

Difference Between Elastic and Muscular Arteries

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Key Difference - Elastic vs Muscular Arteries

Arteries are one type of blood vessels that deliver blood from the heart to the rest of the tissues in our body. Hence, they carry and deliver oxygen-rich blood to all parts of the body. The artery is a muscular tube that is surrounded by a smooth tissue. Wall of the artery is composed of three layers namely, tunica intima, tunica media and tunica externa (adventitia). The tunica intima is the inner layer that is surrounded by a smooth tissue known as the endothelium. Tunica media is the muscle layer that handles the high pressure. Tunica externa is a connective tissue that is anchoring the artery to the nearby tissues. There are two types of arteries namely elastic and muscular. Elastic arteries are the conducting arteries in the body that consist a higher amount of elastin and collagen fibers in the tunica media of the artery wall and they are the closest arteries to the heart. Muscular arteries are the distribution arteries in the body that are consisted of a large number of layers of smooth muscles in the tunica media of the artery wall and they are closer to specific tissues to deliver blood. Accordingly, **the key difference** between Elastic and Muscular Arteries is that **elastic arteries have a greater amount of elastin in the tunica media while muscular arteries have a lesser amount of elastin and more smooth muscles in the tunica media.**

What are Elastic Arteries?

Elastic arteries are the conducting arteries in the body that are consisted of a large amount of elastin and collagen fibers in the tunica media of the wall. They are directly receiving the oxygenated blood from the heart. Aorta and pulmonary artery are the best examples of the elastic arteries in our body. Aorta is the largest artery in the circulatory system. It branches into smaller arteries called arterioles and capillaries. The pulmonary artery is unique and different since it carries low oxygen blood from the heart to lungs.

As the name suggests, elastic arteries are elastic in nature. The walls of these arteries have a lot of elastin in order to control the high blood pressure that directly exerts from the heart. During the contraction of the heart, blood eject into these arteries that stretch in order to accommodate the blood surge.

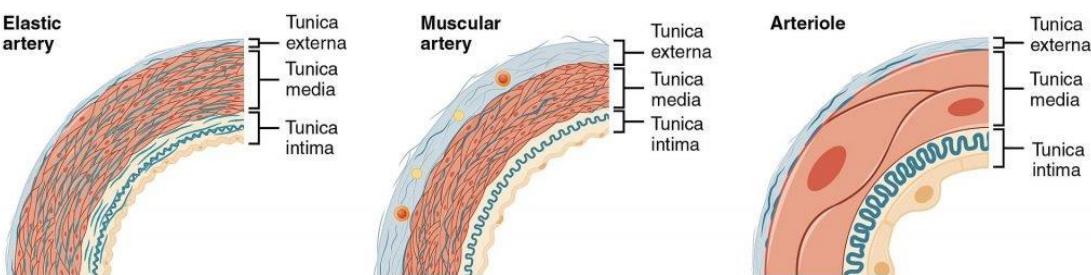


Figure 01: The Elastic and Muscular Arteries

The arterial hydrostatic pressure that results from the ventricular contraction is known as [systolic pressure](#). The elastic wall recoils in order to maintain the blood pressure between heart contractions. And it is continuing to move the blood even when ventricles are relaxed. The arterial hydrostatic pressure between the contractions is known as diastolic blood pressure. Arterial tunica adventitia has small “*vasa vasorum*” (small blood vessels that supply blood to large arteries). The tunica media is broad which has concentric fenestrated sheets of elastin. And it also contains collagen and a lesser amount of smooth muscle fibers. The tunica intima is made up of a single layer of flattened epithelial cells together with a supporting layer of elastin-rich collagen. This layer also contains [fibroblasts](#) cells and myointimal cells. With aging, it accumulates [lipids](#) and gets thicker. And it is one of the first characteristics of [atherosclerosis](#).

What are Muscular Arteries?

Muscular arteries are the distribution arteries in the body that consist of a large number of layers of smooth muscles in the tunica media of the wall. The muscular arteries distribute blood to various parts of the body. These include coronary and femoral arteries. The tunica media of the wall of these arteries have a higher amount of smooth muscle cells which enables them to contract and relax (dilating). It changes the amount of blood to be delivered according to their need.

The Structure of an Artery Wall

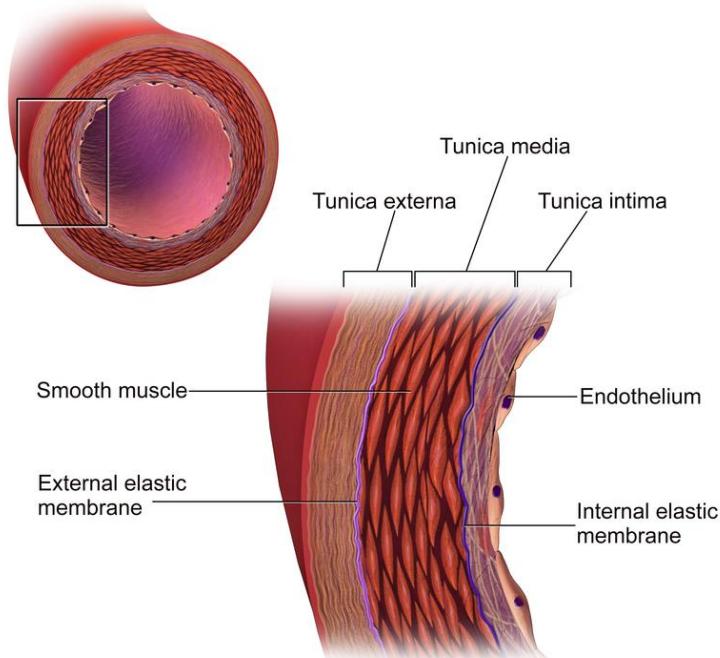


Figure 02: Structure of an Artery Wall

Muscular arteries have a lesser amount of elastin in their tunica media. They have a clear layer of the internal elastic layer between tunica intima and tunica media. But they have few well defined external elastic layer between tunica media and tunica adventitia. The tunica intima has the flattened endothelial cells. The tunica media consists of a layer of smooth muscle cells, some elastin, and collagen. Tunica adventitia is really broad and it contains elastin and collagen.

What are the Similarities Between Elastic and Muscular Arteries?

- Both are types of arteries.
- Both contain smooth muscle fibers, elastin, and collagen in their wall.
- Both contain blood that is rich in oxygen.
- Both these arteries can change their structure according to the need.

What is the Difference Between Elastic and Muscular Arteries?

Elastic vs Muscular Arteries	
Elastic arteries are the conducting arteries in the body that are consisted of a large amount of elastin and collagen fibers in the tunica media of the artery wall.	Muscular arteries are the distribution arteries in the body that are consisted of a large number of smooth muscles in the tunica media of the artery wall.
Size	
Elastic arteries are the largest in the body such as the aorta and pulmonary artery.	Muscular arteries are smaller compared to elastic arteries. The examples are coronary artery and femoral artery.
Structural Changes	
Elastic arteries can stretch and recoil again in response to the pressure.	Muscular arteries can constrict and relax which change their diameter. This regulates the blood supply according to the need.
Function	
Elastic arteries are conducting arteries.	Muscular arteries are distributing arteries.
Amount of Elastin	
Elastic arteries have a higher amount of elastin	Muscular arteries have a lesser amount of

in the tunica media in the wall.	elastin in the tunica media in the wall.
Amount of Smooth Muscle Fibres	
Elastic arteries have fewer amounts of smooth muscles fibers in the tunica media in the wall.	Muscular arteries have a high amount of smooth muscles fibers in the tunica media in the wall.
Broadness of Tunica Media	
Elastic arteries have broader tunica media in the wall.	Muscular arteries have narrow tunica media on the wall compared to elastic arteries.
Broadness of Tunica Adventitia	
Elastic arteries have narrow tunica adventitia on the wall compared to muscular arteries.	Muscular arteries have broader tunica adventitia in the wall.

Summary - Elastic vs Muscular Arteries

The artery is a muscular tube that is surrounded by a smooth tissue. The wall of the artery has three layers; tunica intima, tunica media, and tunica adventitia. The tunica intima is the inner layer that is consisted of a layer of endothelial cells. Tunica media is the middle muscle layer that handles the high pressure exerts on the heart. Tunica media has elastin, collagen, and smooth muscle fibers. Tunica externa (adventitia) is a connective tissue that anchors the artery to the nearby tissue. Tunica externa contains collagen, elastin and vasa vasorum. The arteries are two types, depending on structure and function. They are elastic artery and muscular artery. Elastic arteries are located very close to the heart and are subject to a high pressure during the pumping of the oxygenated blood from the heart to the artery. Hence, they contain a high amount of elastin and collagen in the middle layer of the artery wall enabling the arteries to expand or withstand the high pressure. Muscular arteries deliver oxygenated blood to specific tissues. Tunica media of the muscular artery contains a relatively high amount of smooth muscle and low amount of elastin and collagen compared to elastic arteries. This is the difference between elastic and muscular arteries.

Reference:

- 1,Paxton, Steve, et al. "The Leeds Histology Guide." Histology Guide, 1 Jan. 1970. [Available here](#)
- 2."Blood Vessels & Hemodynamics." SlidePlayer. [Available here](#)
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Image Courtesy:

- 1.'2103 Muscular and Elastic Artery Arteriole'By OpenStax College - Anatomy & Physiology, [Connexions Web site](#). Jun 19, 2013. ([CC BY 3.0](#)) via [Commons Wikimedia](#)
- 2.'Blausen 0055 ArteryWallStructure'By Blausen.com staff (2014). "Medical gallery of Blausen Medical 2014". WikiJournal of Medicine 1 (2). DOI:10.15347/wjm/2014.010. ISSN 2002-4436. - Own work, ([CC BY 3.0](#)) via [Commons Wikimedia](#)

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