Edward Kelly, M.D.*
Cincinnati, Ohio

This 20-year-old Negro woman has been admitted to the hospital with cough, fatigue and night sweats for several months. These symptoms later proved to be due to tuberculosis in the left upper lobe. At the age of one year she had a large heart. Systolic murmur, best heard at the second left intercostal space, was found. For the past five years she has had exertional dyspnea. She has never been cyanotic.

Physical examination reveals rales and wheezes over the left upper lobe, apparently the result of the tuberculosis. A continuous murmur is heard over the entire thorax, best in the right infraclavicular area. She also has a Grade II systolic ejection murmur at the pulmonic area and a loud, fixed, split second pulmonic sound. Contrast medium has been injected into the main pulmonary artery. Figure 2 is a frontal view of the right pulmonary arteries. Electrocardiography revealed right bundle branch block and right ventricular hypertrophy. Cardiac catheterization showed evidence of an atrial septal defect.

Fluoroscopically, striking pulsation was noted in the nodule adjacent to the left upper lobe density.

*From the Cincinnati General Hospital, University of Cincinnati College of Medicine.
**Diagnosis: Multiple Pulmonary Artery Branch Stenosis**

Figure 1 shows an enlarged heart, large central pulmonary arteries and prominent vessels in the right upper lobe. There is collapse of the left upper lobe with a peculiar bump on its inferior lateral aspect. Figure 2 demonstrates multiple stenotic pulmonary artery branches with post-stenotic dilatation.

At operation, the pulmonary artery branches were noted to be enlarged proximal and distal to the stenotic areas. There was an enlarged lymph node lying between the left upper lobe bronchus and a dilated pulmonary artery. Transmitted pulsations from the artery to the node apparently caused the collapse. Both the left upper lobe and this node contained tubercle bacilli.

Gay, et al., classified pulmonary artery stenosis into four main types:

I. Single stenosis of the main, right or left pulmonary artery with normal distal branches. The constriction may vary from a membranous diaphragm to an elongated stenotic segment.

II. Single stenosis of the bifurcation of the main pulmonary artery involving the origins of the right and left branches. This is usually a long segment.

III. Multiple stenoses of pulmonary artery branches with normal main, right and left pulmonary arteries.

IV. A combination of two of the above.

Pulmonary artery stenosis is an isolated finding in 40 per cent of the reported cases. Associated cardiovascular anomalies include pulmonary valvular stenosis (30 per cent), tetralogy of Fallot (15 per cent), and atrial septal defect (15 per cent). Pathologically, there is proliferation of the intima at the site of the stenosis and a thin-walled post-stenotic vessel.

The roentgen findings vary with the type of stenosis and the nature of the associated cardiac anomaly. In Type I the undivided pulmonary artery may be small and concave if the stenosis is long, but it may be large (post-stenotic dilatation) if the stenosis is short. In Type II, the main pulmonary artery is usually large and its right and left branches are small. In Type III the stenoses are short and the vessels are large proximal and distal to the constrictions. In Type IV the size of the main pulmonary artery depends on the length of the central stenosis, but there is dilatation distal to the peripheral stenosis. On plain film, one cannot differentiate Type III from multiple pulmonary arteriovenous fistula. However, fluoroscopically the affected vessels pulsate vigorously. Selective angiocardiography is diagnostic. Oblique views sometimes are required for outlining the stenoses. Right ventricular enlargement or an associated heart defect may be found.

Too few cases are reported to draw any conclusion concerning prognosis. Often the associated cardiac defect will determine this. Types I and II lend themselves to surgical correction provided the associated cardiac lesion is not prohibitive.

**References**


Readers are invited to submit articles for the Roentgenogram of the Month. Please submit a brief abstract of your case to Benjamin Felson, M.D., Department of Radiology, Cincinnati General Hospital, Cincinnati Ohio.