# Foreword

Dr. Paolo Angelini has prepared a very scholarly book on coronary artery anomalies. It is the best book on this subject that I have seen. Throughout the years, numerous classification systems for coronary anomalies have been proposed. None of those systems is ideal, but the one proposed by Dr. Angelini is both comprehensive and clinically useful. It shows the thoroughness with which he has penetrated this topic.

Although coronary anomalies are relatively uncommon, lack of knowledge about them can lead to inaccurate diagnoses in the cardiac catheterization laboratory and sometimes to disastrous complications during cardiac operations. One of the most common coronary anomalies is origination of the left circumflex coronary artery from the first portion of the right coronary artery or from the right sinus of Valsalva, with retroaortic coursing to the left atrioventricular sulcus. This anomaly, which may affect as many as 1 in 300 persons, is usually entirely benign. When the left circumflex artery arises directly from the right sinus rather than from the right coronary artery, however, myocardial ischemia can occur during exertion. More rarely, the left main coronary artery arises from the right coronary artery or from the right sinus and follows a retroaortic course to the left side of the heart.

A particularly troublesome coronary anomaly is origination of the left main coronary artery from the right sinus of Valsalva, with coursing of the anomalous artery between the pulmonary trunk and the aorta to the left side of the heart. The typical patient is a young boy who faints during exertion. This anomaly is very dangerous and nearly always requires operative intervention. In contrast, when the right coronary artery arises from the left sinus of Valsalva and courses between the pulmonary trunk and the aorta, it rarely causes any functional disturbance or myocardial ischemia. Except on very rare occasions, this condition can be viewed as a benign anomaly.

Although many coronary anomalies are innocuous, nearly all of them can occasionally lead to problems. A single coronary artery of the right or left type is usually a benign anomaly. In recent years, however, a famous professional basketball player who died suddenly at 40 years of age was found to have a single right coronary artery. By the time it reached the front of the heart, the artery was so small that extensive scarring of the anterior left ventricular wall resulted, followed by sudden death. Origination of both the left anterior descending artery and the left circumflex artery directly from the left sinus (absent left main coronary artery) is always benign. However, at cardiac catheterization, if only one of these arteries is injected with contrast material, a misdiagnosis may occur.

Study of the coronary arteries can teach us a great deal about myocardial ischemia. For example, it has been debated whether myocardial ischemia produces an increase in the myocardial mass. Studies of young children with origination of the left main coronary artery from the pulmonary trunk indicate that these hearts increase in weight considerably by the age of 1 year, when heart failure usually becomes evident. Moreover, because systemic hypertension is so prevalent in adults, it is difficult to prove whether myocardial ischemia resulting from atherosclerotic coronary artery disease produces myocardial hypertrophy. However, this clearly occurs in some coronary anomalies, specifically origination of the left main coronary artery from the pulmonary trunk.

The variability in patient response to a particular coronary anomaly is intriguing. Most patients with origination of the left main coronary artery from the pulmonary trunk die at approximately 1 year of age. Nevertheless, an occasional patient with the same anomaly may live for 50 years and die of a condition totally unrelated to that anomaly. The reason for this extreme variability is a mystery.

Throughout the years, coronary anomalies associated with major congenital malformations of the heart have received considerable attention. Whereas coronary anomalies *not* associated with major congenital cardiovascular anomalies are complex, those *associated* with major congenital cardiovascular anomalies are even more so. Dr. Angelini and his colleagues have done a splendid job in discussing these types of anomalies. I congratulate them for producing a superb book that will be a valuable resource for adult and pediatric cardiologists and for cardiovascular surgeons.

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