myocardial wall attachment. Schneider and Bednarkiewicz, Tsai et al., and Yakes have described techniques for percutaneous retrieval of ectopic Greenfield filters. Transesophageal echocardiography should be considered prior to retrieval for localization, evaluation of valvular compromise, and assessment of wall penetration.

When percutaneous retrieval is unsuccessful or contraindicated, asymptomatic stable patients should initially be monitored closely for evidence of acute complications. Periodic ECG evaluation should be done to detect any new conduction disturbances. Radiographic evaluation for evidence of further filter migration should also be done periodically. If change in filter position is noted, repeated echocardiography should be considered. Operative intervention should most likely be limited to patients with intractable arrhythmias, valvular dysfunction, or evidence of tamponade. In summary, in an asymptomatic patient without evidence of further filter migration or increasing conduction system abnormalities in whom percutaneous removal is unsuccessful or unfeasible, the morbidity associated with leaving the filter in place must be weighed against that of surgical removal.

REFERENCES

Massive Hemoptysis Caused by a Ruptured Subclavian Artery Aneurysm

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We report a case of left subclavian artery aneurysm, which ruptured and penetrated through the left upper lung parenchyma causing massive hemoptysis and a left hemothorax. Through sternothoracotomy, tangential aneurysmorrhaphy under proximal control and left upper pulmonary lobectomy were performed. The patient is doing well after nearly three years of follow-up.

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Aneurysms of the subclavian artery are rare.1-5 Rupture of this artery causing massive hemoptysis appears to be an unusual presentation. This prompted us to report on the clinical course and management of the case at hand.

CASE REPORT

A 50-year-old woman was referred to the National Cheng-Kung University Hospital on July 19, 1989, because of massive hemoptysis. She had chronic cough for one year and had begun to expectorate blood-tinged sputum five days before. When she visited a private clinic, the chest x-ray film (Fig 1) showed a mass density in the upper part of the left lung. Two days before this admission, massive hemoptysis occurred and she was transferred to a hospital, where the subsequent chest x-ray film (Fig 2) showed the mass density progressively enlarged and a left hemothorax. Upon referral to our hospital, the chest computed tomography scan revealed a

Figure 1. The mass density in the left upper lung field indicates a left subclavian artery aneurysm.
left subclavian artery aneurysm (Fig 3). There was a rupture of the aneurysm and penetration through the left upper lung parenchyma with a complication of the left hemorhax. Physically, there was no difference in bilateral radial pulsations. Emergency sternothoracotomy (medial sternotomy with a transverse incision along the left second rib bed) was carried out. After proximal control of the left subclavian artery, tangential aneurysmorrhaphy and a left upper lobectomy were performed.

The operative findings were as follows: (1) There was a 12 x 10 x 8-cm left subclavian artery pedicle aneurysm with a laminated thrombus, located at the apex of left pleural cavity. (2) The aneurysm pedicle was only 2 cm in diameter. It was adherent to the apex of the left lung. (3) The left upper lung lobe was penetrated by the aneurysm with retention of blood clots. (4) There was 1,000 ml of clotted blood in the left pleural cavity.

The resected specimens were taken for pathologic examination. Some of the thrombi were lined by a thin layer of endothelium. There was a large tunnel-like structure in the upper portion of the left lung lobe from the upper border into the anterolateral wall, 7 cm long and 3.5 cm in diameter. Microscopically, sections showed the canal without true endothelial lining but with fibrous proliferation along the canal. The remaining pulmonary parenchyma was moderately congested. Postoperatively, the left radial pulsation was weak compared with the right. The patient was discharged in good condition two weeks after the operation. She has remained well after nearly three years of follow-up.

**Comment**

Subclavian artery aneurysms are rare. Rupture of subclavian artery aneurysms is also an unusual complication. Patients with subclavian artery aneurysms have been found to have a high incidence of other peripheral aneurysms. Most patients with aneurysms of the subclavian artery are symptomatic. Localized pain, Horner's syndrome, hoarseness, and paresthesia of an arm are the manifestations. However, massive hemoptyysis is an unusual presentation.

In 1978, Hobson et al. recommended that arteriography should be utilized in patients with peripheral arterial aneurysms to identify other areas of involvement. In the presented case, chest computed tomography demonstrated the nature of the lesion and its surrounding pulmonary changes. To control bleeding in this emergency case, we preferred not to perform arteriography.

Surgical treatment for the patients with subclavian artery aneurysms should be considered to avoid the risk of rupture, embolus formation, or thrombosis. A variety of techniques are used with different surgical approaches and arterial repairs. Surgical approaches consist of supraclavicular incision, axillary incision, median sternotomy, thoracotomy, or a combination of all of these depending on the location of the aneurysm. Median sternotomy with a transverse incision along the second rib bed was used for the case reported herein. It provides a good exposure to do the aneurysmorrhaphy under proximal control and to perform a concomitant left upper lobectomy. Coselli and Crawford described the methods of repair using tube graft replacement on most patients. The remainder of the patients had a patch angio-plasty, an exclusion and extra-anatomic bypass, or ligation and resection. Pairolero and colleagues performed a tangential aneurysmorrhaphy on 8 of 28 surgically treated patients. In this presented case with massive hemoptyysis, the emergency operation was performed with the patient under anesthesia performed with double-lumen endotracheal intubation.

Many authors recommend resection of the aneurysm and arterial reconstruction. Our patient had a weak radial pulsation which was directly related to the narrowing lumen after a tangential aneurysmorrhaphy.

**References**