

Post-Pulmonary Endarterectomy: What to Expect During the First Year and How to Handle the Unexpected

Section Editor

Mary Bartlett, MS, RN, CS, FNP

Thao Drcar, MS, RN, ANP-BC, CNS

*University of California, San Diego
La Jolla, California*

Pulmonary thromboendarterectomy (PTE) surgery has revolutionized the treatment of chronic thromboembolic pulmonary hypertension (CTEPH). The majority of patients who undergo PTE report good functional status and improved quality of life, and survival of patients who undergo PTE is considerably greater than patients who have not undergone surgery.¹ However, despite its significant benefit to patients, providers caring for these patients postoperatively must be aware of a number of clinical sequelae of the procedure. The purpose of this article is to present an overview of what to expect during the first year following PTE surgery. Postoperative hypoxemia, post-sternotomy limitations, pericardial effusion, long-term anticoagulation, and residual pulmonary hypertension (PH) are issues that arise and will be addressed.

It is very common for patients to manifest post-procedural hypoxemia, which may persist for months. Even patients who did not require supplemental oxygen prior to PTE may need oxygen for several months following their procedure. The mechanism of this hypoxemia is believed to originate from ventilation-perfusion mismatching, which commonly occurs from a variety of causes. Pulmonary vascular “steal” is a phenomenon uniquely seen in a great deal of PTE patients and results from reversible redistribution of pulmonary blood flow away from previously well perfused lung regions into newly endarterectomized segments induced by the surgery.² This redistribution of flow can give the postoperative nuclear perfusion scan a very abnormal appearance that

tends to improve over the following year. For this reason, a follow-up ventilation/perfusion scan is suggested 6 and 12 months following PTE surgery to establish a new baseline for the patient. As with other cardiothoracic surgical procedures, postoperative atelectasis can also contribute to hypoxemia, as well as hemidiaphragm paralysis due to phrenic nerve injury related to the procedure. Periodically assessing the patient’s oximetry following surgery is advised so that supplemental oxygen can be weaned and discontinued as oxygenation improves.

As with any procedure that requires a median sternotomy, patients may be limited by postoperative pain. Patients exhibit a wide variety of perceptions of pain, with many requiring narcotics for several weeks following discharge to those who are easily managed with acetaminophen. Patients with chronic pain syndromes prior to surgery can be particularly challenging to manage in the postoperative period given their tolerance to narcotics. A pain specialist may best manage such patients after discharge. Current guidelines for sternal precautions recommend that patients should avoid lifting more than 5 to 10 pounds, weight bearing of the upper extremities, driving, or returning to work for 6 to 8 weeks to reduce the risk of sternal complications. Certain risk factors are associated with sternal wound complications including obesity, diabetes mellitus, redo sternotomy, COPD, smoking, and female gender with large breast size.³ It is therefore important for patients to adhere to these short-term activity limitations. Any signs or symptoms

suggestive of sternal wound infection such as increased redness or drainage from the incision, fever, or sternal instability should be evaluated immediately as these infections can be life threatening if not dealt with promptly.

The importance of lifelong anticoagulation should be stressed in this patient population, which has a strong propensity for rethrombosis. Unless contraindicated, warfarin is typically recommended after PTE, as its effects can be measured and reversed in the event of a hemorrhagic complication. The role of newer oral anticoagulants in the treatment of patients following PTE surgery has yet to be determined. The provider has to be vigilant for any of the known complications related to anticoagulation.

Pericardial effusion may occur after PTE, in part due to the early use of anticoagulation and the complexity of the surgery. Pericardial effusion most often develops within the first month following PTE. Common symptoms include acute dyspnea, malaise, chest pain, presyncope, or syncope. Clinical features of tamponade may include hypotension, tachycardia, and pulsus paradoxus. When pericardial effusion is suspected, it is imperative the provider promptly obtain an echocardiogram and chest x-ray. A chest x-ray is easy to obtain quickly and may demonstrate an enlargement of the cardiac silhouette, but echocardiography is the definitive study in diagnosing pericardial effusion. Management strategy depends on the patient’s clinical condition and echocardiographic findings.

For smaller effusions, holding anticoagulation short term and/or steroids or colchicine may be effective in resolution of the effusion. For larger effusions,

Correspondence: tdrCAR@ucsd.edu

especially with tamponade physiology, evacuation is necessary.⁴ Patients should continue to exhibit clinical improvement following PTE surgery. Any clinical deterioration such as worsening of dyspnea, chest pain, hypoxemia, or evidence of right heart failure or hemodynamic instability should prompt the provider to order an echocardiogram immediately since tamponade is life threatening. Postoperative pleuritis/pleural effusions may also be seen and are managed similarly to pleural effusions following other cardiothoracic surgical procedures with observation, drainage, or steroids, depending on the size and symptoms.

Finally, post-procedural residual PH can be observed in some cases. The pathogenesis of such residual PH may be related to the inability to surgically resect

all of the thrombus/fibrotic material from the pulmonary arteries during the procedure or superimposed small vessel vasculopathy that is similar in appearance pathologically to PAH. PAH-directed medical therapy may have a role in the treatment of these patients. There are no guidelines that define what level of residual PH following PTE surgery should be treated or when therapy should be initiated. However, prior to committing to this costly and arduous journey, patients should consult a center with expertise in CTEPH.

In summary, while the majority of CTEPH patients experience improvement in right heart function and symptom relief after PTE, the recovery period can be overwhelming for many. It is important to note that many patients do not have such issues after surgery.

Knowing what to expect during the first year after PTE offers peace of mind for patients and clinicians alike.

References

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