

Vascular Model Repository

Specifications Document



0142_H_CORO_KD

Legacy Name: KDR33

Model added: 19 Oct 2022

Species	Human
Anatomy	Coronary
Disease	Kawasaki Disease
Procedure	None

Clinical Significance and Background

Coronary

Just like every tissue in the body, the heart itself also requires oxygenated blood to function. The coronary arteries supply blood to the heart and stem from the root of the ascending aorta. The two main coronary arteries are the left main and right coronary arteries, and they wrap around the outside of the heart.

The left main coronary artery (LCMA) supplies blood to the left side of the heart muscle and divides into two branches: the left anterior descending (LAD) artery and the left circumflex (LCX) artery which supply blood to the front left and outer backside of the heart respectively.

The right coronary artery (RCA) supplies blood to the right ventricle, the right atrium, and the SA (sinoatrial) and AV (atrioventricular) nodes, which regulate the heart rhythm. Together with the left anterior descending artery, the right coronary artery also helps supply blood to the middle or septum of the heart.

Kawasaki Disease

Kawasaki disease (KD), also known as Kawasaki syndrome, is an acute febrile illness of unknown cause that primarily affects children younger than 5 years of age. The disease was first described in Japan by Tomisaku Kawasaki in 1967, and the first cases outside of Japan were reported in Hawaii in 1976. Kawasaki disease causes swelling (inflammation) in children in the walls of small to medium-sized blood vessels that carry blood throughout the body as well as inflammation of the coronary arteries, which supply oxygen-rich blood to the heart. Inflammation of the coronary arteries can lead to the weakening and bulging of the artery wall (aneurysm). Aneurysms increase the risk of blood clots, which could lead to a heart attack or cause life-threatening internal bleeding.

Children with Kawasaki disease might have a high fever, swollen hands and feet with skin peeling, and red eyes and tongue. But Kawasaki disease is usually treatable, and most children recover without serious problems if they receive treatment within 10 days of onset.

Clinical Data

General Patient Data

Age (yrs)	16.7
Sex	Female

Specific Patient Data

Age at Kawasaki Disease Diagnosis	12.1
BSA (m ²)	1.64
Cardiac Output (l/min)	5.69
Pressure sys/dias (mmHg)	102/47
Thrombosis	No
Thrombosis Location	N/A
Medication	Aspirin, Warfarin

Notes

Model of a patient suffering from Kawasaki disease, but no thrombosis was detected in the coronary aneurysms. Paper patient 7. \nSee [paper](#) for more details. See below for information on the image data.

Image Modality: MR

Image Type: VTI

Image Source: The Hospital for Sick Kids (SickKids)

Publications

See the following publications which include the featured model for more details:

Grande Gutierrez, N., Mathew, M., McCrindle, B., Kahn, A., Burns, J., & Marsden, A. (2017, November). Hemodynamic based coronary artery aneurysm thrombosis risk stratification in Kawasaki disease patients. In APS Division of Fluid Dynamics Meeting Abstracts (pp. G5-008).

<https://doi.org/10.1016/j.ijcard.2019.01.092>

License

Copyright (c) Stanford University, the Regents of the University of California, Open Source Medical Software Corporation, and other parties.

All Rights Reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this data to use the data for research and development purposes subject to the following conditions:

The above copyright notice and the README-COPYRIGHT file shall be included in all copies of any portion of this data. Whenever reasonable and possible in publications and presentations when this data is used in whole or part, please include an acknowledgement similar to the following:

"The data used herein was provided in whole or in part with Federal funds from the National Library of Medicine under Grant No. R01LM013120, and the National Heart, Lung, and Blood Institute, National Institutes of Health, Department of Health and Human Services, under Contract No. HHSN268201100035C"

AND/OR

N.M. Wilson, A.K. Ortiz, and A.B. Johnson, "The Vascular Model Repository: A Public Resource of Medical Imaging Data and Blood Flow Simulation Results," J. Med. Devices 7(4), 040923 (Dec 05, 2013) doi:10.1115/1.4025983.

AND/OR

Reference the official website for this data: www.vascularmodel.com

THE DATA IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE DATA OR THE USE OR OTHER DEALINGS IN THE DATA.