Morphology of the Cardiac Conduction System, with Special Reference to Characteristic Cytoarchitecture of the Left Bundle Branch

Tatsuo Shimada and Toru Soeda

Oita University, Yufu-city, Oita, 879-5591, Japan

According to a Tawara's monograph (1906), the atrioventricular bundle (His bundle) originated from the atrioventricular node (Tawara node) penetrated the atrioventricular fibrous septum ran a short distance as a compact bundle, and then bifurcated into the right and left bundle branch. The connecting system finally reached various portions of the ventricular wall as terminal ramifications (Purkinje fibers).

From light microscopic observations of serial sections stained with hematoxylin and van Gieson, the individual muscle fibers in the right bundle branch ran closely and parallel to each other. Meanwhile, those in the left bundle branch did not run tightly nor parallelly, but rather ran in various directions as a loose bundle. Especially, the left bundle branch appeared to be quite characteristic for the purpose of equal distribution. some of the muscle fibers situated at the posterior half moved to its anterior half. Inversely, several fibers situated at the anterior half also moved to the posterior half.

In this study, the cytoarchitecture of the right and left bundle branch micro-dissected is demonstrated three-dimensionally by

scanning electron microscopy. Connective elements were digested by the NaOH maceration method, because the overall muscle bundle was surrounded by a connective tissue sheath.