponade and shock. An echocardiogram is indicated whenever a MPE is suspected. Not only does it confirm the presence of an effusion, but its findings can dictate whether or not urgent treatment is indicated (e.g. if signs of tamponade are evident). A diagnostic pericardiocentesis or pericardial biopsy is sometimes needed to confirm the cause of the effusion.

## Treatment Options

- *Systemic chemotherapy or radiotherapy* are effective for chemo- or radio-sensitive tumors such as previously untreated breast cancer and many lymphomas. Reaccumulation rates for both modalities are about 1/3 overall, depending on the patient's overall course and response to therapy (5).
- *Pericardiocentesis* results in immediate symptom relief in most patients, however the effusion may rapidly re-accumulate in many patients, requiring repeat pericardiocentesis (within 1-2 weeks in some series) (6).
- *Pericardial sclerosis* involves instilling a sclerosing agent with the intention of scarring the pericardium to the epicardium, preventing reaccumulation of the MPE (similar to pleural effusions – see *Fast Fact #157*). Multiple agents have been studied including doxycycline, minocycline, and bleomycin. Success rates (no reaccumulation at 30 days) are about 70-90% (7, 8). Longer term success rates have not been defined due to the poor survival of study patients. The major side effect is chest pain (50-70%), cardiac arrhythmias, and fever (8, 9, 10). In head to head comparisons with doxycycline, bleomycin has been shown to have fewer side effects and to lead to shorter hospitalizations (10, 11, 12).
- *Surgical decompression* therapies range from less invasive (balloon pericardiostomy, subxiphoid or thoroscopic pericardiostomy) to more extensive (open thoracotomy with pericardial stripping). A pericardial 'window' (which allows ongoing drainage of fluid externally or internally such as into the pleural cavity) is often created. Case series have suggested reaccumulation rates with surgical therapies are low (less than 15% up to 10 months out) (13, 14, 15).

**Decision-Making** The treatment of MPEs depends on how urgently treatment is needed, the likelihood of the tumor responding to anti-neoplastic treatments, and the anticipated survival of the patient. A multidisciplinary approach to decision-making, involving input from medical and radiation oncology, cardiology, and thoracic surgery is recommended. Simple pericardiocentesis may be appropriate for patients with short prognoses (< 1 month), particularly if their MPE is not expected to re-accumulate in their remaining life-span. A symptomatic

patient with no signs of tamponade and a chemotherapy-sensitive tumor such as untreated breast cancer may receive a durable response from a pericardiocentesis for symptom relief, followed by chemotherapy. Patients with longer prognoses (>1 month) who are expected to re-accumulate their MPEs will likely benefit most from sclerosis or surgical decompression; there is no clear evidence currently suggesting one strategy is superior to the other. Symptom directed care without specific intervention for the MPE is an appropriate option for patients with very short prognoses and for those who decline more invasive treatments.

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