Vascular Model Repository Specifications Document

0092_0001

Species	Human
Anatomy	Aorta
Disease	Healthy
Procedure	-

Clinical Significance and Background

Aorta

The largest blood vessel and the human body's primary artery, the aorta is responsible for carrying oxygenated blood pumped from the heart to rest of the body. The aorta is divided into four sections: the ascending aorta, the aortic arch, the thoracic aorta, and the abdominal aorta.

The ascending aorta starts at the left ventricle of the heart where at the root, it supplies blood to the heart muscle through the coronary arteries. From the aortic root, the ascending aorta continues to rise up until it reaches the aortic arch.

The aortic arch loops over the bifurcation of the pulmonary trunk and has three major artery branches leaving through the top: the brachiocephalic trunk, the left common carotid artery, and the left subclavian artery. The brachiocephalic trunk sends blood to the right side of the brain and right arm/neck/chest while the left common carotid artery sends blood to the left side of the brain and the left subclavian artery sends blood to the left arm/neck/chest.

After the aortic arch, the aorta begins to descend all the way to the abdomen. The section of the descending aorta that starts after the aortic arch and ends at the diaphragm is called the thoracic aorta, and it supplies blood to the chest and spinal cord.

The last section of the aorta, the abdominal aorta, starts at the diaphragm and ends just above the pelvis. This section is responsible for supplying blood to the stomach, kidneys, liver, and intestines. Past the abdominal aorta, the artery branches into two separate iliac arteries, one for each leg, which are responsible for supplying oxygenated blood to the legs and lower half of the body.

Clinical Data

General Patient Data

Age (yrs)	11
Sex	Male

Notes

Healthy aorta control group. See [DOI](#) for more details. See below for information on the image data and boundary conditions associated with the model.

Image Modality:	CT
Image Type:	DICOM
Image Source:	TLAB
Image Manufacturer:	SIEMENS
Boundary Conditions:	Refer to boundary conditions in the SimVascular file.

Publications

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

Jr. LaDisa, J. F., Dholakia, R. J., Figueroa, C. A., Vignon-Clementel, I. E., Chan, F. P., Samyn, M. M., ... & Feinstein, J. A. (2011). Computational simulations demonstrate altered wall shear stress in aortic coarctation patients treated by resection with end-to-end anastomosis. Congenital heart disease, 6(5), 432-443. http://www.doi.org/10.1111/j.1747-0803.2011.00553.x

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