Rupture of the Coronary Sinus with Hemopericardium
A Rare Complication of Coronary Arteriovenous Fistula

By J. H. Habermann, M.D., M. L. Howard, M.D., and E. S. Johnson, M.D.

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 epigastric 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
in origin. The fistula apparently led to gradual dilatation of both arterial and venous structures,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.5

It is of interest that Scott6 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.

Acknowledgment
The authors wish to thank Dr. S. E. Gould, Wayne County General Hospital, Eloise, Michigan, for his review of the material, and members of the Departments of Histology and Photography of Denver General Hospital and the Denver Coroner's Office for their technical assistance.

References
5. GOULD, S. E.: Personal communication.
Rupture of the Coronary Sinus with Hemopericardium: A Rare Complication of Coronary Arteriovenous Fistula

J. H. HABERMANN, M. L. HOWARD and E. S. JOHNSON

Circulation. 1963;28:1143-1144
doi: 10.1161/01.CIR.28.6.1143

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 1963 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/28/6/1143

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Circulation can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Circulation is online at:
http://circ.ahajournals.org/subscriptions/