

# Unusual types of coronary artery lesions

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The most common form of coronary artery disease is coronary atherosclerosis, which often produces narrowing of the lumen of epicardial branches of the coronary arteries. However, many other pathological processes may involve the coronary artery, for example, various forms of arteritis, trauma, metabolic causes, congenital abnormalities, thromboembolism, or functional disorders. A few of these subjects will be discussed.

## **Coronary artery aneurysm**

Coronary artery aneurysm was described by pathologists more than 200 years ago. With the advent of coronary arteriography, antemortem diagnosis of coronary aneurysm became possible. The etiology is atherosclerosis in more than half of the cases. Other causes are congenital, mycotic-embolic, dissecting, and syphilis. Trauma and various forms of arteritis, especially the infantile form of polyarteritis nodosa and Kawasaki's disease (MCLNS) are associated with coronary artery aneurysm. The aneurysms have no distinctive clinical features and the major presenting symptoms are angina or myocardial infarction, which are related to embolization of thrombotic material from the aneurysm to the distal artery or thrombosis of the aneurysm and occlusion of the coronary artery. Rupture can occur

in polyarteritis nodosa or mycotic aneurysm. It is less common in the congenital form and rarely occurs in atherosclerotic cases.

### **Ectasia of the coronary artery**

Generalized aneurysmal dilatation and irregularity of the coronary artery have been called coronary ectasia. This is a distinct clinical entity, although it is not well studied and its natural history is not well known. Its incidence has been reported to be about 1.2%. Its etiology is atherosclerotic, and the aneurysmal dilatation occurs because of destruction of the muscular and elastic element of the media by the atherosclerotic process. There is a higher prevalence of a positive family history for coronary artery disease, hypertension, history of myocardial infarction, and abnormal electrocardiogram. Chest pain is often nonexertional and prolonged. There seems to be a higher incidence of abdominal aortic aneurysm in these patients, and in a few cases, aneurysms of other arteries have been reported. The prognosis is similar for patients with triple-vessel coronary artery disease, although a somewhat more favorable prognosis has been reported by other investigators.

### **Ostial stenoses of coronary arteries**

Ostial stenoses of coronary arteries are clinically important entities. They increase the risk of coronary arteriography and may cause diagnostic difficulties. The prognosis for a significant left coronary artery ostial lesion is the same for left main trunk lesion. The etiology is mostly coronary atherosclerosis and this type of ostial lesion is associated with atherosclerotic involvement of other segments of the coronary artery system. Syphilis is the typical cause of ostial lesions. Other forms of aortitis are also

responsible for ostial lesions. Ostial lesions have been reported following aortic valve replacement. There seem to be two separate mechanisms: one is direct injury to the vessel at the time of cannulation and perfusion; the second is due to turbulence of blood flow in patients who have a ball valve aortic prosthesis. Disabling angina develops shortly after aortic valve replacement and can be treated by revascularization surgery.

### **Coronary artery dissection**

Dissection of an aneurysm of the aorta may extend to the coronary arteries and this is the most common form of coronary artery dissection. Primary dissection of the coronary arteries is rare. These patients are relatively young. The female to male ratio is 3:1. The dissection mostly involves a single coronary artery, and the left anterior descending is commonly involved. Coronary atherosclerosis is minimal or absent. Of 32 women, 12 were in the peripartum period. Dissection may be iatrogenic and may occur during cardiac catheterization or cardiac surgery. It may occur following chest trauma and has occurred following cardiac massage. Primary dissection may occur in Marfan's syndrome. Primary dissection usually involves the proximal segment of the vessel; therefore, these patients are potential candidates for revascularization surgery.

### **Coronary thromboembolism**

Coronary thrombosis is believed to play a role in the pathogenesis of coronary atherosclerosis. It is frequently seen in patients with acute transmural myocardial infarction and it is rare in patchy, multifocal, subendocardial infarction. It may be responsible for my-

ocardial infarction in women who are taking contraceptive pills, and it may occur in coronary artery aneurysm.

### **Coronary embolism**

Coronary embolism should be suspected in patients who are susceptible to embolization when there is ischemic type of chest pain or other evidence of myocardial ischemia. It occurs in patients with prosthetic valves, bacterial and marantic endocarditis, and in patients with calcific valvular heart disease. Emboli may originate from the left ventricle or the left atrium, and may occur in patients with atrial fibrillation or following cardioversion.

### **Irradiation**

Coronary artery disease may occur following irradiation of the mediastinum, such as is used for the treatment of Hodgkin's disease or for carcinoma of the breast. These patients are relatively young and free from coronary risk factors. The pathology of the coronary arteries is different from that of the usual coronary atherosclerosis, and it shows

fibrous thickening of the intima and adventitia, and paucity of lipids in the intima. There is also an accumulation of plasma cells in the adventitia.

### **Myocardial bridge**

It is not uncommon for a segment of the left anterior descending artery to be intramyocardial. Its incidence has been reported by pathologists to be between 6% and 60%. Severe systolic compression (milking) is less commonly observed. Myocardial bridge was believed to have no hemodynamic significance until 1975 when Binet operated on a young patient with chest pain and myocardial bridge with a good clinical result.

Recent studies from Montreal Heart Institute have shown that patients with angina and Grade III (>75%) compression of the left anterior descending artery can have evidence of myocardial ischemia based on electrocardiographic and metabolic studies. Subjective and objective improvement have been noted in a few patients who underwent surgery.