

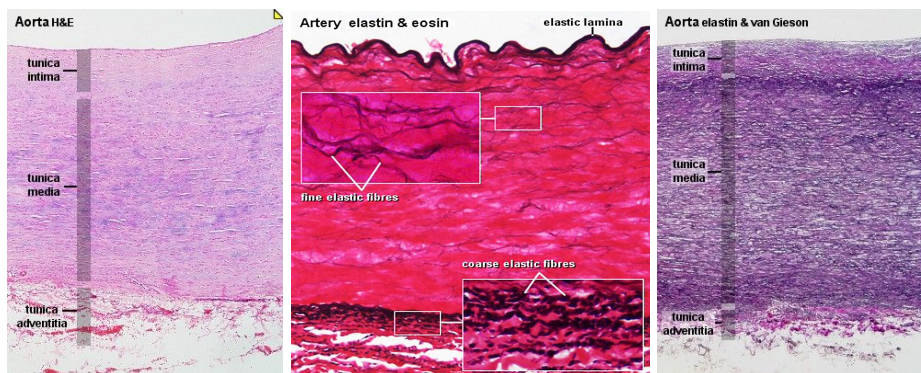
Histology Lab -Histology of blood vessels

Ps. → I intended writing some extra notes from theory material as a review to help you get the full understanding.

If you come by any mistake (whether it be spelling, grammatical or scientific) while browsing this handout, kindly report it to the academic team 2023od@gmail.com or Fb account [الفريق الأكاديمي](#)

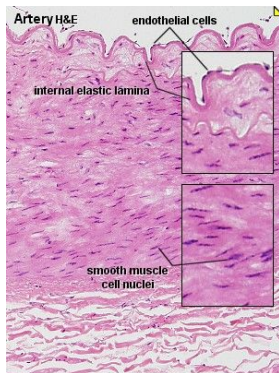
- **Blood vessels (arteries / veins) have common composition :**
 - SMCs
 - CT (**elastin + collagen**)
 - Endothelial cells (**lining the lumen**)
- The 3 layers are (intima ➡ media ➡ adventitia)
- 1st layer (in ➡ out) is : **Intima** → composed of **EC + small amount of CT** called **Subendothelial CT** .
IEL → delimits the tunica intima from the tunica media , it's a **layer of Elastic Tissue** (meaning it can be differentiated microscopically) , considered to be **the outer layer of T.intima** .
 Seen **commonly in arteries**
- 2nd layer is : T.Media → layer of **circumferential** (يعني تُحيط بجدار الوعاء الدموي بشكل دائري) smooth muscle , (does it contain CT ? **Yes ,you can see elastic fibers and collagen**) → **EEL** → delimits T.Media from T.adventitia , **seen in arteries** - Large elastic and muscular arteries - **absent in** , small arteries and arterioles + veins .
 - T.media composed of also(in addition to CT) :
 - SMC (vasoconstriction -dilation) .
 - Elastic fibers (**systole - expanded , diastole-contracted**) .
 - **Nervi Vasorum**
- 3rd layer is : T.adventitia → composed of :
 - CT (including Collagen -esp type I) .
 - Vasa vasorum → In macroscopic preparations vasa vasorum are visible **as fine dark lines on the surface of the larger arteries** .
 - **Nervi vasorum**

- **Arteries :(thickest layer is T.media)**
 - Large elastic arteries .



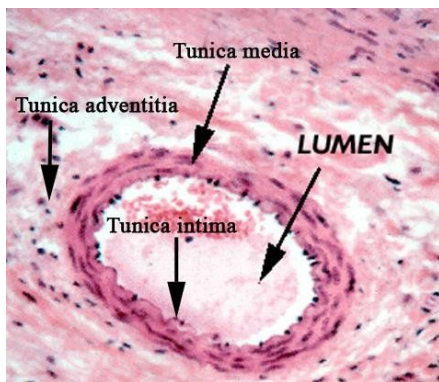
Note the predominant elastic fibers , IEL(rt),relatively thick T.intima .

- Medium sized muscular arteries .



- (1)The **tunica intima** is **thinner** than in elastic arteries.
- (2)The **tunica media** is dominated by numerous concentric layers of smooth muscle cells (easily differentiated by the **spotted like appearance** , stained dark blue by H of H&E dye) .
- (3) **broad** and **thick** Tunica adventitia

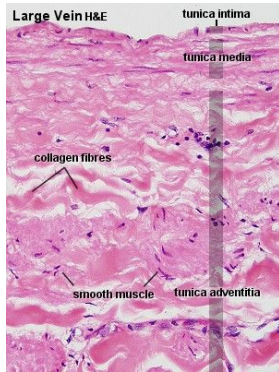
- Small sized arteries+arterioles .



- (1)Very thin T.intima , and the nucleus and surrounding cytoplasm may 'bulge' slightly into the lumen.
- (2)The T.media consists of 1-3 concentric layers of smooth muscle cells
- (3)T.adventitia is difficult to be distinguished from the connective tissue surrounding the vessel(merging) .

- Veins .(thin T.media, thickest : T.adventitia)
 - The **walls** of veins **are thinner** than the walls of arteries, while **their diameter is larger** .

- Large veins .

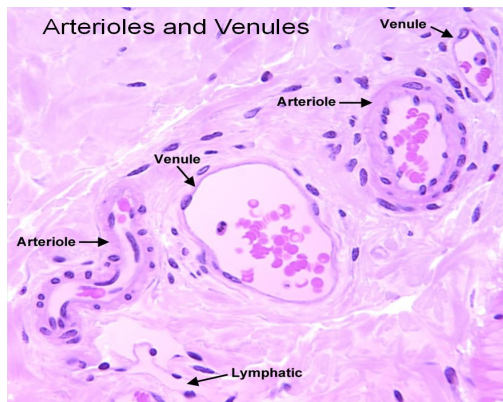


- (1) thin T.intima .
- (2) 2-3 layers of SMCs in T.media .
- (3) The **tunica adventitia** is very wide, and **it usually contains bundles of longitudinal smooth muscle + collagen fibers.**

* **Small and medium sized veins will not contain smooth muscle in the tunica adventitia.**

* **adventitia of large and muscular veins contain Vasa vasorum , but vasa vasorum of muscular veins is much more numerous than in similar size muscular arteries .**

- Venule



- (1) Very thin clear t.intima
- (2) 2 layers of SMCs in T.media (thinner than of arterioles)
- (3) T.adventitia isn't distinguished as it's fused with surrounding tissues .

Reminder

- * small arteries + arterioles → ECs are oriented longitudinally and SMCs of T.media are wrapped around vessel wall in a circular fashion
 - * IEL is more predominant in muscular arteries than in elastic arteries .
 - * EEL is absent in Small arteries and arterioles + veins .
 - * veins → no IEL and no EEL .
 - * Capillaries → EC (one single layer) + Basal lamina
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