A 76-year-old woman was admitted to the hospital because of episodes of ventricular tachycardia. She had a history of myocardial infarction in 1973 and underwent coronary artery bypass surgery in 1993. Transesophageal echocardiography revealed grade 3 mitral valve regurgitation. A left and right cardiac catheterization was performed with insertion of a Swan-Ganz catheter via the right femoral vein. Shortly after inflating the balloon in the wedge position, the patient experienced an episode of hemoptysis of approximately 50 mL. The pulmonary artery pressure was 40/20 mm Hg (mean, 21 mm Hg). Because of oxygen desaturation, she was transferred to the ICU. The chest radiograph then obtained showed a well-circumscribed rounded mass in the right middle lung zone (Fig 1), which was not seen on prior chest radiographs.

What is the diagnosis?

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Figure 1. Posteroanterior (top) and lateral (bottom) chest radiographs demonstrate a well-circumscribed rounded mass involving the middle lobe.
Diagnosis: False aneurysm of the pulmonary artery induced by a Swan-Ganz catheter

Discussion

Because of suspected intrapulmonary hemorrhage, a CT scan of the thorax was performed that showed a large mass in the right mid-zone with slight enhancement after contrast administration (Fig 2). Because the possibility of a perforation of the pulmonary artery was also considered clinically, a pulmonary angiogram was performed. Initial anteroposterior cut film angiography of the right lung was performed, injecting 30 mL of contrast medium (Iomeron 350; Bracco-Byk; Byk-Gulden, Germany) at 20 mL/s through a 7.1F Hellman angled pigtail catheter (Cordis Europe; Roden, The Netherlands). Enhancement of the lesion was prompt. A selective right interlobar pulmonary artery injection more clearly demonstrated a persistent collection of contrast arising from the medial branch of the artery of the middle pulmonary lobe, compatible with a false aneurysm (Fig 3). No contrast extravasation into the airways was noticed.

The pigtail catheter subsequently was exchanged over an exchange wire for a 7F headway guiding catheter with a 5F inner coaxial catheter (Nycomed; Paris, France). This catheter was advanced over an angled 0.035-inch Radiofocus guidewire (Terumo; Tokyo, Japan) into the medial branch of the middle lobe pulmonary artery. A 8 × 11-mm detachable gold valve balloon (GVB 17; Nycomed) was used to occlude the segmental artery proximal to the pseudoaneurysm. Postembolization digital pulmonary arteriogram showed successful occlusion of the segmental artery (Fig 4).

Pulmonary artery rupture is a rare complication of pulmonary artery Swan-Ganz catheterization (0.05 to 0.2%). The most common presenting symptom is hemoptysis, which can be fatal in 45 to 65% of cases. If the patient survives, a false aneurysm of the pulmonary artery may be the result, which is located most often in segmental or subsegmental branches of the right middle or lower lobe pulmonary artery. This may lead to recurrent life-threatening hemorrhage. Dynamic contrast-enhanced CT and pulmonary angiography are used to confirm the diagnosis. Transcatheter embolotherapy is the treatment of choice with lower morbidity and mortality than lobectomy. Occlusion of the pulmonary artery branches is a well-accepted method of treatment by either selective placement of coils or a detachable balloon in the feeding artery of the false aneurysm.
Both occlusion methods share similar limitations and complications during the placement of the embolization device. Advantages of the detachable balloon technique are the possibility to selectively occlude the feeding vessel just proximal from the false aneurysm, without the risk of migration that can be the case with coils. A review article by DeLima et al described 92 cases of pulmonary artery rupture induced by pulmonary catheterization that led to 28 occurrences of false aneurysm. Of these, only 12 false aneurysms were detected and treated (11 by transcatheter embolotherapy) before rupture. All patients treated before rupture of the false aneurysm survived, whereas mortality was 100% in patients with rupture of false aneurysms before treatment.

Our patient survived her iatrogenic complication that happened almost 2 years ago, without having recurrent hemoptysis. The mass on her chest radiograph was no longer visible after 5 months.

In conclusion, a diagnosis of false aneurysm of the pulmonary artery should be considered in all patients who experience hemoptysis associated with Swan-Ganz catheterization.

**REFERENCES**


**FIGURE 4.** Selective occlusion of the feeding vessel (medial branch of the middle lobe artery) of the false aneurysm by a detachable balloon (arrow). Top: cut film. Bottom: digital subtraction angiography.