Plaque rupture probably is the most important cause of myocardial infarction. Plaque rupture is thought to be precipitated by proteases that attack a weakened fibrous cap overlying an inflamed atherosclerotic plaque. Obviously, plaque rupture is of major interest for atherosclerosis researchers and a major target for development of therapy in the pharmaceutical and biotechnology industries.

There is an urgent need for good models to study plaque rupture in our laboratories. Studies of gene-targeted mice that model atherosclerosis in humans have led to in-depth understanding regarding the initiation and progression of atherosclerosis. In contrast, studies of plaque activation, rupture, and thrombosis have been hampered by a paucity of animal models. Histopathologic analyses of human lesions, largely from autopsy material, have provided important data on cellular properties and histochemical composition of ruptured plaques. These data are of great importance, but they cannot substitute for experimental models that permit investigators to intervene in the pathological process in a controlled fashion.

In this issue of Arteriosclerosis, Thrombosis, and Vascular Biology, Christopher Jackson and his colleagues review their development of a mouse model for plaque instability and rupture.\(^1\) They have found that the brachiocephalic artery (also known as the innominate artery) of hypercholesterolemic mice contains atherosclerotic plaques with histopathologic features that are suggestive of plaque instability and, in some cases, overt rupture. They have presented their evidence for plaque instability and rupture at this site in a series of original articles published in ATVB and elsewhere, and now summarize their findings in a Brief Review. They argue that plaques in mice by necessity differ from those in humans and propose a new set of criteria to define plaque rupture in mice.

Back-to-back with the article by Jackson et al, we publish another Brief Review, which presents a different point of view on the topic.\(^2\) The authors, Stephen Schwartz and his colleagues, use their experience from analysis of human lesions to assess the evidence for plaque rupture in mouse models. In their Brief Review, they question the histopathologic criteria used for identifying plaque rupture in mice and criticize the interpretation of “buried caps” as indirect evidence for previous plaque ruptures. They point out that different strains of mice seem to develop different lesion phenotypes in the brachiocephalic artery and emphasize the need for further studies of genes associated with atherosclerosis.

These two Brief Reviews reflect the current need for models of plaque rupture and the interest in the cardiovascular community to develop and evaluate such models. They differ in their approach and arrive at contrasting conclusions. The Editors of ATVB do not wish to censor the ongoing debate by providing space for only one view on plaque rupture. By publishing the Brief Reviews back-to-back, and by providing the authors with an opportunity to respond to the other Brief Review in a Letter to the Editor,\(^3,4\) we give the readers of ATVB the opportunity to judge for themselves the state of the art. We hope that the exchange of views will stimulate additional studies in this important area of research.

Disclosures

None.

References

Two Views on Plaque Rupture
Göran K. Hansson and Donald D. Heistad

Arterioscler Thromb Vasc Biol. 2007;27:697
doi: 10.1161/01.ATV.0000261344.03489.0c
Arteriosclerosis, Thrombosis, and Vascular Biology is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2007 American Heart Association, Inc. All rights reserved.
Print ISSN: 1079-5642. Online ISSN: 1524-4636

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://atvb.ahajournals.org/content/27/4/697

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Arteriosclerosis, Thrombosis, and Vascular Biology 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 Arteriosclerosis, Thrombosis, and Vascular Biology is online at:
http://atvb.ahajournals.org/subscriptions/