

**ACTIVE AND PASSIVE HYPEREMIAS.  
HEMORRHAGE**

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# Hyperemia

## Active

- loss of sympathetic activity
- vasoactive compounds



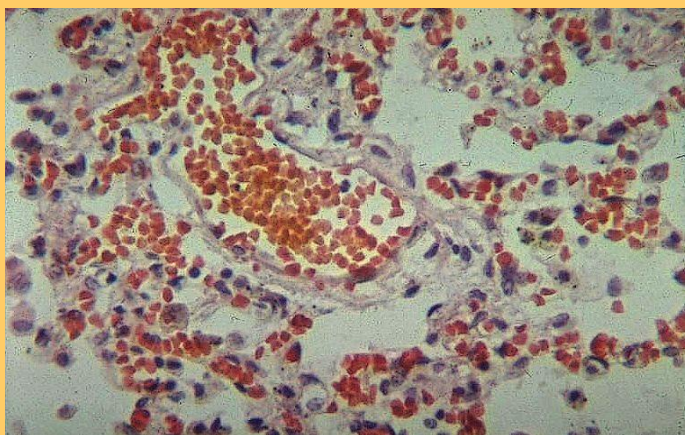
vasodilatation

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- inflammations (rubor, calor) – (NO, PGE2)
- exercise
- eating
- psychological effects (blushing)
- hormones (climax)
- carcinoid flush
- reperfusion
- medicinal drugs

## Passive (congestion)

- venous block
  - a.) local
    - venous thrombus
    - venous compression
    - torsion
    - invagination
    - vena cava superior syndr.
  - b.) systemic
    - right sided heart failure
    - chronic cor pulmonale



# Right sided heart failure

## Dilatation

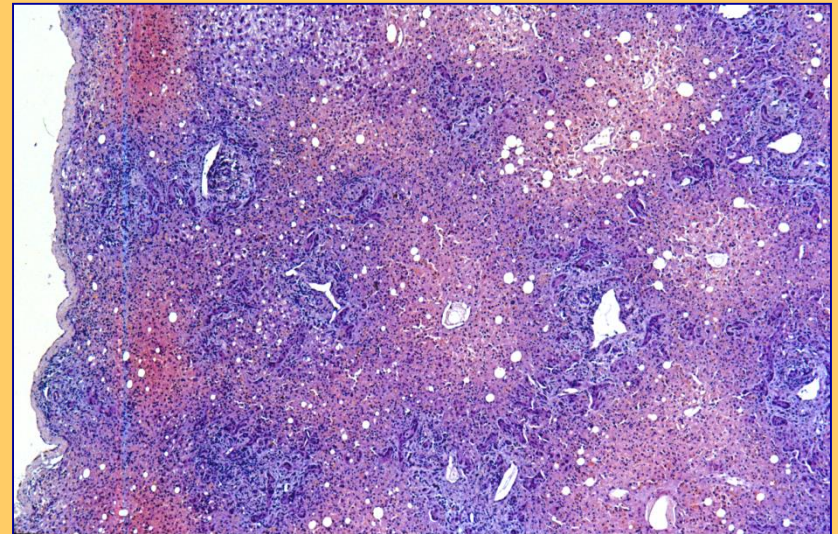
visceromegaly (hepatomegaly, splenomegaly)

congestive gastritis, duodenitis

Kidney: dilatation of stellate veins, livid pyramids

cyanosis

(oedemas)

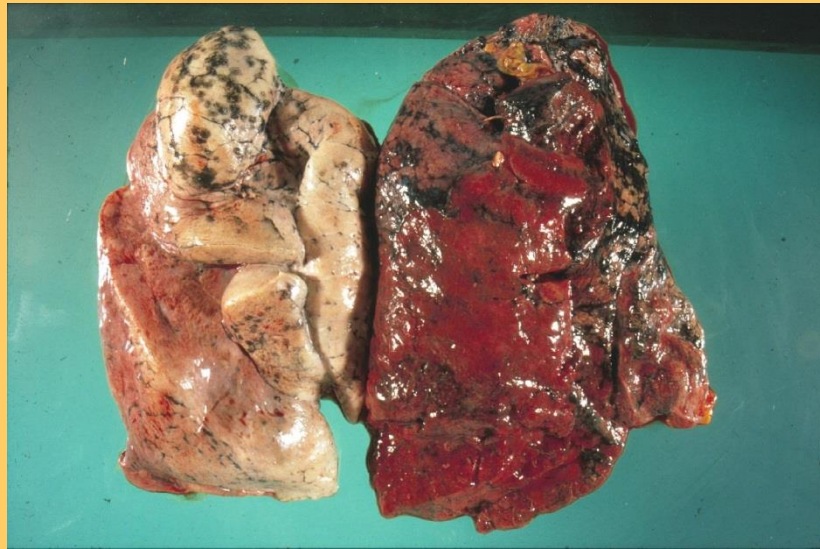


## Cor pulmonale:

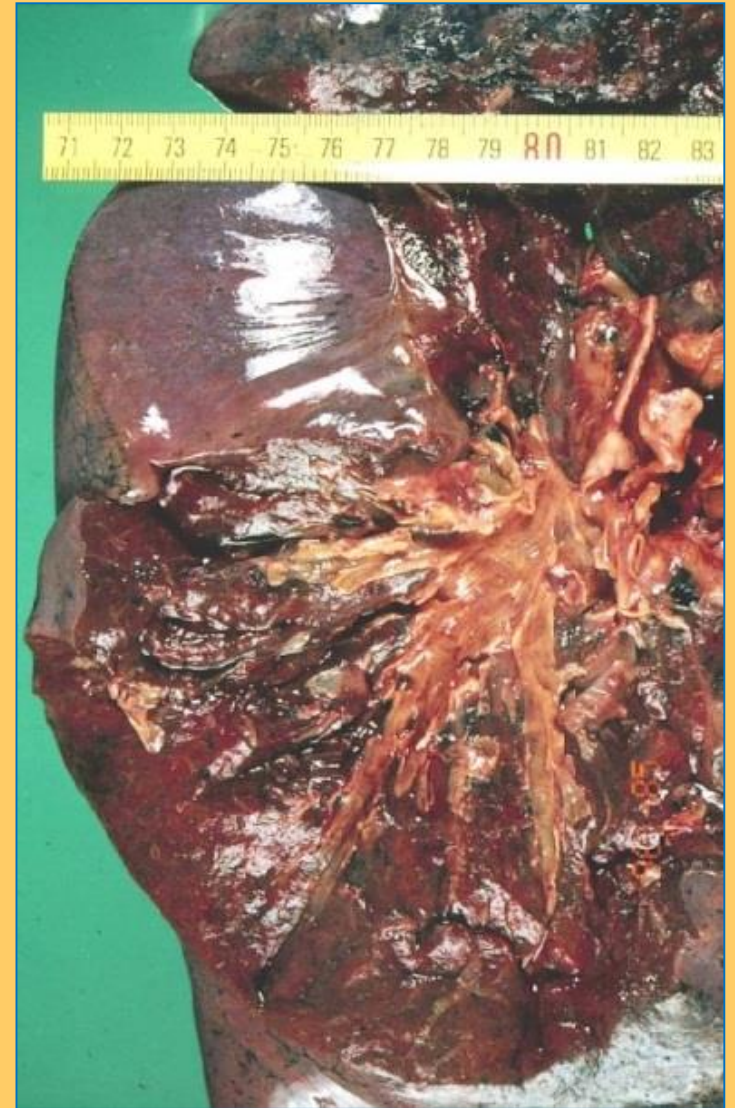
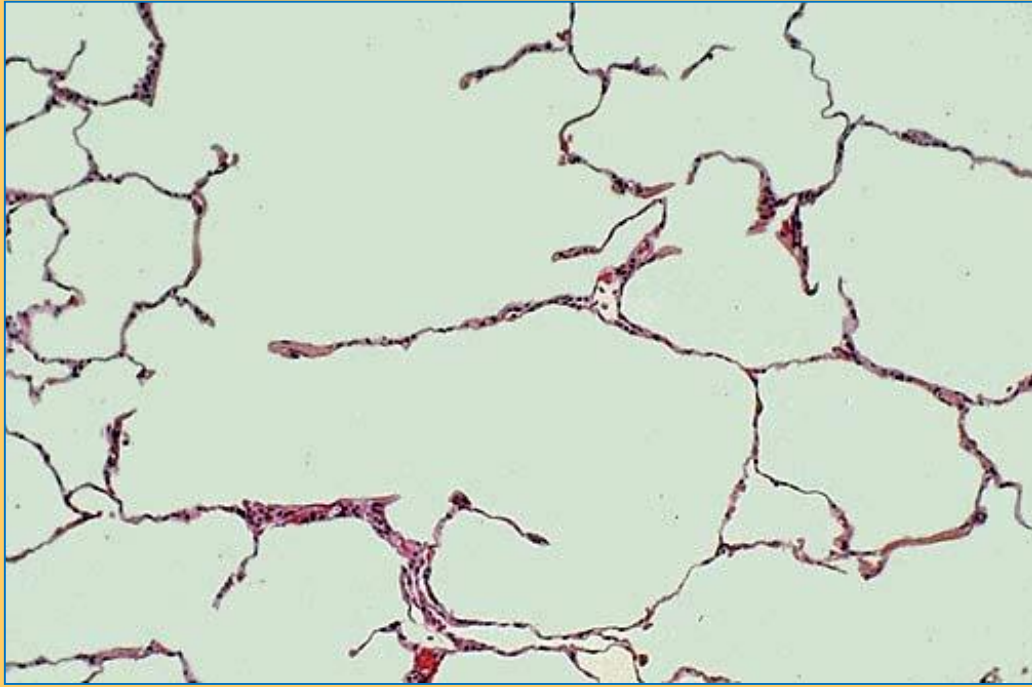
Hypertrophy and/or dilatation of the right side of the heart as a result of pulmonary hypertension (valve diseases, left heart problems excluded!!)

1. Acute cor pulmonale (massive pulmonary embolus, air embolism, amniotic fluid embolization)
2. Chronic cor pulmonale
  - a. diseases of the lung parenchyma  
(chronic bronchitis, emphysema, bronchiectasis, lung fibrosis, sarcoidosis, massive tbc)
  - b. diseases of the chest wall impairing the respiration  
(kyphoscoliosis, pleural callus, extreme obesity)
  - c. diseases of the lung vasculature  
(multiplex pulmonary microembolisation)



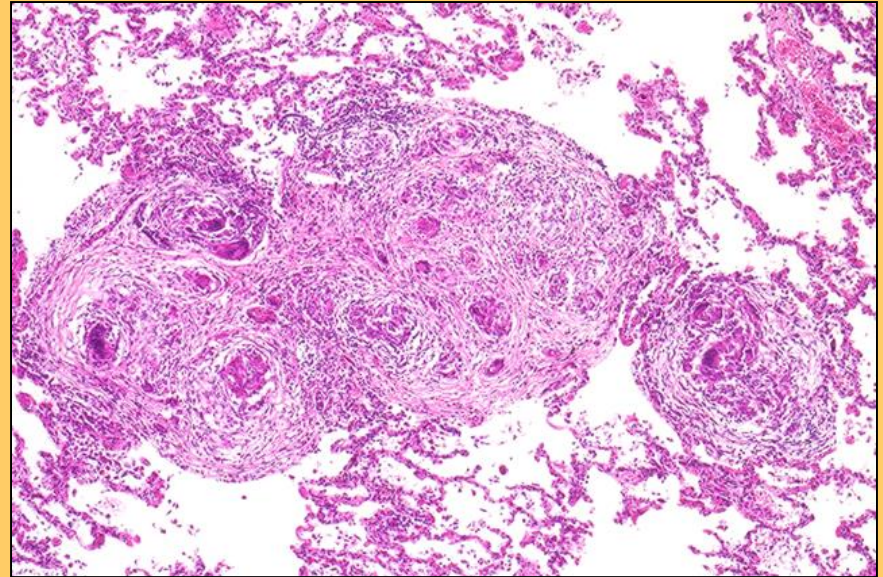


emphysema

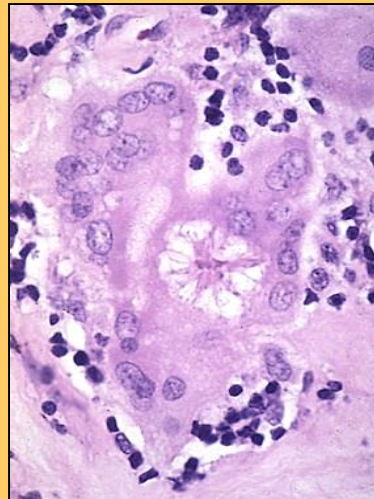
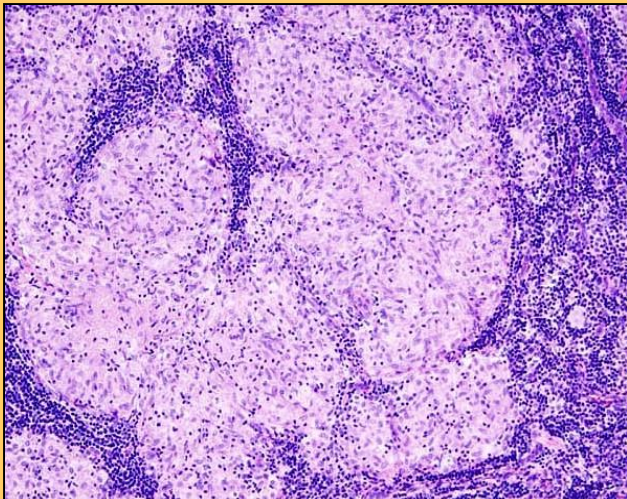


chronic bronchitis

# (Boeck) sarcoidosis - BHL syndrome

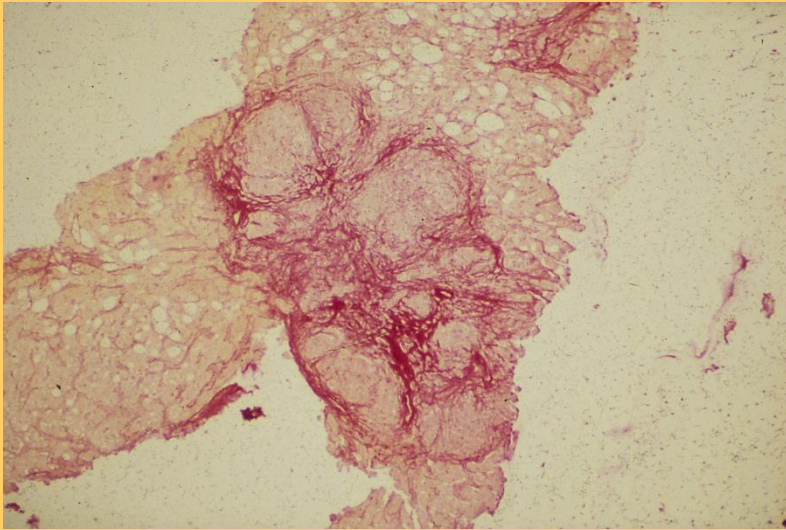


non-caseating granulomas



asteroid body

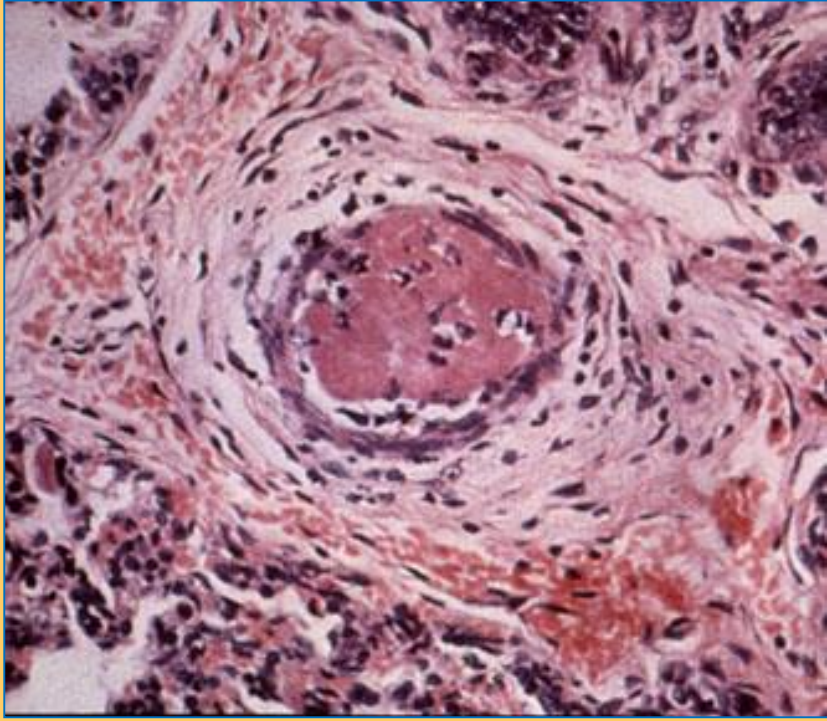




picrosirius red



„honeycomb-lung”

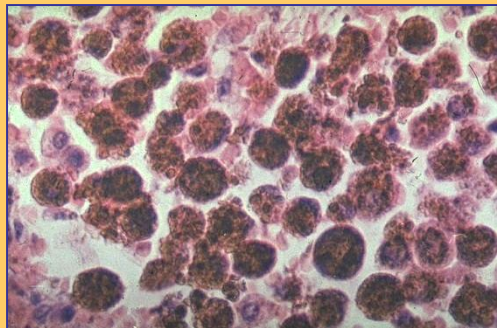
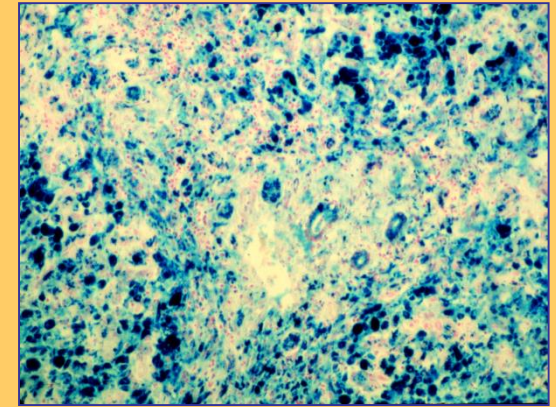
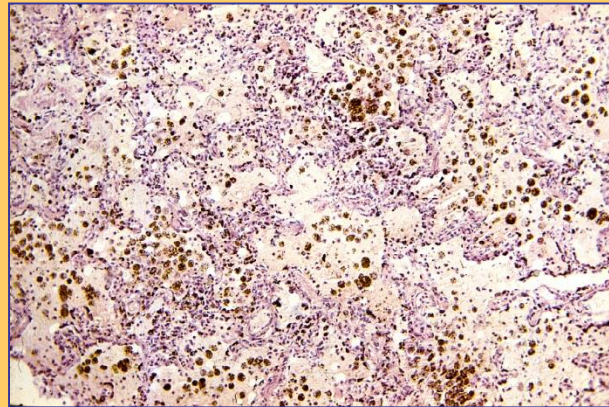


# Consequences of chronic congestion

- organ enlargement (hepatomegaly, splenomegaly)
- induration (spleen, liver, lung, skin)
- atrophy (skin)
- necrosis (bowel, testicle)
- edema

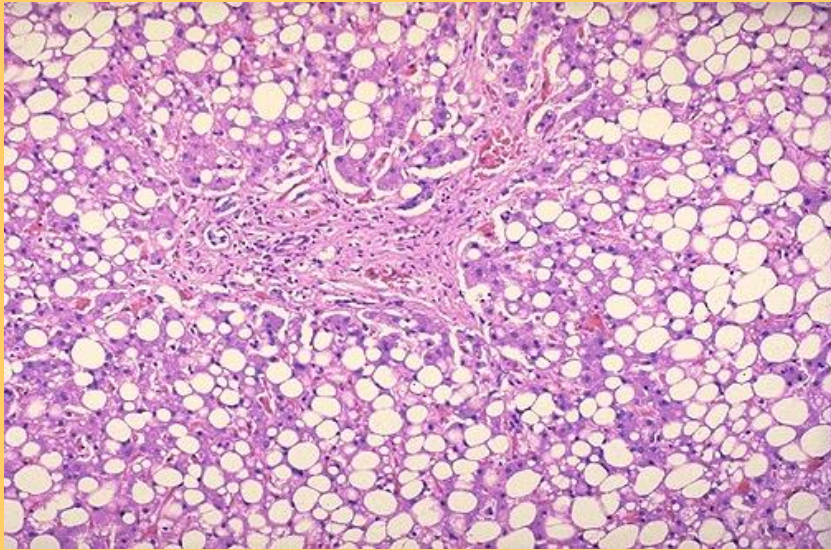


**brown Induration of lungs**



**„heart failure cells”**

postthrombotic syndrome



fatty degeneration



crural ulcer

# **Hemorrhages**

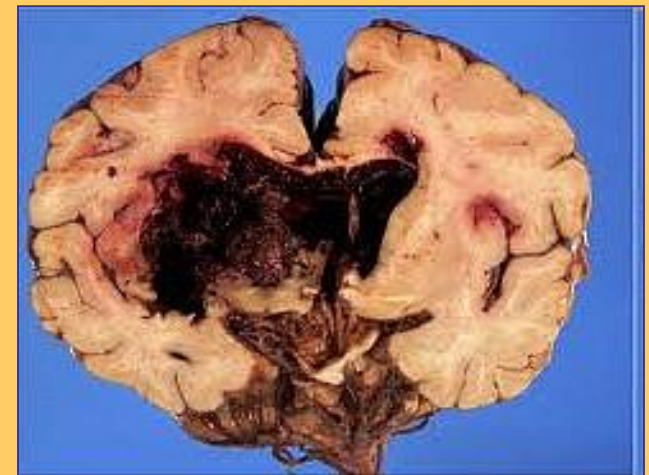
# Classification

## (a) According to the mechanisms

hemorrhage due to arrosion



hemorrhage due to rhexis



hemorrhage due to diapedesis



hemorrhagic diathesis



hemorrhage due to necrosis

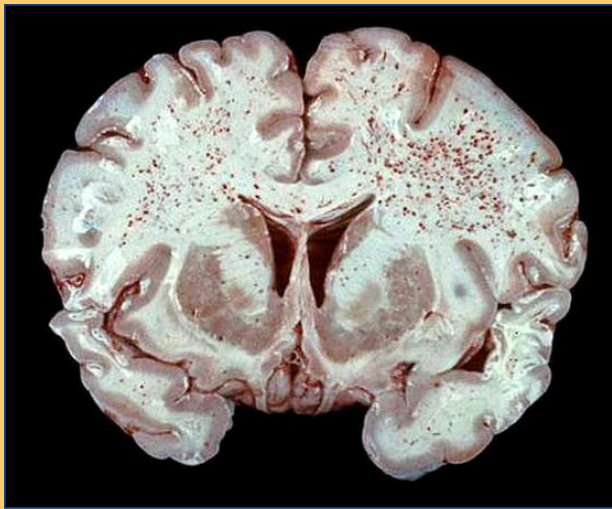


# Classification

(b) according to direction (external, internal - concealed)

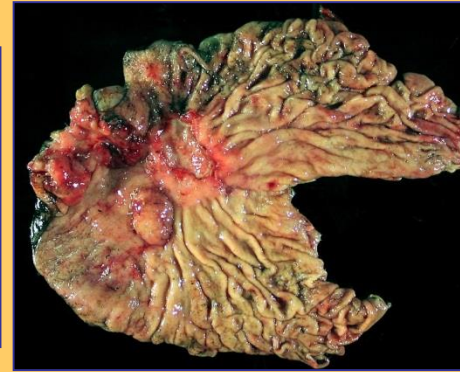
(c) according to size

petechia (purpura) → ecchymosis → suffusion → hematoma

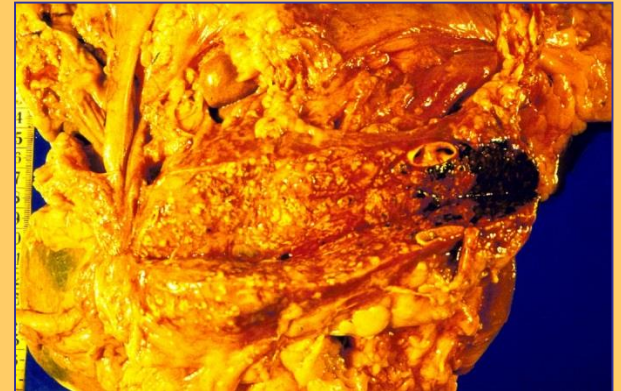




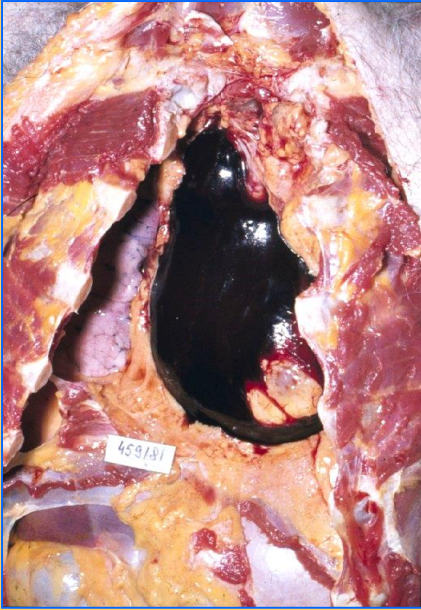
# Bleeding by arrosion



hematemesis  
hematogaster  
melena  
exsanguination  
occult bleeding



# Hemorrhage due to rupture



hemopericardium



aneurysma (Marfan-)

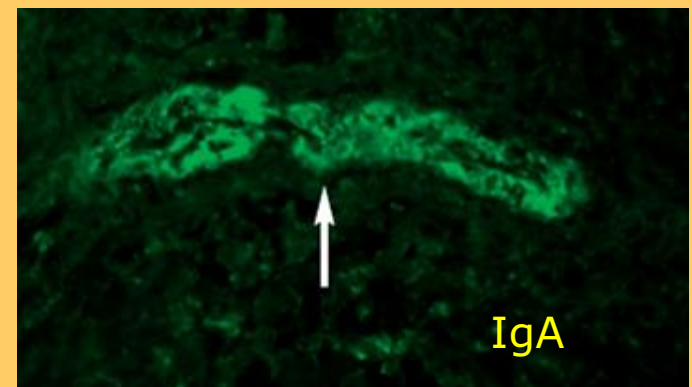


retroperitoneal hematoma



# Hemorrhage due to diapedesis

- Vitamin C deficiency
- Sepsis
- Meningococcus-infection  
(Waterhouse-Friderichsen syndr.)
- Immune-mediated vasculitis  
(Schönlein-Henoch purpura)
- Thrombocytopenia
- Fat embolism



# Hemorrhagic diathesis

(decreased coagulability)

- coagulopathies (loss of coagulation factors)

DIC

Vitamin K deficiency (liver cirrhosis!)

hemophilia A (deficiency of factor VIII)

- thrombocytopathies

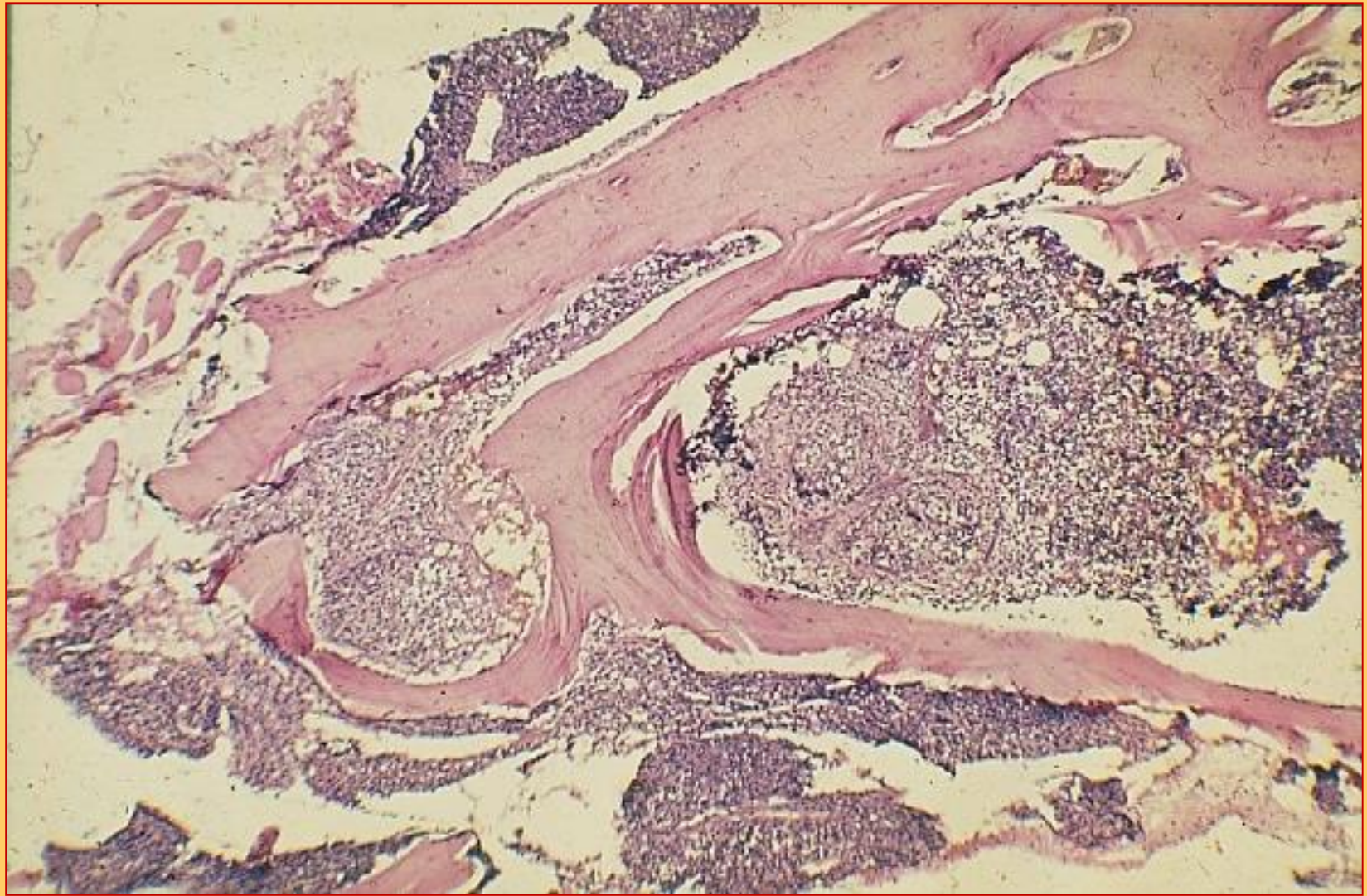
thrombopenias (leukaemias, bone marrow metastases,  
cytostatics)

thrombasthenias (aspirin, NSAIDs)

- vasculopathies

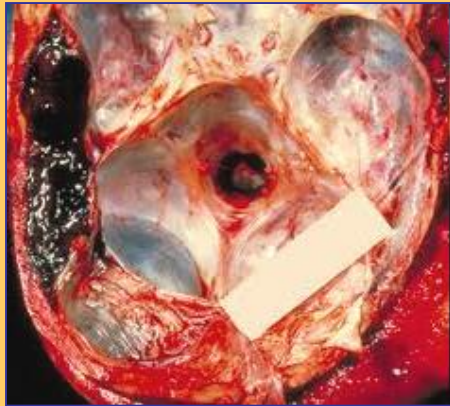
Schönlein-Henoch purpura

Vitamin C deficiency



# Intracranial hemorrhages

- epidural bleeding (trauma)
- subdural bleeding (trauma)
- apoplexia (hypertension)
- subarachnoideal bleeding (berry aneurysms)

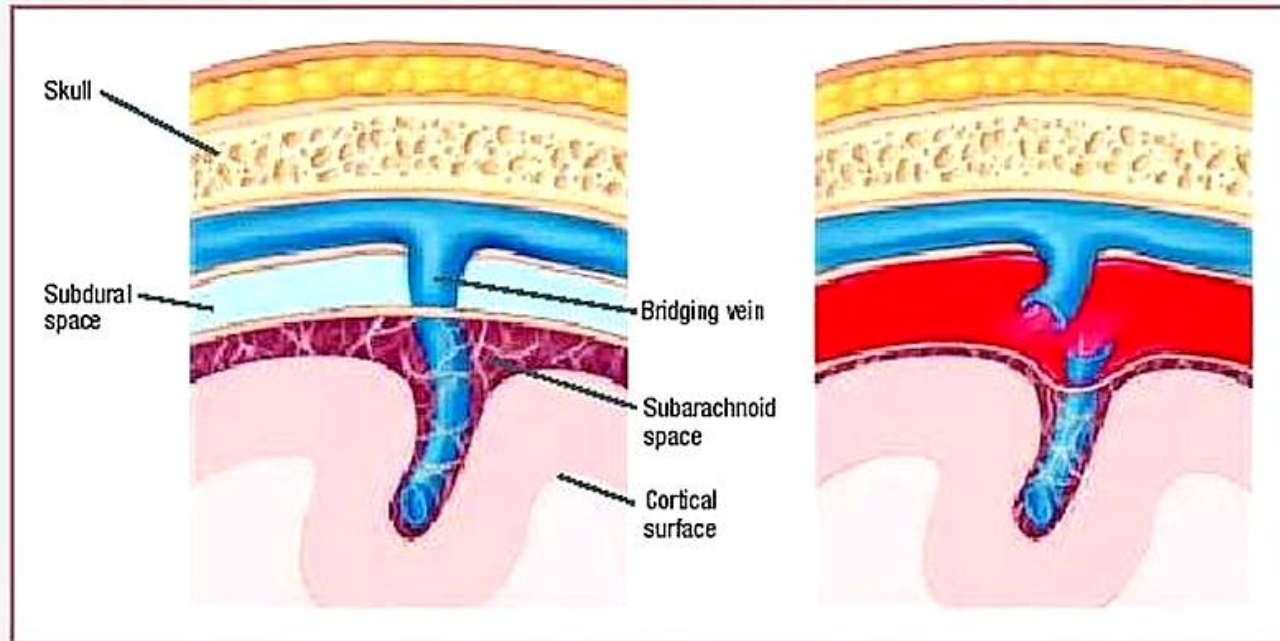


acute subdural

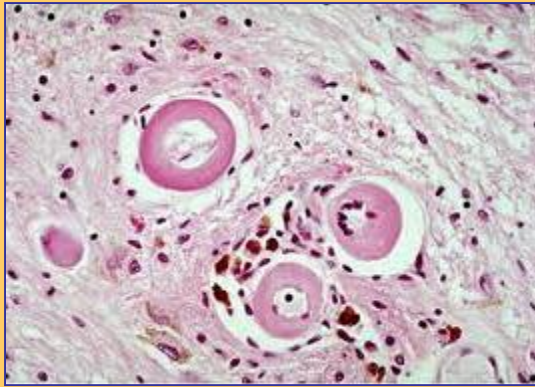


chronic subdural

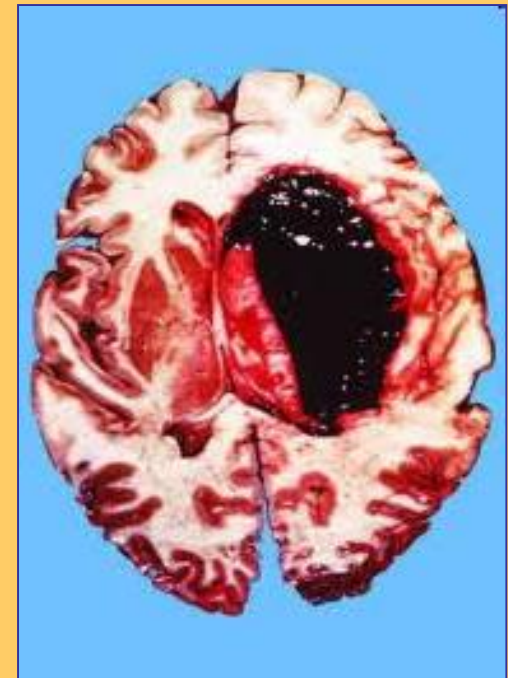
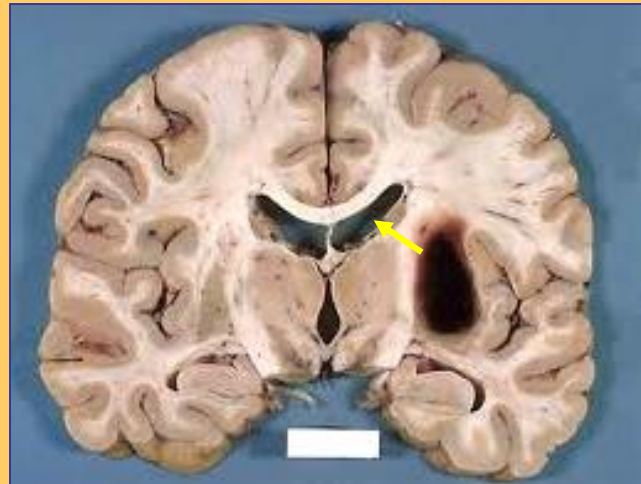
## The mechanism of subdural and subarachnoid hemorrhage



The bridging veins travel from the surface of the cerebral cortex through the arachnoid and subdural spaces under the skull (left). When violent shaking or impact injury causes shearing of the bridging veins (right), the subdural space fills quickly with blood. Bleeding into the subarachnoid space also can occur.



hypertension – hyaline vessels

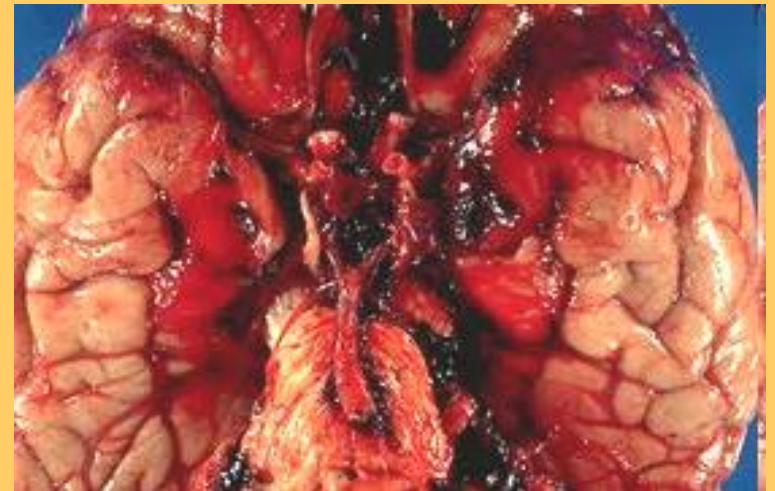


internal hemocephalus

- vessel malformation
- infective endocarditis (*Streptococ. viridans*)  
„mycotic aneurysma”
- atherosclerosis

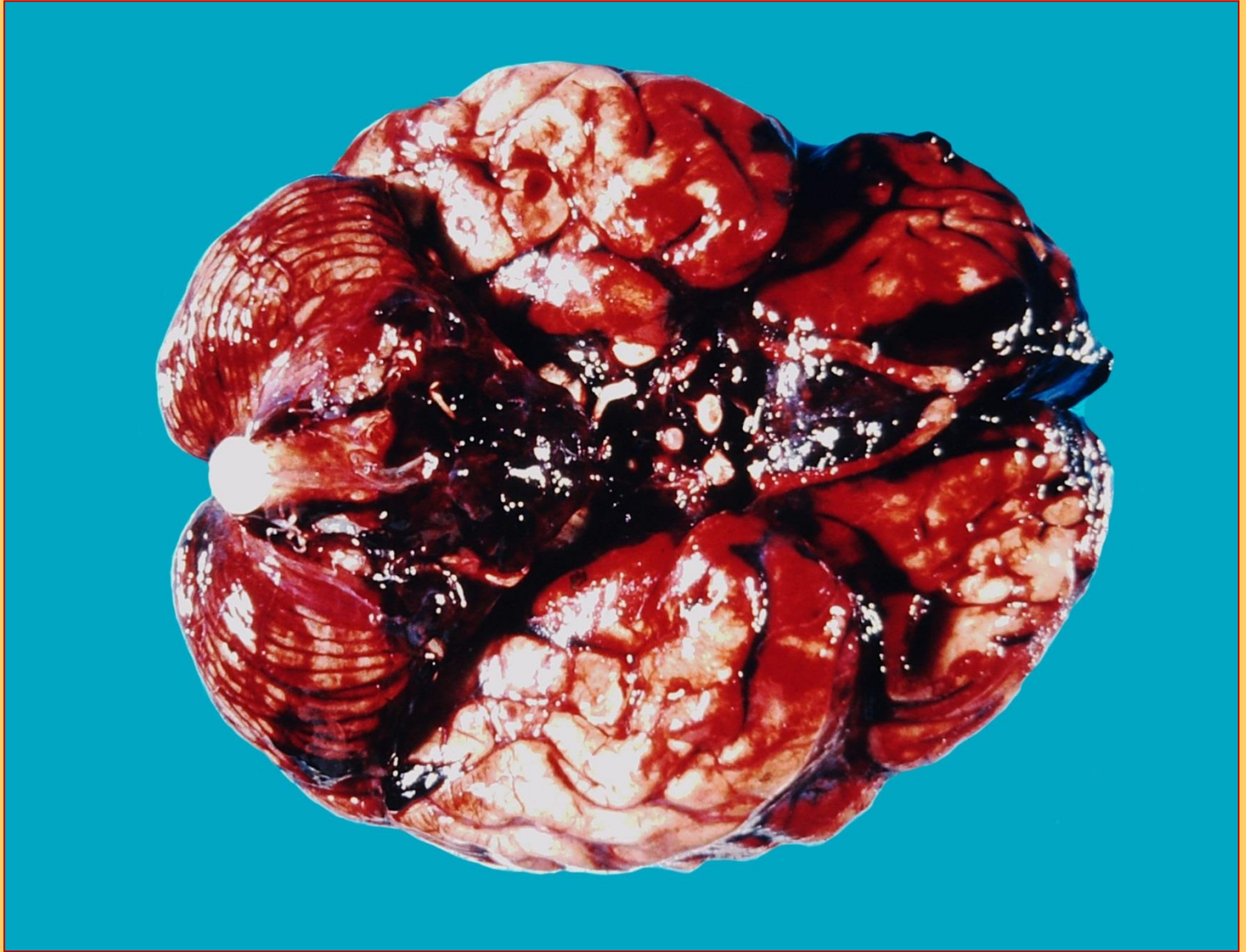


berry-aneurysm



subarachnoideal bleeding





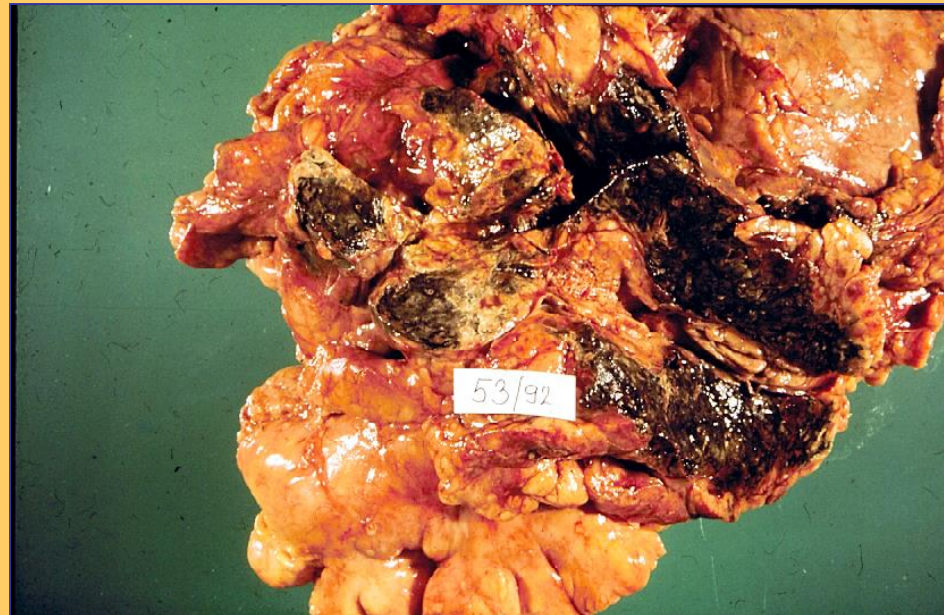
# Apoplexia

brain

pancreas

adrenal gland

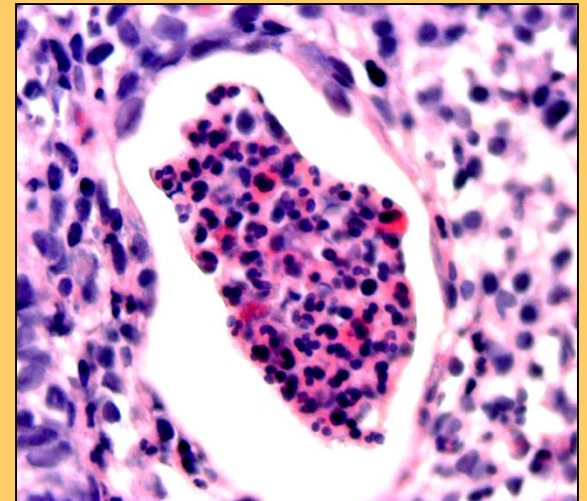
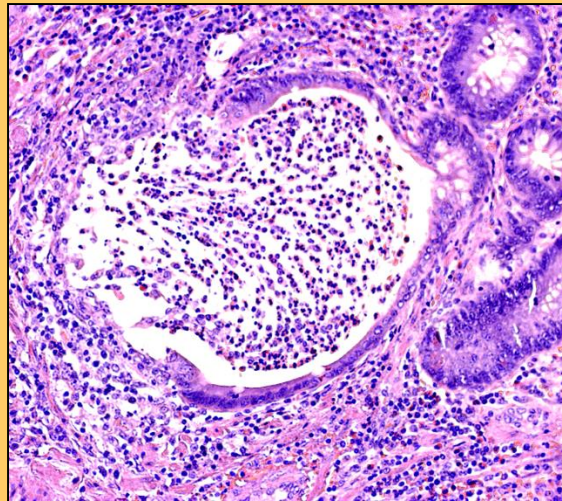
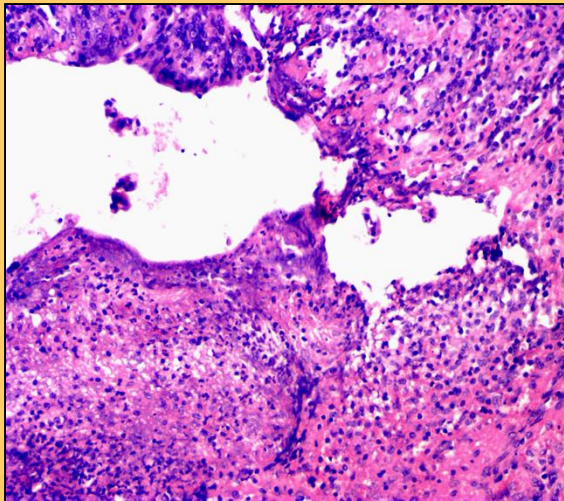
endometrium



# Ulcerative colitis



hematochesia



# Ulcerative colitis

## Complications:

hematochesia (anemia)  
pseudopolyps  
mucosal atrophy  
toxic megacolon  
sclerotizing cholangitis  
colonic cancer (after 8-10 years)



## Outcome of hemorrhages

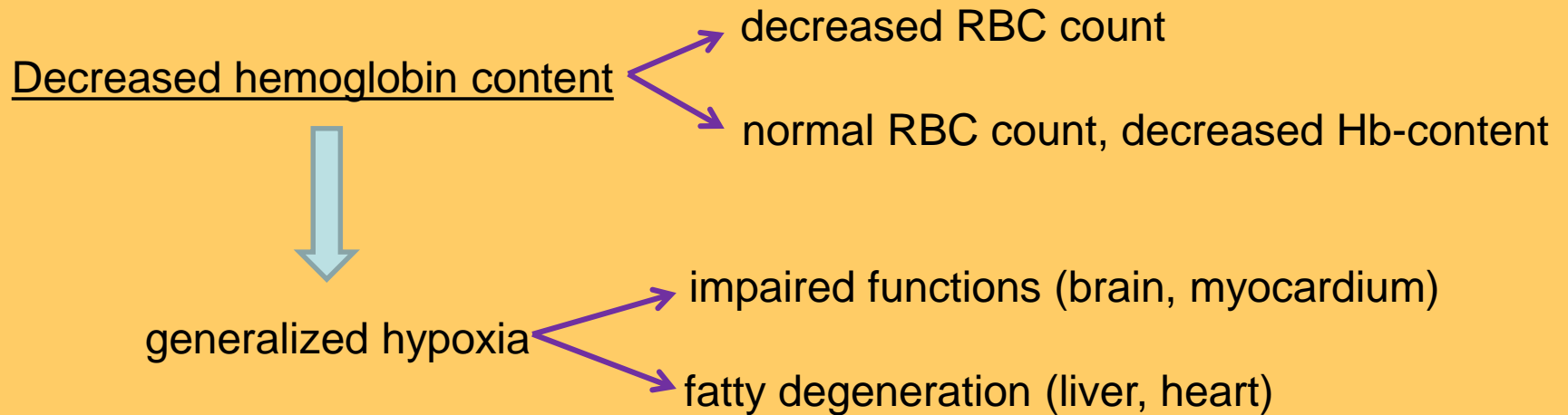


hemosiderosis

exsanguination - hemorrhagic  
shock

Iron deficient anemia

# Anemias



**ANEMIA IS NOT A DISEASE, JUST A SYMPTOM!**

## Classification of anemias

Microcyter  
normocyter  
macrocyter

hypochromic  
normochromic  
hyperchromic

acute  
chronic

1. decreased RBC production
2. RBC destruction (hemolysis)
3. blood loss