

Abstract

The vasa vasorum of the coronary arteries is a system of tiny vessels that nourish the wall of the coronary arteries. Recently, the vasa vasorum has been attributed importance in the pathogenesis of atherosclerosis, necrosis of the tunica media, or in excessive healing of the intima after stenting. The vasa vasorum system is described in detail on pathologically altered hearts, however, studies that would deal with a detailed description on a healthy human heart or on its animal model are minimal. The aim of the dissertation was to describe the structure and origin of the vasa vasorum of the coronary arteries on an animal model of the heart of a pig, to describe the history of the term vasa vasorum and possibly to describe secondary findings on the examined samples.

A total of 36 healthy pig hearts were used in the study. Part of them was injected with India ink through the ostium of the coronary arteries and subsequently histologically processed, other hearts were directly fixed in toto in formalin and histologically processed, the remaining part of the hearts was injected through the ostium of the coronary arteries with mercox resin and then corrosive casts of the coronary arteries were created. These samples were evaluated using a scanning electron microscope. Histological processing of the samples consisted of staining with Hematoxylin Eosin, Weigert van Giesson and blue trichrome. The resulting specimens were examined using a light microscope.

From all of the samples, only two branches were described that correspond to the definition of vasa vasorum interna. However, neither branch was branching in the wall of the coronary artery, but only in the adventitia. These branches cannot be recognized as vasa vasorum interna. All other findings correspond to the original theory, that is, the vasa vasorum of the coronary arteries arise from their branches and branch in their adventitia.

In the thesis, the vasa vasorum system of the coronary arteries of the animal heart model was described in detail, the disproved theory about the vasa vasorum interna, and the venous valves of the peripheral veins of the heart and the vasa nervorum of subepicardial nerves were described.