

LECTURE ONE:

WALL OF THE HEART & CARDIAC VALVES

Objectives:

describe the microscopic structure of:

1. Wall of the heart:
 - Endocardium.
 - Myocardium.
 - Epicardium.
2. Cardiac valves.



CVS Block



@Histo433

Wall of the heart

Endocardium

(Endo) means that this layer comes with blood .

Consist of :

1) Endothelium : 1st layer

Simple squamous epithelium

2)Subendothelial C.T: 2nd layer.

*Contains coronary vessels

“branch of aorta which supply the heart itself”

* Nutritional supply for endothelium because it is Avascular

3)Dense C.T layer.

4)Subendocardial layer : loose

C.T extends to myocardium to

form endomesium ,

has **Purkinje fibers**

vesseles & nerves



myocardium

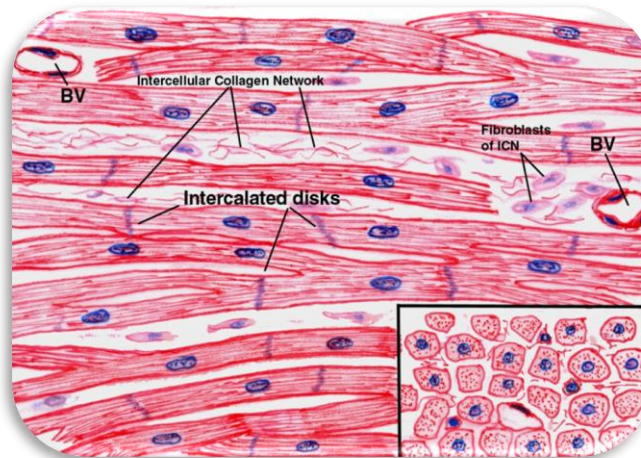
Contains : **THICKEST** LAYER

*cardiac muscle fibers

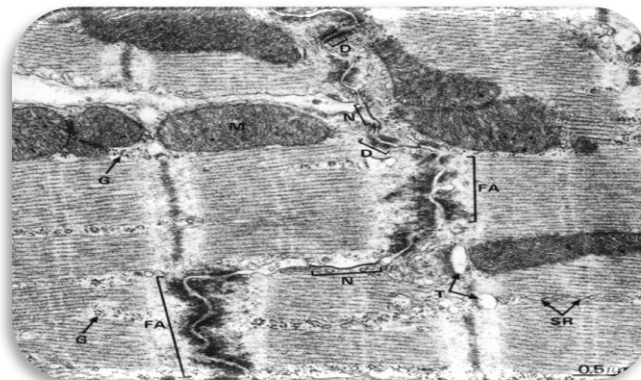
(striated and involuntary).

*endomysium

1) light microscope:



2) Electric microscope:



Epicardium

It is the **visceral layer** of pericardium .

2 layers :

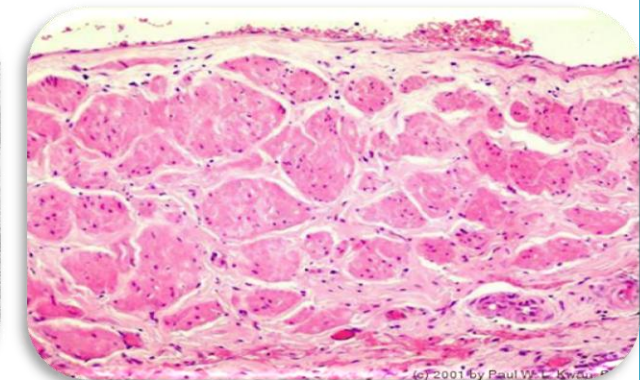
1)Mesothelium :

Simple Squamous epithelium of **serous membranes** such as pericardium and plura

2)subpericardial C.T:

Loose C.T. contains the coronary vessels, nerves, ganglia & fat cells

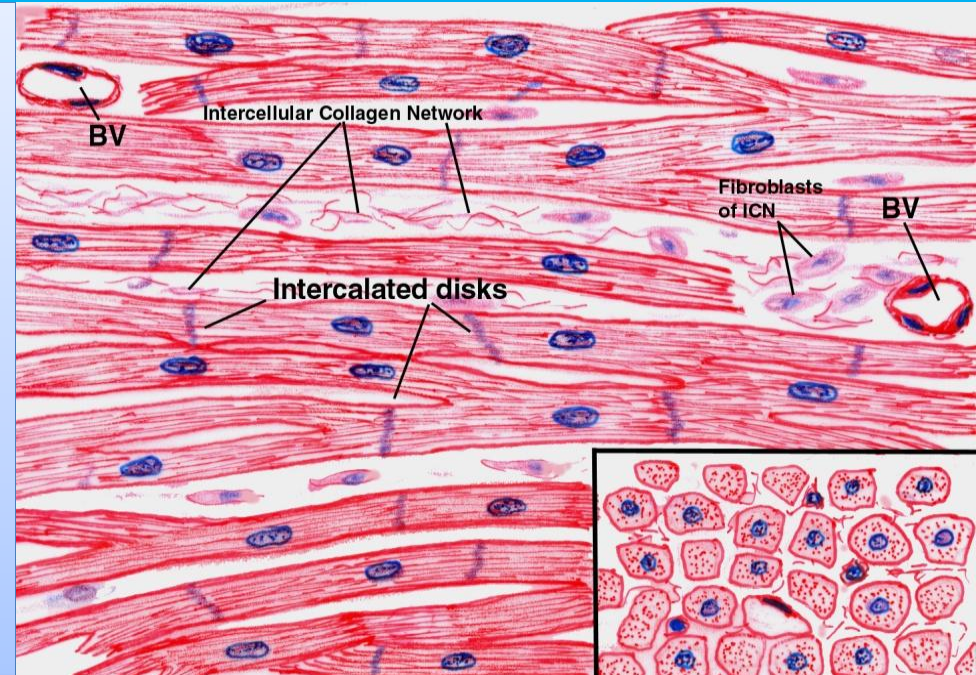
because of fat cells it has **yellowish appearance** .



Myocardium

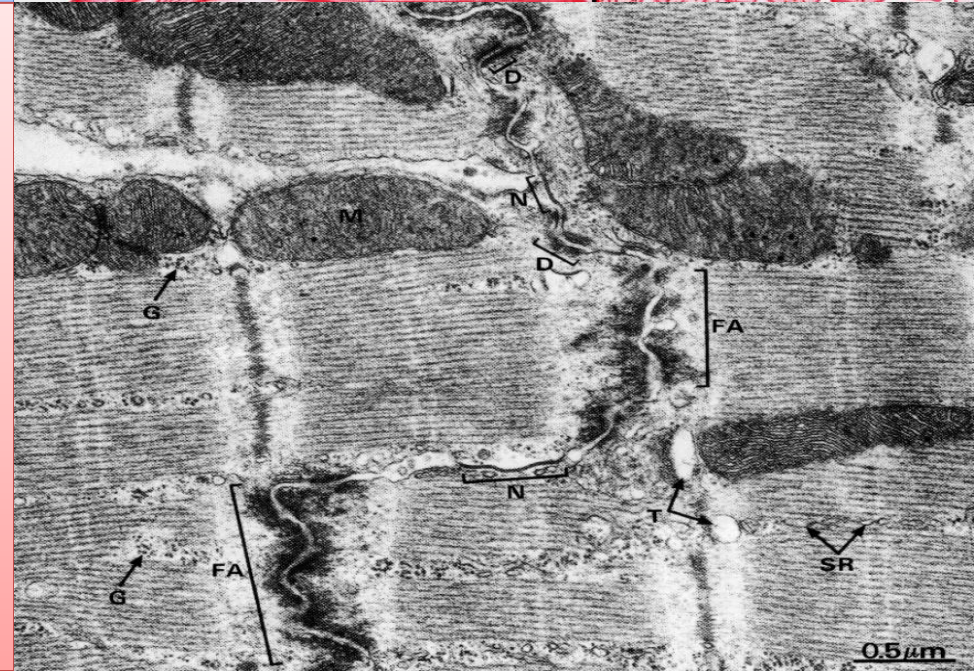
In Light microscope you will see :

- 1) Intermediate cylindrical fibers , branch and anastomoses
- 2) Mononucleated fibers , central and oval nuclei.
- 3) Acidophilic sarcoplasm with few striations (less myofibrils)
- 4) Thin sarcolemma.
- 5) Intercalated discs to separate the cardiac fiber into cells



In EM you will see:

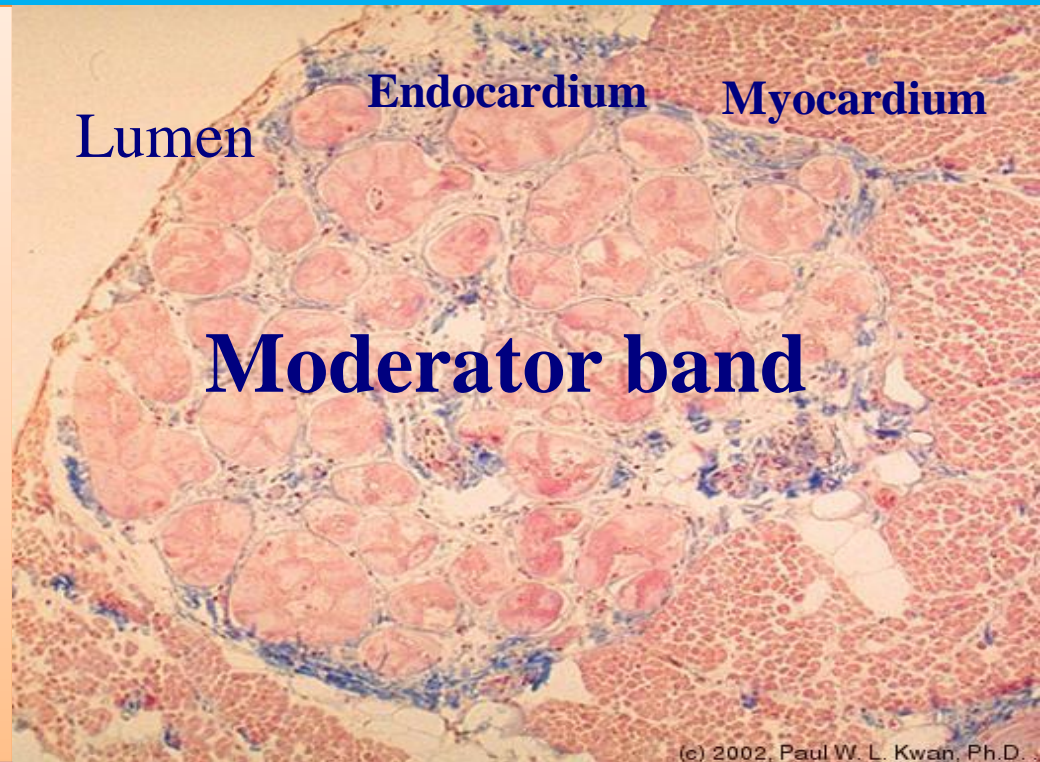
- 1) Few myofibrils (striations formed by actin and myosin)
- 2) Mitochondria in large numbers (energy)
- 3) Sarcoplasmic reticulum less than skeletal muscles (forming **DIADS** when its cisterna comes in contact with T-tubules ***action potential**)
- 4) Intercalated disc for communication between cells because it has **gap junctions** and **desmosomes**



Moderator band and Purkinje fibers

PURKINJE fibers are modified cardiac muscles . Found in **ENDOCARDIUM**
They are 200 times faster than ordinary myocytes in conduction.
What make them special ?

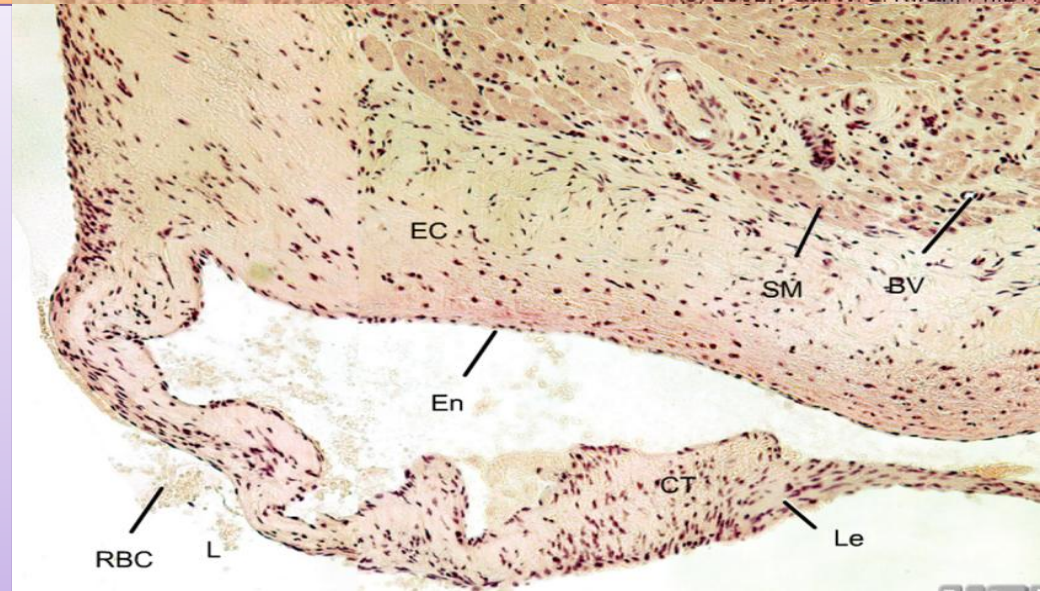
- *rich in collagen ->pale cytoplasm
- *larger in size
- *lesser striations



Valves

Each valve is formed by cusps or leaflets
“in mitral valve there are 2 cusps”

- *extension of endocardium but they are : lined and covered by endothelium , core is formed of dense **Avascular** CT
- *blood capillaries are found in the base of leaflet



MCQs

1-Cardiac muscle is divided into short segments by:

- A. Gap junction B. intercalated discs C. mitochondria

2-Endothelium of cardiac muscle is composed of :

- A. simple squamous epithelium B. stratified squamous epithelium
C. simple columnar epithelium.

3-The thickest layer in the Wall of the heart is :

- A. Endocardium. B. Myocardium. C. Epicardium.

4-Which one of the following structure consider as AVASCULAR:

- A. Cardiac Valves B. Epicardium C. Purkinje Fibers.

5-It is a Visceral layer of pericardium :

- A. Endocardium B. Myocardium C. Epicardium

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Good luck with your Mid-Block exam

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تنبيه: هذا العمل اجتهاد وجمع للملاحظات ولا يمنع من الرجوع الى المحاضرة الاصلية.