

Vascular Model Repository

Specifications Document



0136_H_CORO_KD

Legacy Name: KDR01

Model added: 14 Feb 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)	6.8
Sex	Male

Specific Patient Data

Age at Kawasaki Disease Diagnosis	0.4
BSA (m ²)	0.99
Cardiac Output (l/min)	3.79
Pressure sys/dias (mmHg)	106/48
Thrombosis	Yes
Thrombosis Location	Right Coronary Artery
Medication	Aspirin, Warfarin

Notes

Model of a patient suffering from Kawasaki disease and thrombosis in a coronary aneurysm. Paper patient 1. \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>

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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

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