Rupture of the Coronary Sinus with Hemopericardium

A Rare Complication of Coronary Arteriovenous Fistula

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Many excellent reviews of coronary arteriovenous fistulas have recently appeared in the literature.\(^1\),\(^2\) In the majority of these fatal cases, death was attributed to congestive heart failure.

Rupture of the coronary sinus as a complication of a coronary arteriovenous fistula has not, to our knowledge, been reported. The present case is thought to be unique in that the fistula was accompanied by thrombosis of a greatly dilated coronary sinus, with perforation of the overlying sinus wall producing tamponade and death.

Case Report

J. H., a 52-year-old salesman, complained of epigastrium and chest pain for 3 days. At 3:00 A.M. of the fourth day, he was found groaning with pain and died shortly. There was no history of any previous cardiac difficulty, and a recent physical examination had revealed no heart murmurs or other noteworthy abnormalities.

At autopsy the significant findings were limited to the pericardium and the heart. The pericardial sac contained 800 ml. of partially clotted blood. A perforation 3 mm. in diameter of the wall of the coronary sinus was identified as the source of the bleeding (fig. 1). The coronary sinus was greatly dilated and thick-walled. It contained an adherent thrombotic mass, much of which was recently formed (fig. 2). Older thrombi were identified in two tributary veins (the cardinal vein and the oblique vein to the right atrium). Between the site of perforation and the right atrial cavity was a complex vascular network. This consisted of a saccular aneurysm of the circumflex branch of the left coronary artery and a fistulous communication between this vessel and the coronary sinus (fig. 3).

Microscopic sections of the circumflex artery disclosed moderately severe atherosclerotic changes. The wall of the coronary sinus was dilated and sclerotic, and showed focal necrosis at the perforation (fig. 4). Numerous other sections of the heart showed no abnormalities.

Discussion

While coronary arteriovenous fistulas are not rare, we are unable to find any previous report of a similar case in which perforation and tamponade resulted. Although this patient had no previous cardiac symptoms, his primary defect is considered to be congenital.

Figure 1

Arrow points to the site of perforation overlying the coronary sinus.

Figure 2

Coronary sinus has been sectioned to show thrombus.
Diagrammatic representation of the arteriovenous fistula: 1, site of perforation; 2, circumflex branch of the left coronary artery; 3, cardinal vein; 4, coronary sinus, and 5, arterial aneurysm.

in origin. The fistula apparently led to gradual dilatation of both arterial and venous structures,\textsuperscript{3,4} followed by thrombosis of the coronary sinus and its tributaries. The terminal perforation appears to have been the result of focal necrosis of the dilated wall of the sinus.\textsuperscript{5}

It is of interest that Scott\textsuperscript{6} reported a fistula connecting the left descending coronary artery and an anomalous branch of the right coronary artery to the pulmonary artery. In his case, as in this one, the absence of a murmur was attributed to a clot within the aneurysm.

Summary

Sudden death is reported in a previously healthy 52-year-old man resulting from a rare complication of a coronary arteriovenous fistula. It is believed that the primary defect was congenital and that the sequence of events was dilatation and thrombosis of the coronary sinus, necrosis of the sinus wall, perforation, and fatal tamponade.

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