Unusual Deformity in Aortic Stenosis Preventing Coronary Artery Cannulation

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Maintenance of myocardial viability is one of the major considerations during direct operations on the aortic valve. Our preference is to cannulate the coronary ostia and perfuse the myocardium with 300 ml. of blood per minute at a temperature of 30 C. Others report satisfactory results with cardiac hypothermia and anoxic arrest. It is our habit to have iced Ringer's solution available so that cardiac hypothermia may be induced if coronary perfusion is too cumbersome. The following case report is chiefly of interest because coronary cannulation was impossible initially and local hypothermia was the only way of protecting the heart.

Case Report

A 45-year-old woman was completely incapacitated by anginal pain that came on many times every day with exertion, with emotional excitement, and even occasionally at rest. Her blood pressure was 180/80 and her pulse was 80 and regular. There was a palpable thrill in the aortic area, and a harsh ejection murmur was audible in the neck as well as in the aortic area. An immediate diastolic murmur was heard along the left sternal border. The electrocardiogram showed left ventricular hypertrophy with strain.

At operation there was moderate poststenotic dilatation of the aorta but the annulus was narrow. The left ventricular pressure was 185/0 and the aortic pressure was 125/75 mm. Hg. The three sinuses of Valsalva were partially filled in with fibrocalcific material so that the free margins of the valve cusps were bound to the aortic wall (fig. 1). In each cusp there was a small hole about 2 mm. in diameter that led from the aorta into the sinus. These were the only passageways for blood to reach the coronary arteries. There was peripheral fusion between the cusps at each commissure for about 5 mm. The cusps did not meet centrally.

Because of the deformed sinuses of Valsalva coronary cannulation was impossible. The pericardium was, therefore, filled with iced Ringer's solution, and cardiac arrest resulted promptly.

The left sinus of Valsalva was gradually developed by excising the fibrocartilaginous material that filled it. It was 35 minutes before the left coronary ostium was exposed and cannulated and coronary perfusion was begun. In due course, the right coronary ostium was exposed and perfused. The fusion at each commissure was incised and the valve was further debrided until a satisfactory orifice had been produced. The heart was defibrillated and the aortotomy was closed, care being taken to remove all air. Coronary perfusion was maintained until the aortotomy incision was closed to the point that an exclusion clamp could be applied.

After bypass the left ventricular pressure was 120/0 and the aortic pressure was 115/80.

Her course since operation has been satisfactory. Fifteen months after operation, she was in good general health. The anginal pain had not recurred. She led a full active life. Her blood pressure was 160/90 and the heart rate was regular at 80. There were a systolic ejection murmur and a soft early diastolic murmur along the left sternal border.

Summary and Conclusion

A case is reported in which, because of deformity of the aortic valve cusps, direct coronary artery cannulation and perfusion was impossible. The heart was protected by local hypothermia until coronary perfusion could be instituted.

Surgeons operating on the aortic valve should be prepared for such a situation.

Reference

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