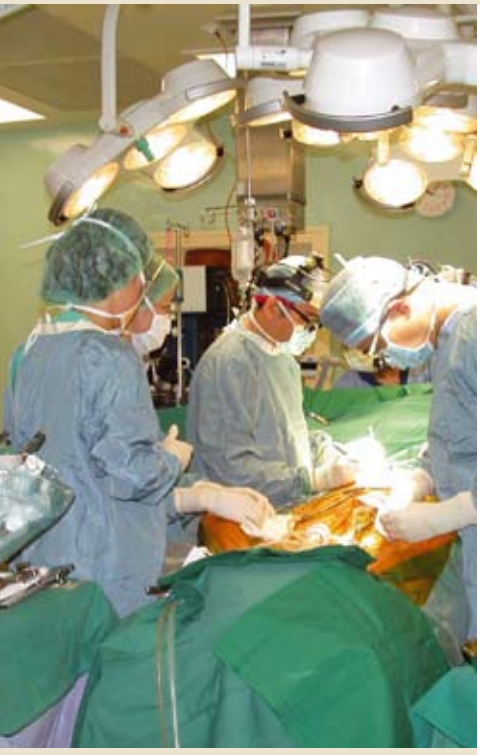
# Pulmonary Thromboendarterectomy



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***Introduction:***

Pulmonary embolism (PE) affects 0.5-1 per 1000 people in the general population each year, and is one of the most common preventable causes of death among hospitalized patients. Unfortunately the diagnosis is missed more often than it is made, because PE often causes only vague and nonspecific symptoms. The clinical diagnosis of PE is unreliable and must be confirmed objectively with ventilation perfusion scanning or CT-angiography. Cardiogenic shock or systolic hypotension (BP <90mmHg), and presence of right-ventricular dysfunction or two principal criteria which govern the severity of PE.

Chronic thromboembolic disease develops in only 0.5% of patients with a clinically recognized acute P.E. Most patients diagnosed with chronic PE have no antecedent history of acute emboli.

We frequently detect pulmonary hypertension even when less than 50% of the vascular bed is occluded by thrombus. This process may lead to an inoperable situation.

The most common symptom associated with thromboembolic pulmonary, hypertension, as other of pulmonary hypertension, is exertional dyspnea syncope or presyncope is another common symptom in pulmonary hypertension. Currently, pulmonary angiography remains the gold standard for diagnosis of chronic thromboembolic pulmonary hypertension. Patients over age 40 undergo coronary arteriography and other cardiac investigations as necessary.

Chronic anticoagulation represents the main stay of medical regimen because of the bronchial circulation, pulmonary embolism, seldom results in tissue necrosis. Pulmonary endarterectomy appears to be permanently curative.

The severity of pulmonary hypertension at the time of diagnosis inversely correlates with duration of survival in this article we report 1 case of successful pulmonary thrombo endarterectomy (PTE), focusing on the surgical technique and outcome of the patient underwent PTE for chronic thromboembolic pulmonary hypertension. Cardiac surgery Department, shahid Rajaee Heart Center, Tehran, Iran.

***Case report:***

A 37 year old man with the chief complaint of chronic cough was under medical treatments for at least one year. 3 months before referral to our center, he was admitted by a lung specialist in a university center and underwent several work ups. Finally suggesting pulmonary thromboembolism, he got medical treatment with heparin & Warfain. After partial amelioration, he developed dyspnea & referred to our center with FC III. He was nominated for pulmonary thromboendarterctomy.

He underwent open heart surgery with midline sternotomy, incision on 30th Oct, 2008. Using bicaval and aortic cannulation and total CPB as routine, he cooled off to 22°c. Initially right atrium was opened and venting through PFO was performed. Main PA was incised, extending through LPA to left lung hilum. Left branches were intact. Then RPA was opened to the extent of right lung hilum. All clots were expelled and thromboendarterectomy of segmental PA branches was performed as for as possible. CPB was discontinued using low dose inotrope. Post op he received heparin for at least 3 days in ICU. After 3 days he was transferred to ward and no special disturbance was encountered during this time.

He discharged after ten days of operation with good general condition and without cough, dyspnea or any other complaint.

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***Comment:***

PE is an extremely common and highly lethal condition that is a leading cause of death in all age groups. The initial treatment of PE is low molecular weight heparin or unfractionated heparin for at least 5 days, followed by warfarin (target INR 2-3) for at least 3-6 months. Percutaneous transcatherter or surgical embolectomy may be life saving in patients ineligible or unresponsive to anticoagulation therapy.

Pulmonary endarterectomy (PTE) is the definitive treatment for chronic pulmonary hypertension resulting from thromboembolic disease. Chronic thromboembolic pulmonary hypertension is estimated to occur in approximately 4% of patients who have developed an acute PE, though the true prevalence is suspected to be much higher. Indications regarding surgical pulmonary embolectomy remain contraversial. In fact surgical embolectomy for massive PE has become a rare procedure often it is viewed as a last chance option for patients undergoing CPR after massive PE. Thus thrombolytic therapy has become the treatment of choice. However a significant proportion of patients suffers from residual obstruction after thrombolytic therapy and faces the development of chronic pulmonary hypertension. Therefore some centers have regained interest in surgical embolectomy after improved risk stratification and reported very good results. Perioperative survival rates up to 89% have been reported so the more widespread use of surgical embolectomy seems warranted. Chronic thromboembolic pulmonary hypertension is characterized by intraluminal thrombus organization fibrous stenosis and vascular remodeling of pulmonary vessels. The only other surgical option for these patients is transplantation. Transplantation not to be appropriate for this disease because of the mortality and morbidity rate of patients on the waiting list, the higher risk of the operation, and the fewer survival rate. PTE is an operation considered to be a curative for this affliction and is therefore superior to transplantation.

Keeping in mind that thrombolysis and catheter embolectomy have varying degree of failure and risk, we propose surgical embolectomy in (sub) massive PE as an alternative procedure or even as a primary treatment. The procedure involves the removal of organized and incorporated fibrous obstructive tissue from the pulmonary arterial tree and is a true endarterectomy not an embolectomy. Surgical outcomes with respect to functional status. Quality of life, hemodynamics, right ventricular function and gas exchange are favorable. Preoperative hemodynamic severity and site of anatomical obstruction are key predictors of post op outcomes.

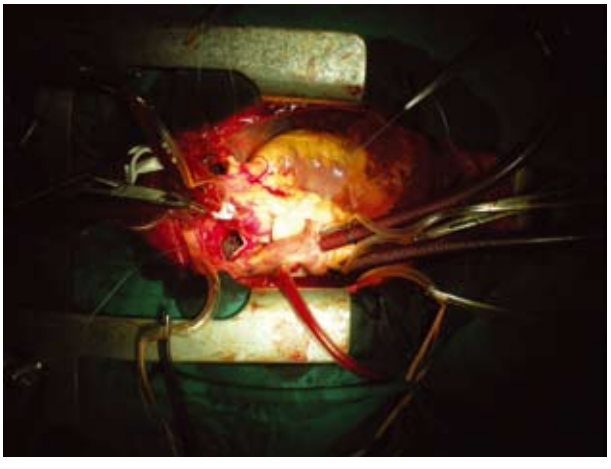
When the diagnosis of thromboembolic pulmonary hypertension has been firmly established, the decision for operation is made based on the severity of symptoms and the general condition of the patient. Most patients who undergo surgery are classified as NYHA class III or IV.

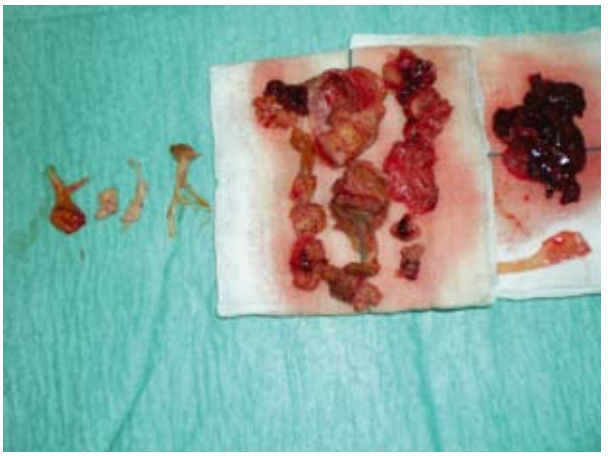
We have increasingly been inclined toward early operation so as to ovoid complications. We are tending to offer surgery to symptomatic patients, whenever the angiogram demonstrates thromboembolic disease.

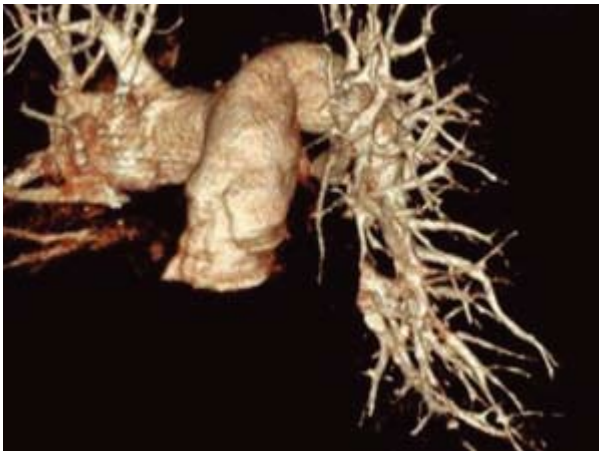
The median sternotomy incision, apart from providing bilateral access.

Avoids entry to the pleural cavities and allows the ready institution of CPB.

Complications specific to this operation include persistent pulmonary hypertension, reperfusion pulmonary response, and neurologic disorder related to deep hypothermia. The advantage of PTE include a lower operative mortality rate and excellent long-term results without the risks associated with chronic immunosuppression and chronic allograft rejection. Although PTE is technically demanding for the surgeon, excellent short and long term results can be achieved. Increased awareness of both the prevalence of this condition and the possibility of a surgical cure should avail more patients of the opportunity to relief from this debilitating and fatal disease. A randomized, controlled trial is overdue to determine the banefits of this therapy in stable patients compared with thrombolytic therapy if "best-practice" therapy is to be achieved for the patients benefit.







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