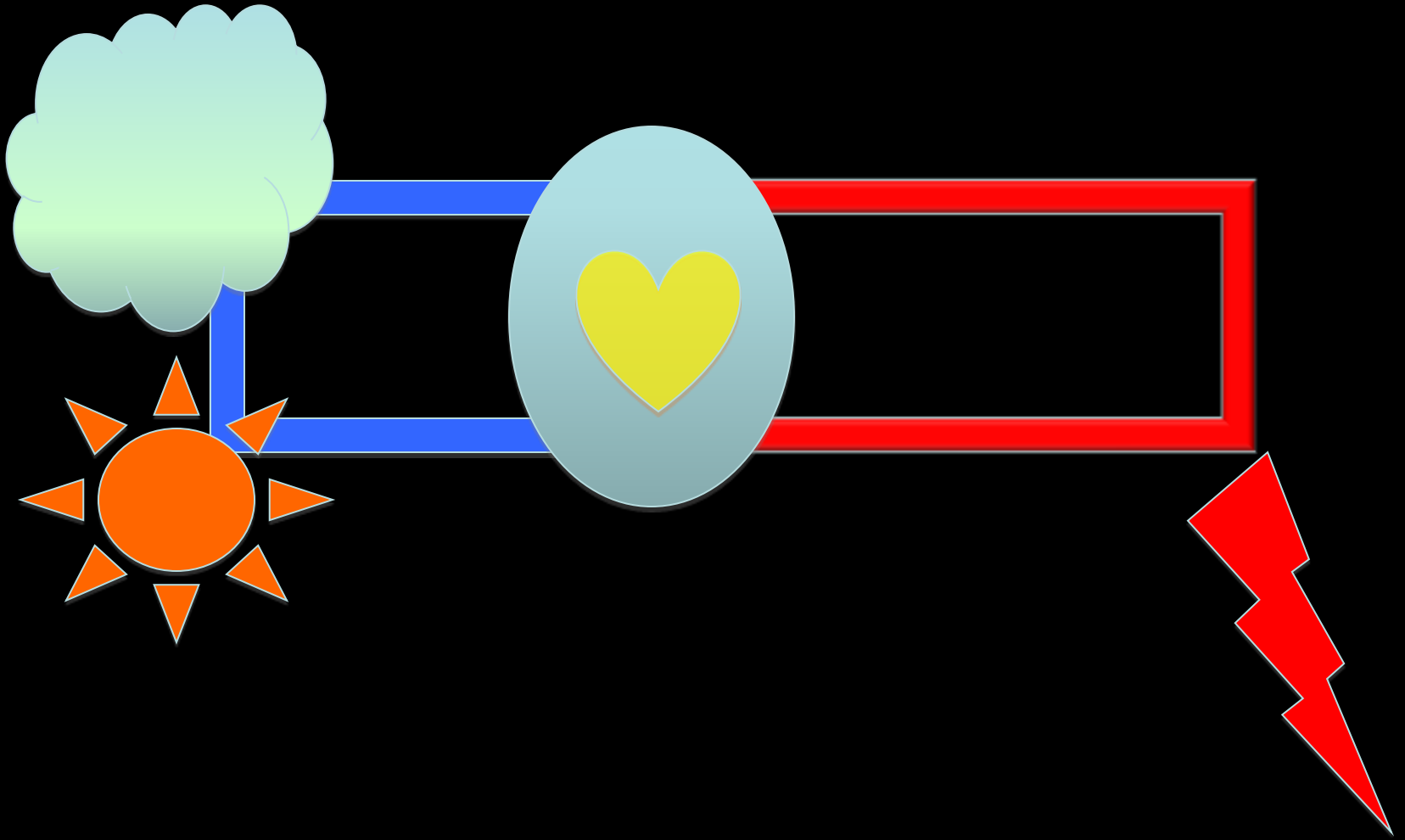


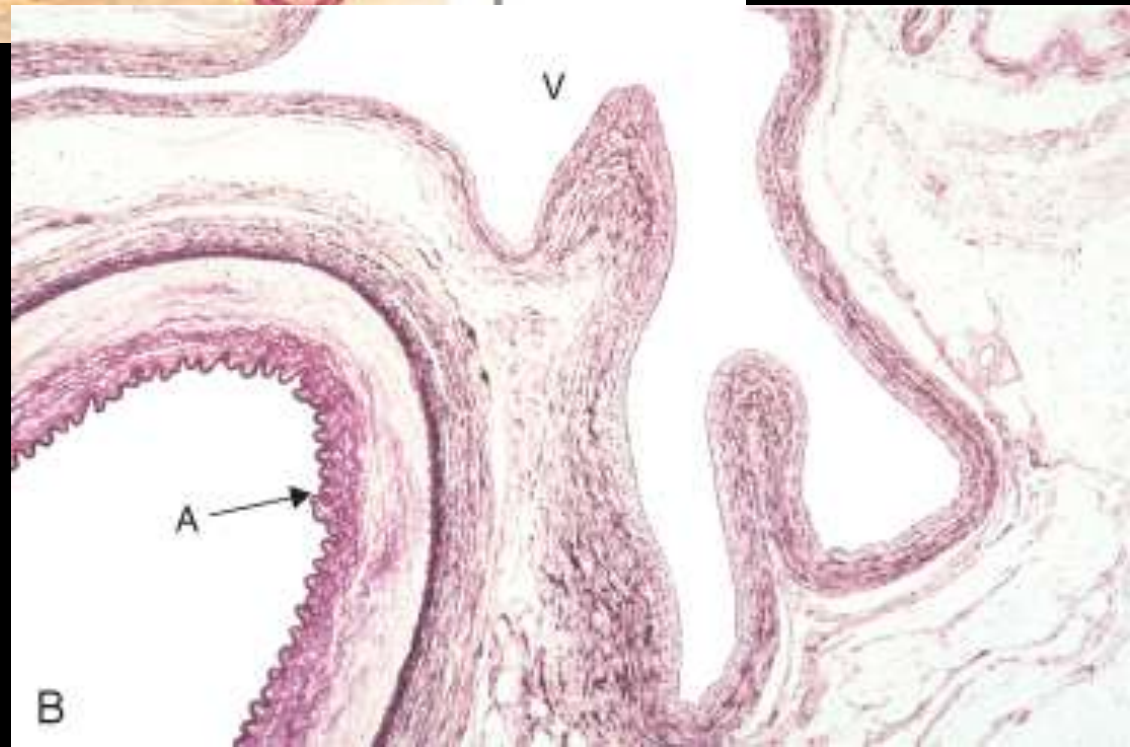
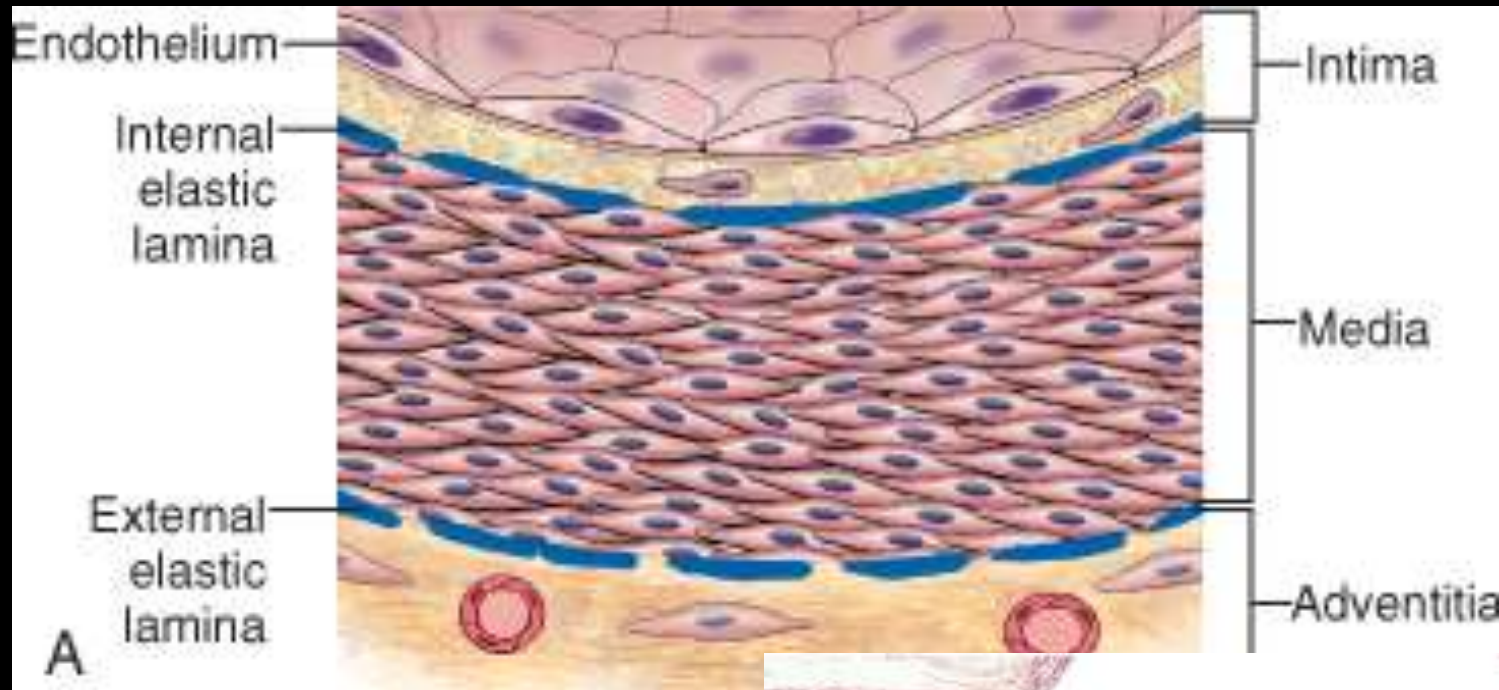
Histologie de l'appareil circulatoire

Pr A. Gérard Abadjian
Faculté de Médecine
USJ 2012

Introduction

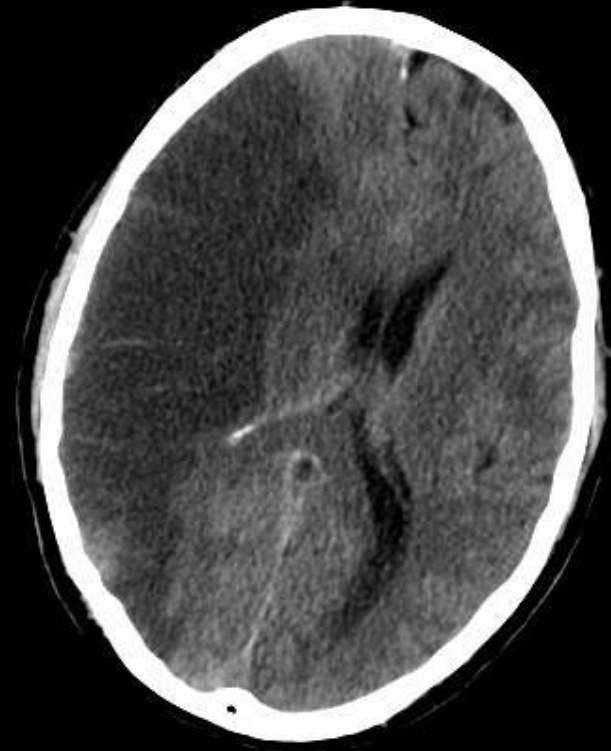
- Rôle:
 - Assurer le mouvement continue des fluides
 - Transport de l'oxygène, métabolites, hormones...
 - Régulation de la température
- Système sanguin:
 - Pompe centrale, le cœur
 - Le système artériel, capillaires, veinules pc.
 - Le système veineux
- Système lymphatique:
 - Drainage de l'excès de fluide extravasculaire
 - Transport de la lymphe aux ganglions
- Structures de base commune:
 - Intima, endothélium
 - Média
 - Adventice





Cas clinique

- Sujet adulte agé
- Confusion et désorientation depuis quelques jours
- Perte de connaissance
- Hospitalisation:



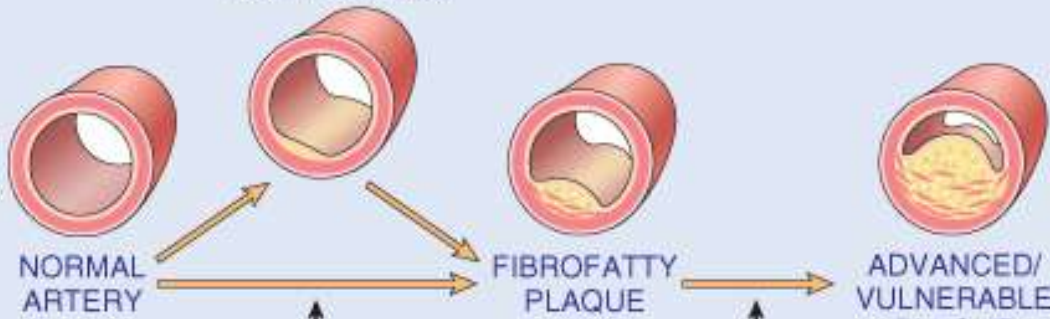
Athérosclérose

Nomenclature and main histology	Sequences in progression	Main growth mechanism	Earliest onset	Clinical correlation	
Type I (initial) lesion Isolated macrophage foam cells	<pre> graph TD I((I)) --> II((II)) II --> III((III)) III --> IV((IV)) IV --> V((V)) V --> VI((VI)) VI --> IV </pre>	Growth mainly by lipid accumulation	From first decade	Clinically silent	
Type II (fatty streak) lesion Mainly intracellular lipid accumulation			From third decade		
Type III (intermediate) lesion Type II changes and small extracellular lipid pools					
Type IV (atheroma) lesion Type II changes and core of extracellular lipid			Accelerated smooth muscle and collagen increase	From fourth decade	Clinically silent or overt
Type V (fibroatheroma) lesion Lipid core and fibrotic layer, or multiple lipid cores and fibrotic layers, or mainly calcific, or mainly fibrotic			Thrombosis, hematoma		
Type VI (complicated) lesion Surface defect, hematoma-hemorrhage, thrombus					

Pre-Clinical Phase

Usually young age

FATTY STREAK



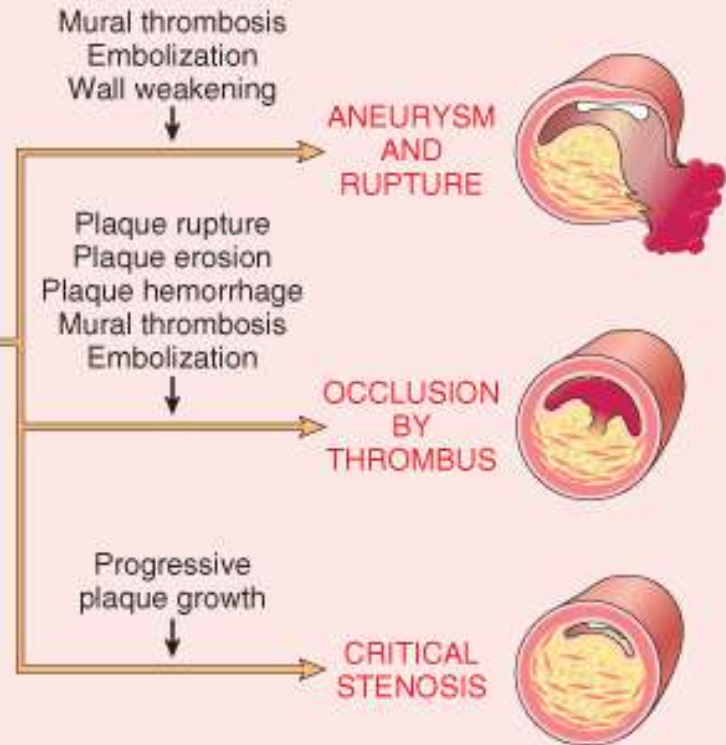
At lesion-prone areas, and accelerated by risk factors:
Endothelial dysfunction
Monocyte adhesion/emigration
SMC migration to intima
SMC proliferation
ECM elaboration
Lipid accumulation

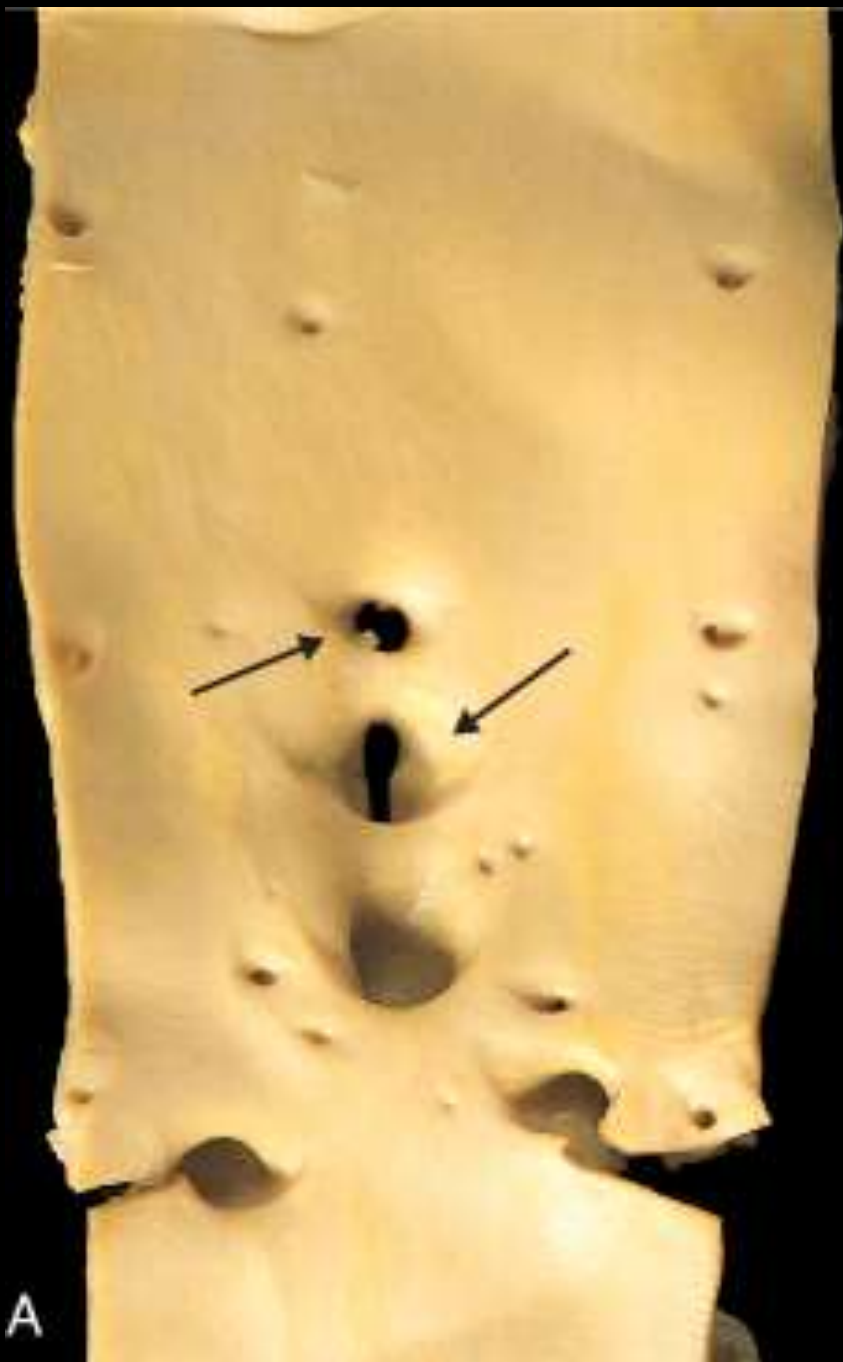
Cell death/degeneration
Inflammation
Plaque growth
Remodeling of plaque and wall ECM
Organization of thrombus
Calcification

Clinical horizon

Clinical Phase

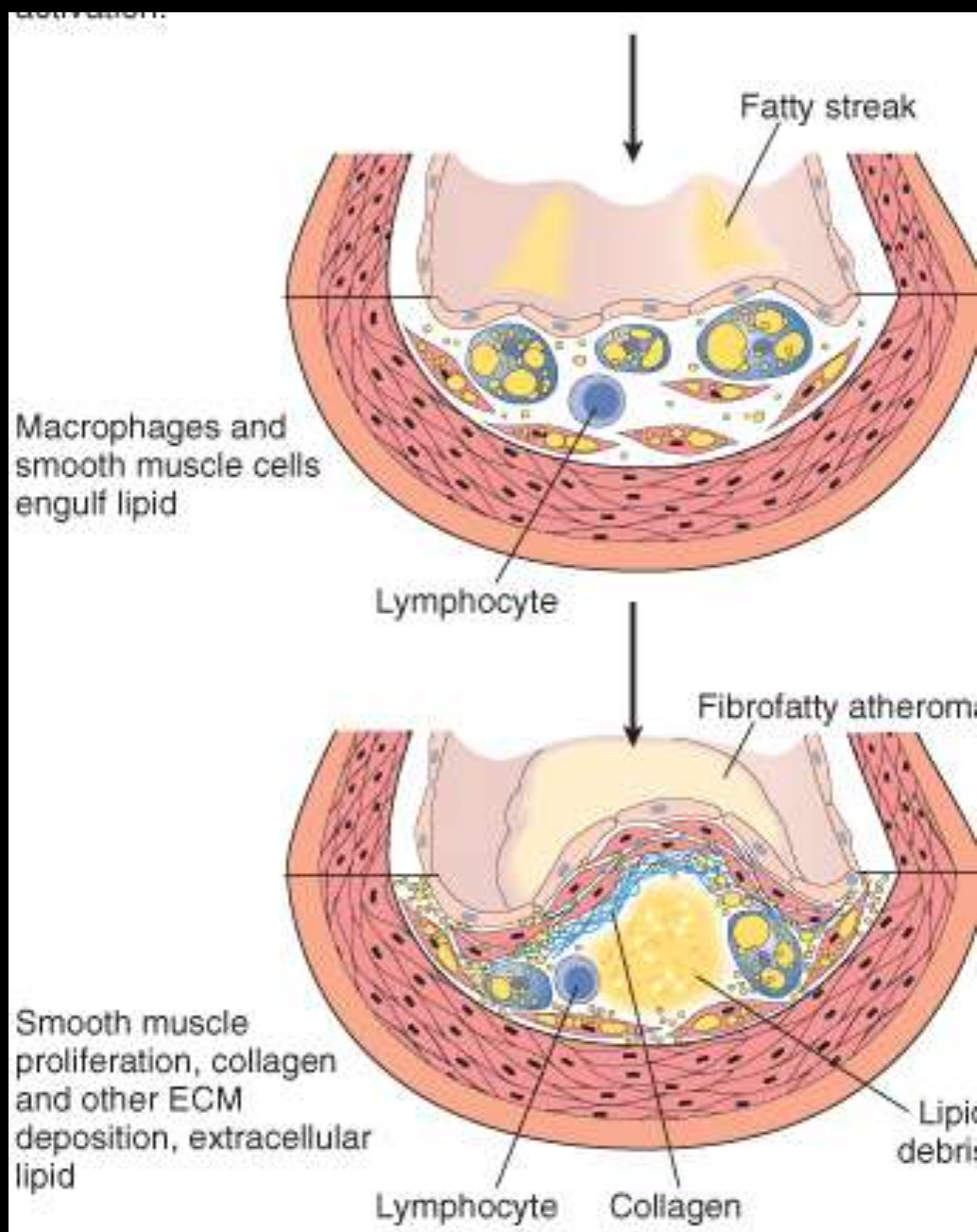
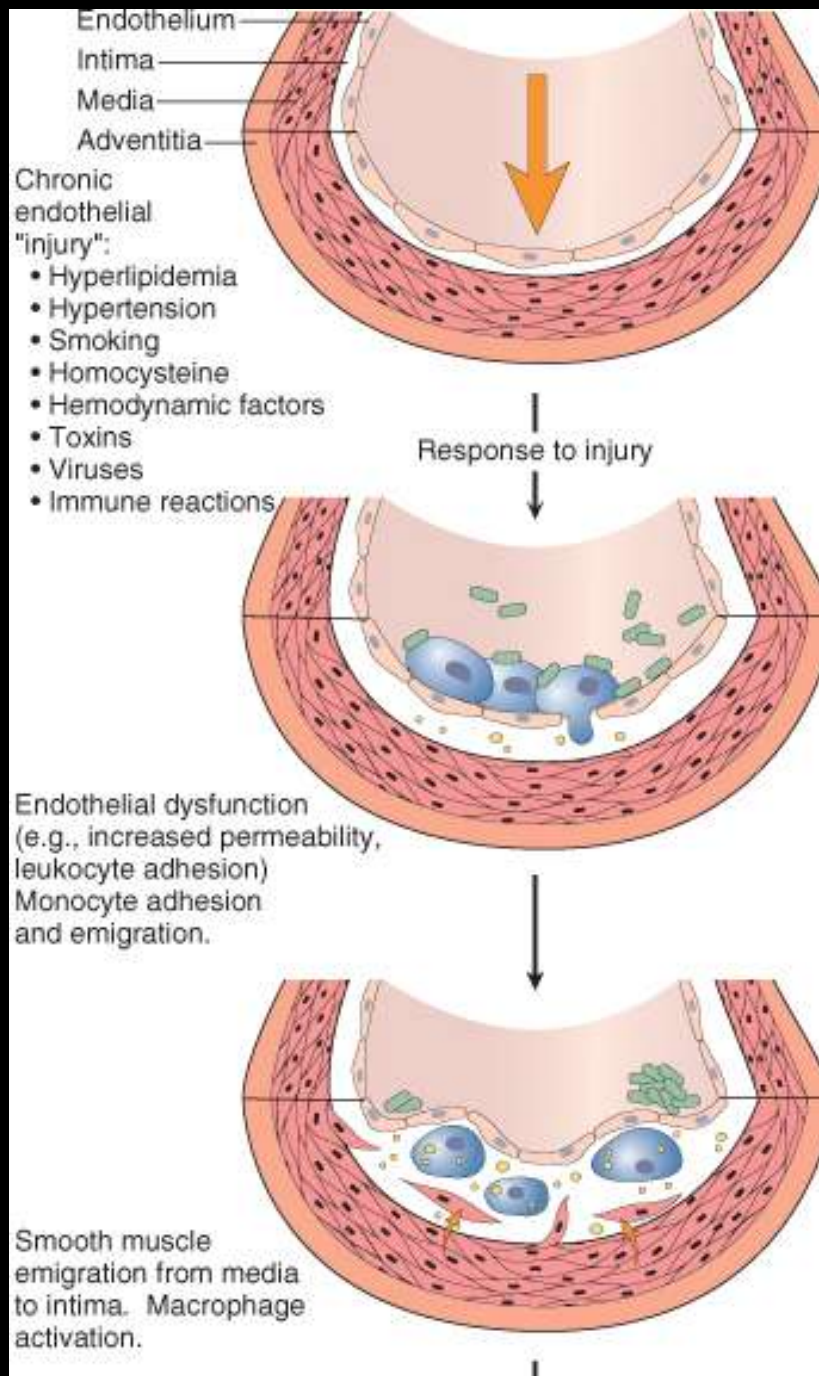
Usually middle age to elderly

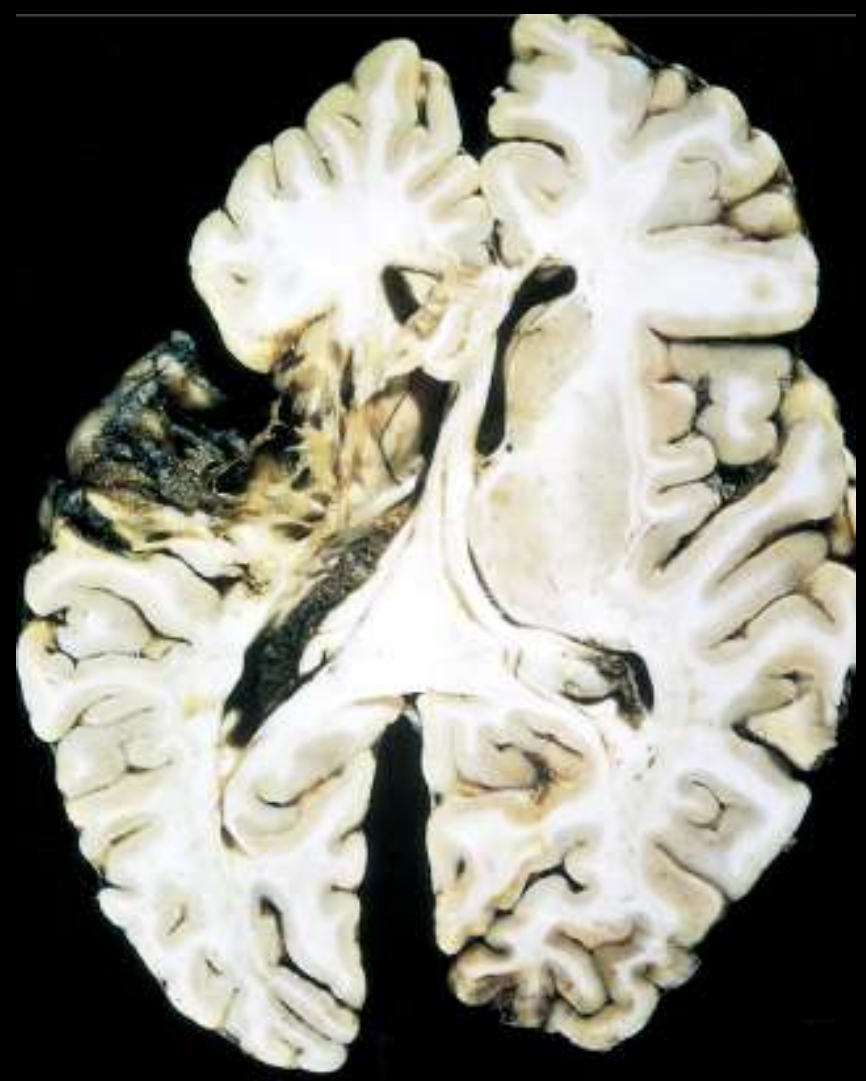
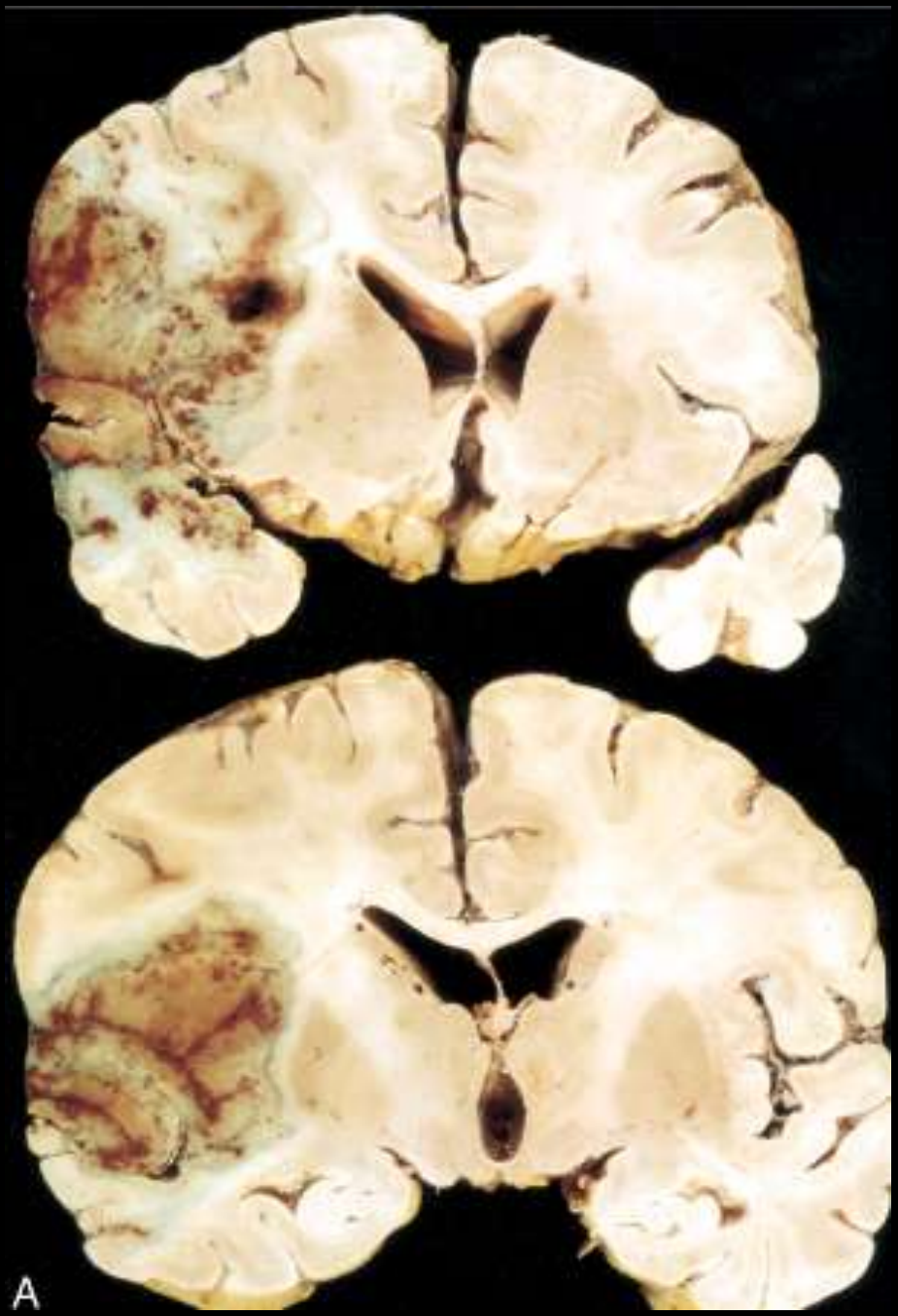






B

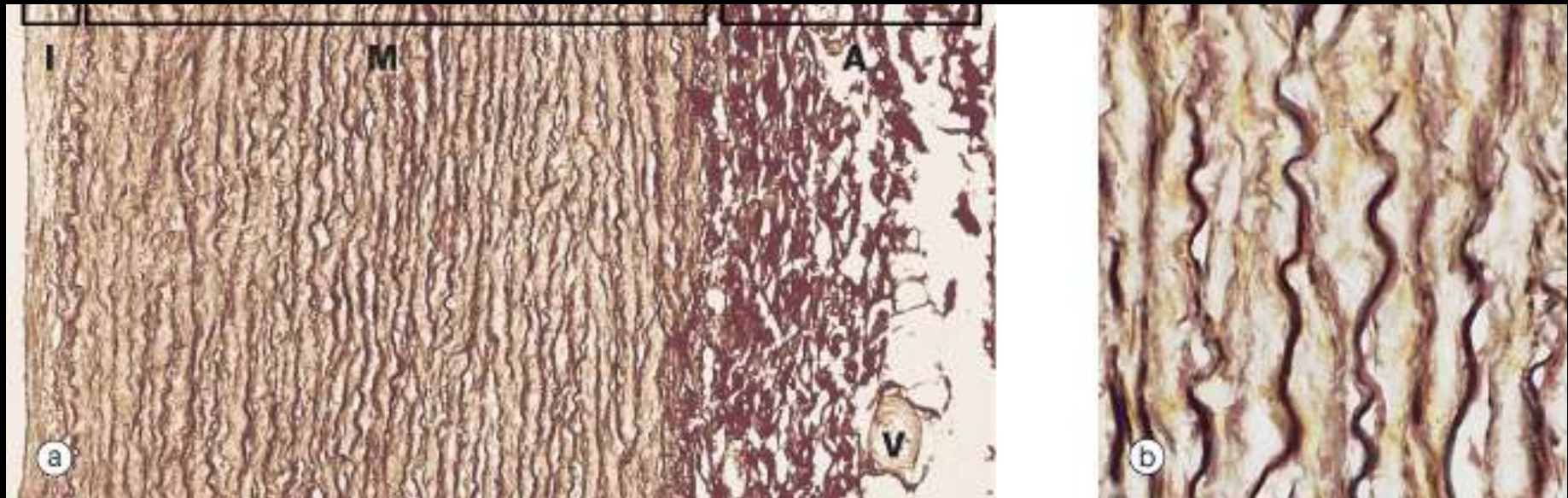




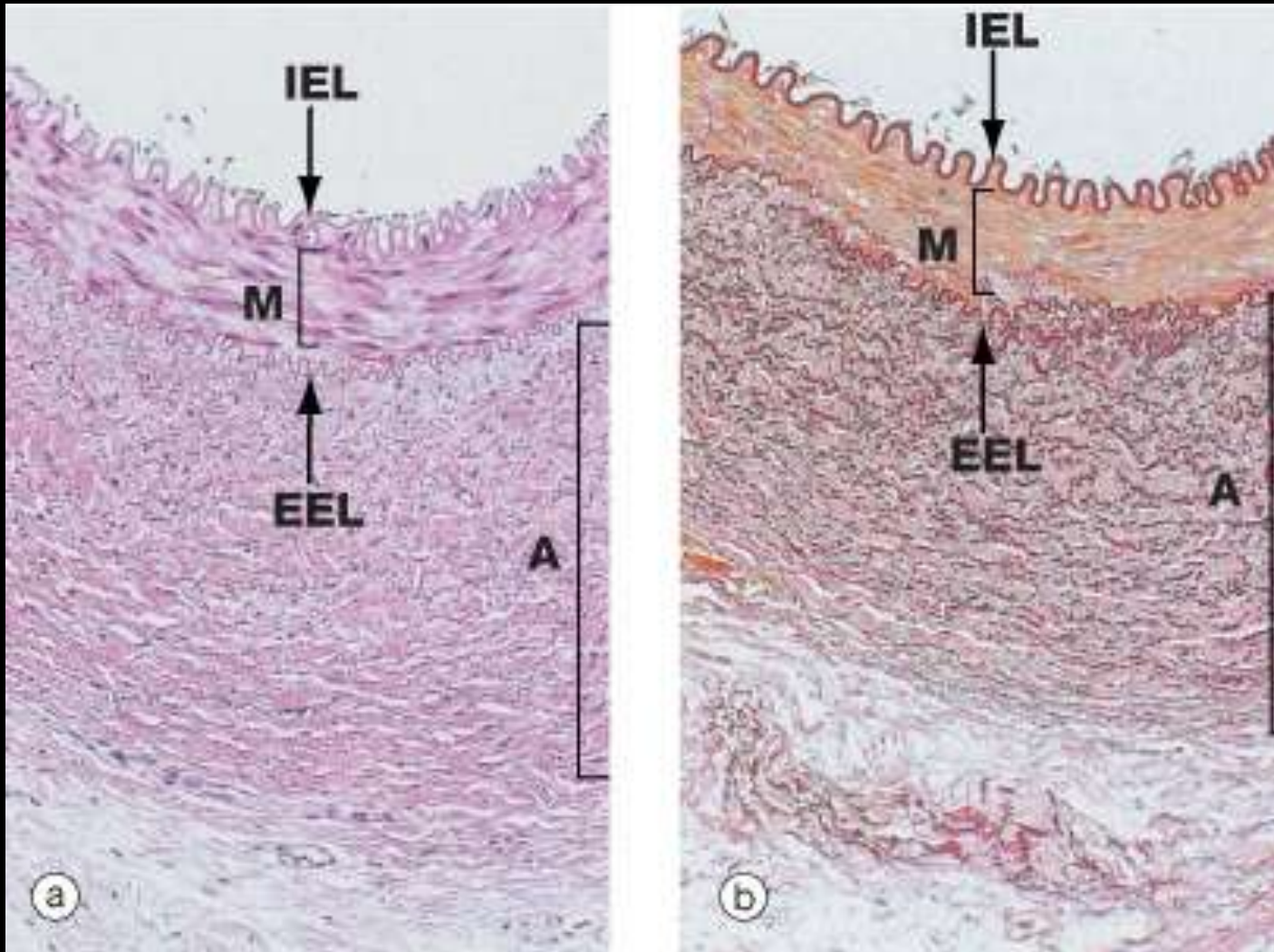
A

Le système artériel

- Rôle: Distribution du sang aux capillaires
- Variation du calibre: systole-diastole: fibres élastiques
- 3 types principaux de vaisseaux:
 - Artères élastiques: Aorte et branches
 - Artères musculaires: Branches de distribution (Extrémités et cérébrales)
 - Artérioles: Branches terminales



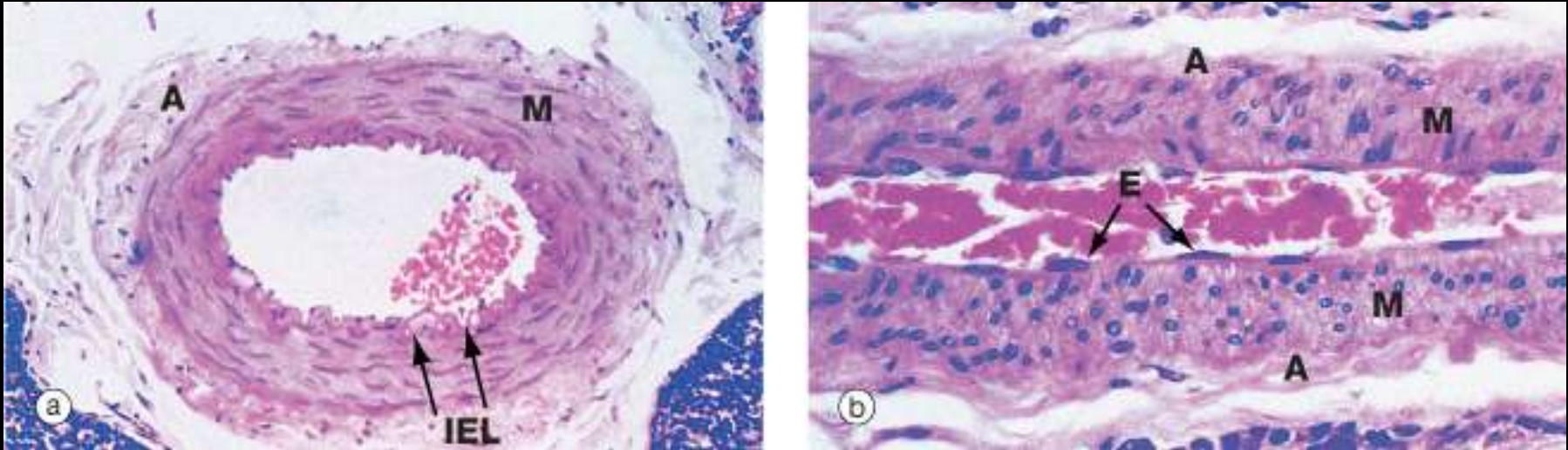
Artère musculaire (HE x 100 – FElast. X 100)



- Limitante élastique interne
- Média

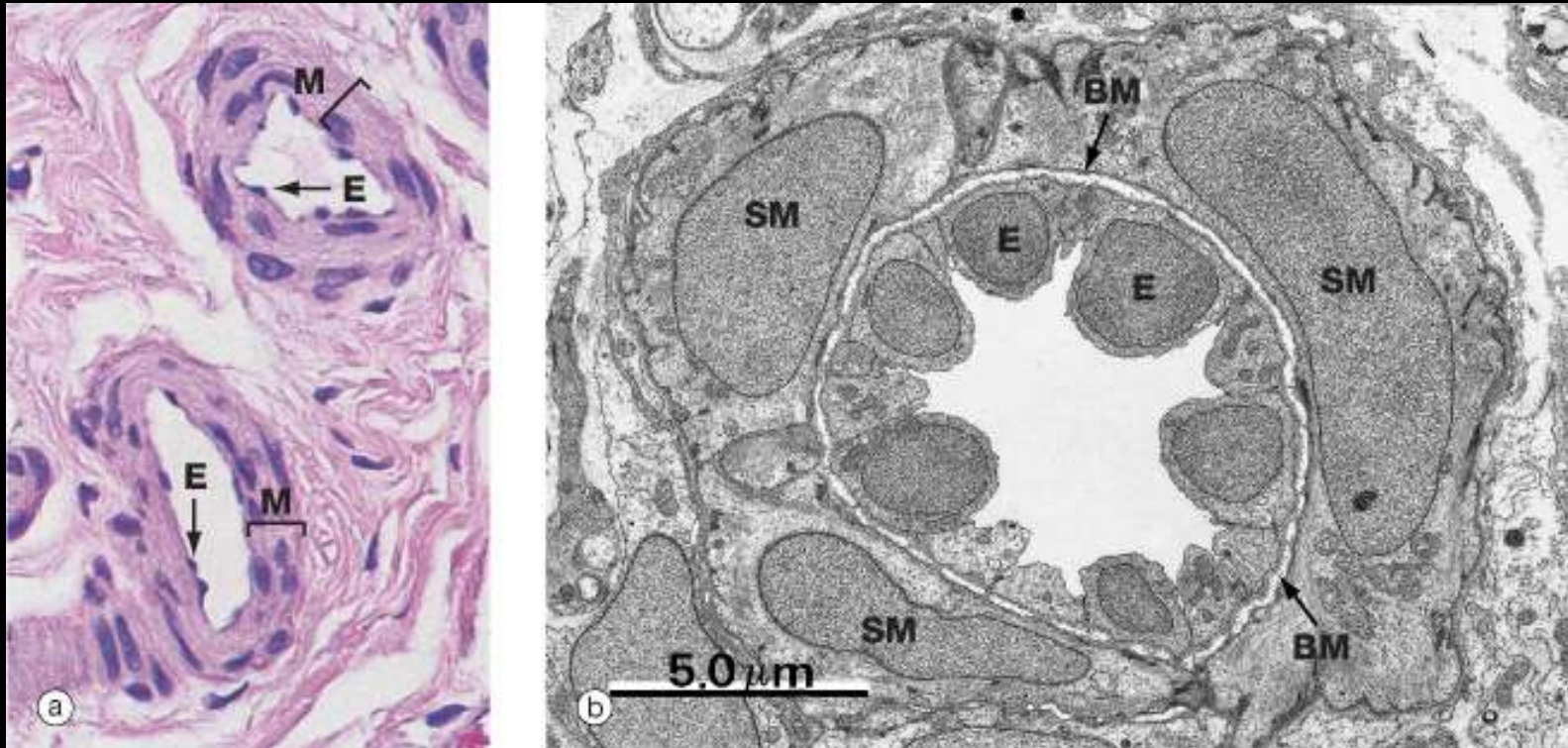
- Limitante élastique externe
- Adventice, fibroélastique

Petites artères musculaires (CT 125 – CL 320)



- Calibre 0.5 – 2 mm
- Limitante élastique interne
- Média 3 à 10 couches de cellules musculaires, peu de fibres élastiques
- Limitante élastique externe peu marquée
- Adventice

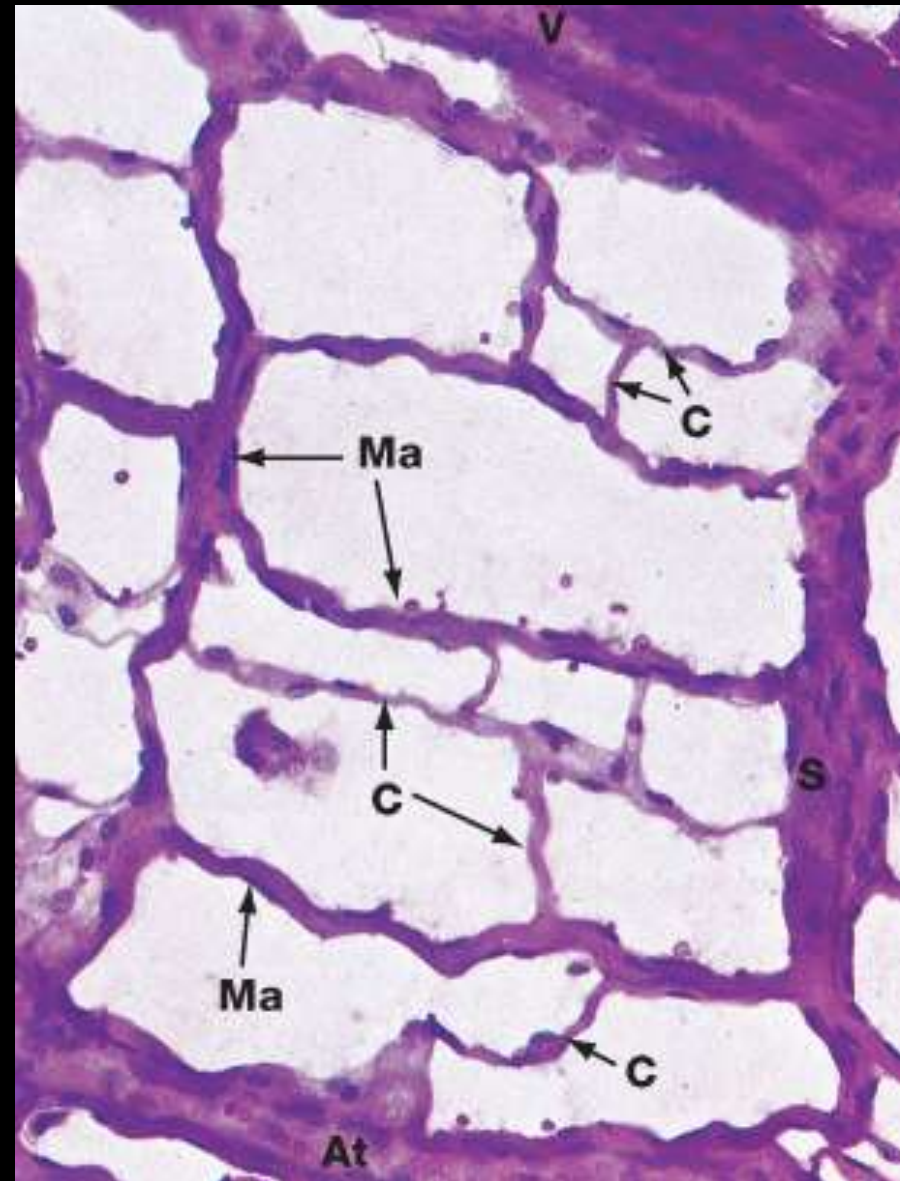
Artérioles (HE 100 – ME 5000)



- Transition progressive
- Perte de la limitante
- Média de 3 couches cellulaires
- Adventice mal délimitée

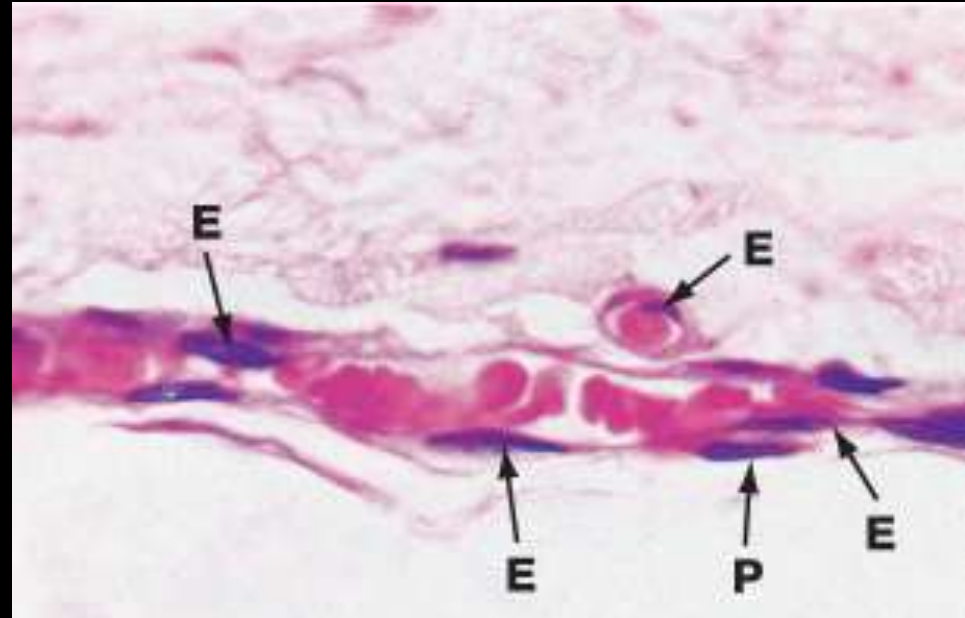
Microcirculation (Etal. Mésentérique 120)

- Echanges gazeux, liquidiens, métabolites
- Réseau capillaire
- Contrôle: sphincters pré-capillaires
- Veinules post-capillaires, veinules collectrices, veinules musculaires.
- Métartéριοles Ma.
- Shunt artério-veineux
- Régulation: SN autonome, hormonal.

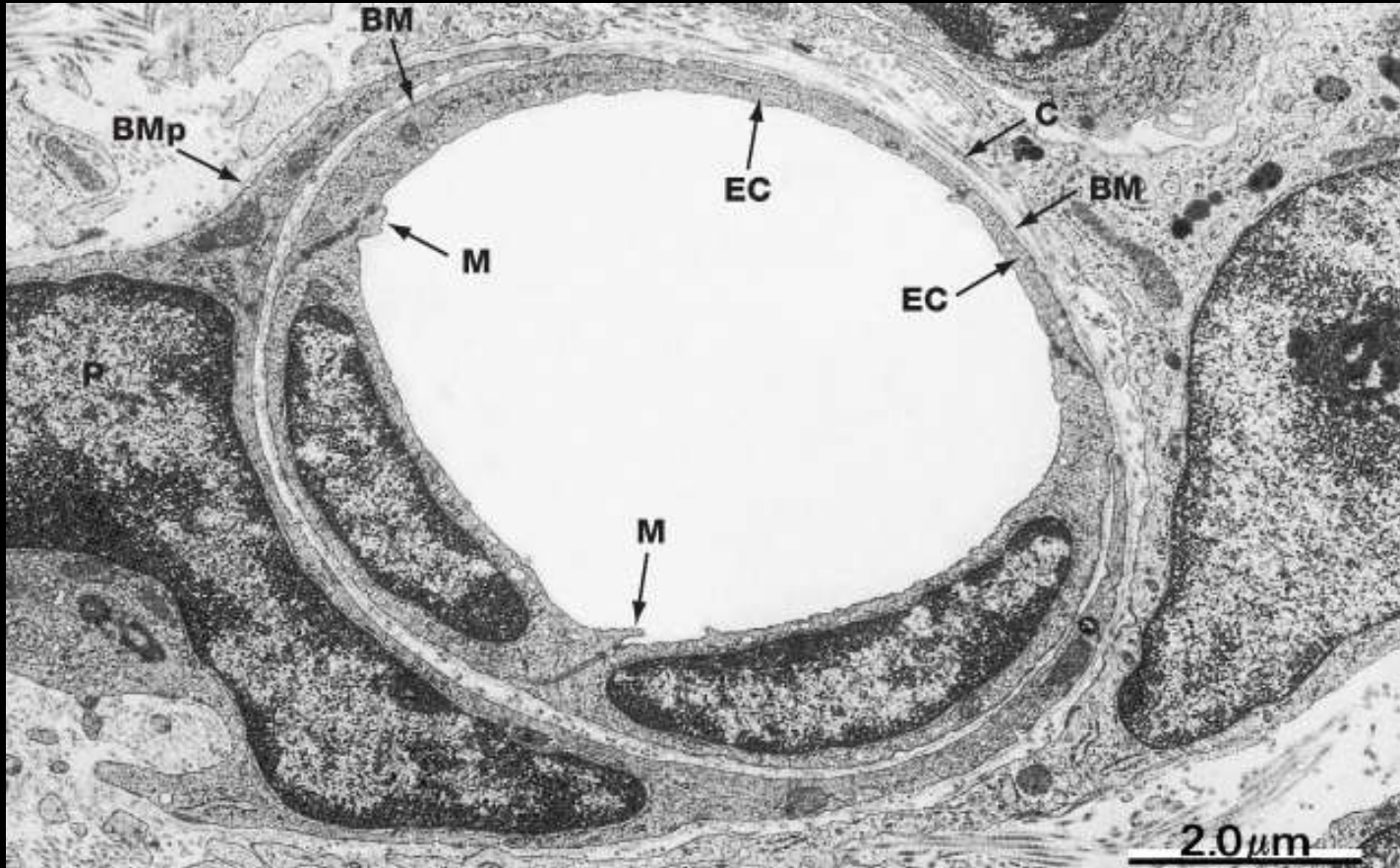


Capillaires (HE x 800)

- Cellules endothéliales aplaties
- Arrondies en coupe transversale
- Couche musculaire et adventitielle absentes
- Péricyte: contraction
- Diamètre du capillaire: GR

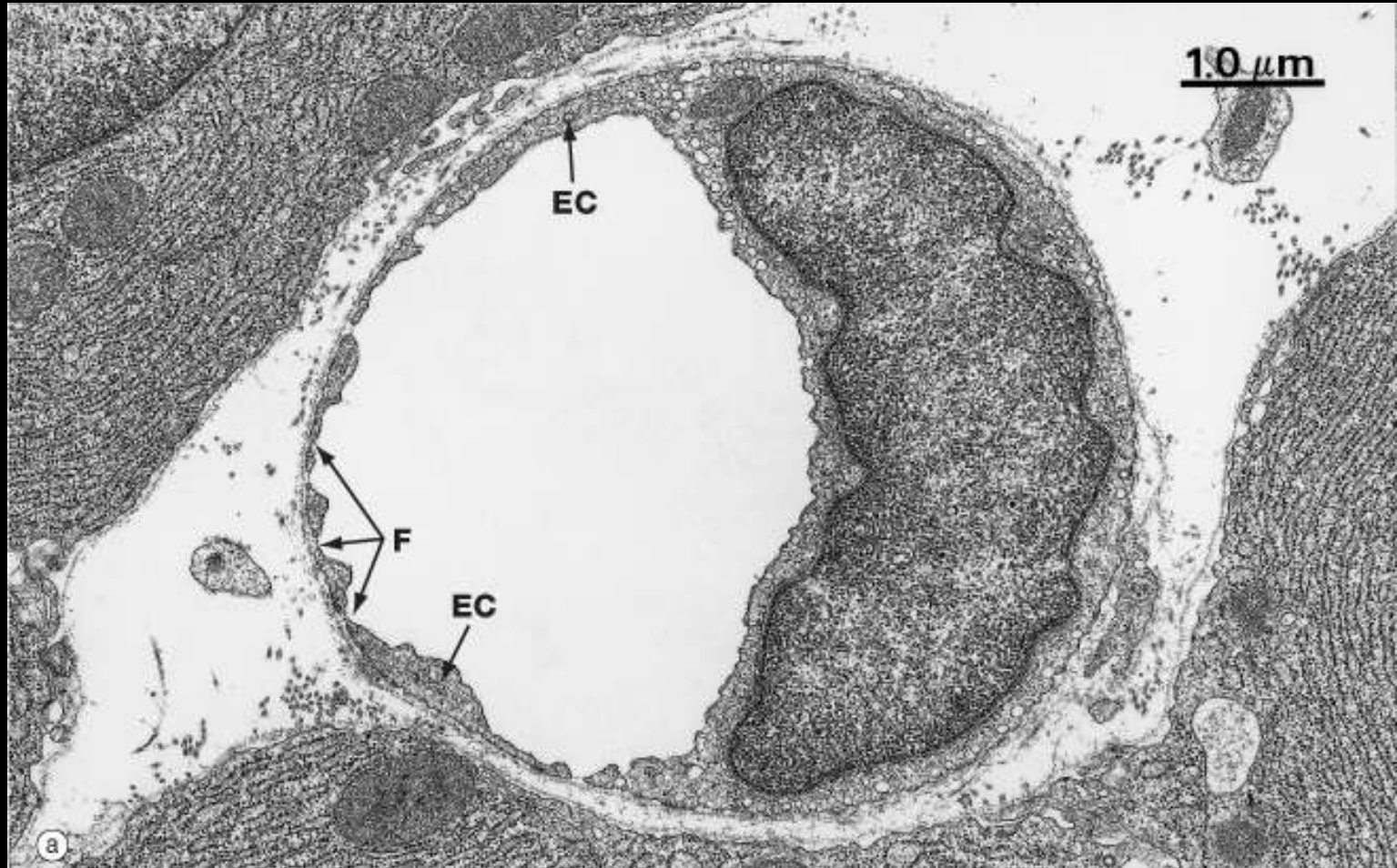


Capillaire à endothélium continu (ME 12 000)



- Jonctions serrées
- Replis marginaux
- Membrane basale
- Péricyte (MB)
- Echanges:
 - Diffusion passive
 - Vacuoles de pinocytose
 - Espaces intercellulaires

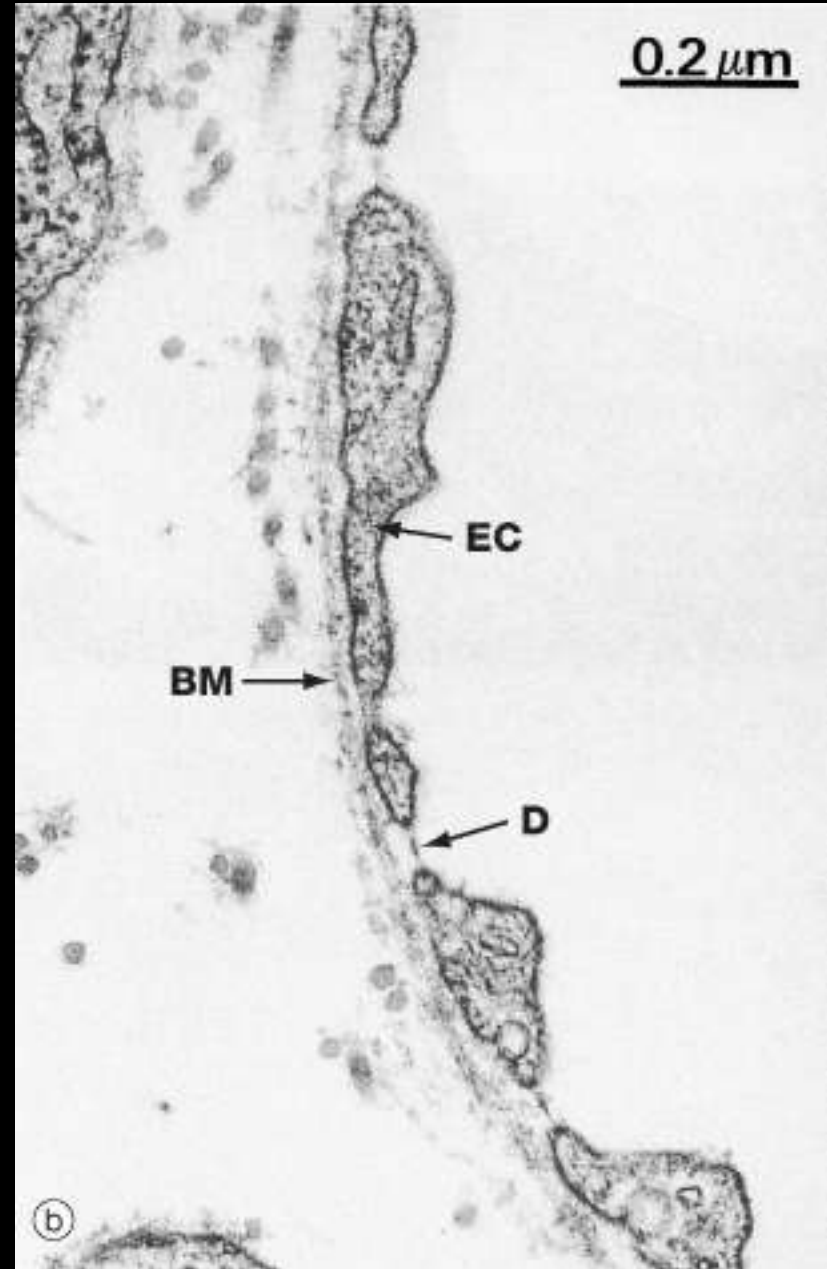
Capillaire à endothélium fenestré (ME 15 000)



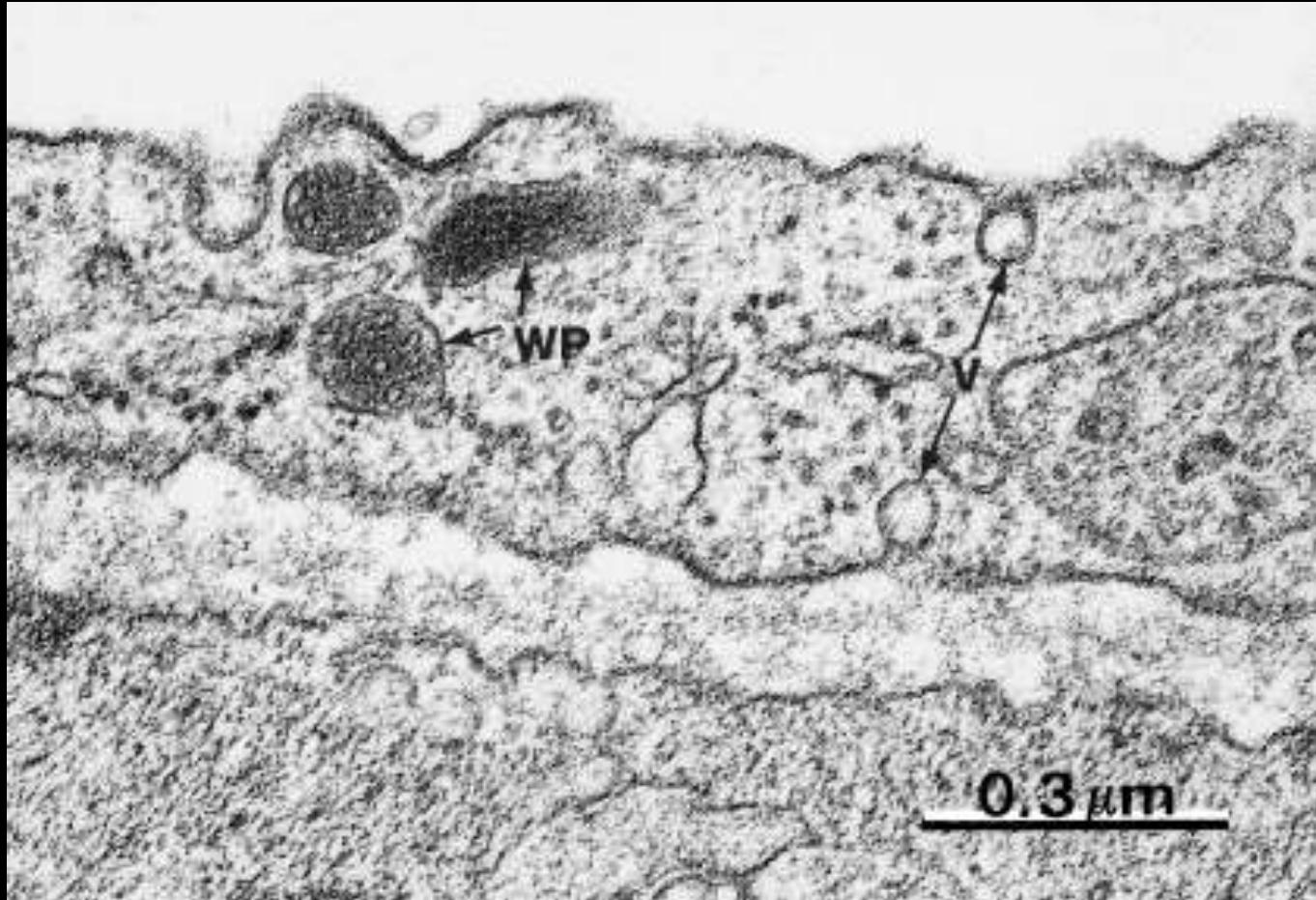
- Echanges moléculaires intensifs (Intestins, Endocrine, Rein)
- Fenestrations (pores)
- Passage rapide de molécules
- Membrane basale, Péricytes rares.
- MB discontinue (Moelle, Rate, Foie)

Capillaire à endothélium fenestré (ME 15 000)

- Pores: Diaphragme
- Fenestrations sans diaphragme dans les capillaires glomérulaires (rein)



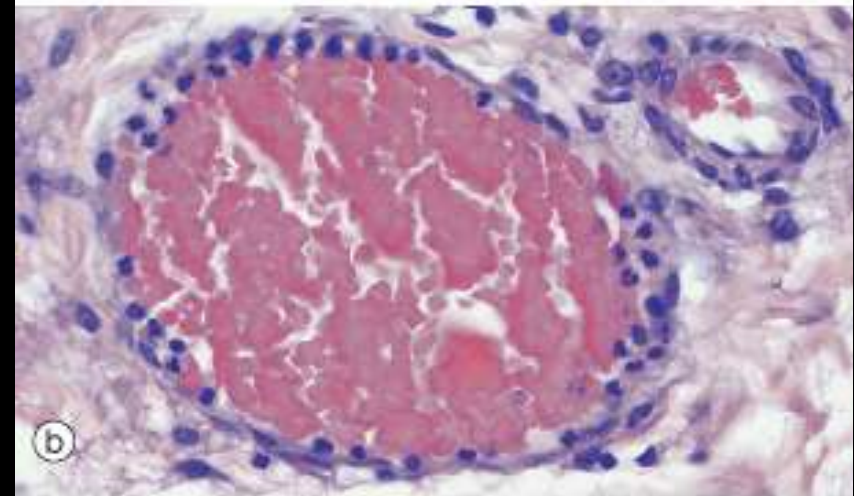
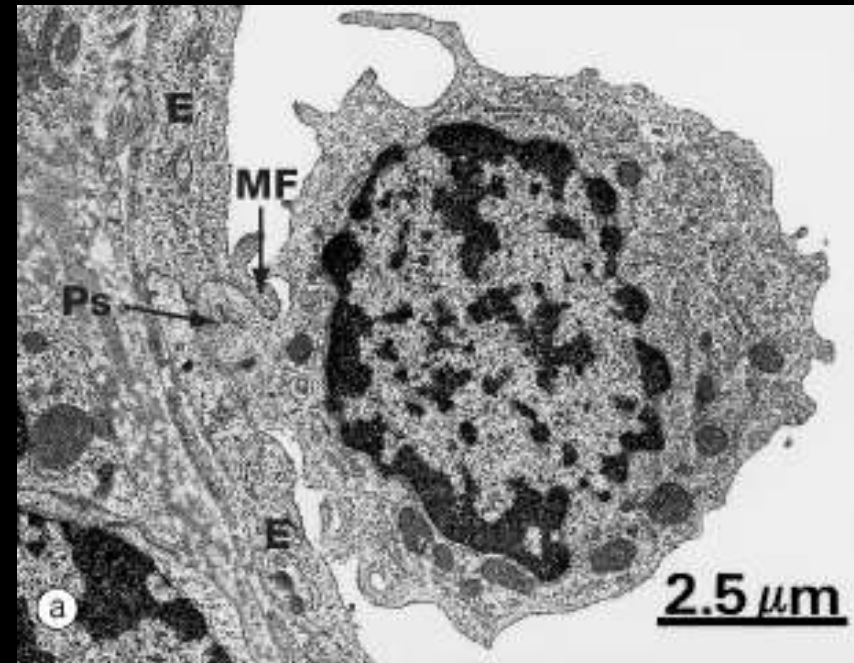
Cellule endothéliale (ME 68 000)



- Vésicules de pinocytose
- Corps de Weibel-Palade
- Contrôle de la coagulation et de la thrombose
- Vasoconstriction-dilatation
- Perméabilité

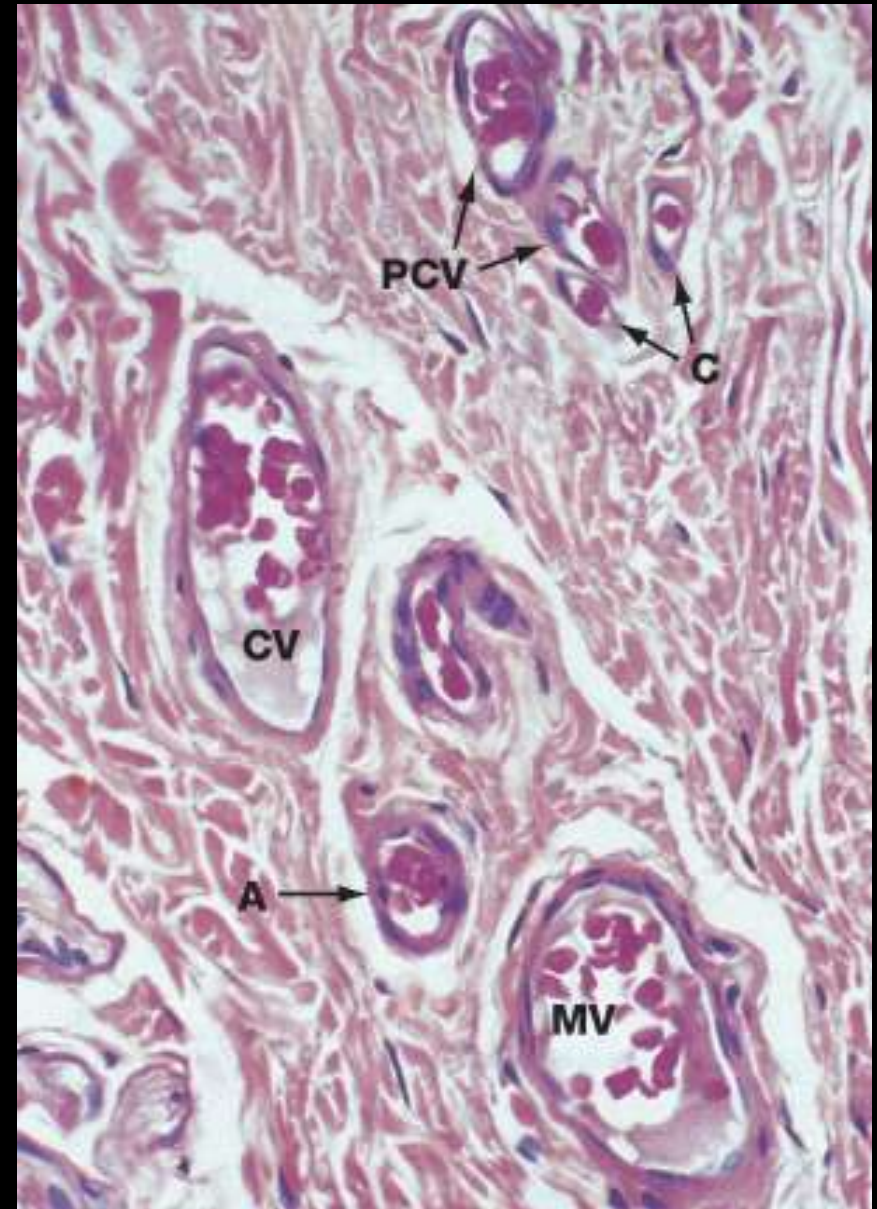
Migration cellulaire (ME 6 000 – HE 600)

- Capillaires et veinules post-capillaires
- Pseudopodes
- Repli marginal
- Jonction intercellulaires complexes rares dans les veinules pc
- Margination leucocytaire

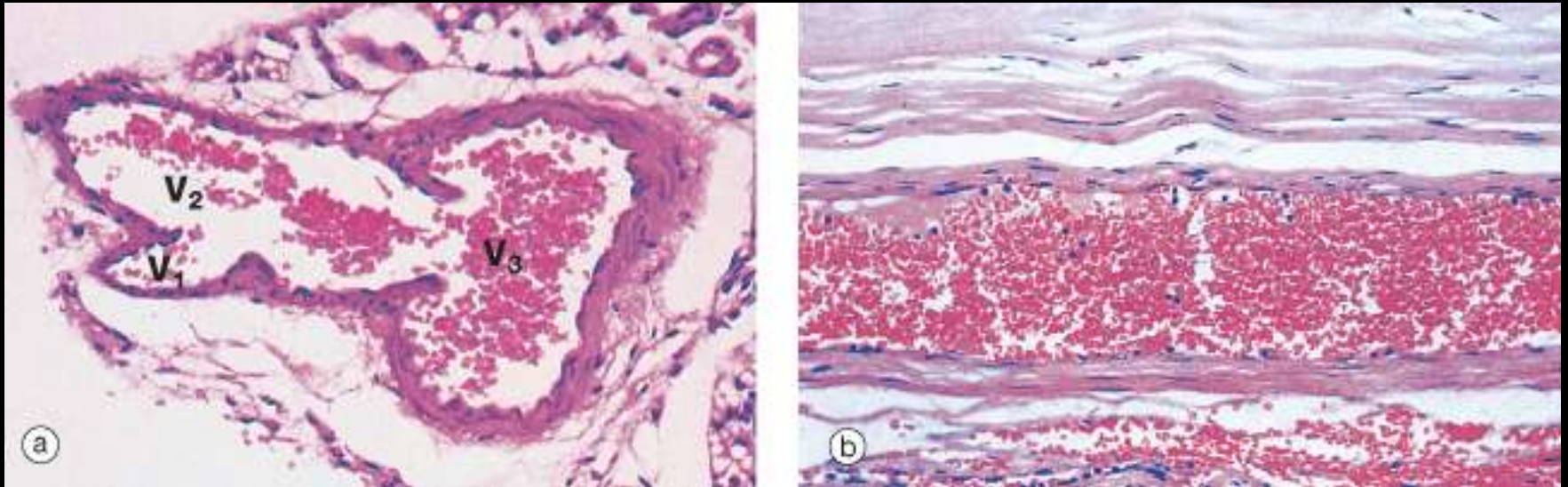


Le système veineux

- Compartiment de basse pression
- Contraction de la paroi et compression extrinsèque
- Valves
- 3 couches
- Constituants élastiques et musculaires peu marqués
- Veinules postcapillaires et veinules collectrices: endothélium et péricytes
- Veinules musculaires

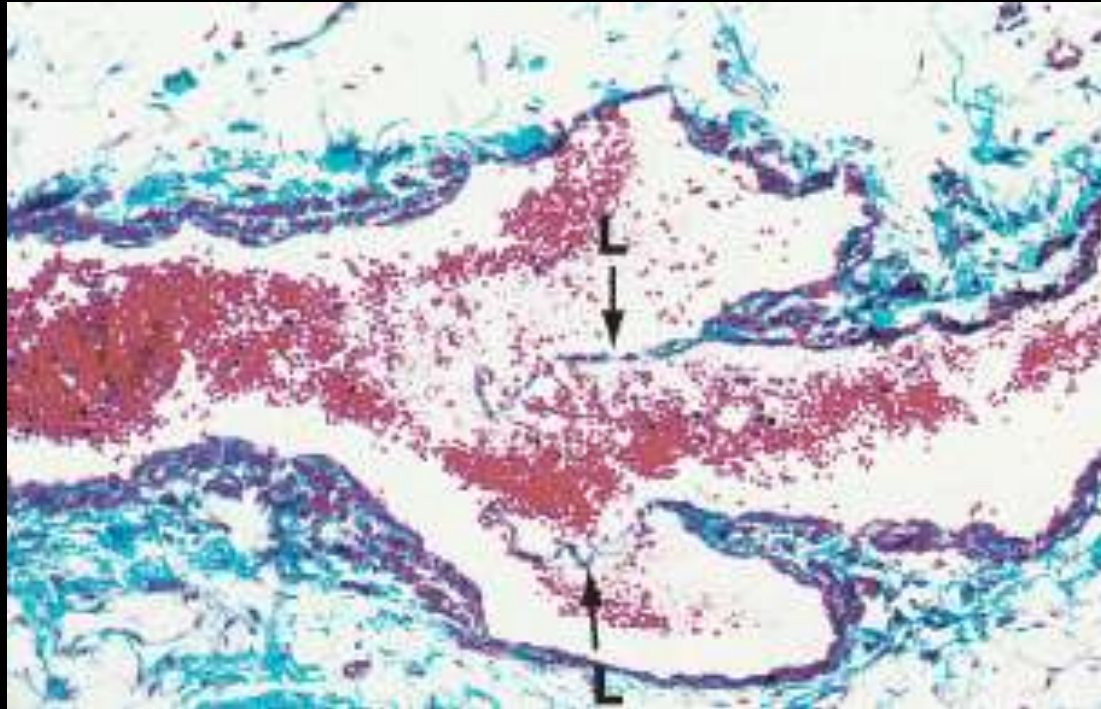


Veinules musculaires et petites veines (HE 125)



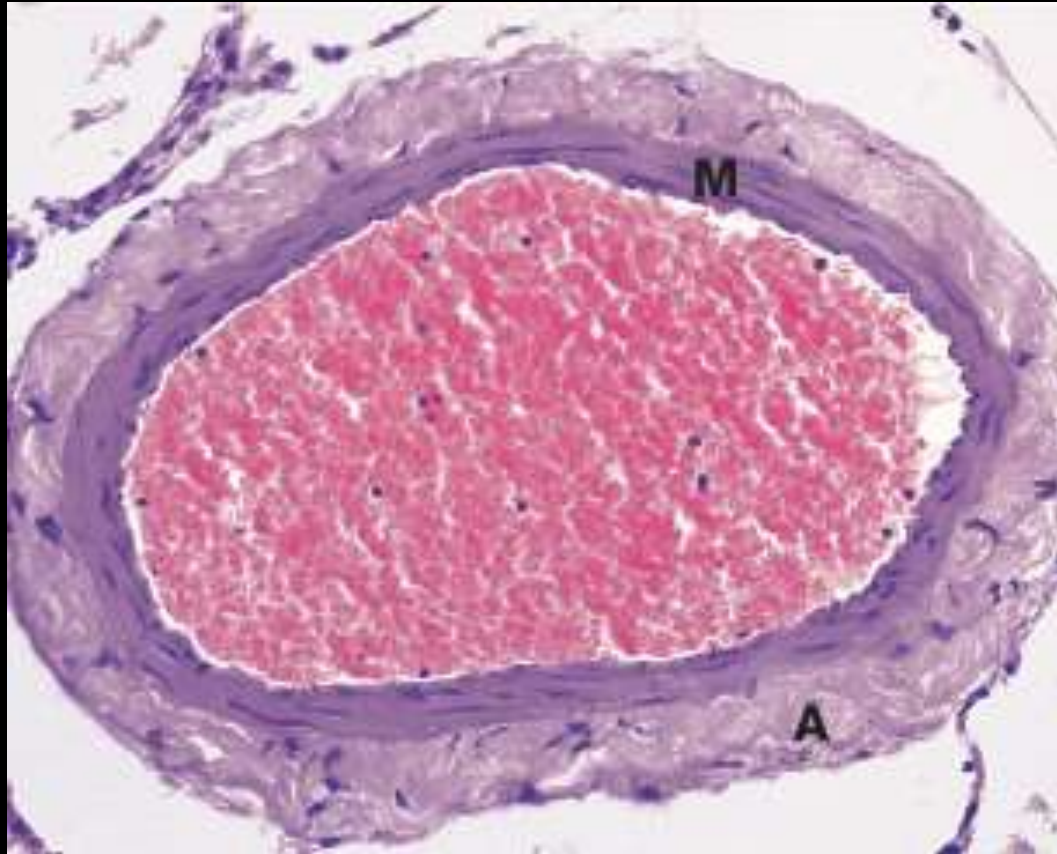
- Petite et large veinules musculaires, Valves
- Petite veine
- Variation de la couche musculaire, lame élastique interne peu développée.

Veine à valvules (Trichrome x 125)



- Projection fibroélastique
- Veines de plus de 2 mm
- Extrémités

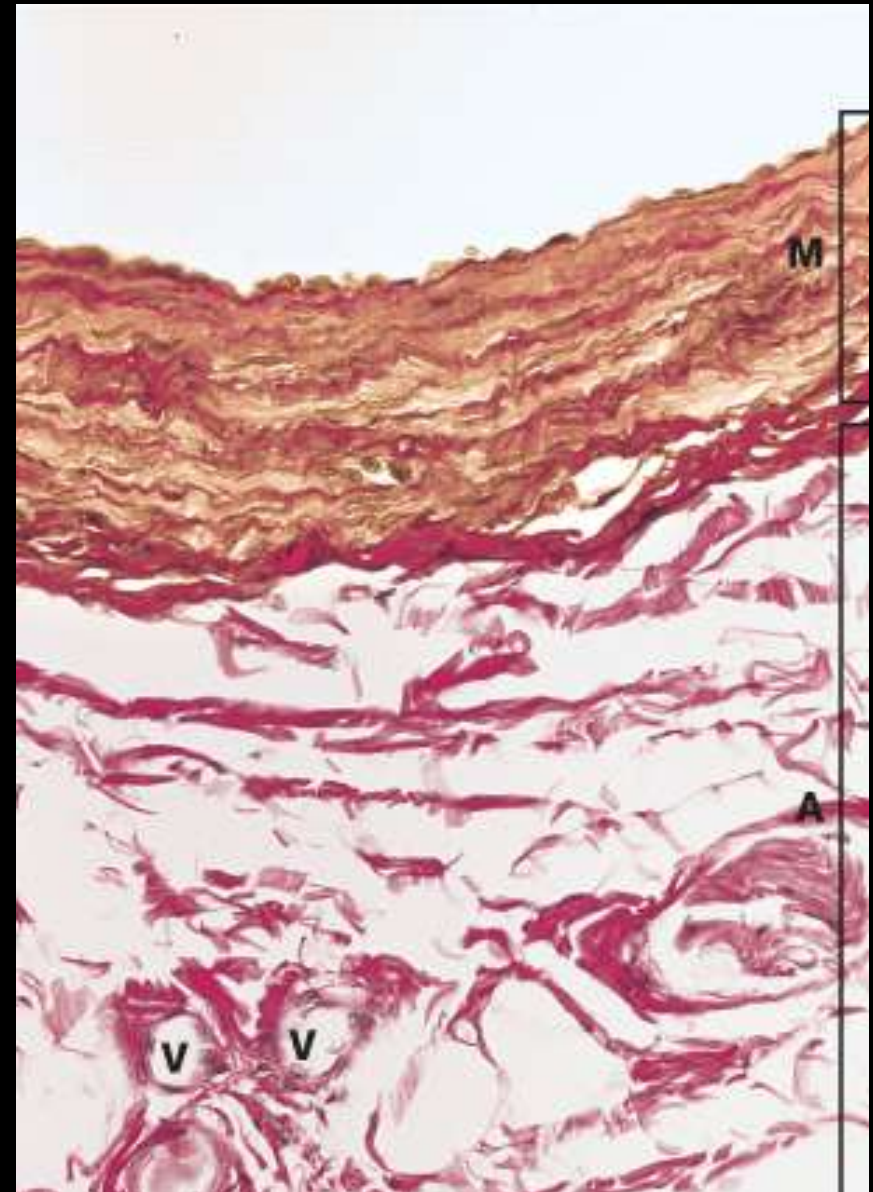
Veine moyenne (HE x 180)



- Intima
- Média de 2 à 4 couches
- Adventice plus épaisse

Veine musculaire large (F Elastique X 250)

- Média: plusieurs couches de cellules musculaires
- Collagène
- Fibres élastiques rares
- Adventice: vasa-vasorum
- Pas de limitante élastique

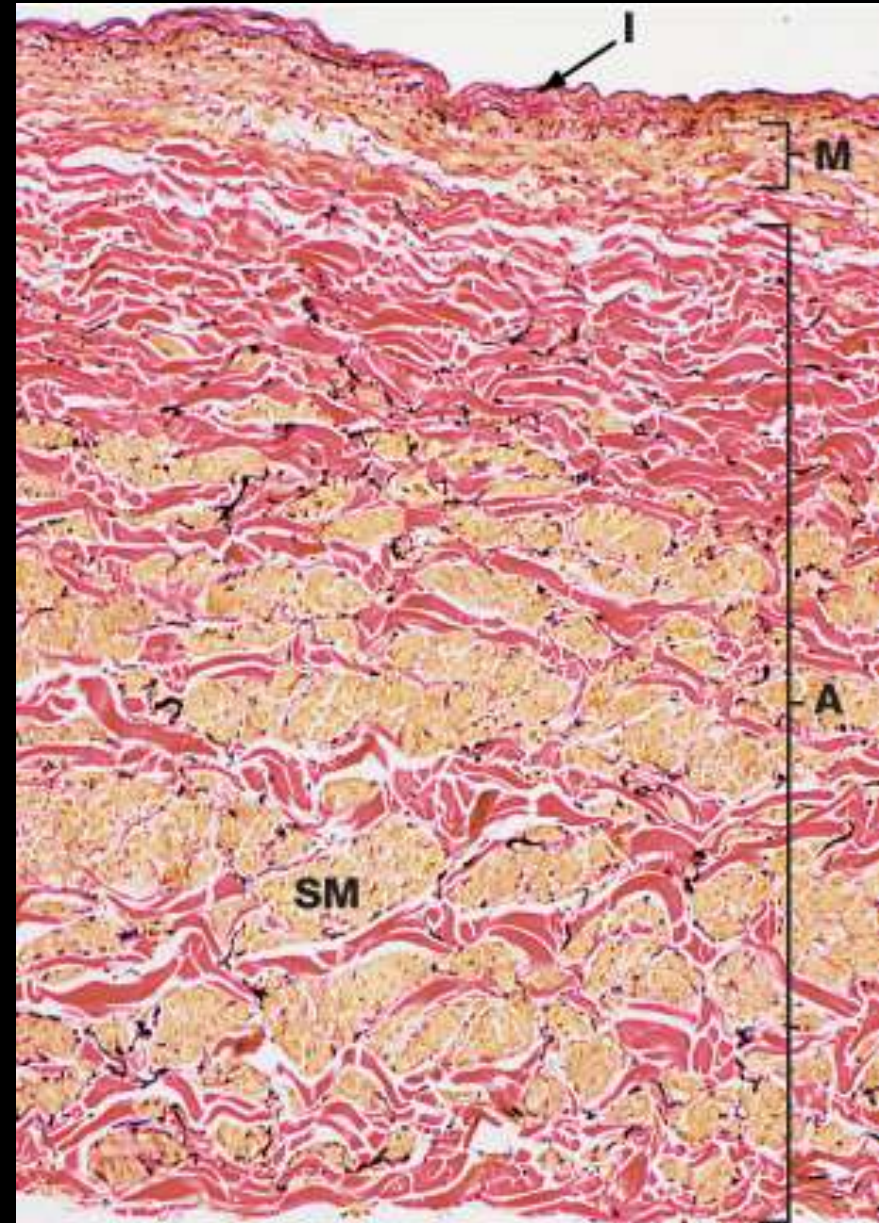


 **MCOURS.COM**

Le N°1 du cours et exercices sur Internet

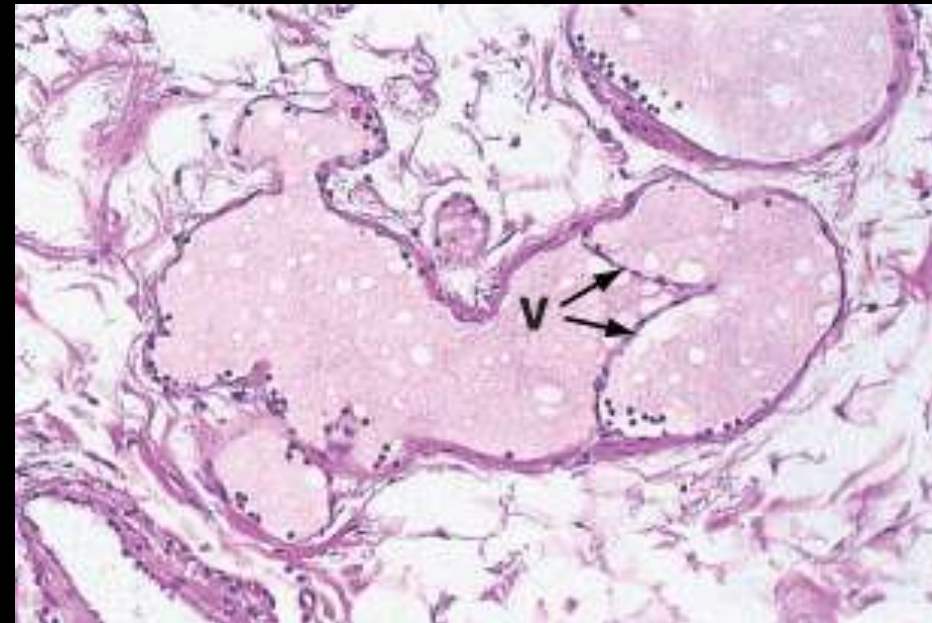
Veine cave inférieure (FElast. X 100)

- Intima distincte, fibro-élastique
- Média: couches circulaires de cellules musculaires lisses
- Adventice: collagène et trousseaux épais longitudinaux de cellules musculaires lisses
- Fibres élastiques réparties dans toutes les tuniques



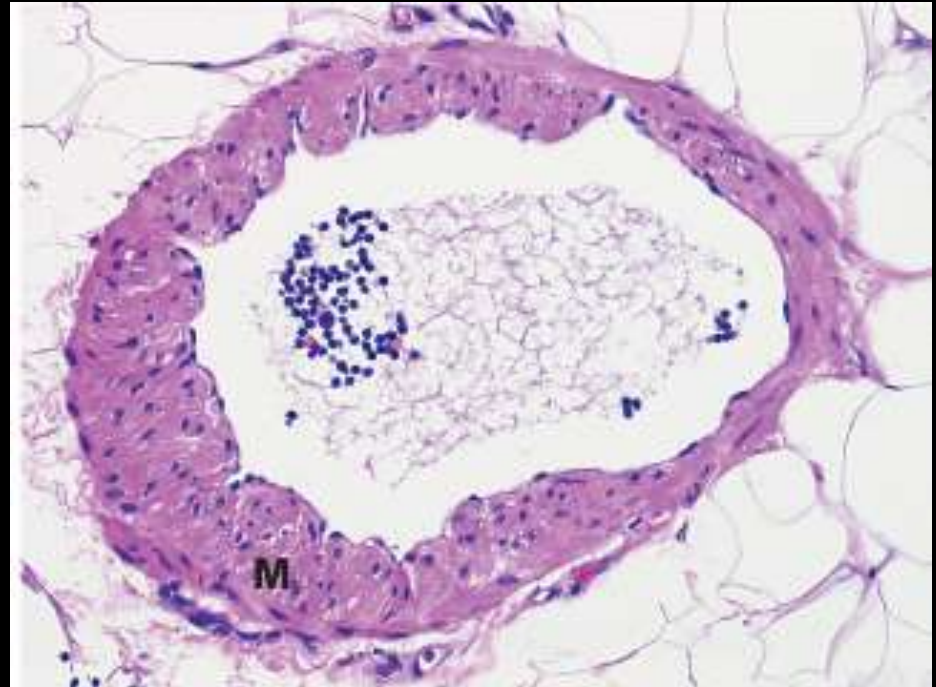
Le système lymphatique

- Dans tout les tissus sauf le système nerveux central, cartilage, os, moelle osseuse, thymus, placenta, dents, cornée.
- Perméabilité supérieure au capillaire:
 - Endothélium fin
 - Membrane basale rudimentaire voire absente
 - Pas de péricytes



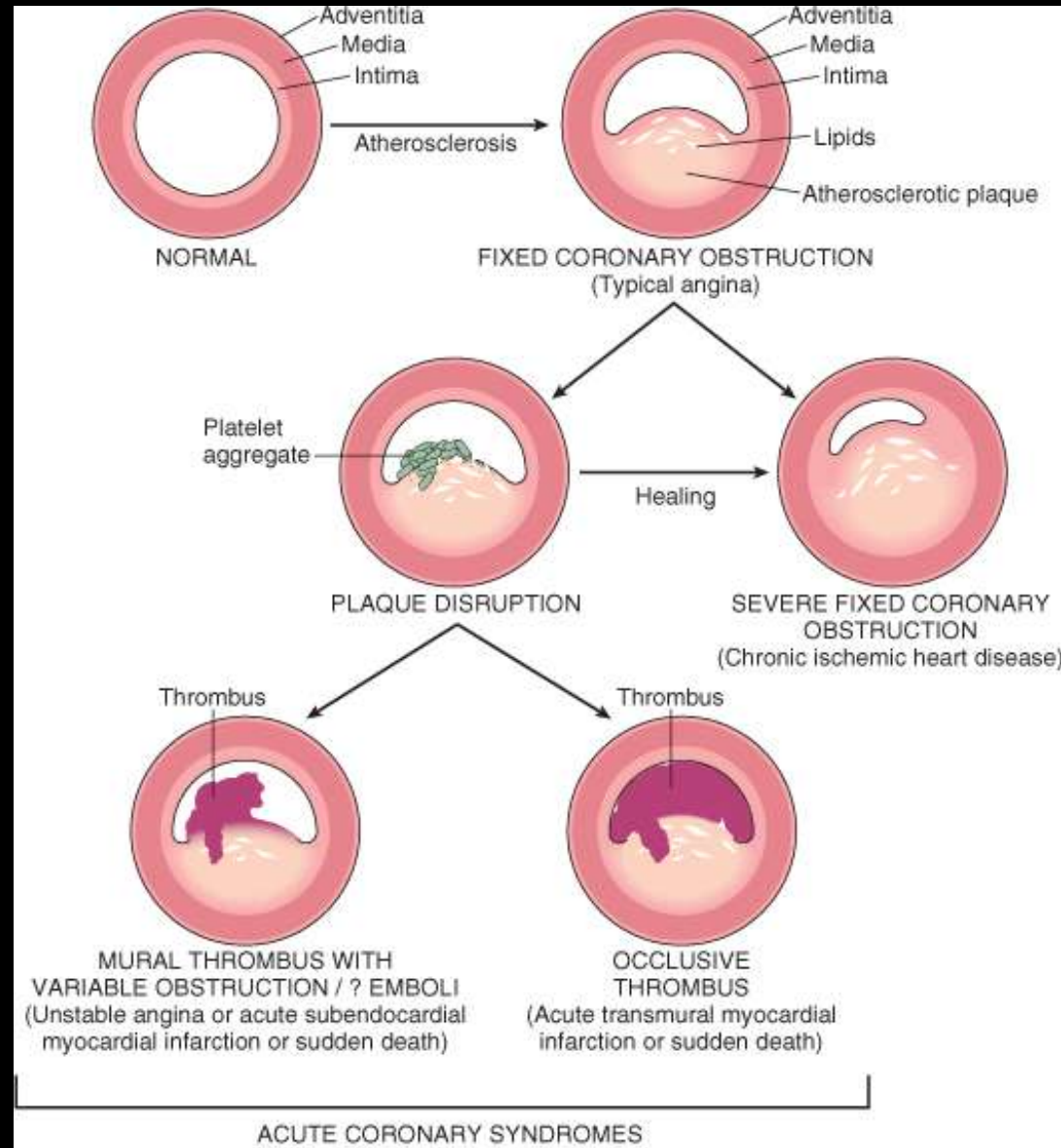
Lymphatique de moyen calibre (HE x 40)

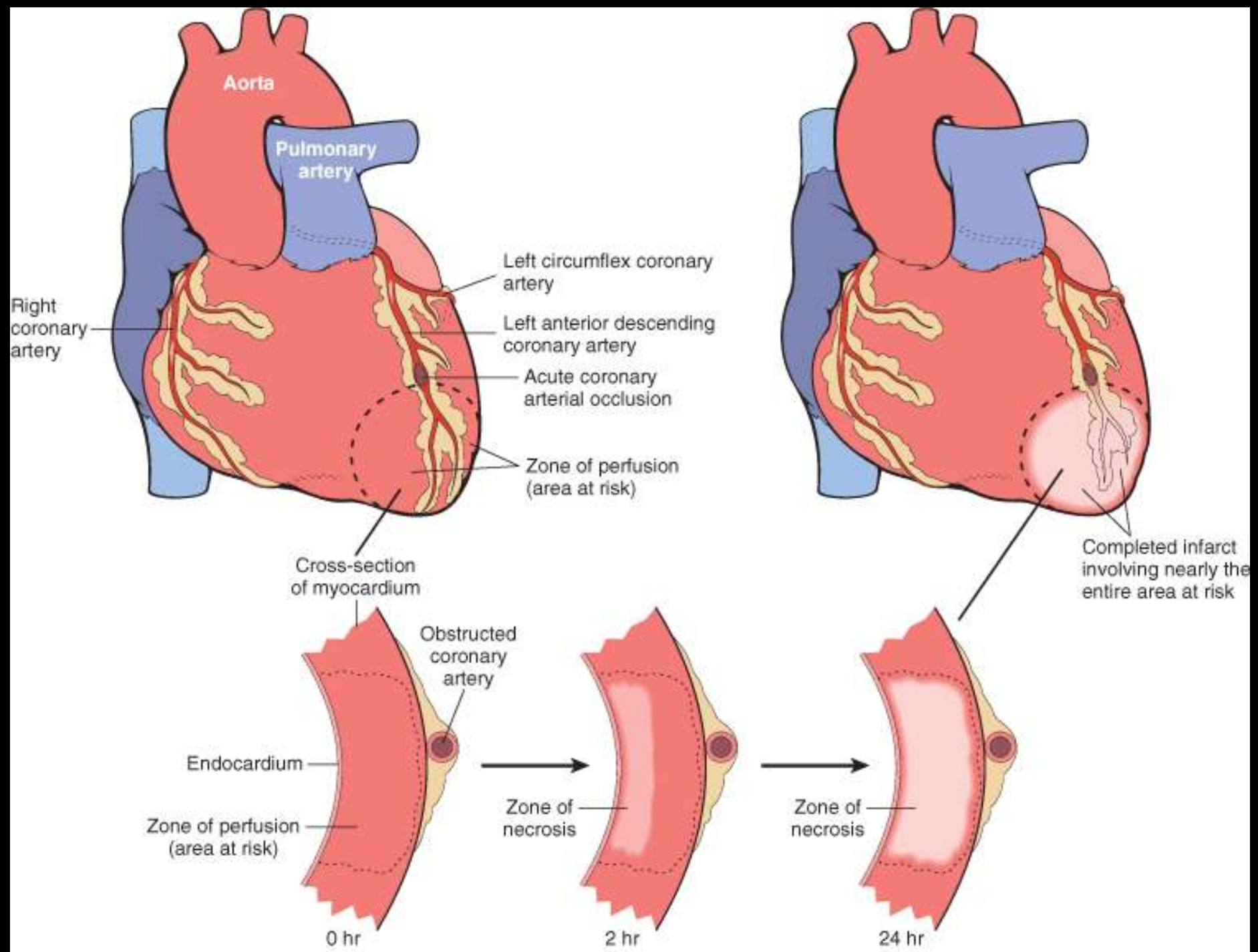
- Paroi musculaire
- Drainage vers le système veineux

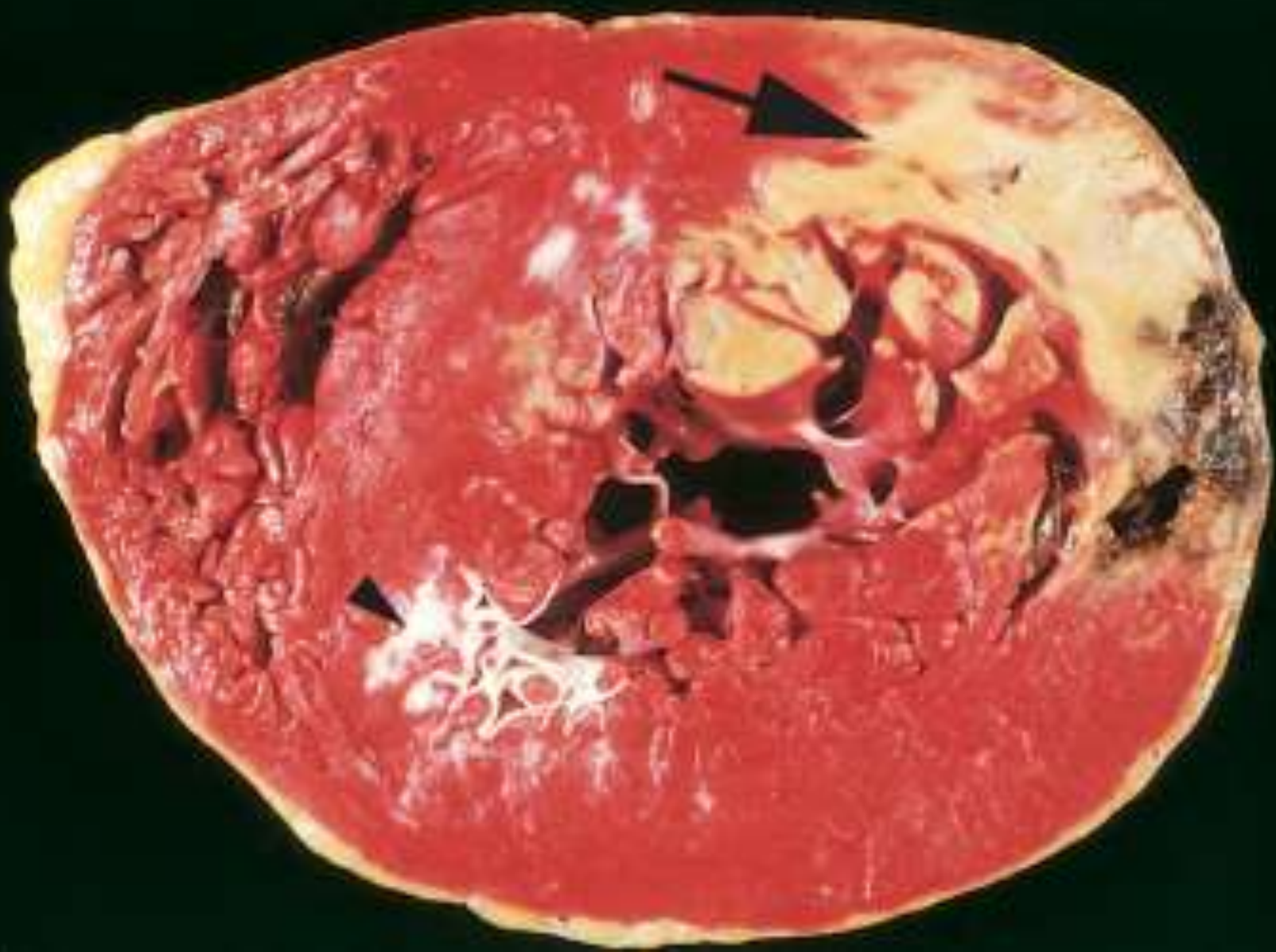


Cas clinique

- Sujet adulte
- Douleur thoracique particulière
- Irradiation
- Urgences.....







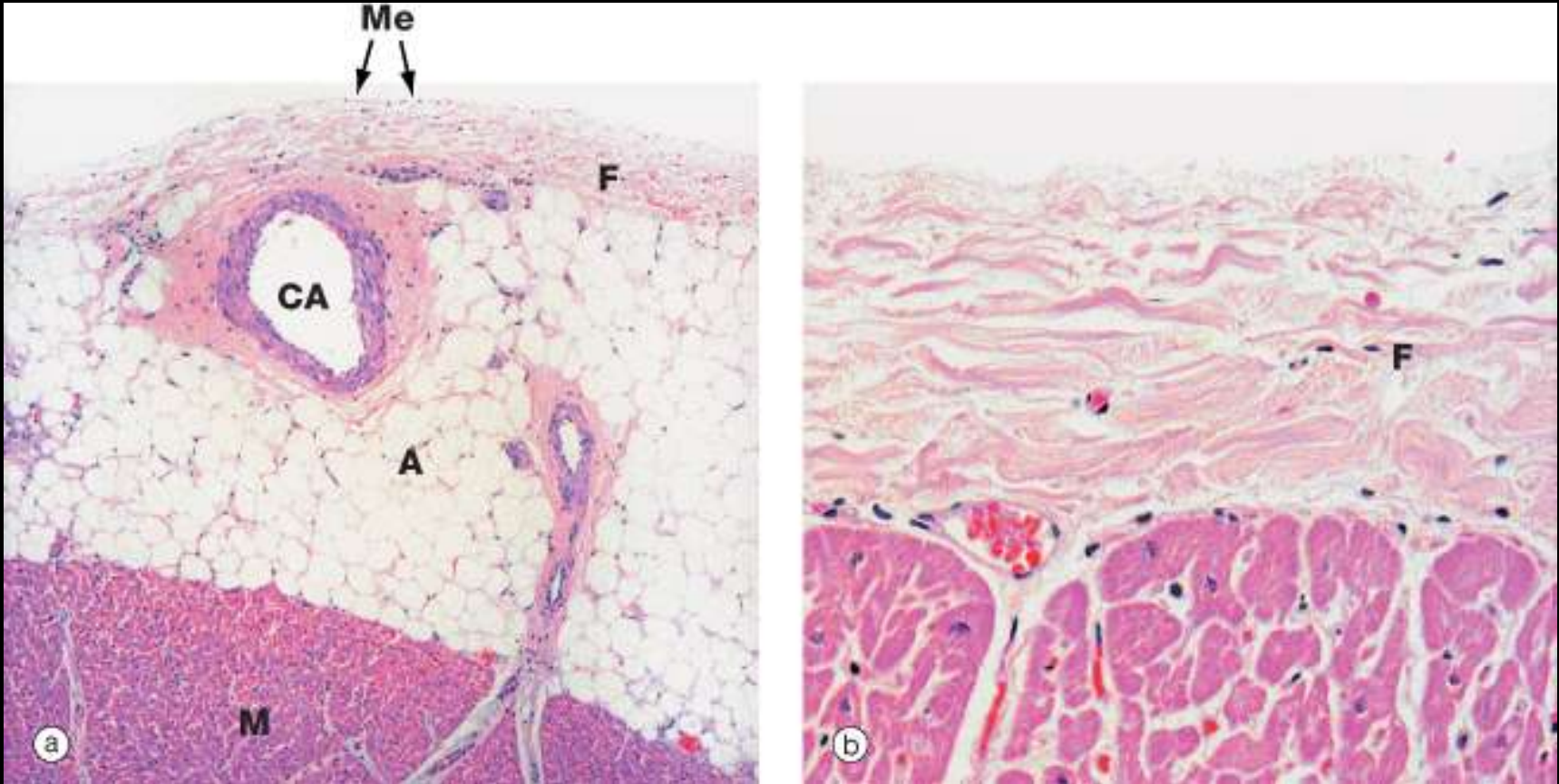
TTC

Cœur – Paroi ventriculaire gauche (HE x 3)



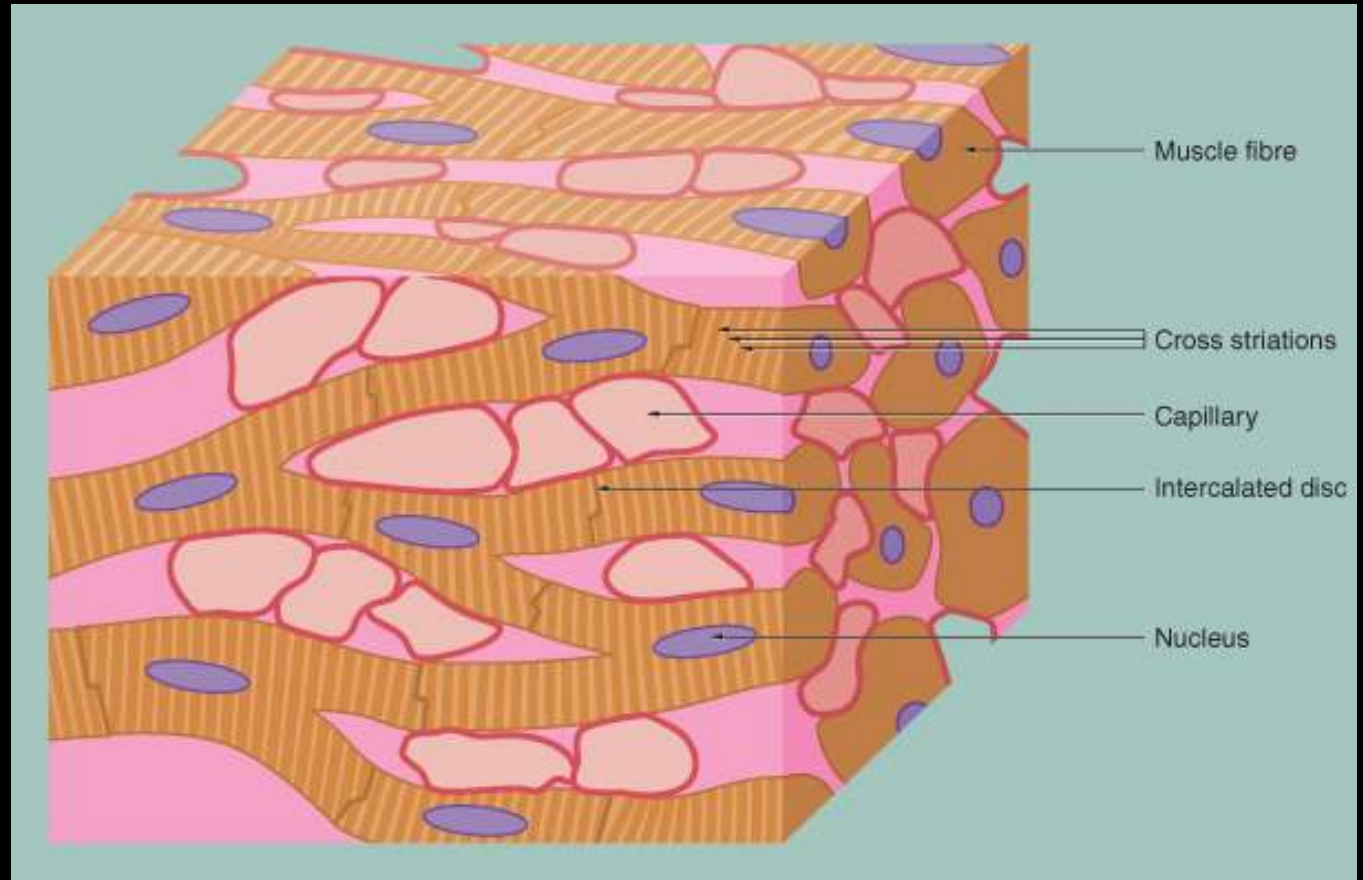
- Endocarde
- Myocarde
- Piliers
- Péricarde

Cœur, Péricarde viscéral (HE x 200 – 500)



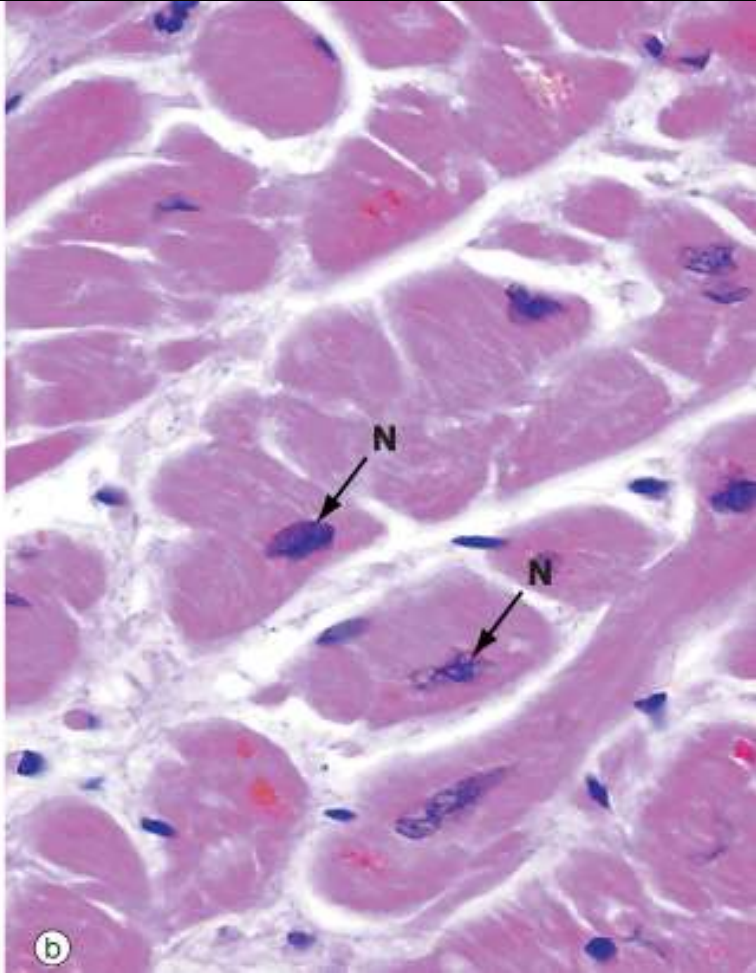
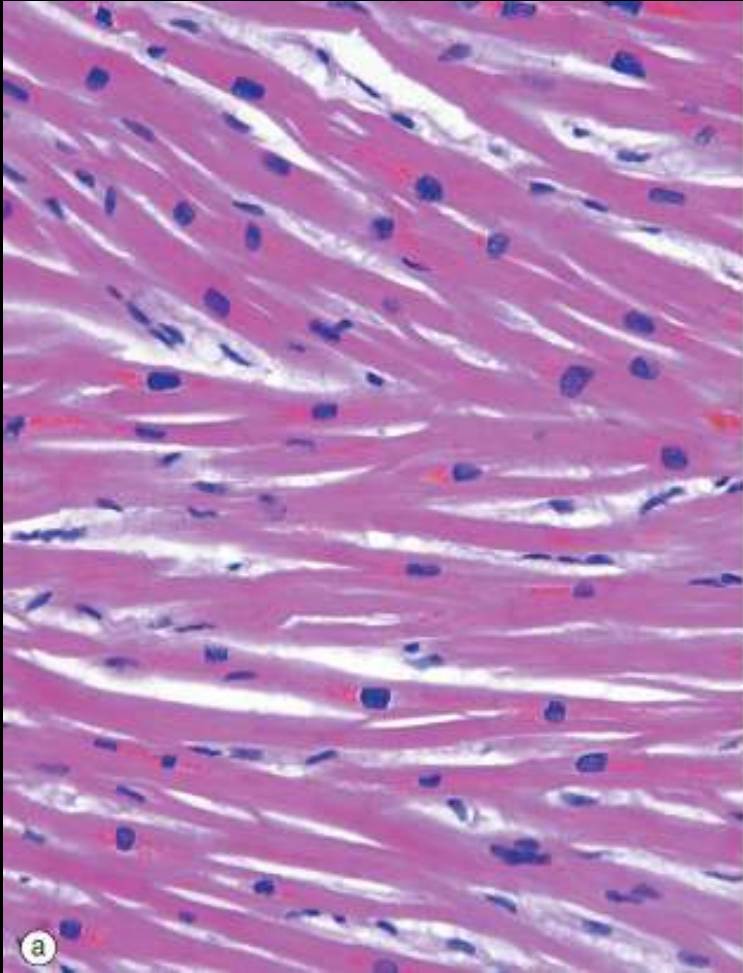
- Mésothélium
- Branche A. coronaire (adipocytes)
- Tissu fibreux dense

Myocarde

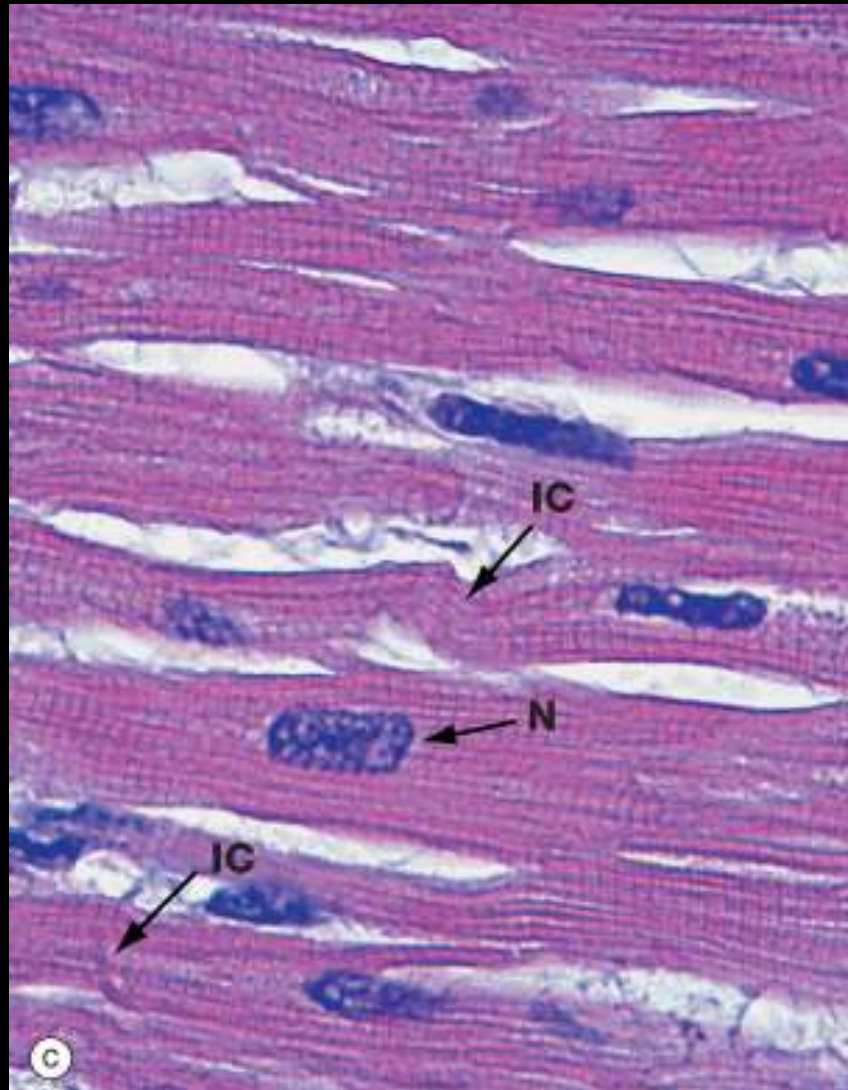


- Fibre myocardique (« syncytiale »)
- Striations
- Disque intercalaire

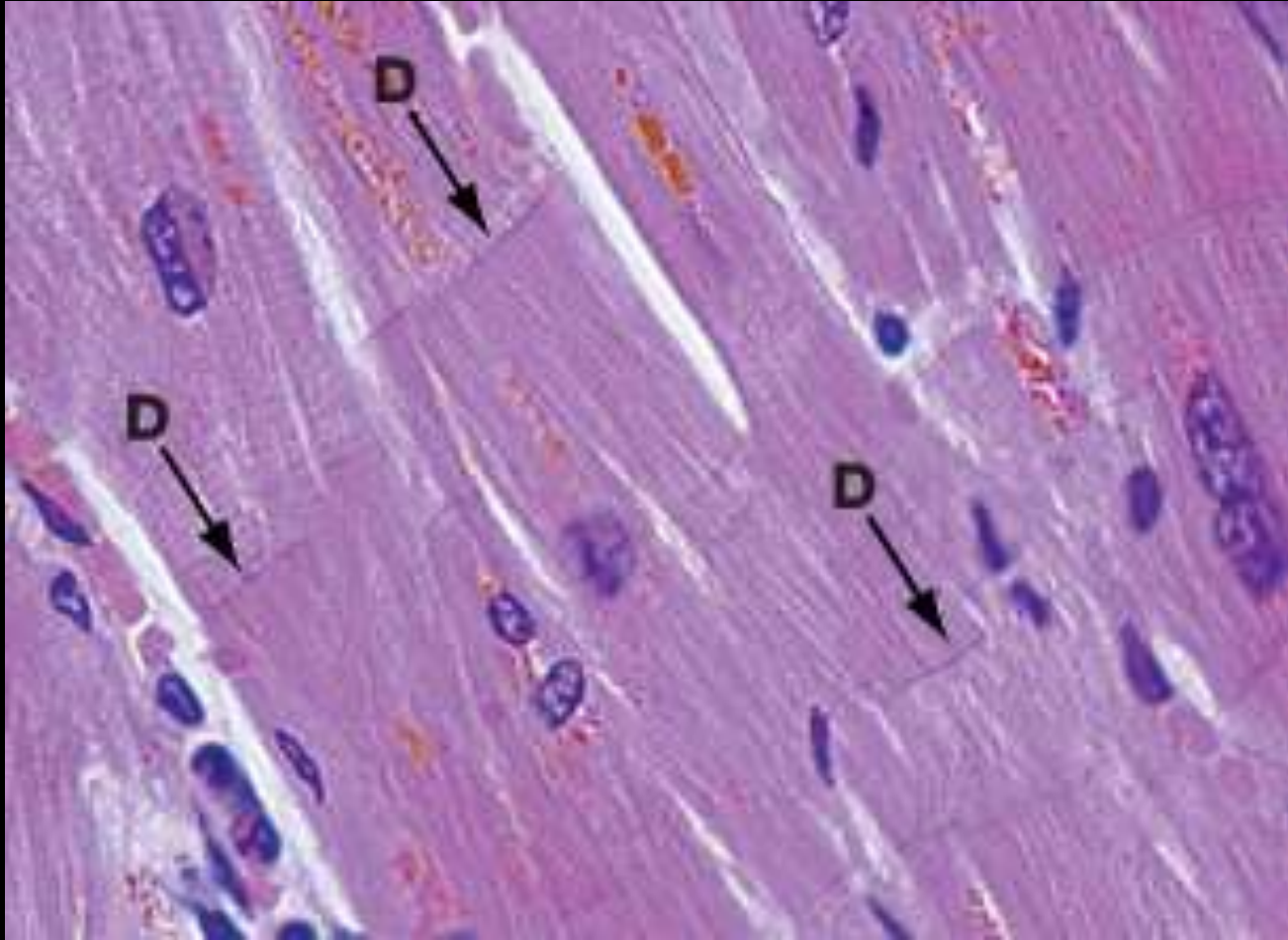
Myocarde (Coupes long. X 200 – transv. X 500)



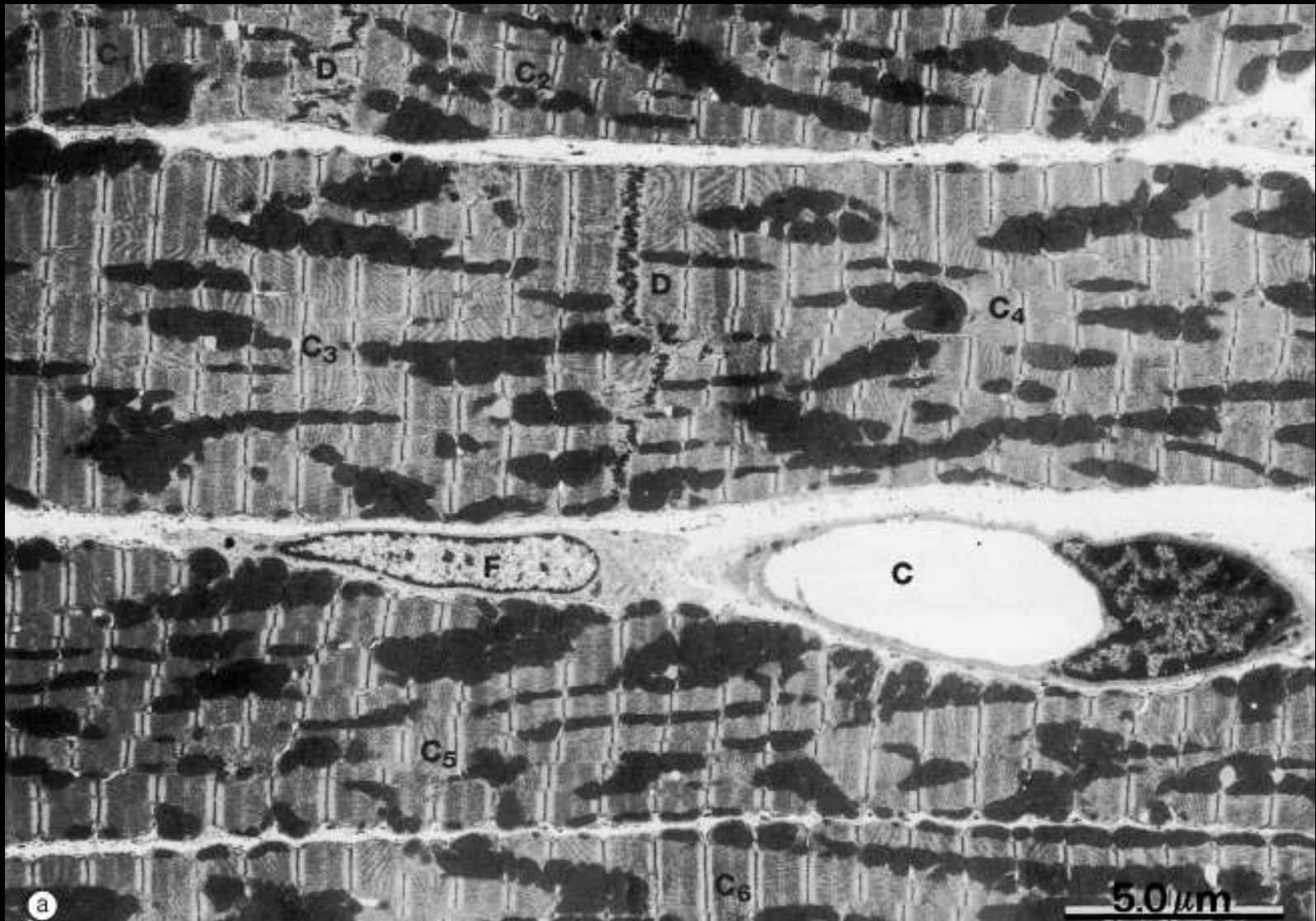
Myocarde (Polarisation HE x 500)



Myocarde (Coupe long. X 500)

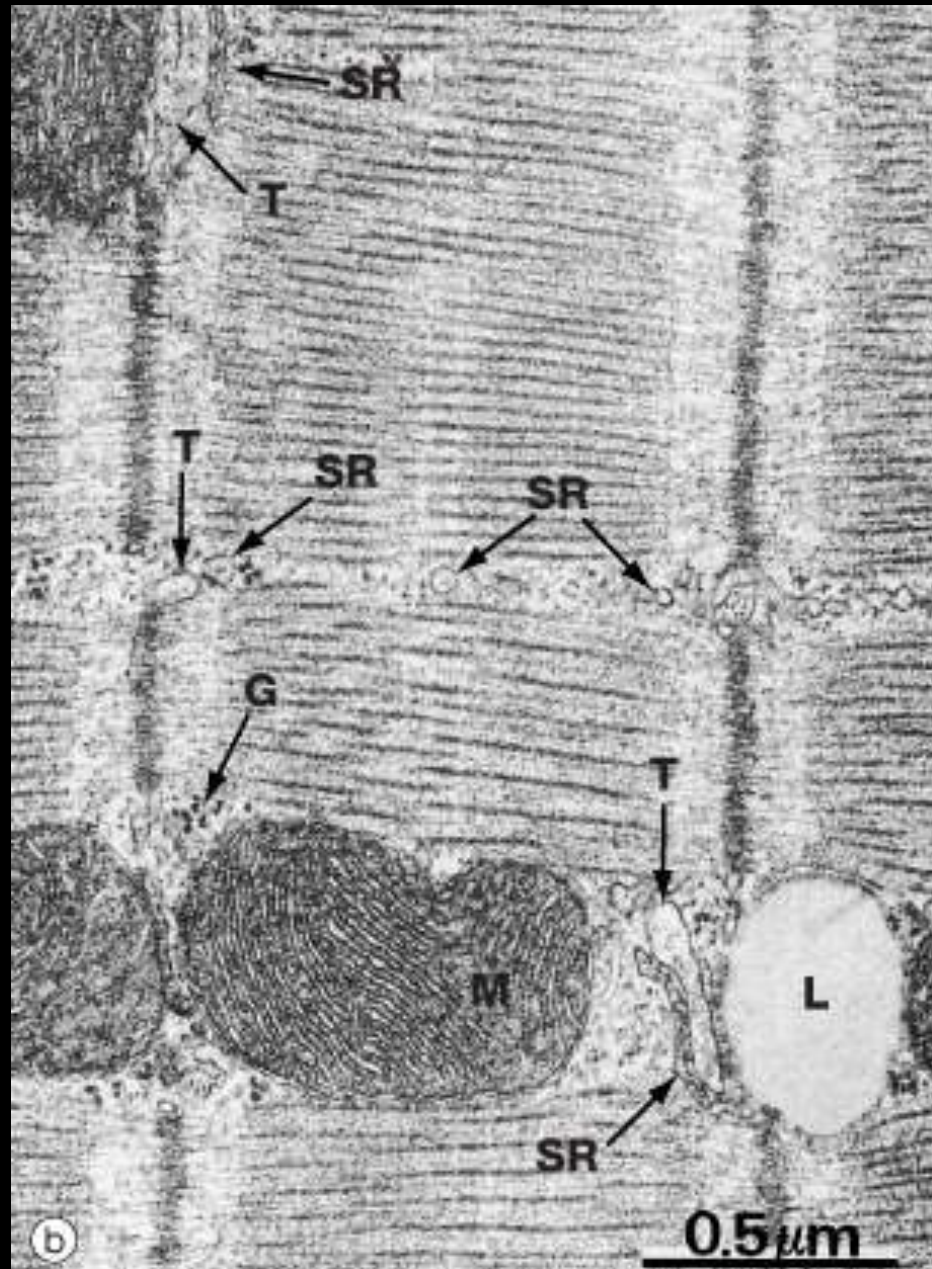


Myocardec (ME x 5000)



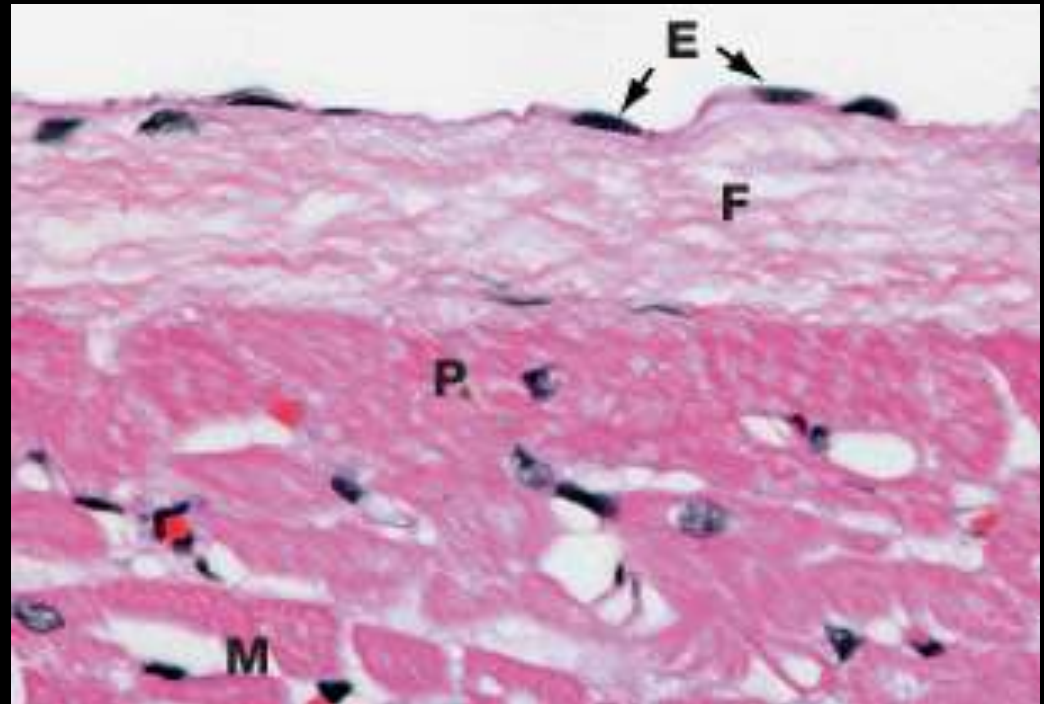
Myocarde (ME x 38 000)

- Sarcomères arrangements tridimensionnels
- Réticulum sarcoplasmique et mitochondries
- Système tubulaire T



Endocarde (HE x 300)

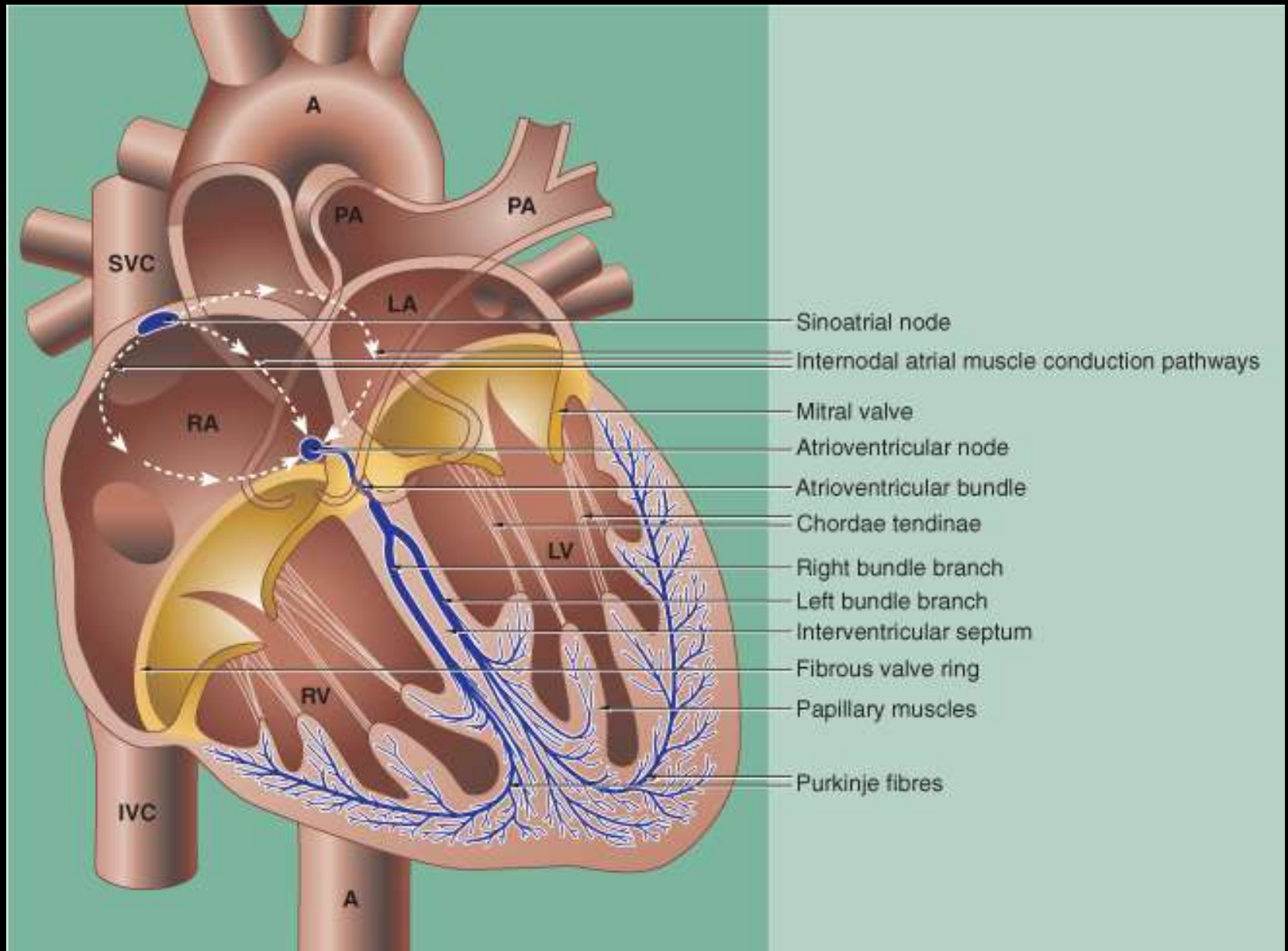
- Cellules endothéliales
- Tissu fibreux
- Fibres de Purkinje
- Myocarde



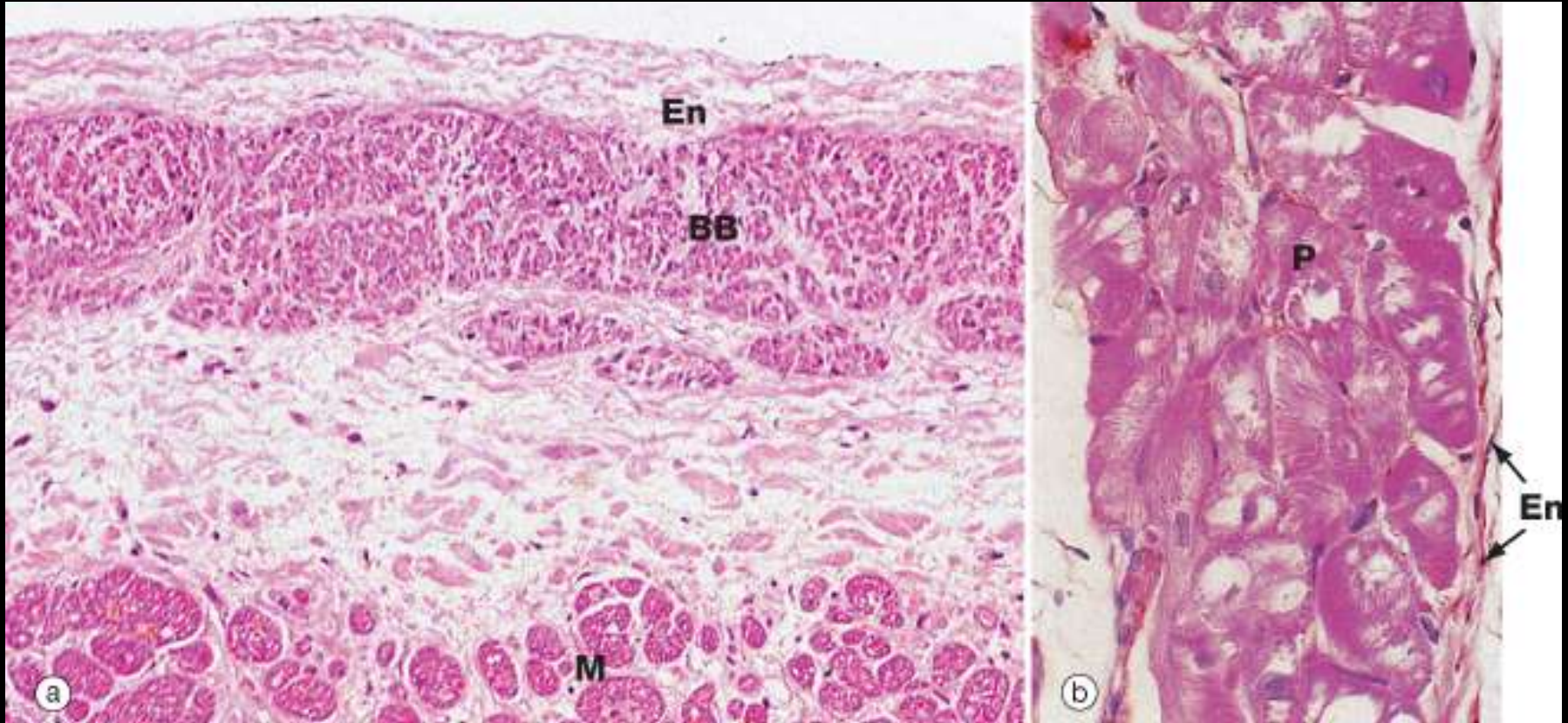
 **MCOURS.COM**

Le N°1 du cours et exercices sur Internet

Systeme de conduction



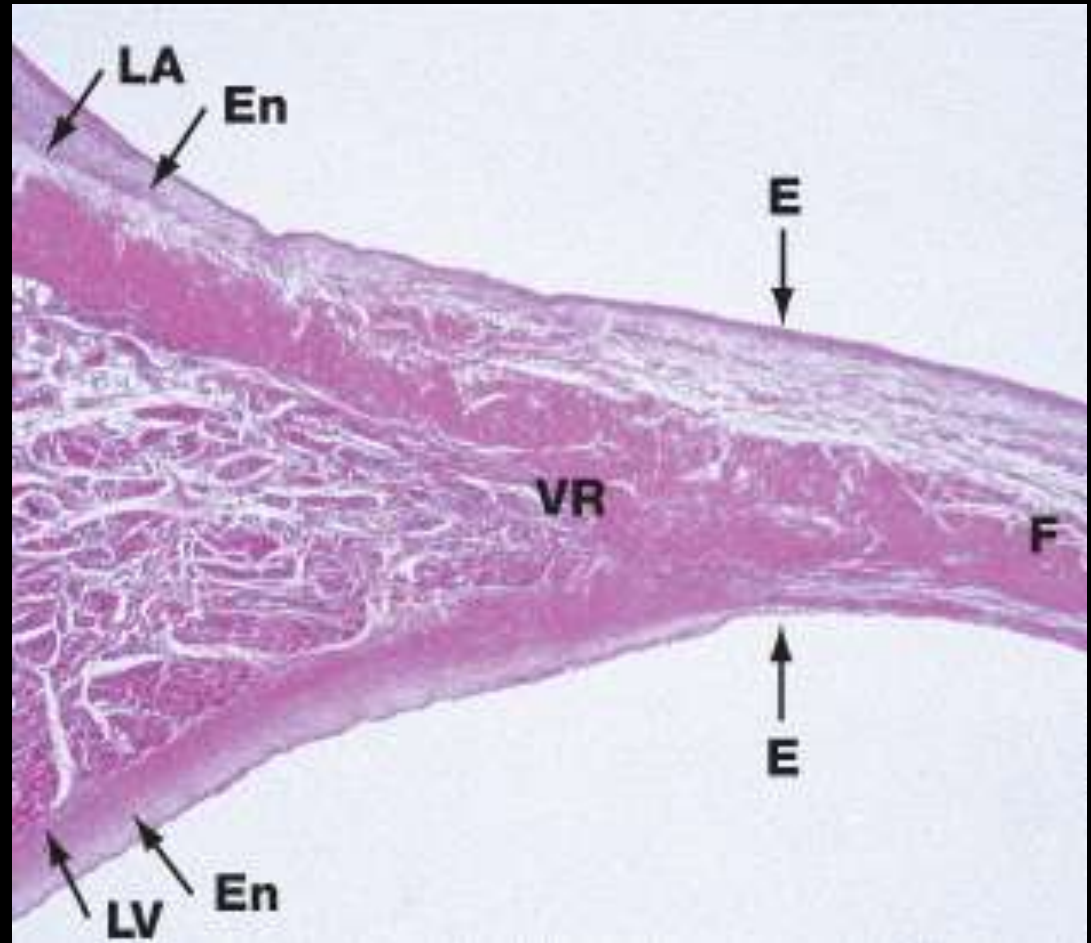
Faisceaux et Fibres de Purkinje (HE 150- HE élastique x 400



- Faisceaux de fibres conduction BB (His)
- Fibres de Purkinje:
 - Fibres plus pâle: Peu de myofibrilles, plus de glycogène, et de mitochondries.
 - Pas de système T
 - Jonction par desmosomes et Gap.

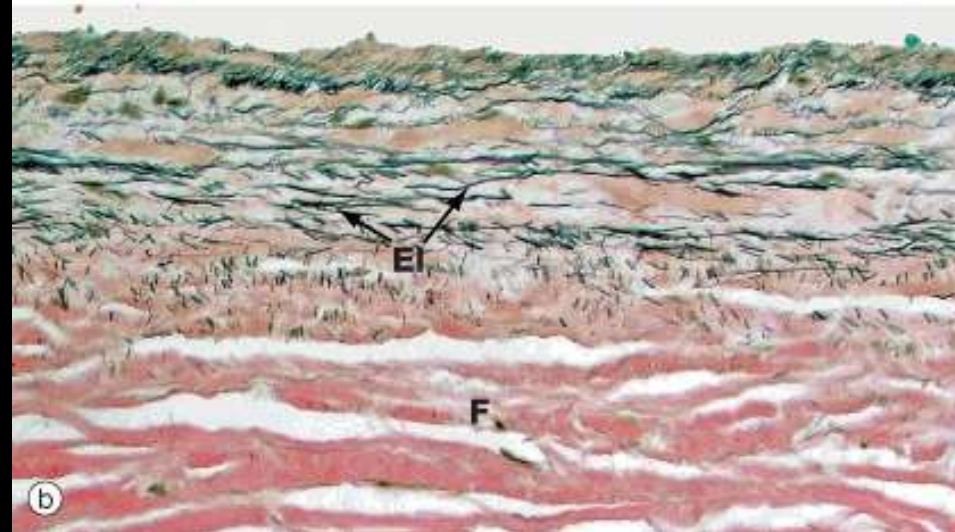
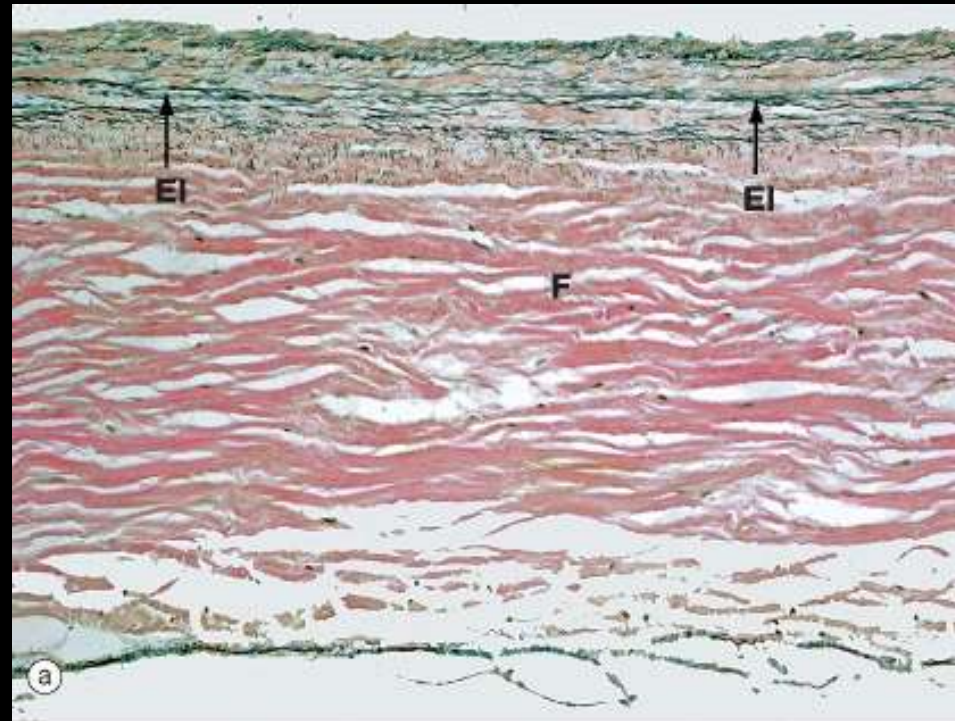
Valvule (HE x 15)

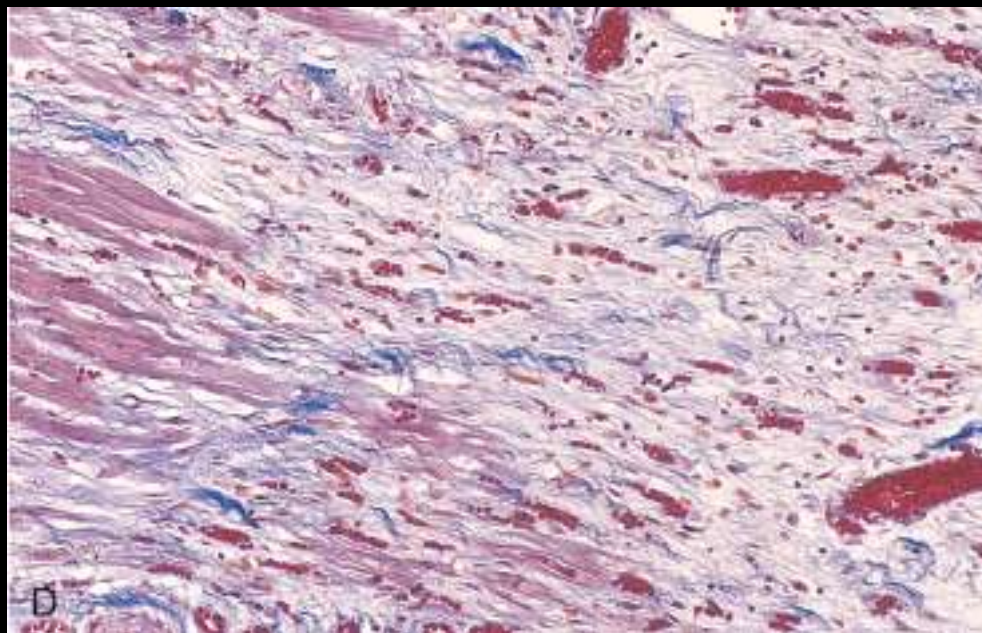
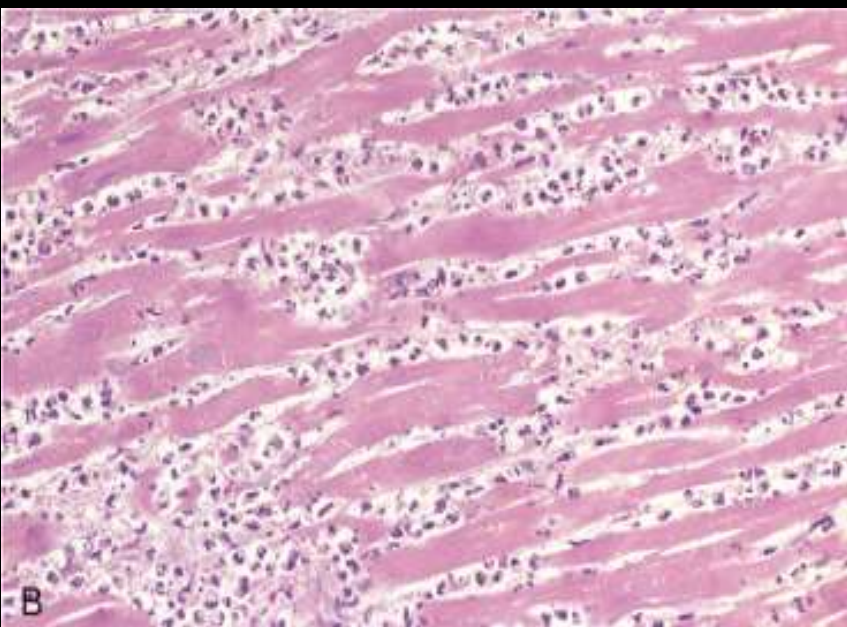
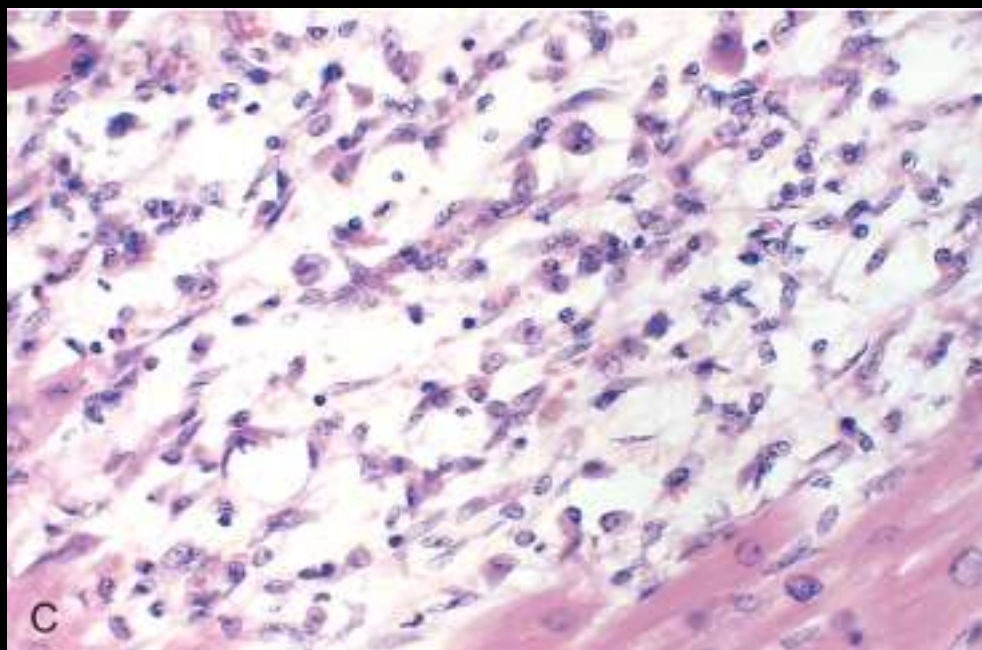
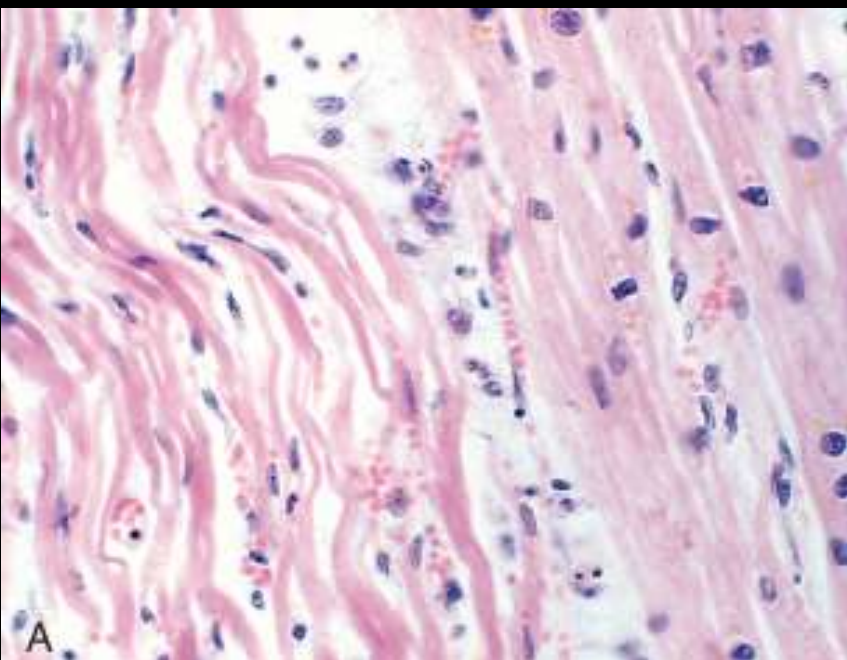
- Feuillet fibroélastique
- Endothélium
- Condensation: Anneau

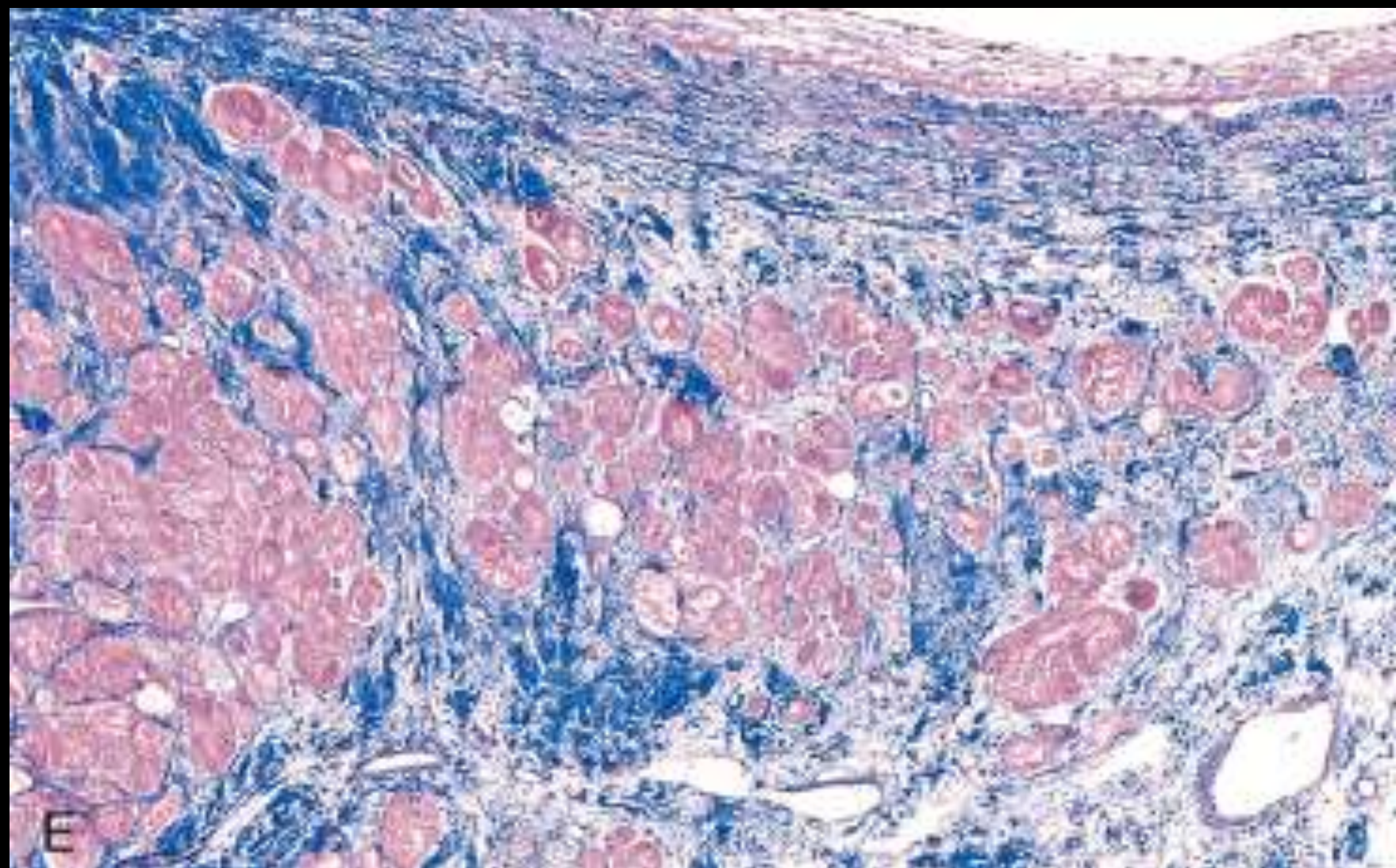


Valvule (Elastique x 30 – x 75)

- Lame fibreuse
- Fibres élastiques







Réalisation

Gérard ABADJIAN

Beyrouth

Le 13 Mai 2007

Copy Prohibited ®

of a database is the record. A record is a collection of related data treated as a single entity. For example, a hockey trading card could be called a record: it brings together the name, photograph, team, and statistics of one player. Using database terms, each of these related pieces of information is called a *field*: each card *record* has a name field, field, and various player statistics fields. The building block of a database is the record. A record is a_

This appendix is intended for users who have little or no experience working with databases or database connections. It explains general concepts, not specific procedures. To see how these concepts apply in practice, see the rest of the help system.

This appendix is intended for users who have little or no experience working with databases or database connections. It explains general concepts, not specific procedures. To see how these concepts apply in practice, see the rest of the help system.

This appendix is intended for users who have little or no experience working with databases or database connections. It explains general concepts, not specific procedures. To see how these concepts apply in practice, see the rest of the help system.

This appendix is intended for users who have little or no experience working with databases or database connections. It explains general concepts, not specific procedures. To see how these concepts apply in practice, see the rest of the help system.

Fin
The End
Merci
de votre attention