

# **LYMPHATIC SYSTEM**

**Vasa lymphocapillaria – rete lymphocapillare**

**Lymphoedema, metastasis**

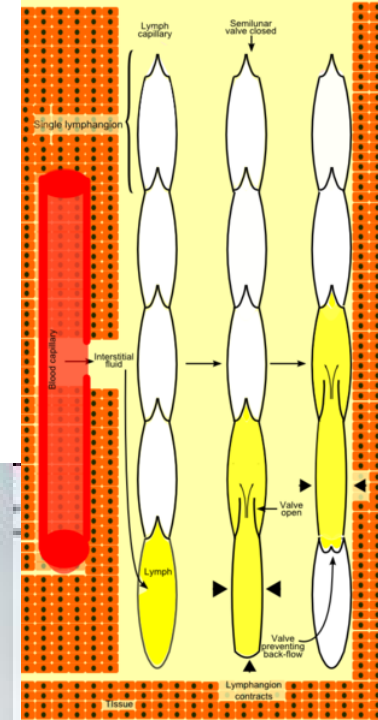
**Vasa lymphatica – vas afferens, vas efferens**

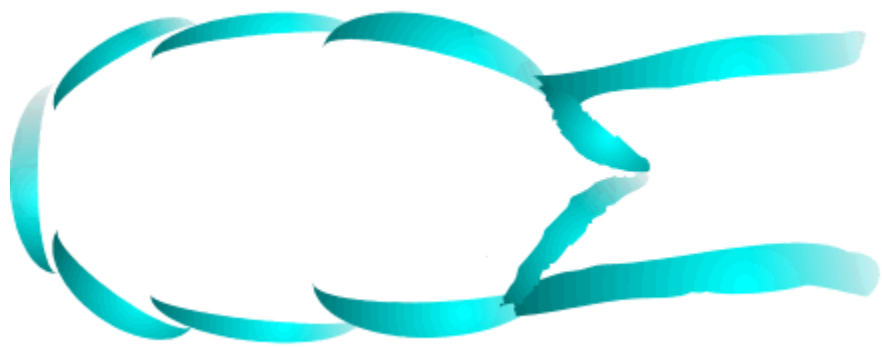
**Lymphangion**

**Trunci lymphatici**

**Lympha – chylus**

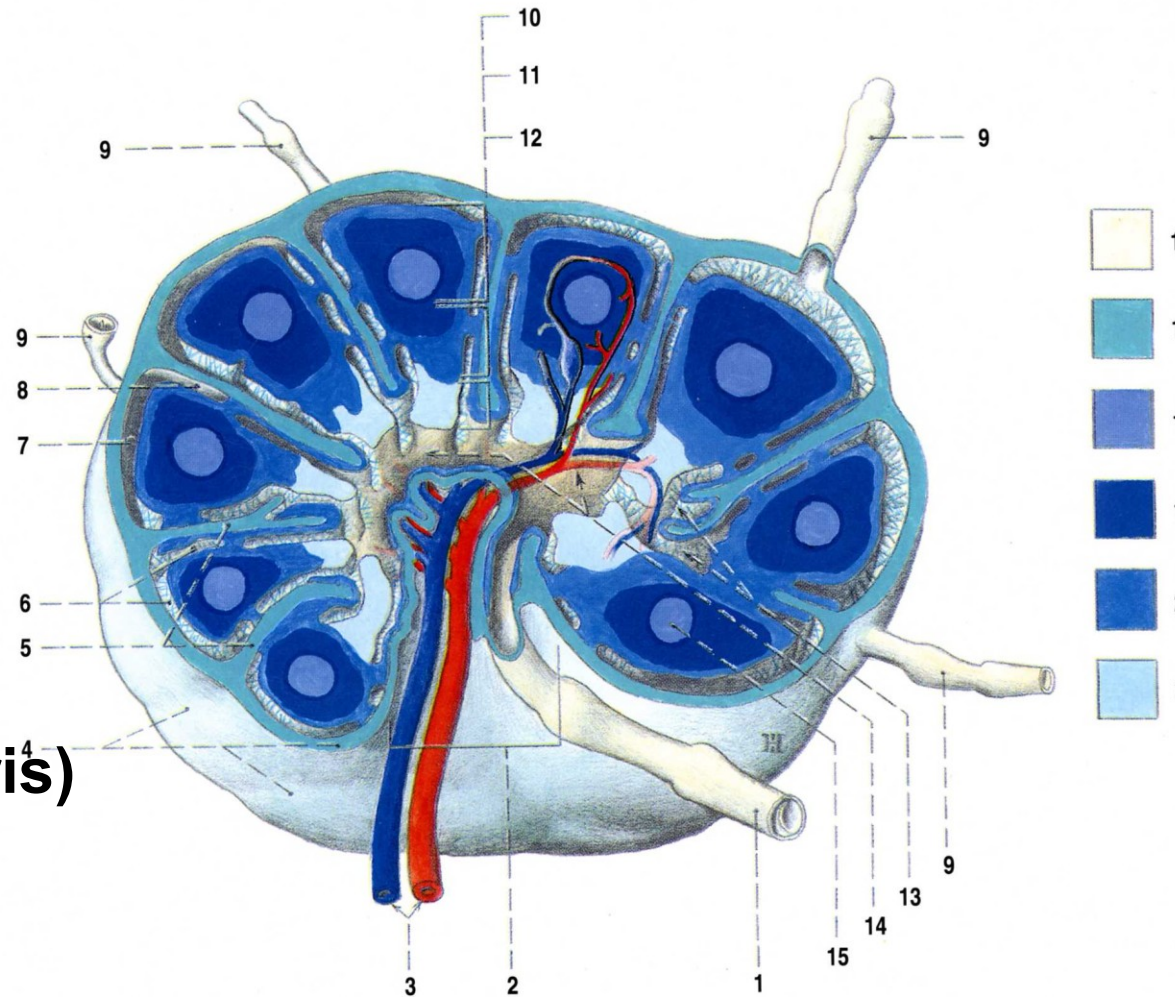
**Folliculi lymphatici, nodi lymphatici, tonsillae, lien, mucosa-associated lymphoid tissue, thymus**





# Nodus lymphaticus

- capsula
- trabeculae
- reticulum
- cortex
- medulla
- hilum
- sinus subcapsularis
- sinus corticalis (peritrabecularis)
- sinus terminalis (medullaris)



## Tributary region Regional lymph nodes

Obr. 124. STAVBA MÍZNÍ UZLINY (schéma); krevní cévy znázorněny jen v jednom mízním uzlíku

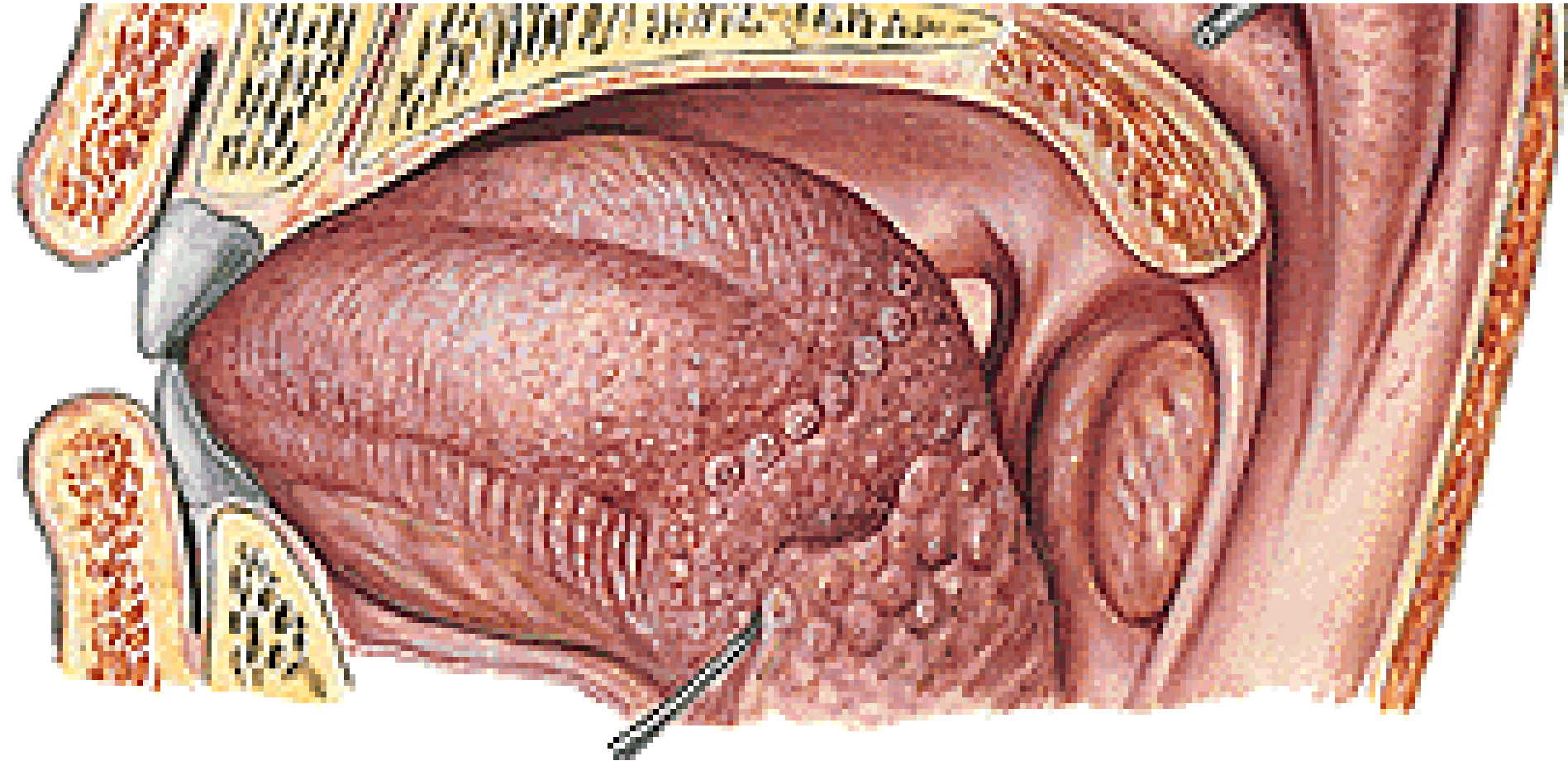
- 1 vas efferens nodi lymphatici
- 2 hilum nodi lymphatici
- 3 krevní cévy uzliny
- 4 capsula nodi lymphatici
- 5 trabeculae
- 6 sinusy uzliny s retikulem
- 7 subkapsulární sinus
- 8 peritrabekulární sinus
- 9 vasa afferentia nodi lymphatici
- 10 cortex uzliny s mízními uzlíky

- 11 parakortikální zóna uzliny
- 12 medulla
- 13 medulární sinus
- 14 terminální sinus
- 15 zárodečné centrum mízního uzlíku
- 16 mízní cévy a sinusy v uzlině
- 17 capsula et trabeculae nodi lymphatici
- 18 zárodečné centrum mízního uzlíku
- 19 intermediární zóna uzlíku obklopující zárodečné centrum
- 20 zevní zóna uzlíku
- 21 medulla nodi lymphatici

# Tonsilla palatina

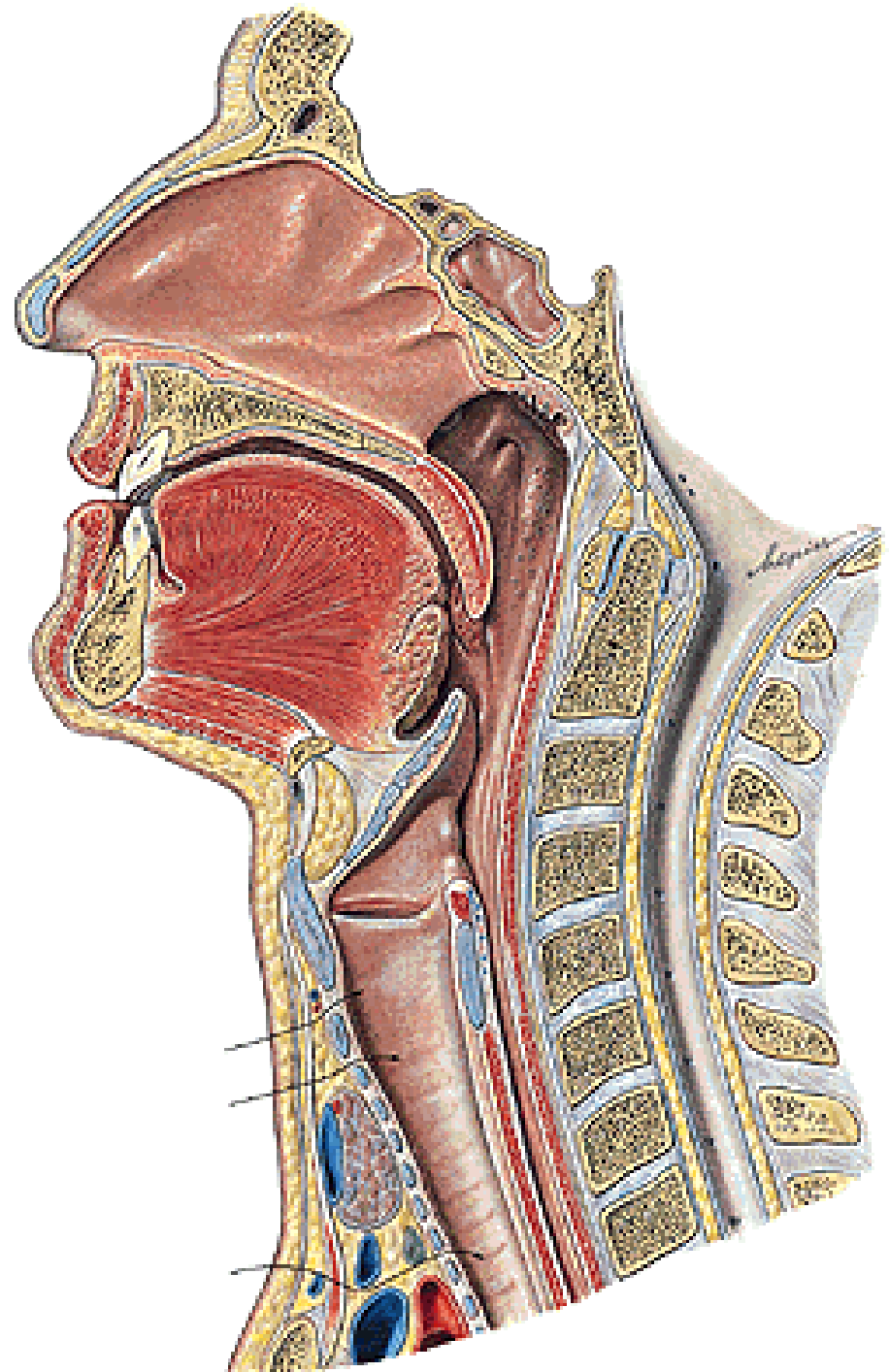


# Tonsilla lingualis

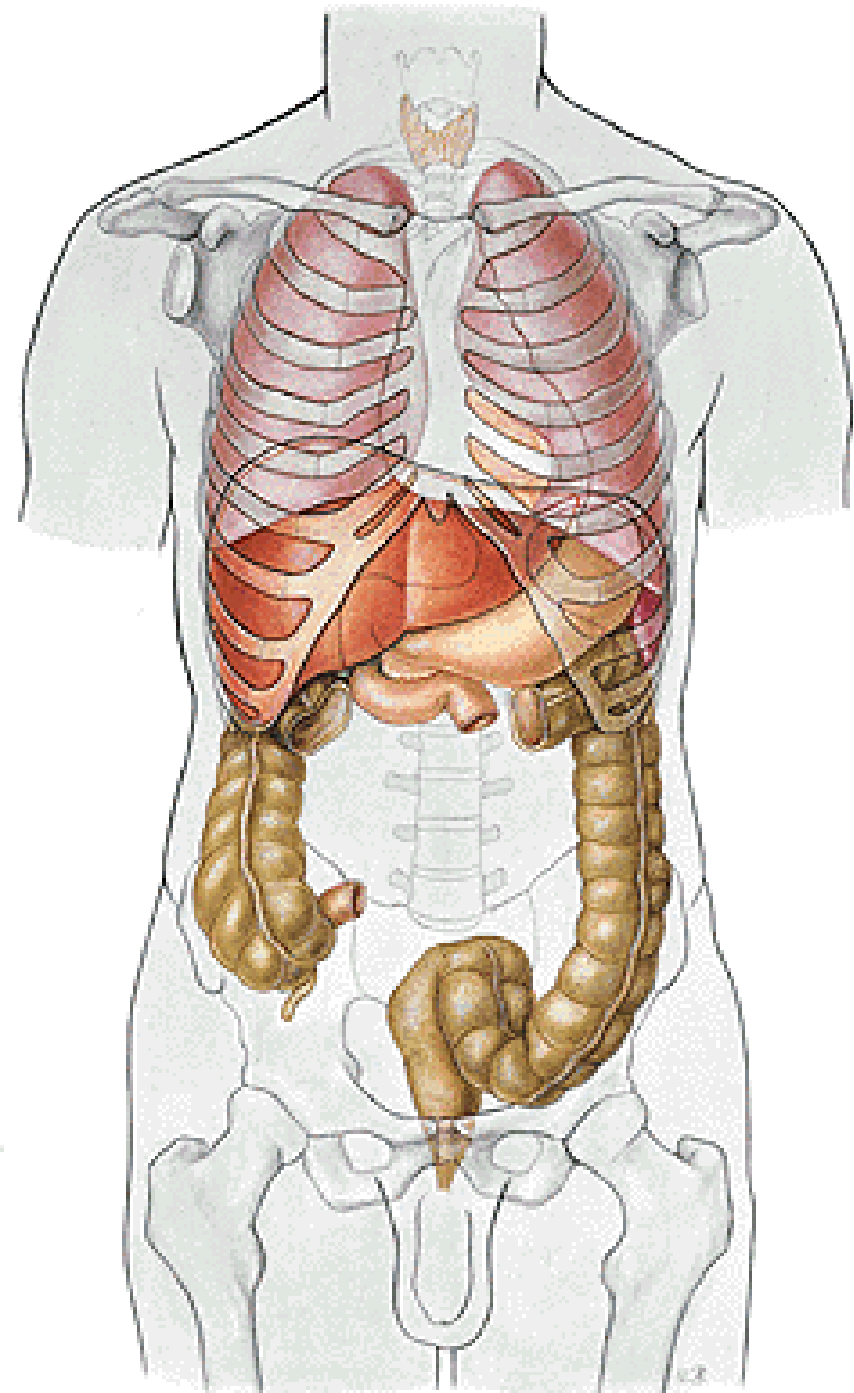


**Tonsilla pharyngea**  
**Tonsilla tubaria**

**Waldeyer's tonsillar ring**

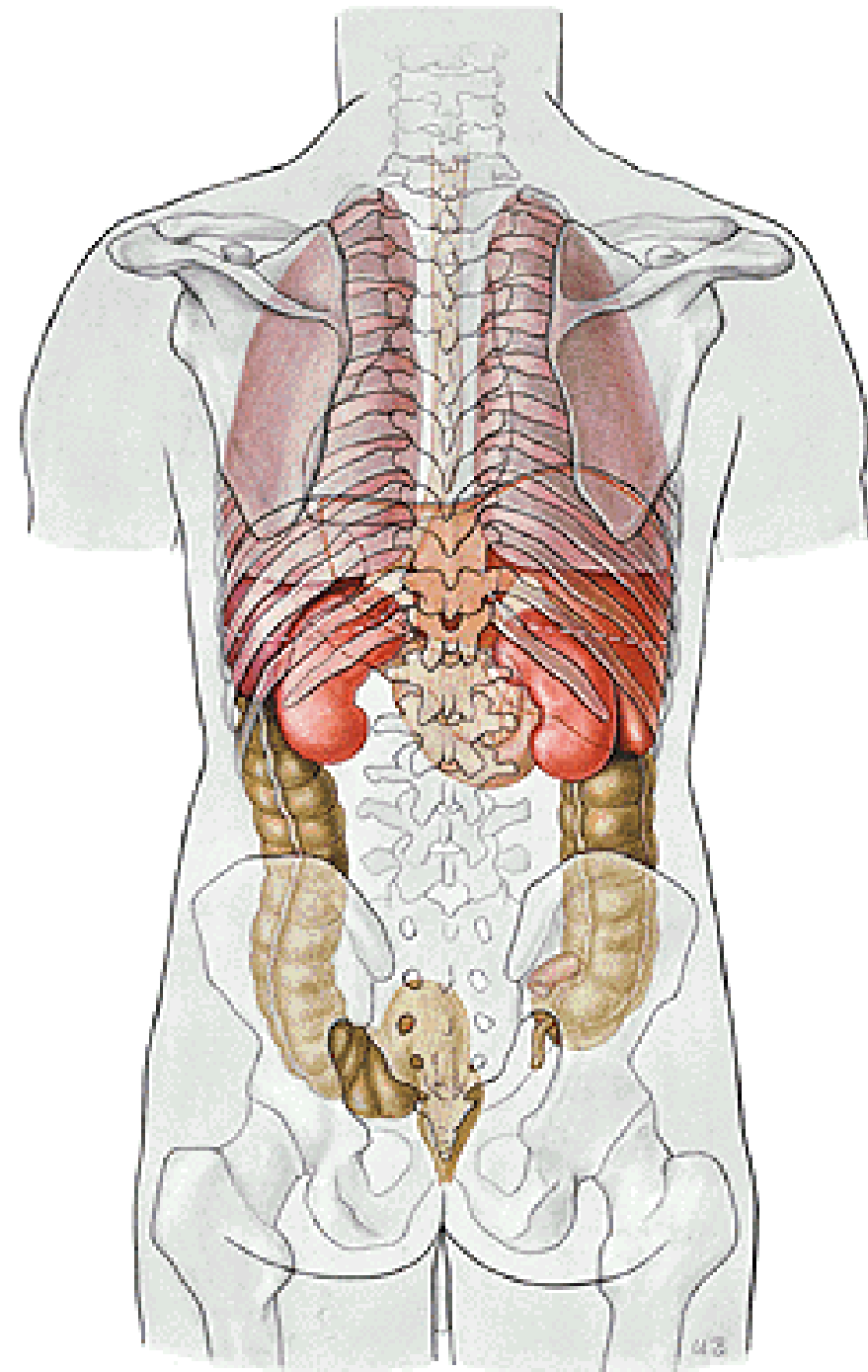


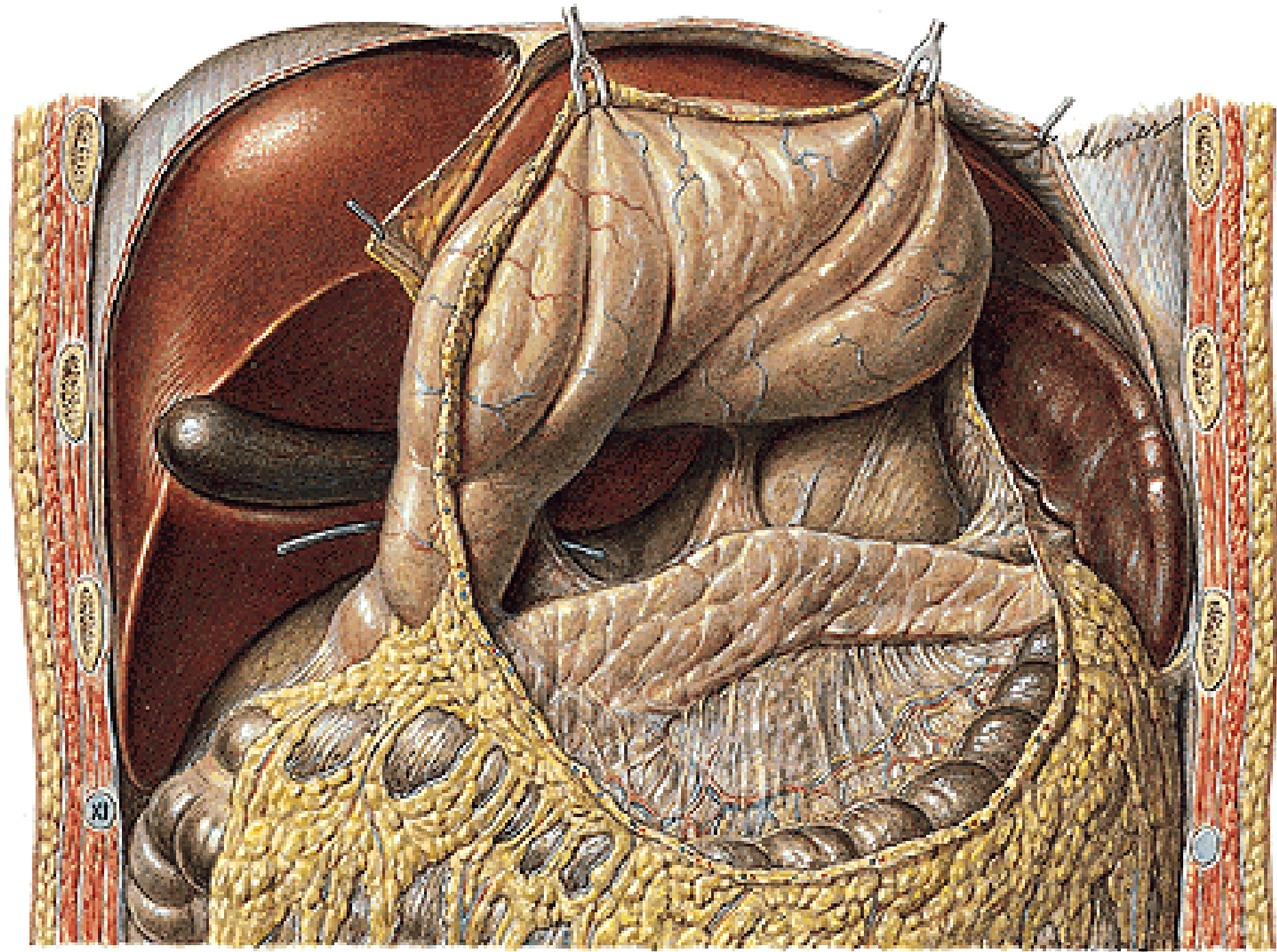
**Tonsilla abdominalis –  
appendix vermiformis**

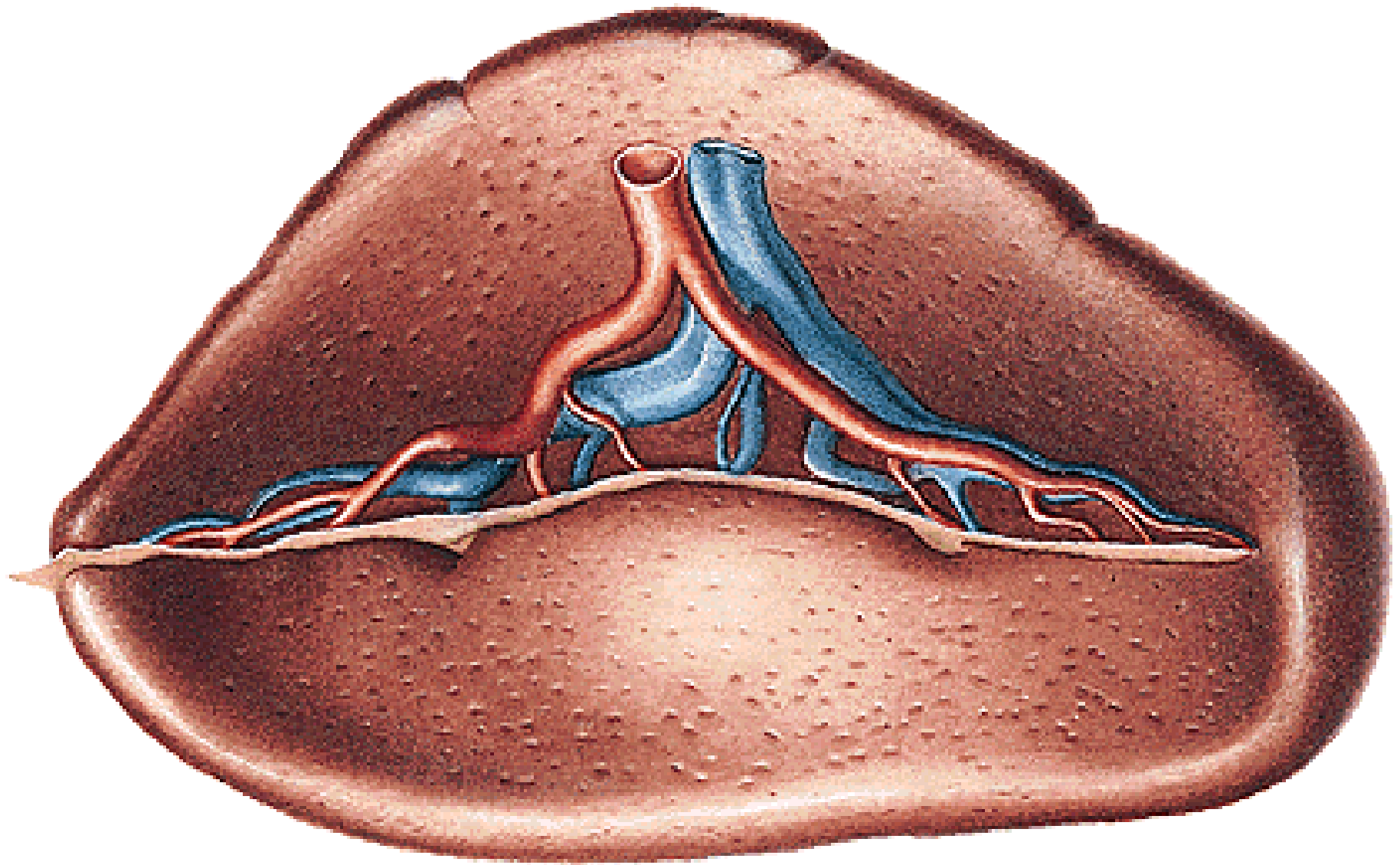




# Lien, splen

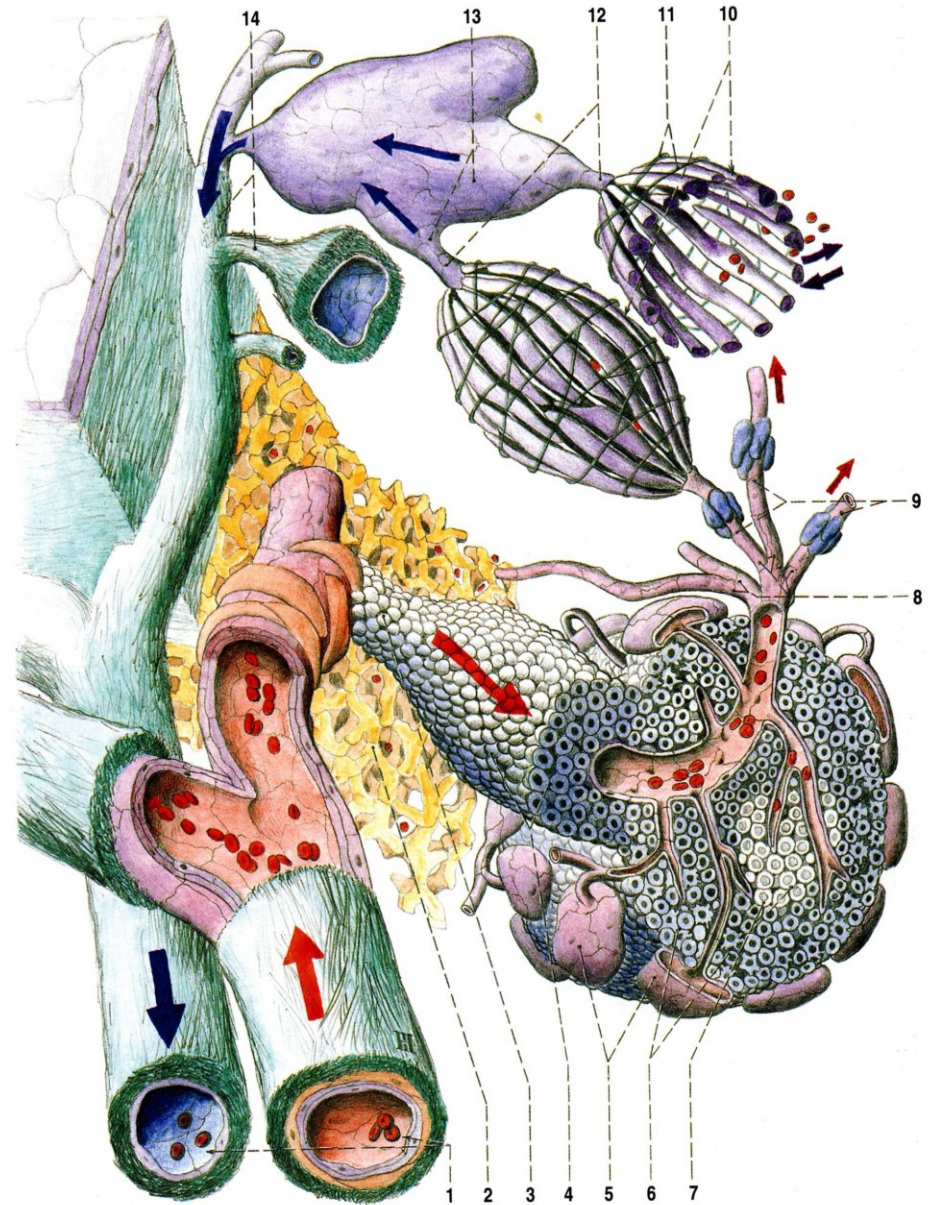








# Reticulum Pulpa rubra Pulpa alba

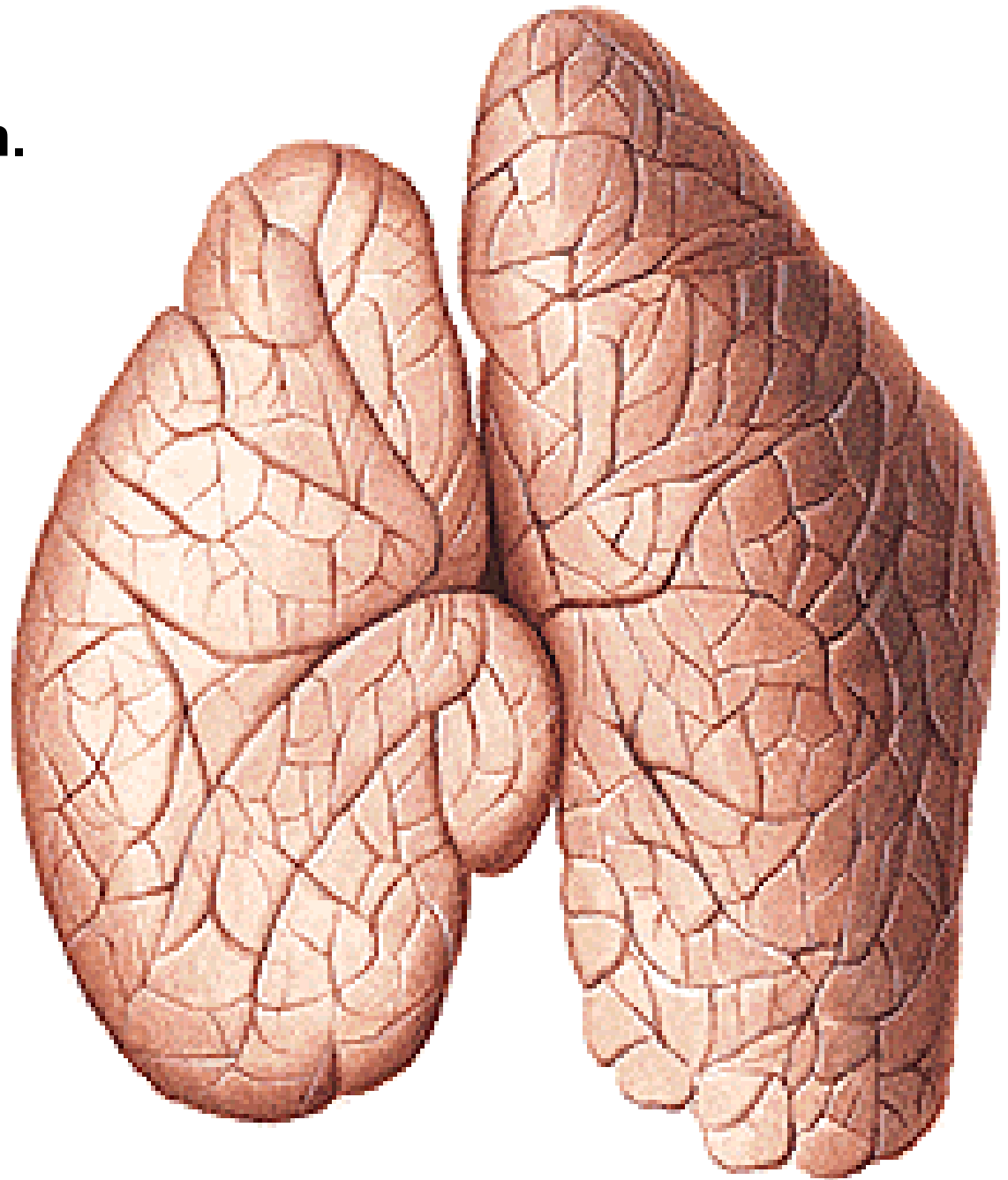


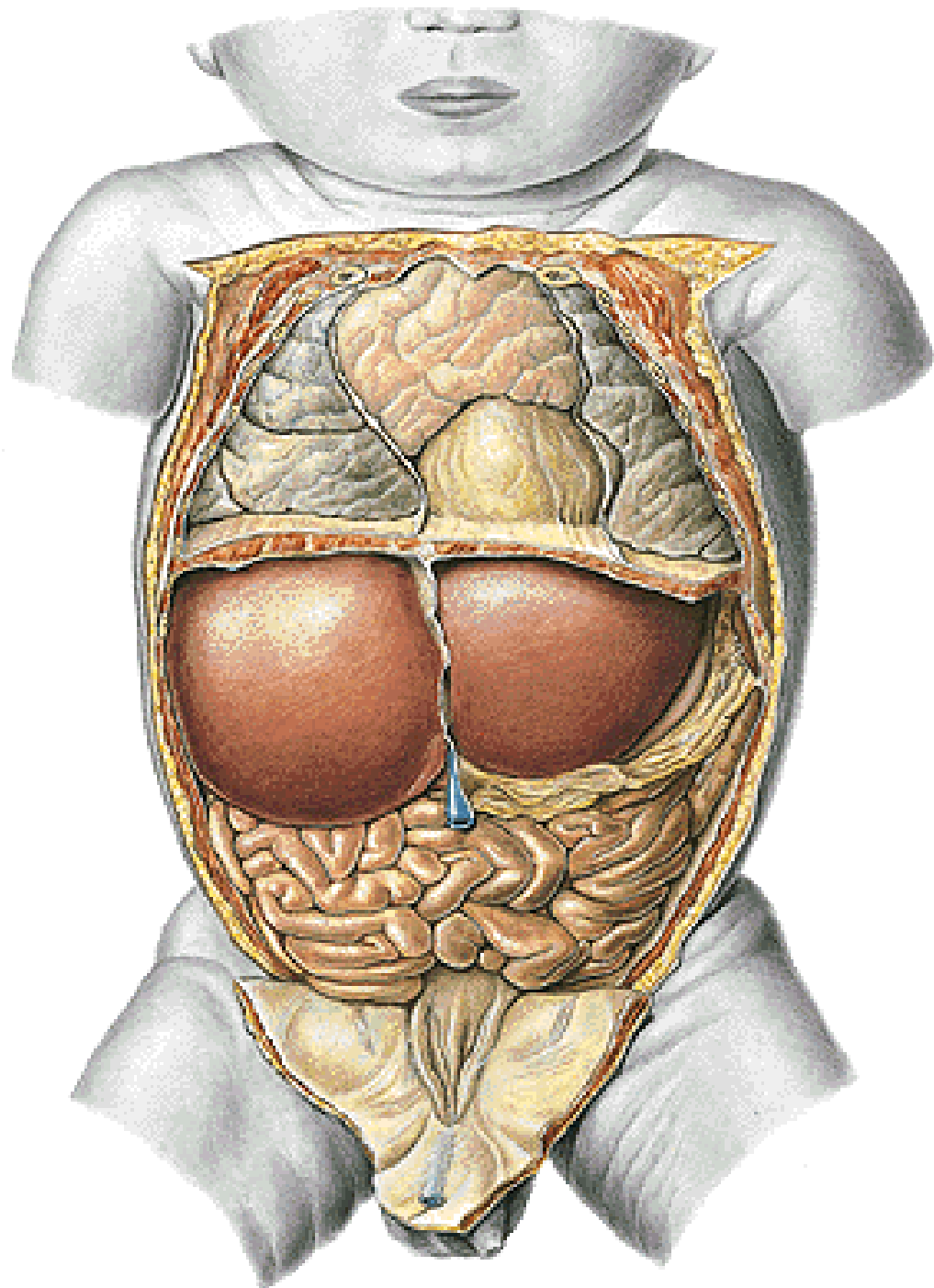
Obr. 123. STAVBA SLEZINY A PRÚTOK KRVE SLEZINOU (schéma); šipky udávají směry toku krve  
 1 trabekulární cévy sleziny  
 2 červená pulpa sleziny  
 3 periarteriální lymfatická pochva  
 4 bílá pulpa sleziny – jeden z folliculi lymphatici lienales  
 5 sinusy marginální zóny mizního uzlíku  
 6 marginální zóna uzlíku s dendritickými buňkami

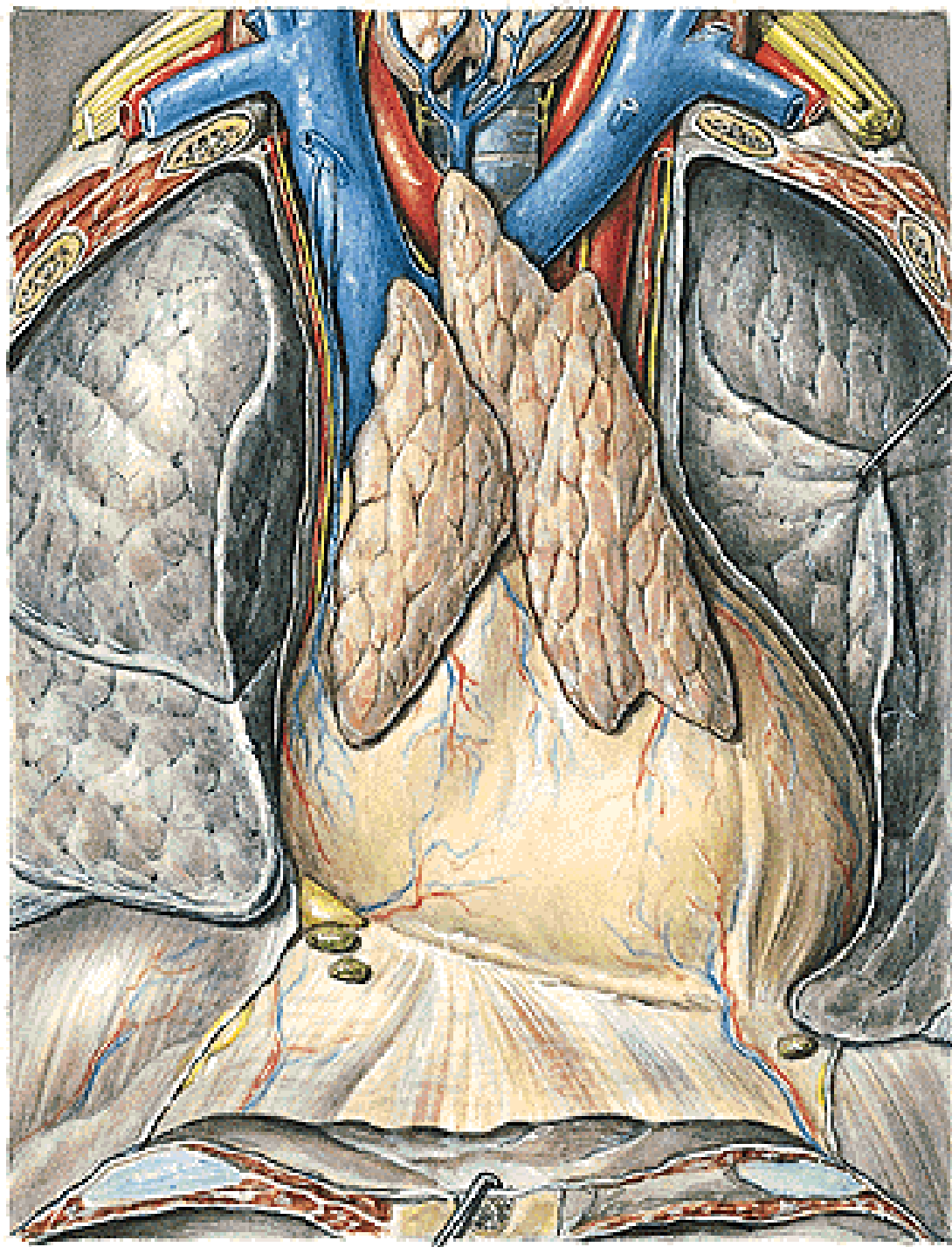
7 zárodečné centrum uzlíku  
 8 penicillus (aa. penicillatae)  
 9 opouzdřené arterky se Schweiggerovým-Seidelovým pouzdrém  
 10 slezinové sinusy (sinus lienis)  
 11 retikulární vlákna obtáčeující sinusy  
 12 postkapilární žíly  
 13 tenkostěnné rozšířené dřeňové žíly  
 14 trabekulární žíly

# Thymus

- lobus dx. et sin.

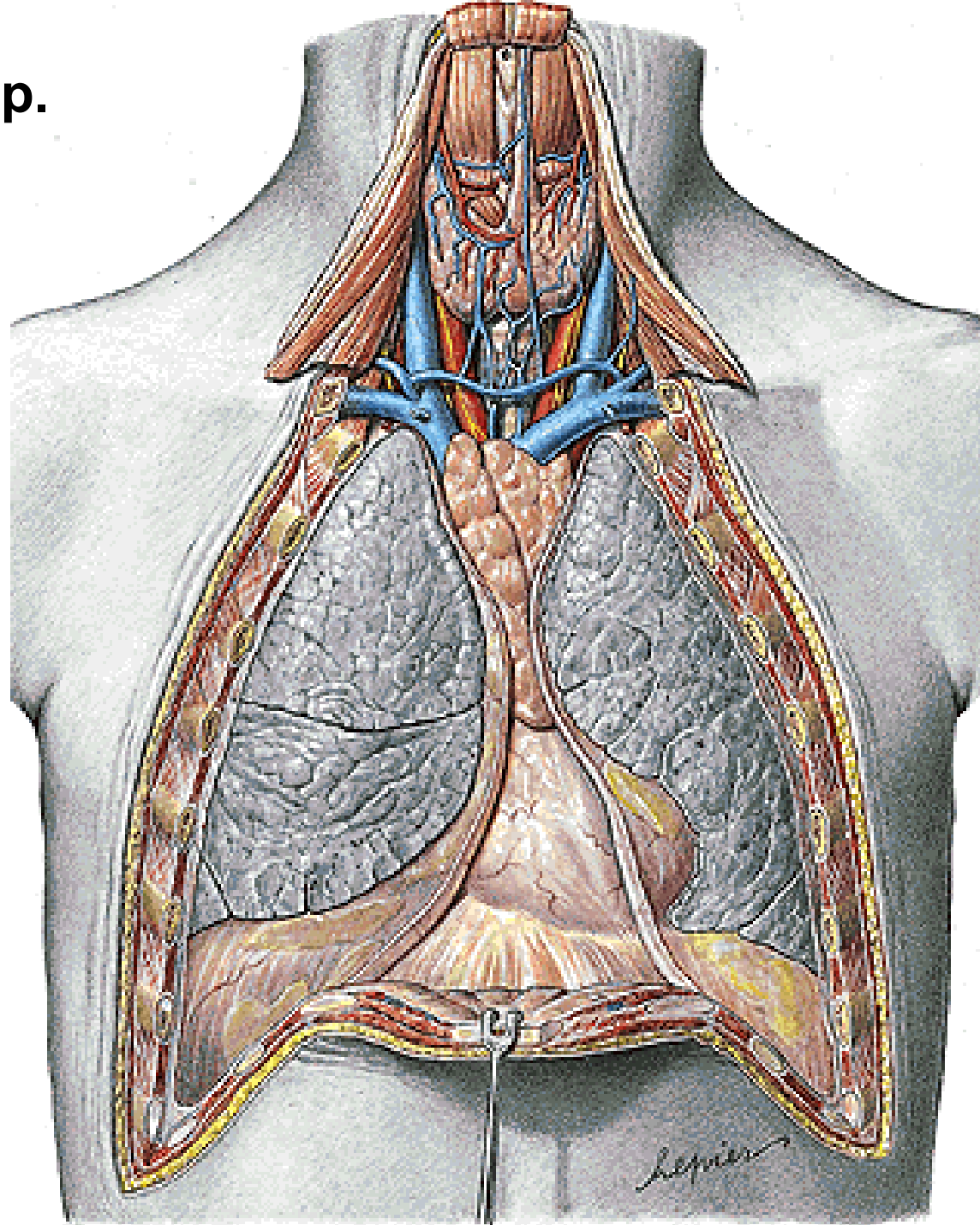






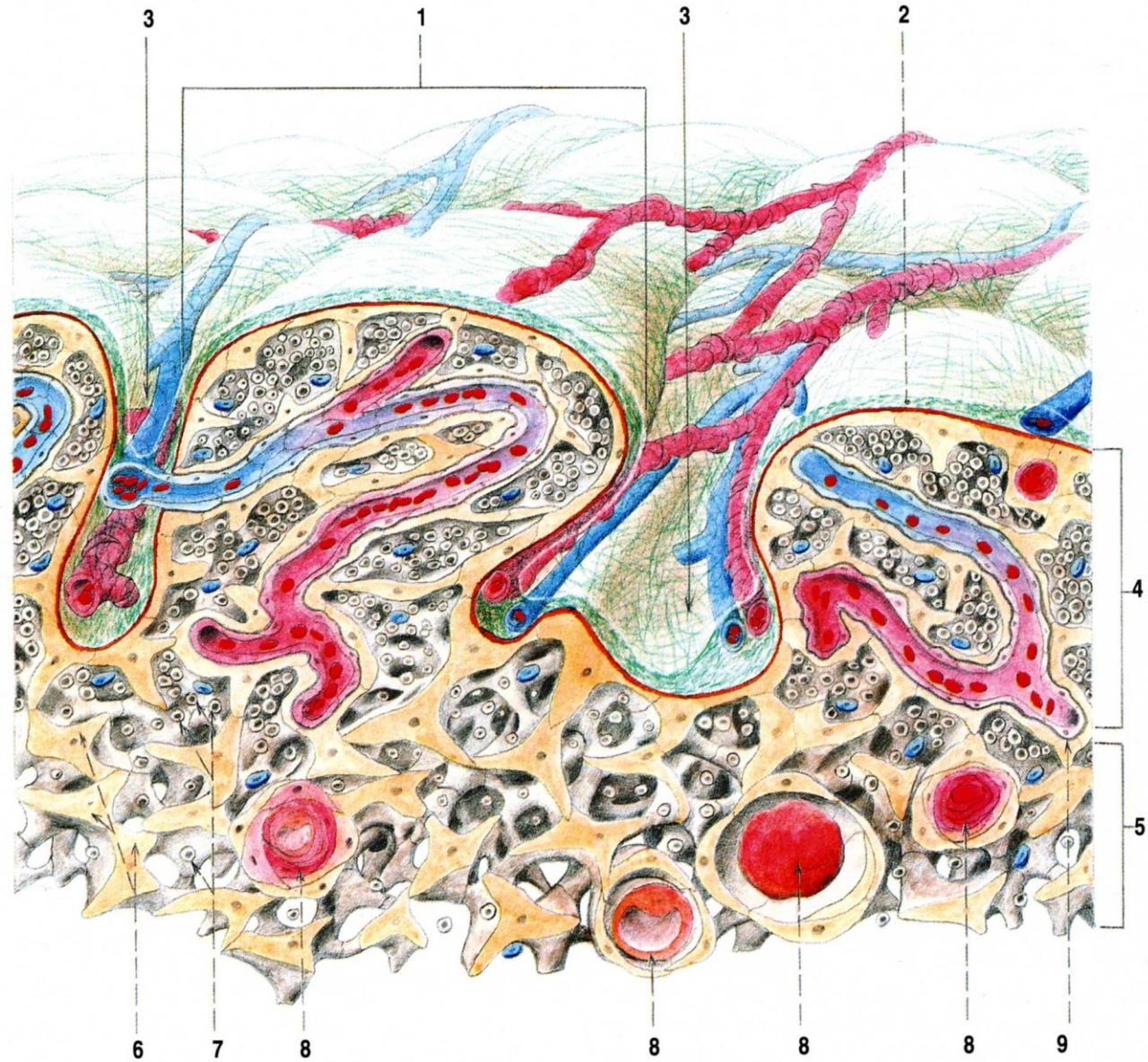


**Area interpleuralis sup.  
(thymica)**



# Thymus

- capsula
- reticulum
- lobuli
- cortex
- medulla

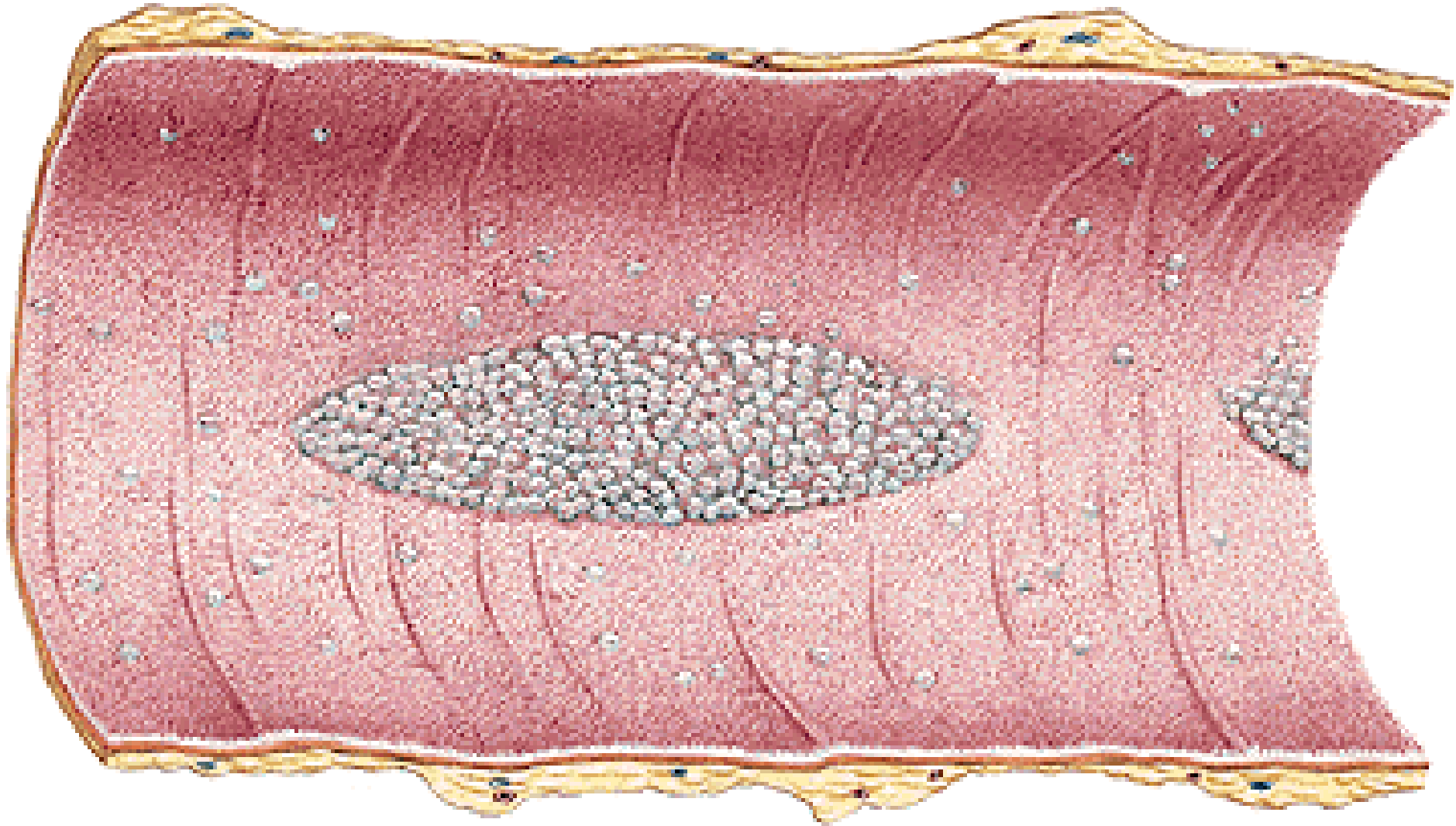


Obr. 128. STAVBA THYMU (schéma)

- 1 lobulus thymi
- 2 capsula thymi
- 3 vazivová septa s cévami
- 4 cortex thymi

- 5 medulla thymi
- 6 retikulum thymu
- 7 lymfocyty v okách retikula thymu
- 8 Hassalova tělíska v různých fázích svého vzniku
- 9 silná bazální membrána kapilár

**Folliculi lymphatici solitarii**  
**Folliculi lymphatici aggregati**



# Truncus lymphaticus dexter

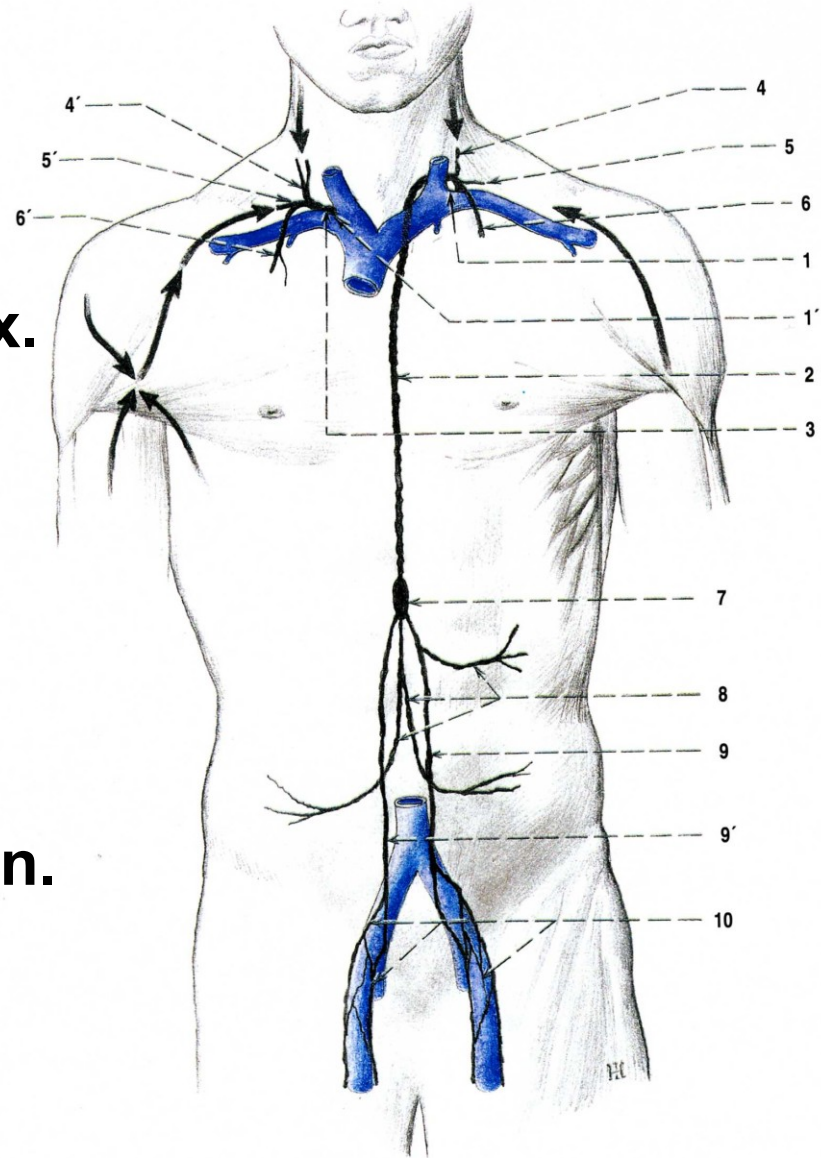
- tr. jugularis dexter
- tr. subclavius dx.
- tr. bronchomediastinalis dx.

# Ductus thoracicus

- tr. lumbalis dx. et sin.
- tr. intestinalis

# (cisterna chyli)

- tr. jugularis sin.
- tr. subclavius sin.
- tr. bronchomediastinalis sin.



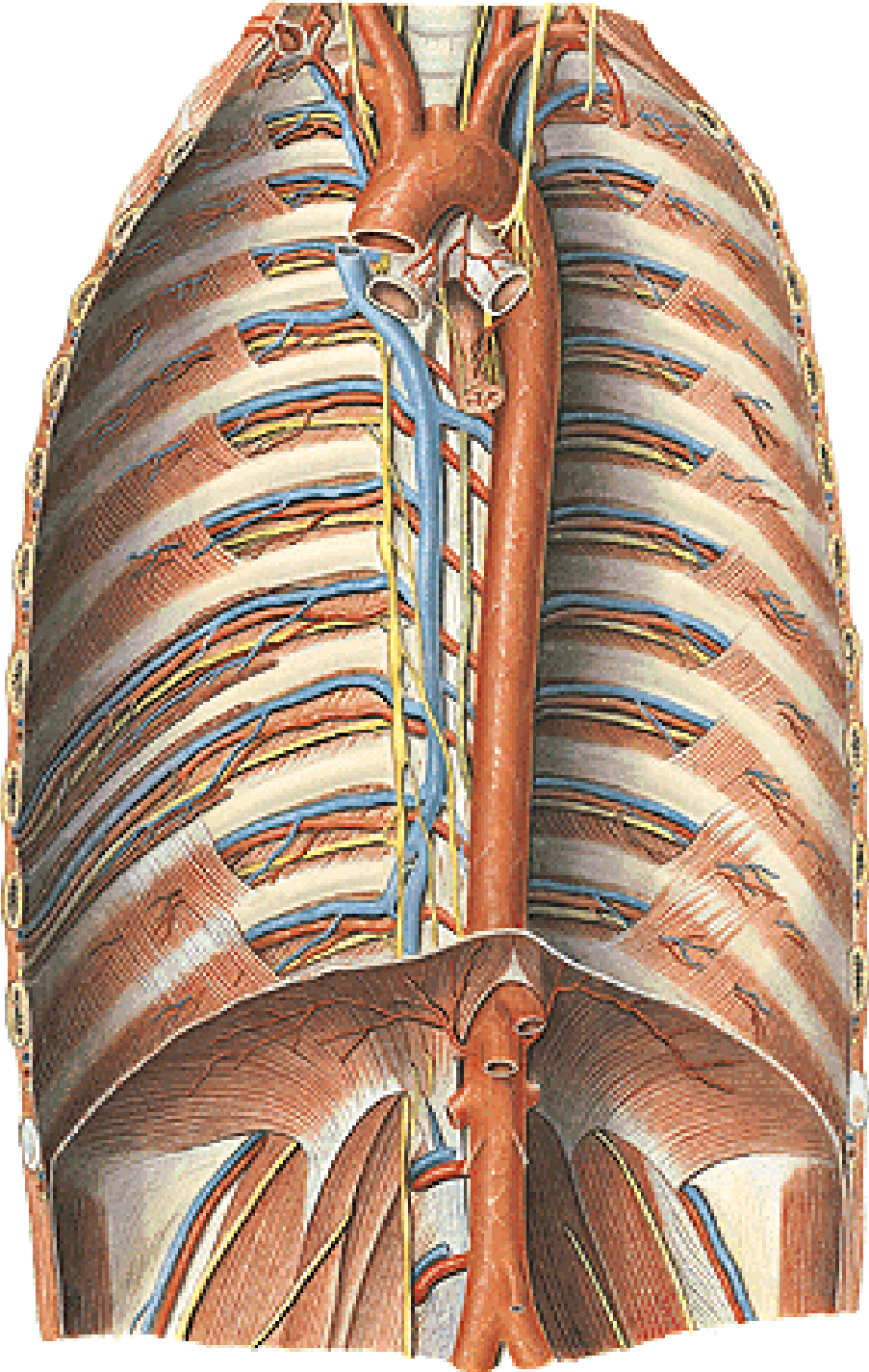
Obr. 129. HLAVNÍ MÍZNÍ KMENY (schéma)

- 1 angulus venosus sinister
- 1' angulus venosus dexter
- 2 ductus thoracicus
- 3 ductus lymphaticus dexter
- 4 truncus jugularis sinister
- 4' truncus jugularis dexter
- 5 truncus subclavius sinister

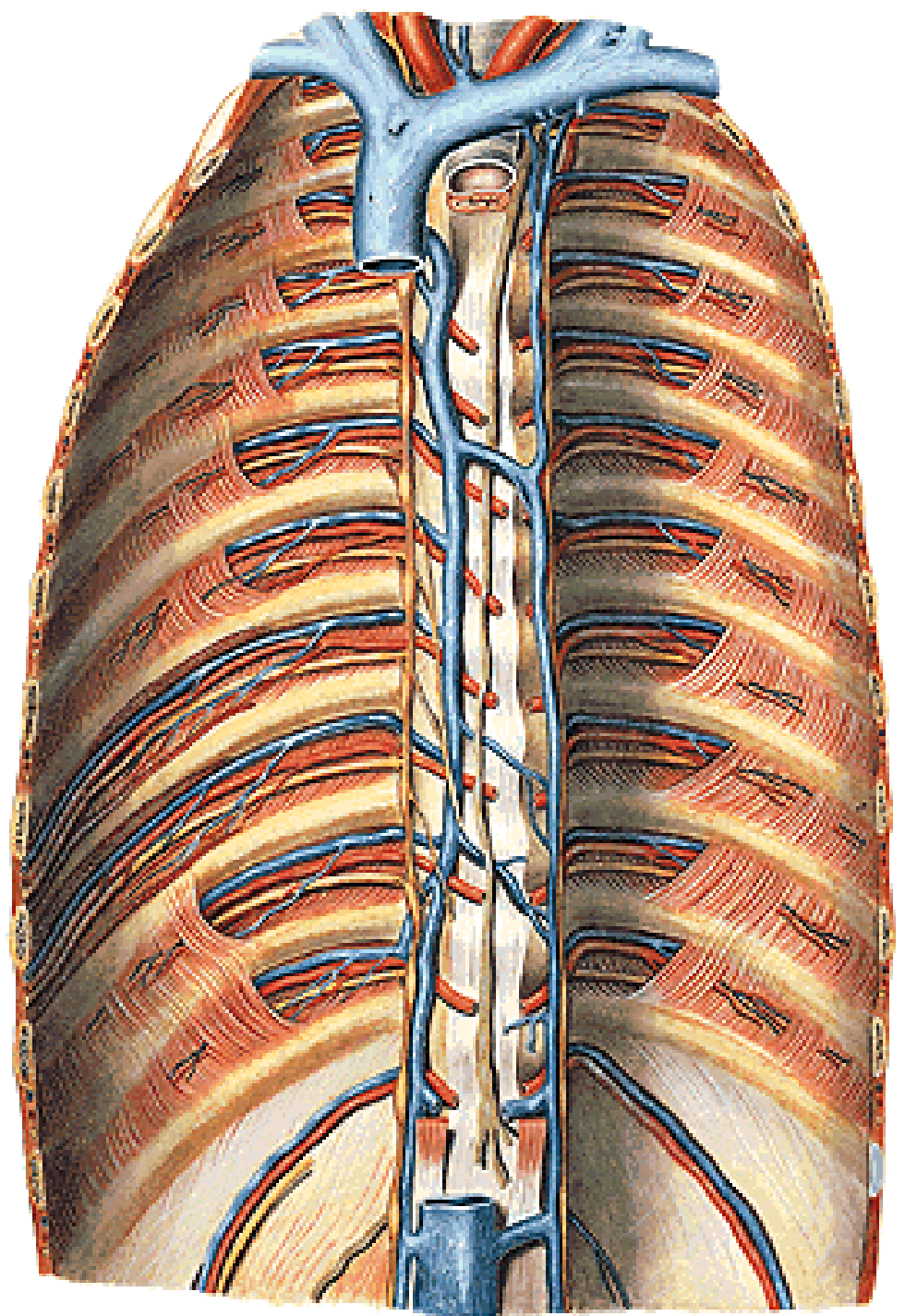
- 5' truncus subclavius dexter
- 6 truncus bronchomediastinalis sinister
- 6' truncus bronchomediastinalis dexter
- 7 cisterna chyli
- 8 trunci intestinales
- 9 truncus lumbalis sinister
- 9' truncus lumbalis dexter
- 10 mízní kolektory z nodi lymphatici iliaci



**Ductus thoracicus**



# Ductus thoracicus



## **Lymphatic drainage of the head and neck:**

**Nodi lymph. occipitales**

**Nll. retroauriculares**

**Nll. parotidei**

**Nll. submandibulares**

**Nll. submentales**

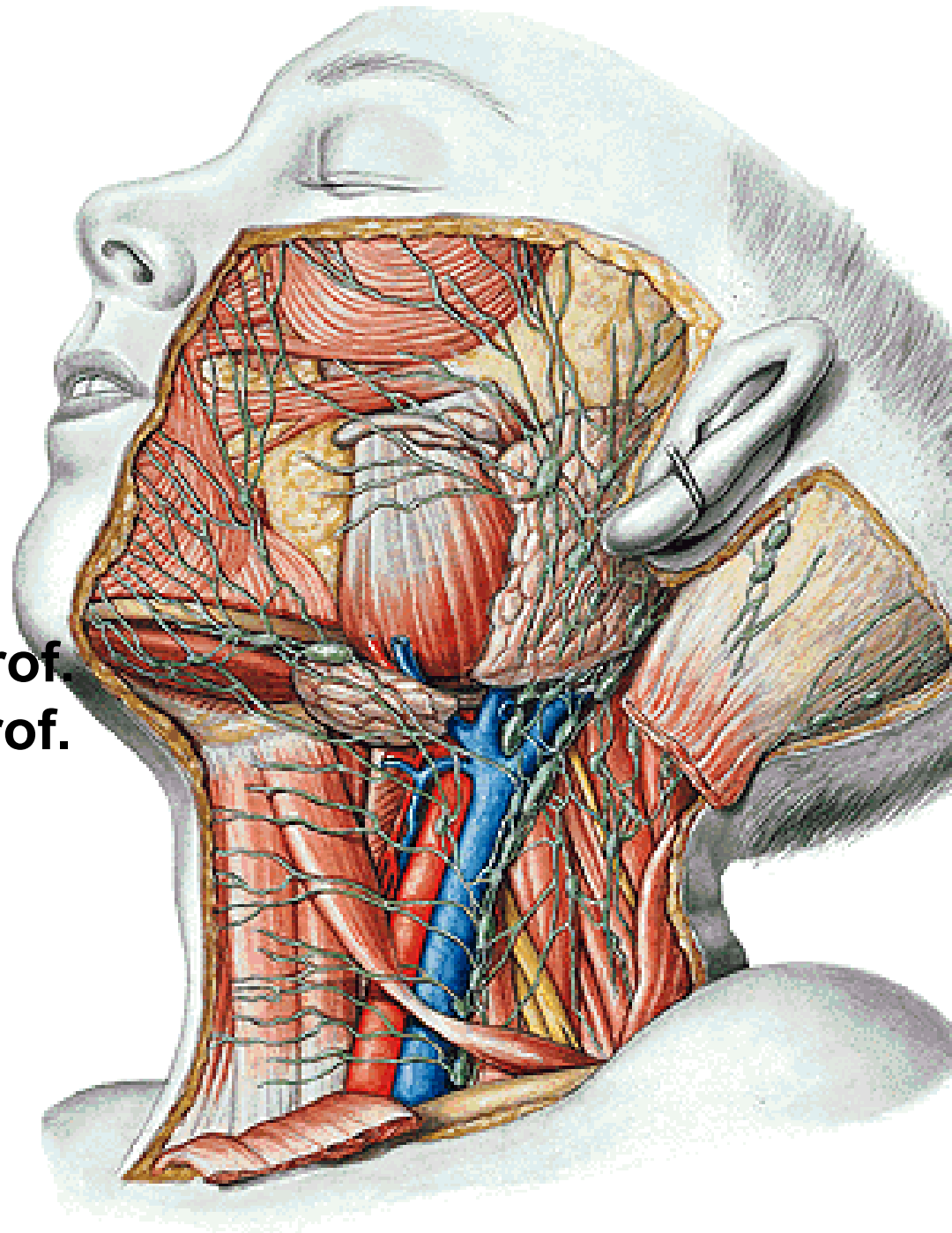
**Nll. cervicales ant.spf. et prof.**

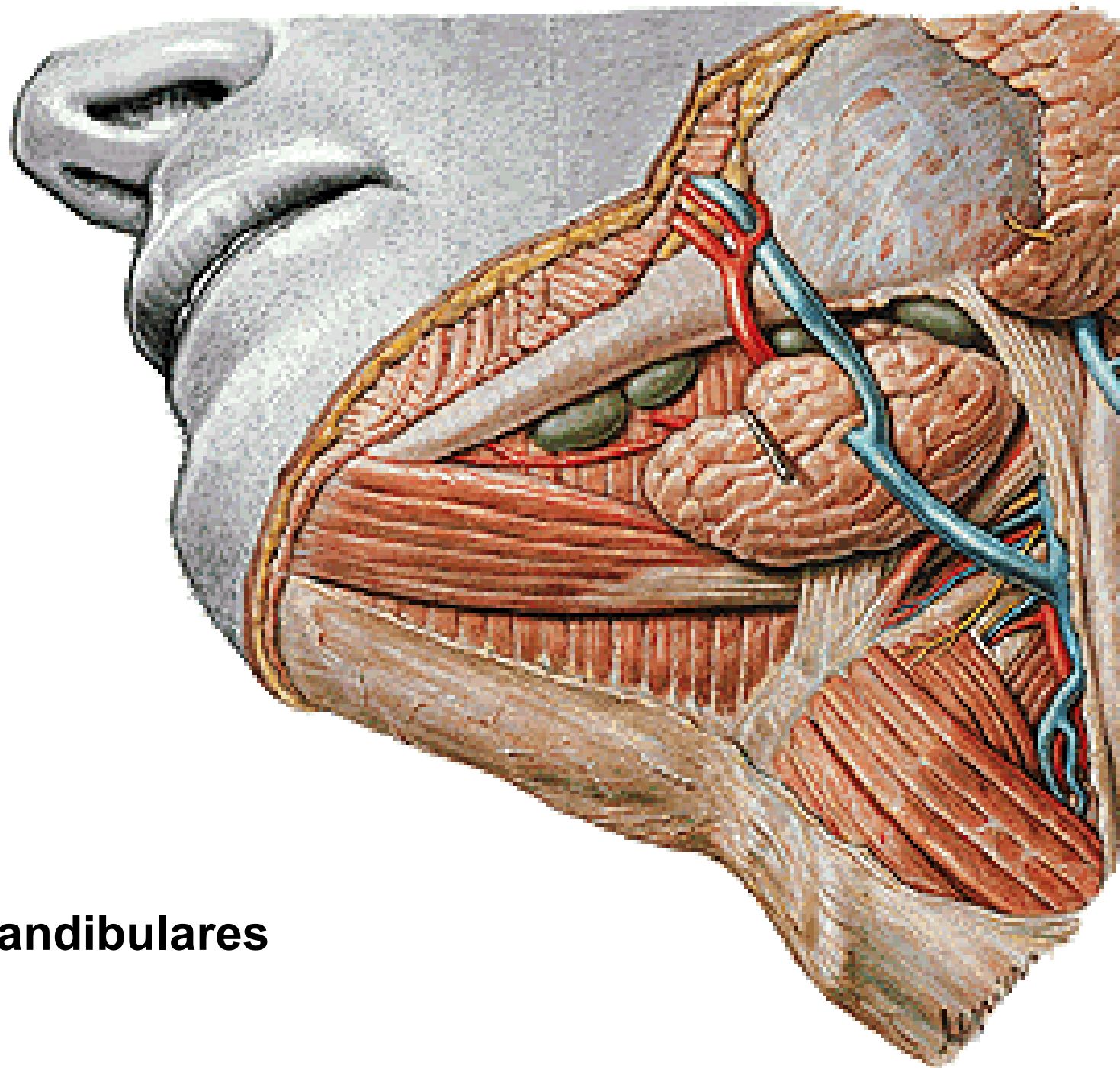
**Nll. cervicales lat. spf. et prof.**

**(nll. jugulares int.**

**nll. supraclaviculares)**

**→ tr. jugularis**



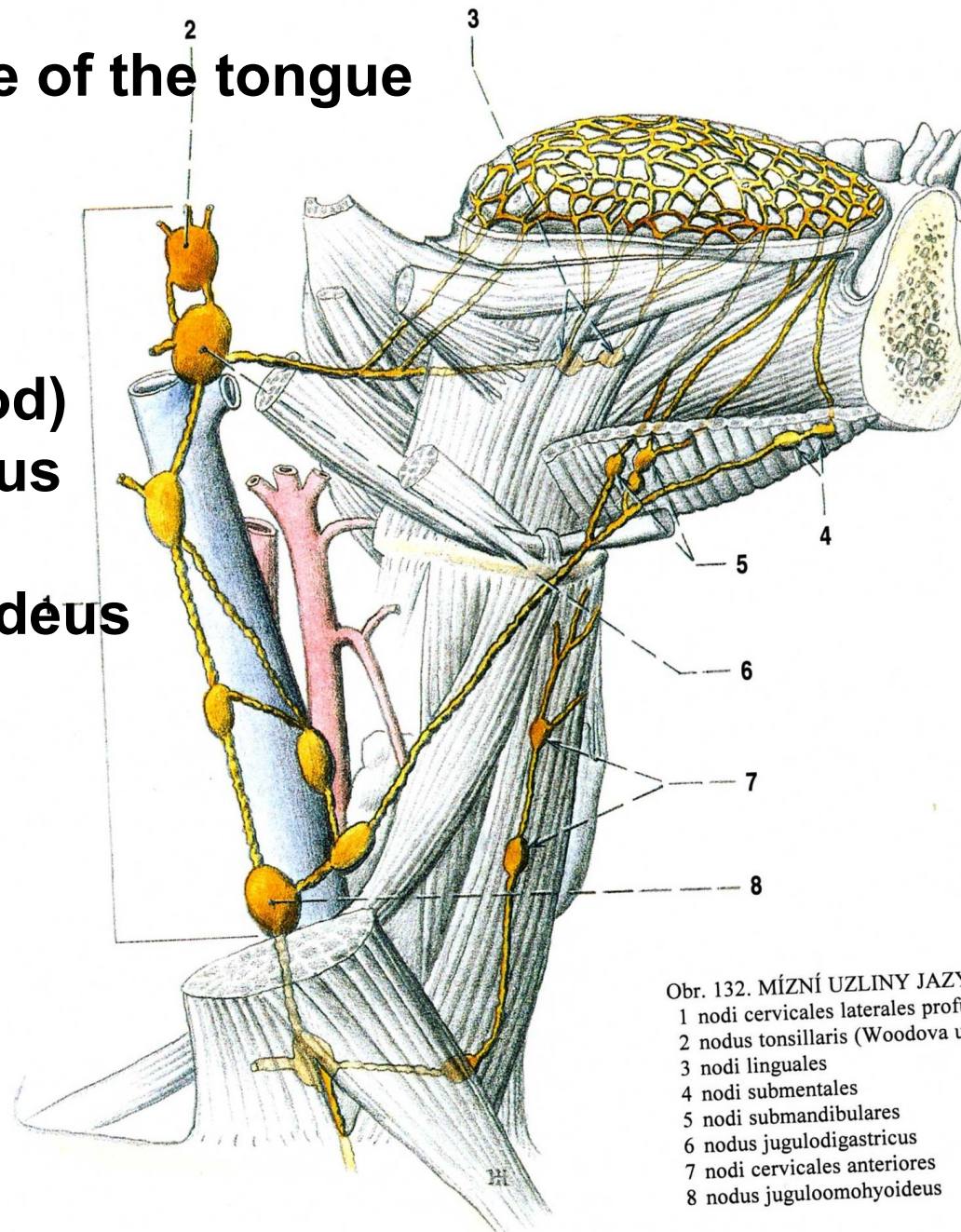


**NII. submandibulares**



# Lymphatic drainage of the tongue

- Nl. tonsillaris (Wood)**
- Nl. jugulodigastricus (Küttner)**
- Nl. juguloomohyoideus**

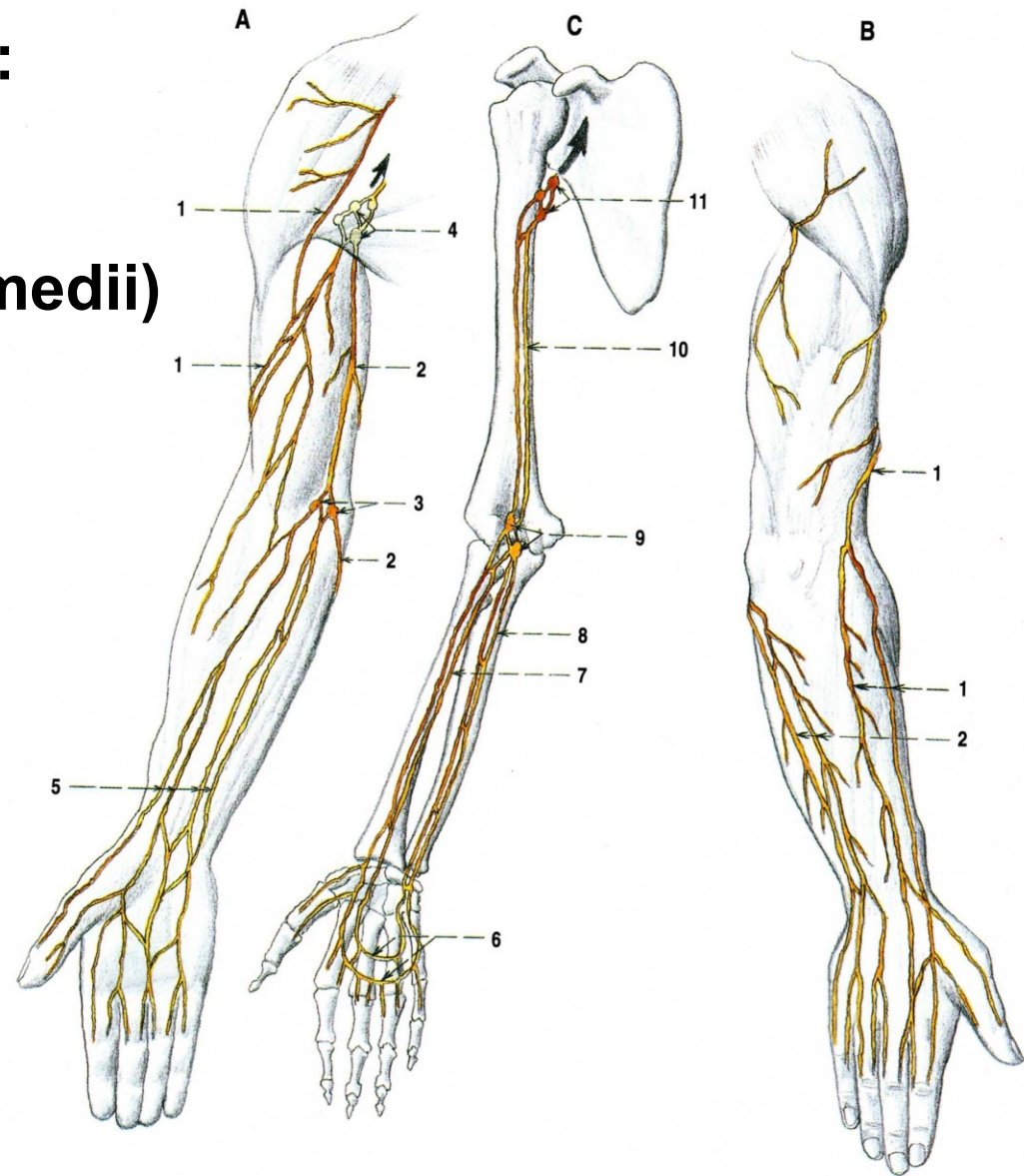


Obr. 132. MÍZNÍ UZLINY JAZYKA (schéma)  
1 nodi cervicales laterales profundi superiores  
2 nodus tonsillaris (Woodova uzlina)  
3 nodi linguales  
4 nodi submentales  
5 nodi submandibulares  
6 nodus jugulodigastricus  
7 nodi cervicales anteriores  
8 nodus juguloomohyoideus

# Superficial lymph vessels:

- collectores laterales
- collectores mediales
- collectores anteriores (medii)

## III. cubitales spf. et prof.

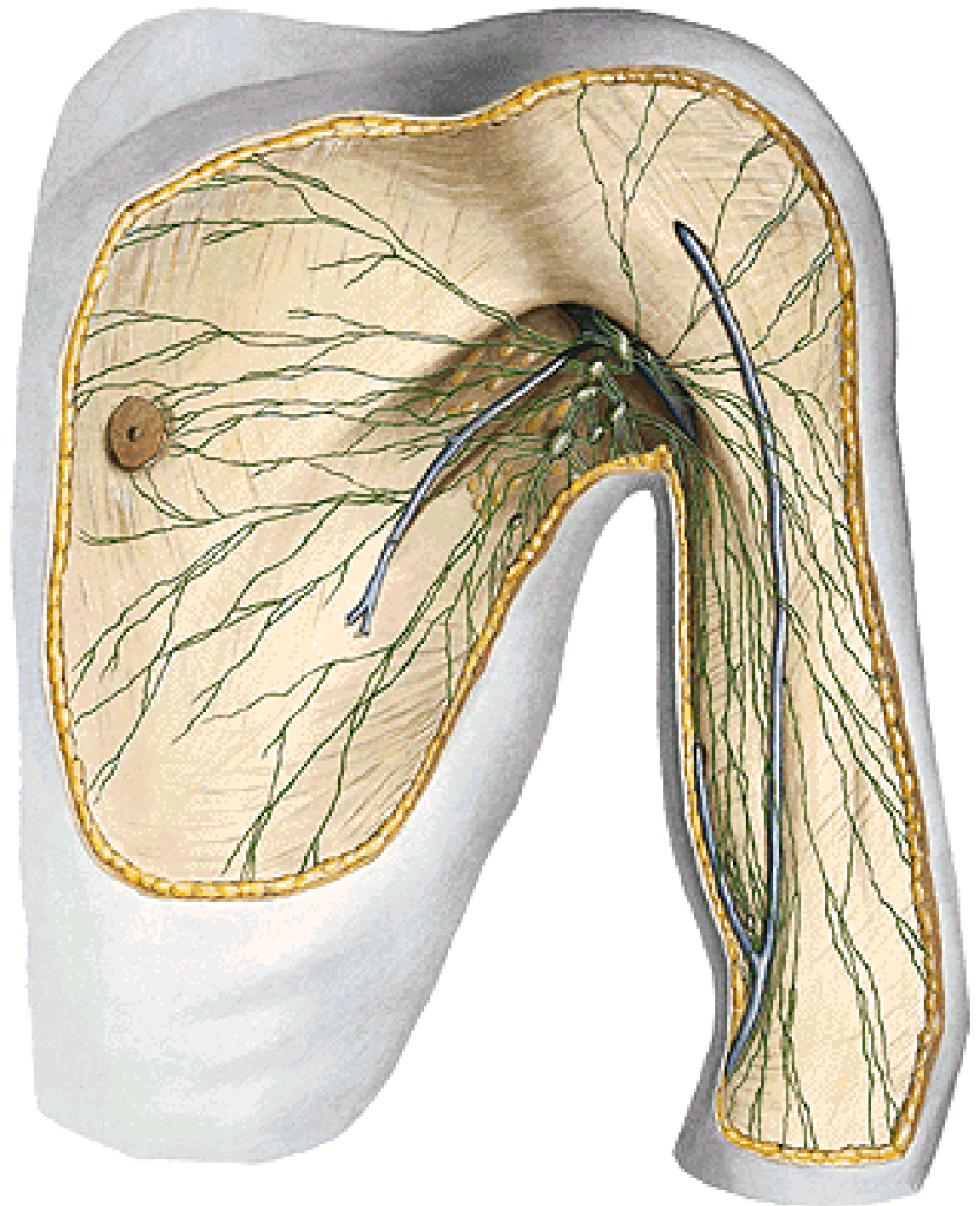


Obr. 133. POVRCHOVÉ A HLUBOKÉ MÍZNÍ CÉVY A UZLINY HORNÍ KONČETINY

- A povrchové mízní cévy; palmární strana předloktí a přední strana paže  
B povrchové mízní cévy; dorsální strana předloktí a zadní strana paže  
C hluboké mízní cévy promítnuté na skelet; pohled zředu  
1 laterální kolektory  
2 mediální kolektory

- 3 nodi cubitales superficiales  
4 nodi axillares  
5 přední kolektory  
6 kolektory při hlubokých krevních cévách dlaně  
7 kolektory podél vv. radiales  
8 kolektory podél vv. ulnares  
9 nodi cubitales profundi  
10 kolektory podél vv. brachiales  
11 nodi axillares

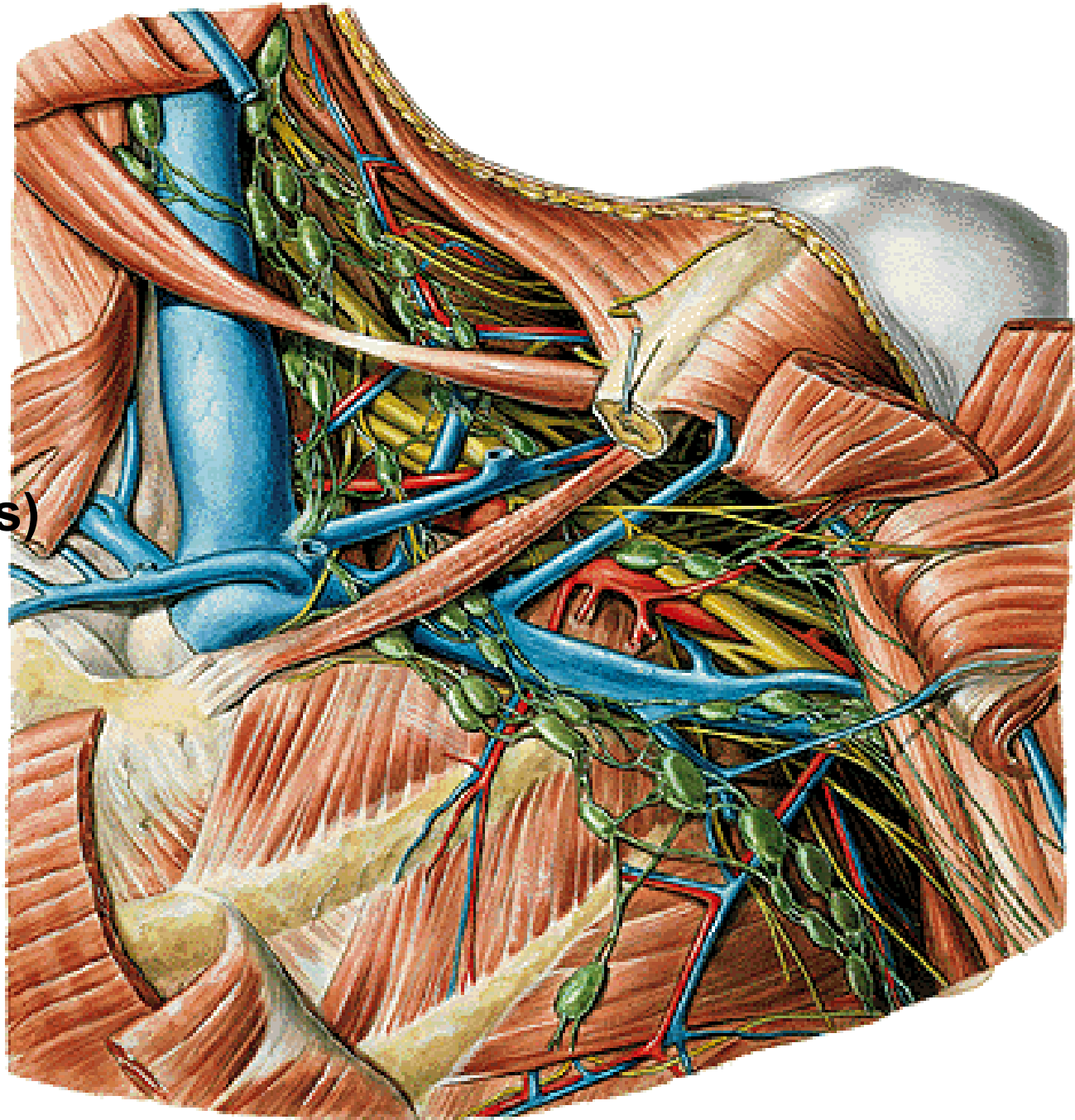
## Nll. axillares



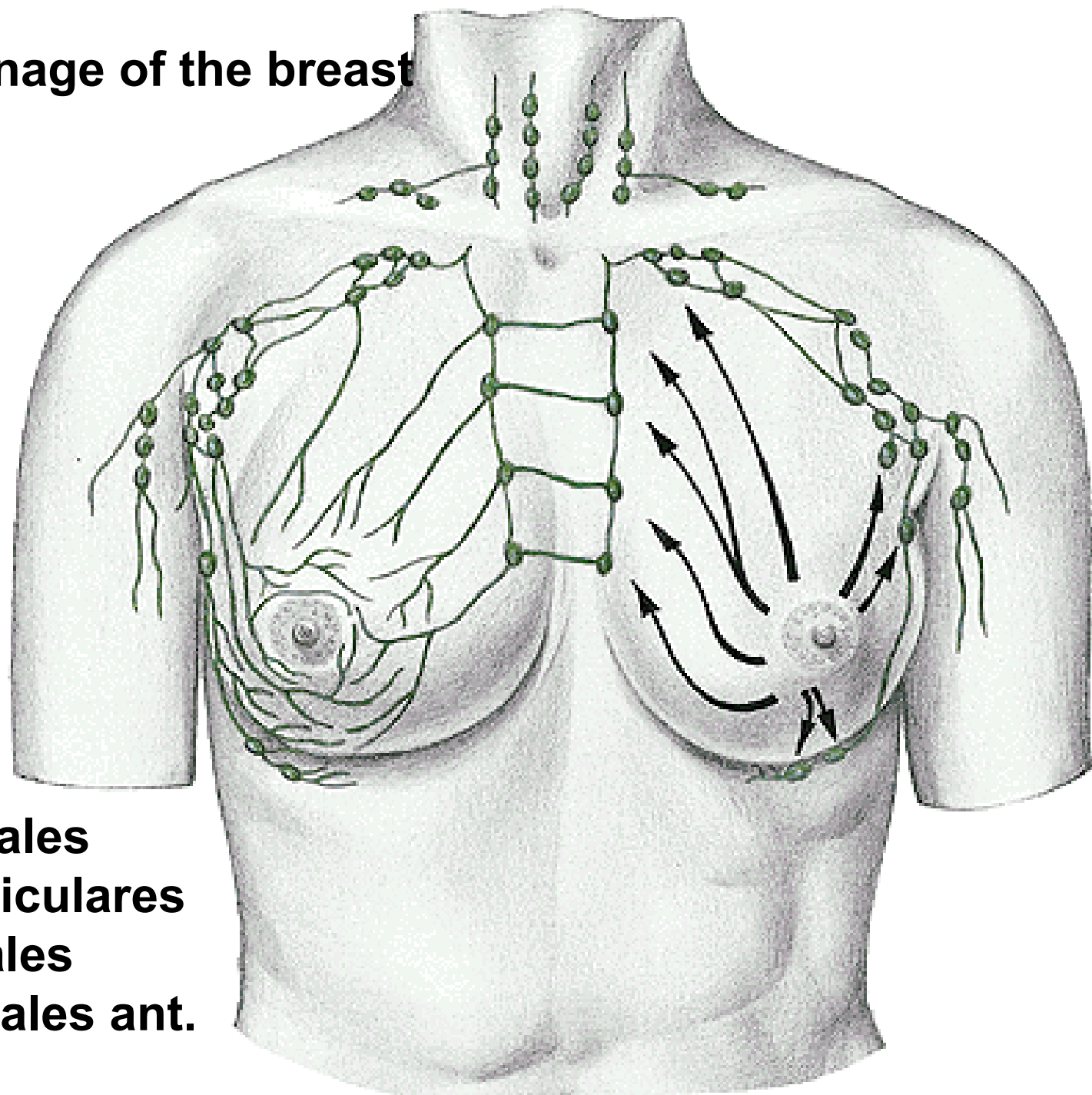
## Nodi lymph. axillares:

- laterales
- pectorales  
(Sorgius)
- subscapulares
- centrales
- apicales  
(infraclaviculares)

→ tr. subclavius



# Lymphatic drainage of the breast

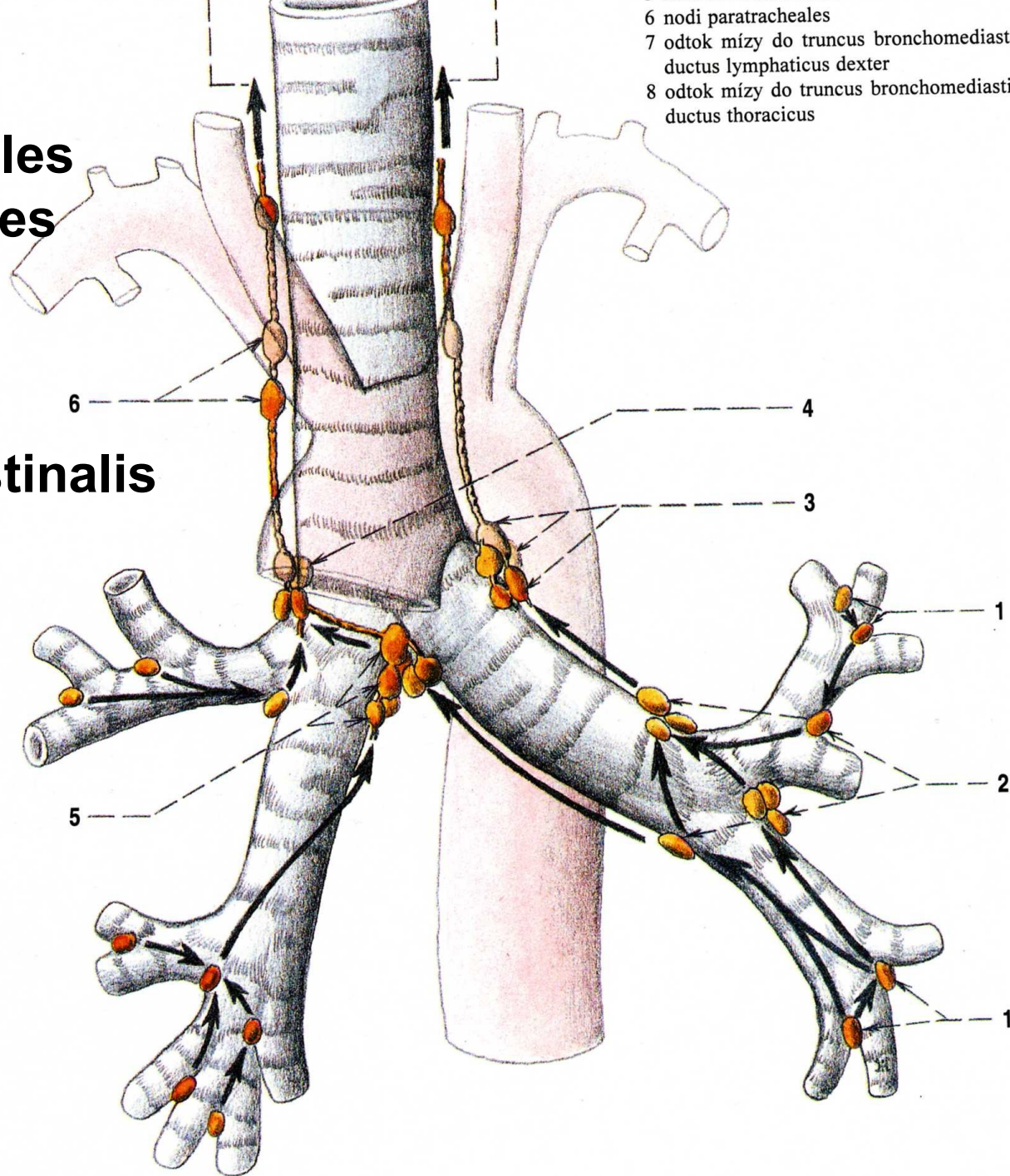


- nll. axillares
- nll. parasternales
- nll. supraclaviculares
- nll. intercostales
- nll. mediastinales ant.

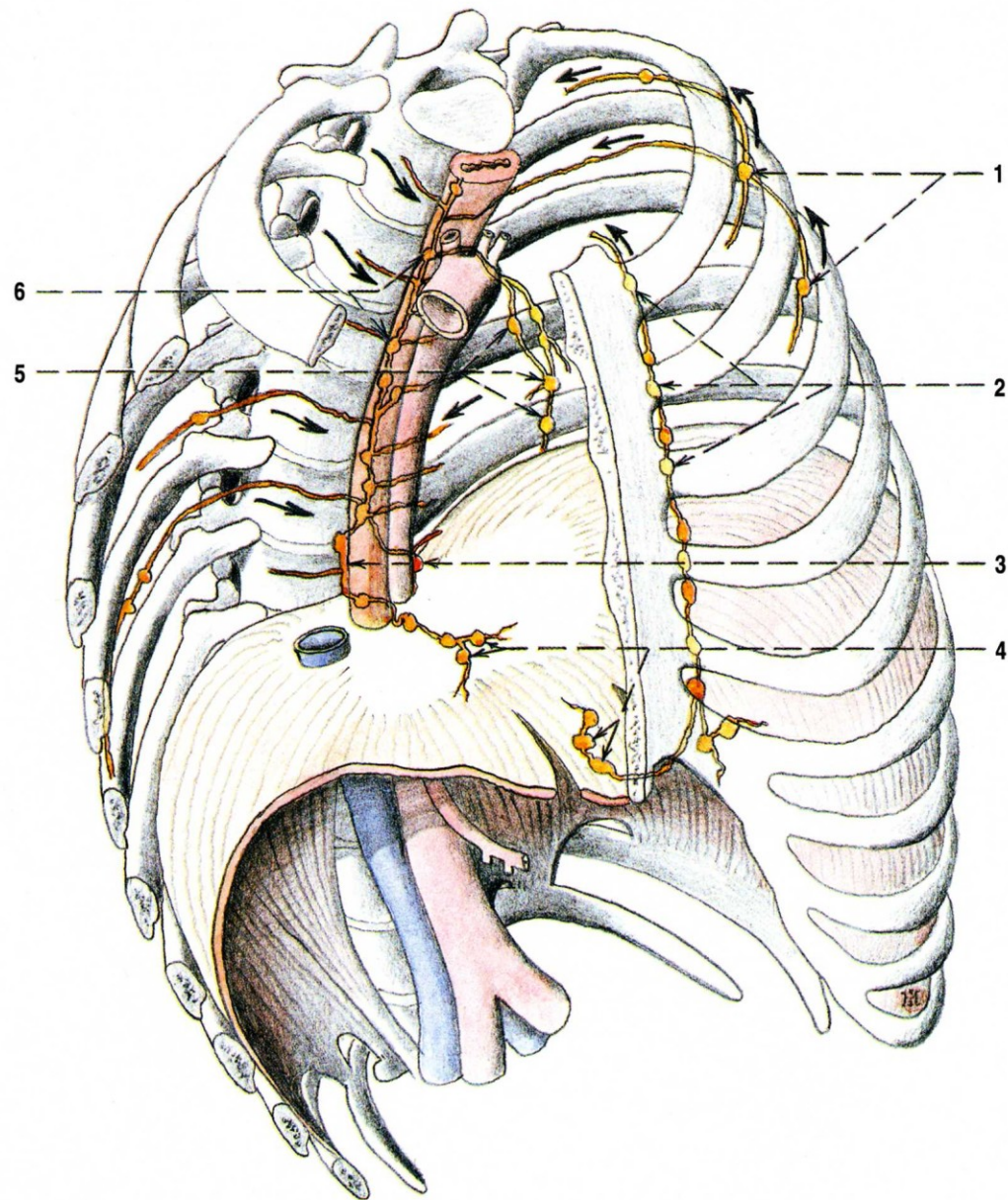


**NII. pulmonales**  
**NII. bronchopulmonales**  
**NII. tracheobronchiales**  
**inf., sup. – dx. et sin.**  
**NII. paratracheales**

**→ tr. bronchomediastinalis**



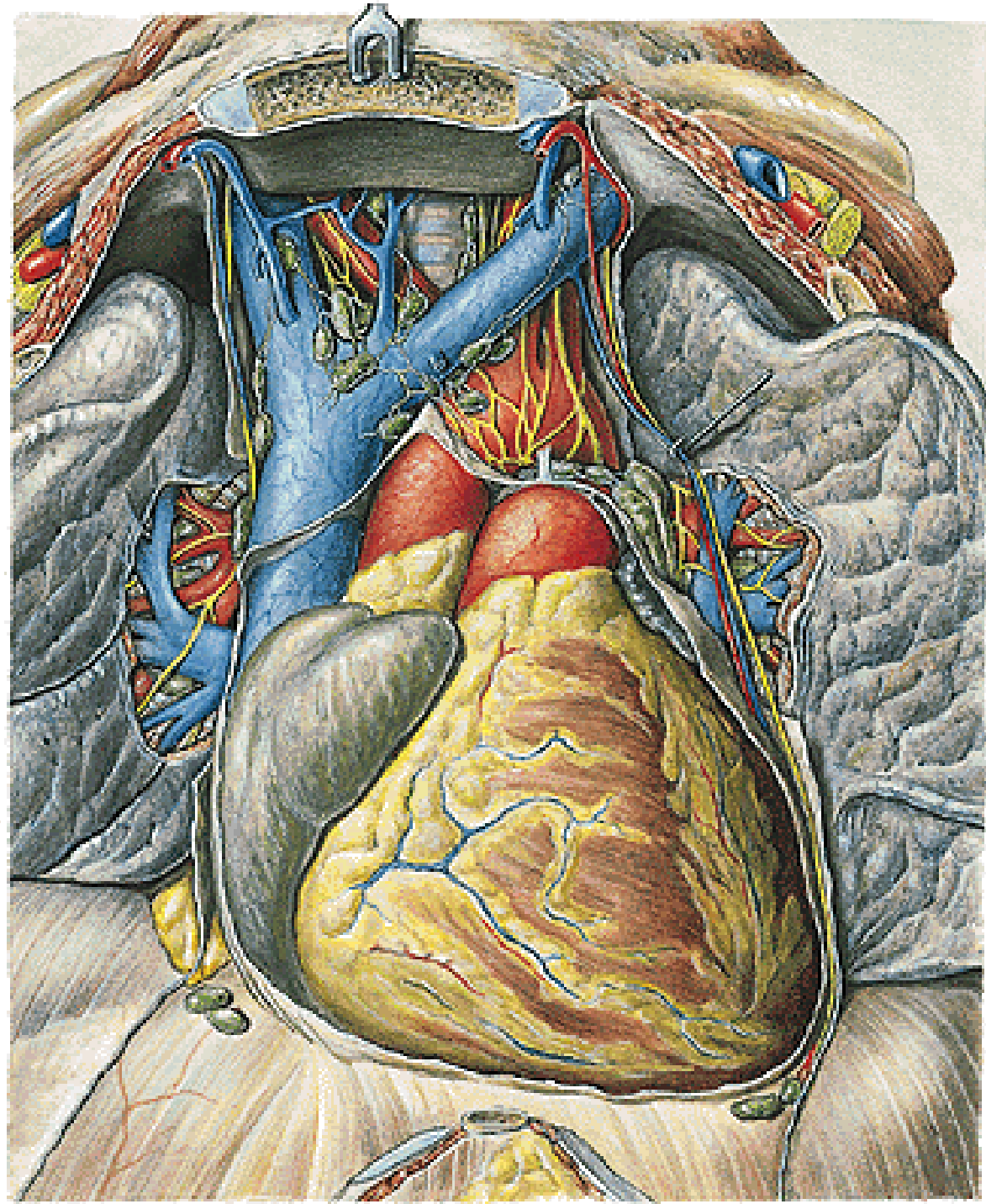
**NII. parasternales**  
**NII. intercostales**  
**NII. praevertebrales**  
**NII. phrenici sup.**



Obr. 135. MÍZNÍ UZLINY HRUDNÍKU; uzliny hrudních stěn a  
 některé orgánové uzliny  
 1 nodi intercostales  
 2 nodi parasternales

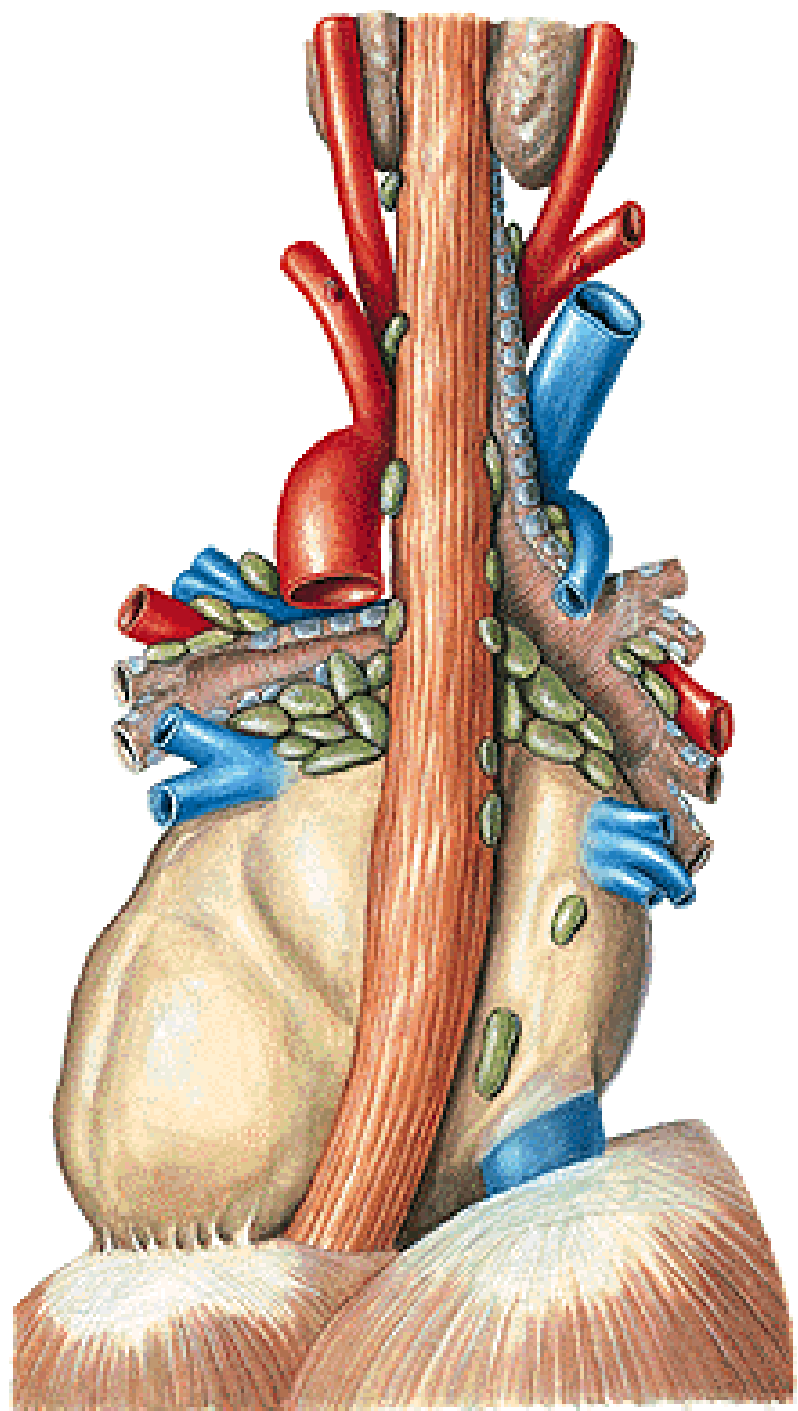
3 nodi paravertebrales  
 4 nodi phrenici superiores  
 5 nodi mediastinales anteriores  
 6 nodi mediastinales posteriores

# NII. mediastinales ant.



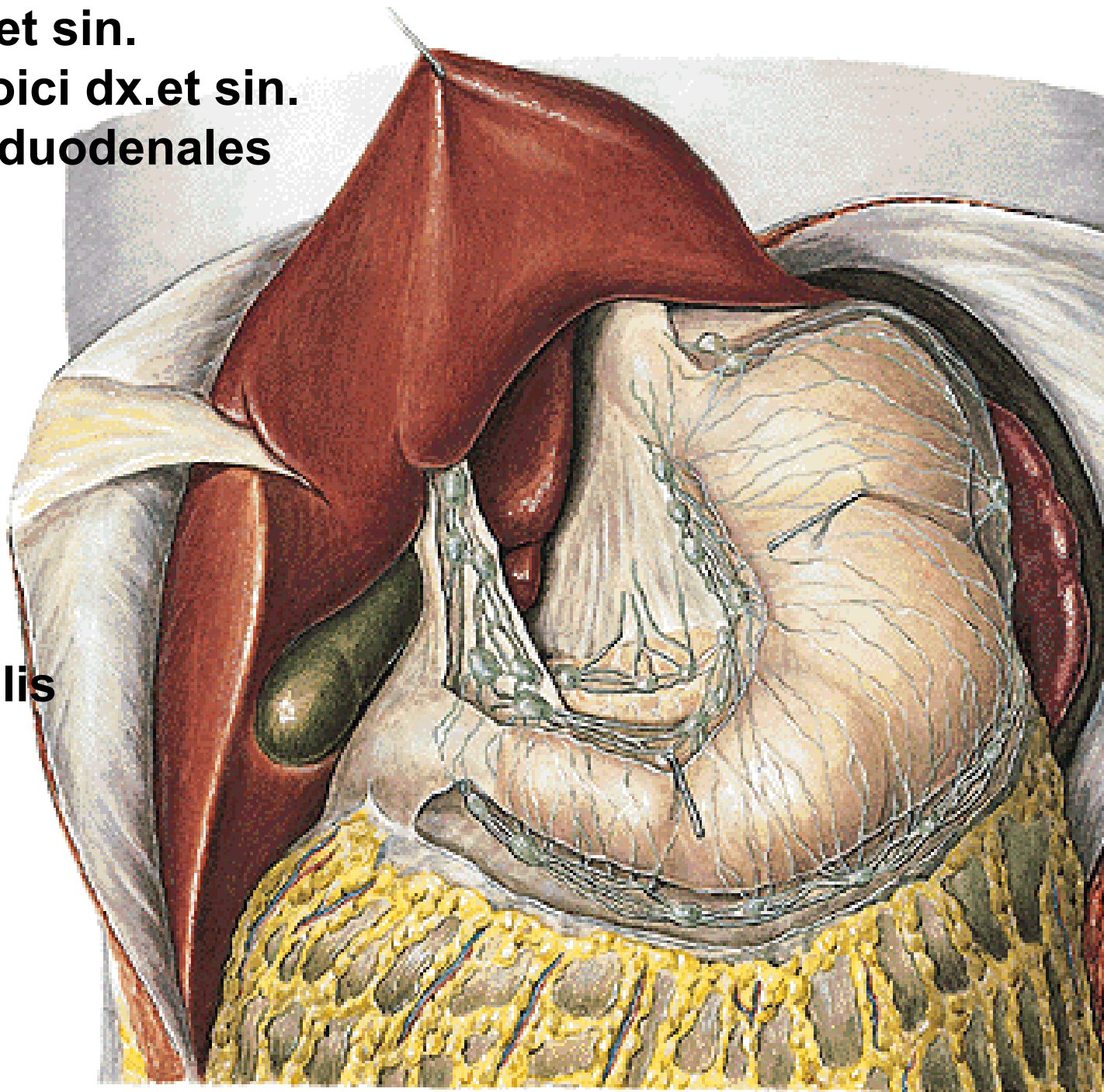


## NII. mediastinales post.



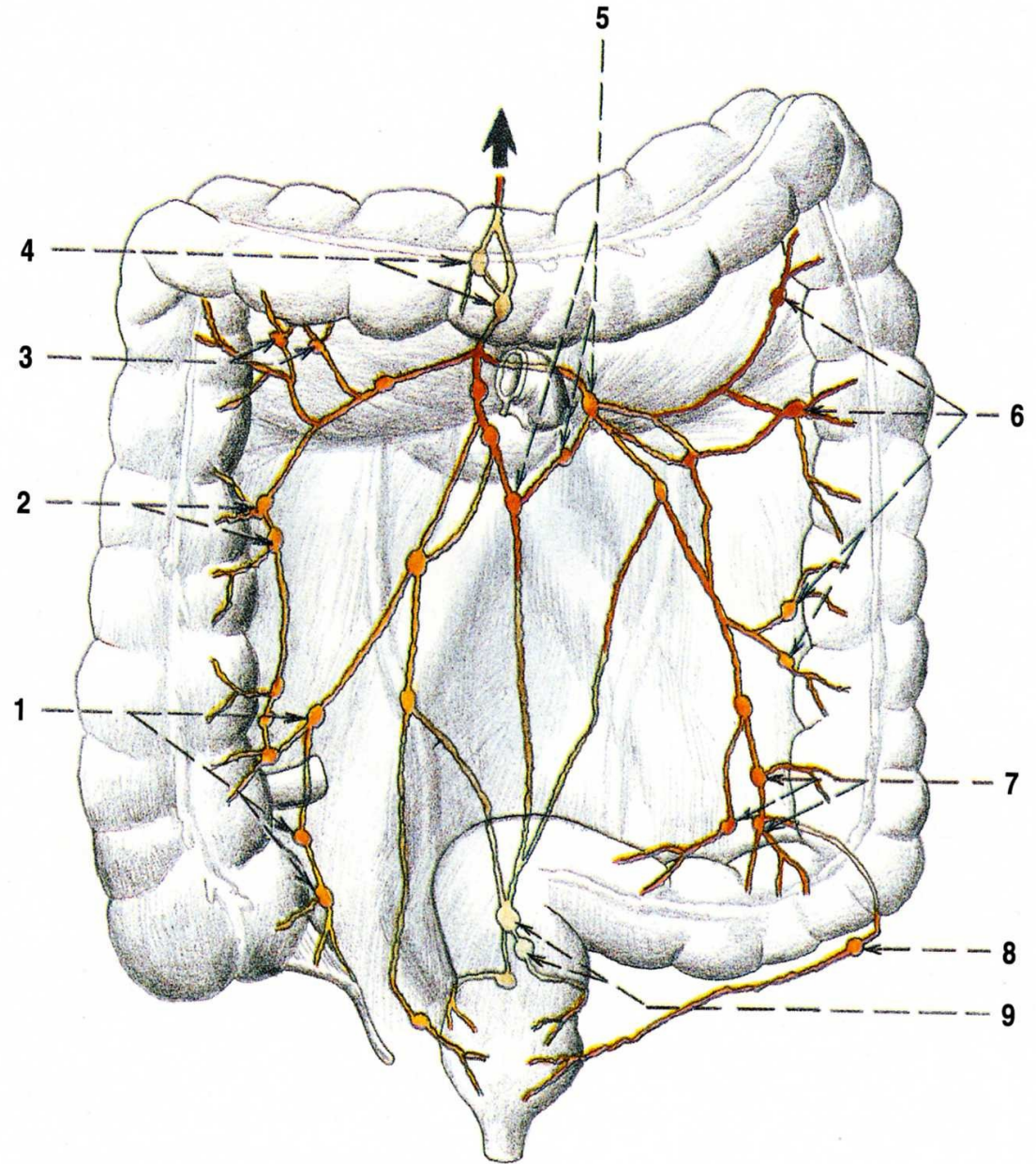
**Nll. gastrici dx. et sin.**  
**Nll. gastroepiploici dx.et sin.**  
**Nll. pancreaticoduodenales  
sup. et inf.**  
**Nll. lienales**  
**Nll. coeliaci**  
**Nll. hepatici**  
**Nll. pancreatici  
sup. et inf.**

**→ tr. intestinalis**



**Nodi ileocolici**  
**Nodi colici dx.**  
**Nodi colici medii**  
**Nodi colici sinistri**  
**Nodi sigmoidei**  
**Nodi rectales sup.**  
**Nodi mesenterici sup.**  
**Nodi mesenterici inf.**

→ **tr. intestinalis**

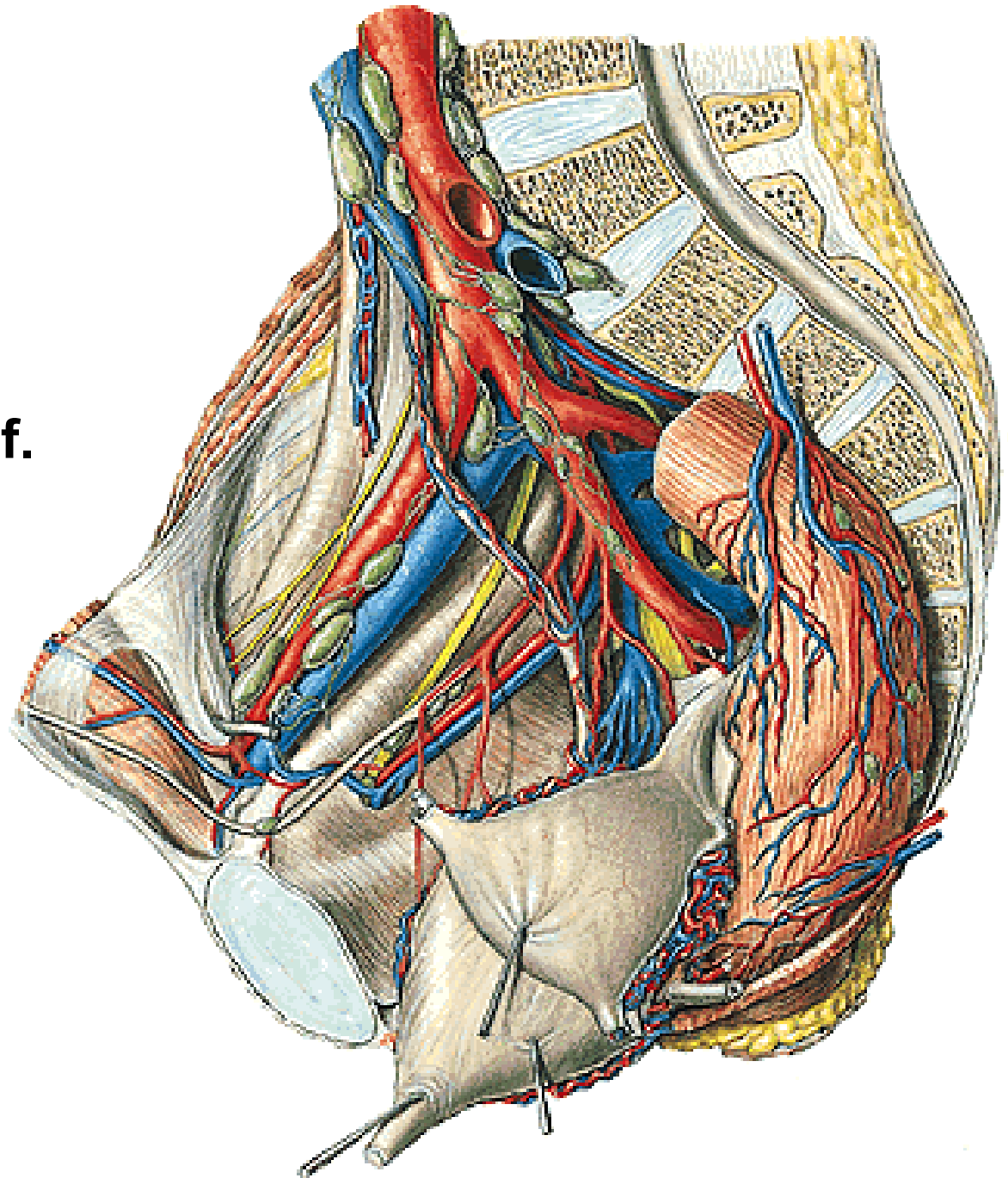


## **Nll. iliaci interni**

- nll. paravesicales
- nll. paravaginales
- nll. parauterini  
(Bayer)
- nll. pararectales
- nll. glutei sup. et inf.
- nll. sacrales

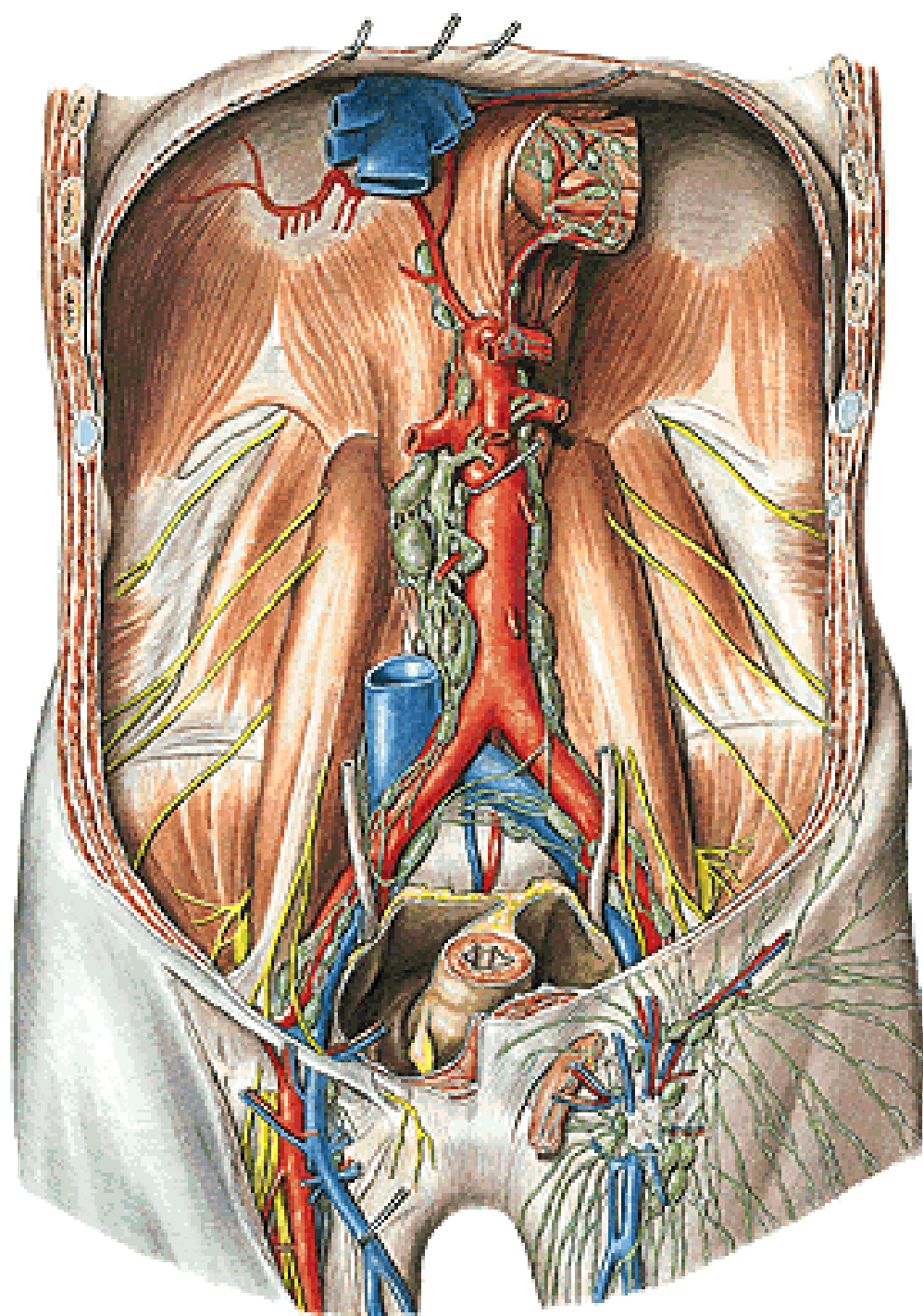
## **Nll. iliaci externi**

## **Nll. iliaci communes**



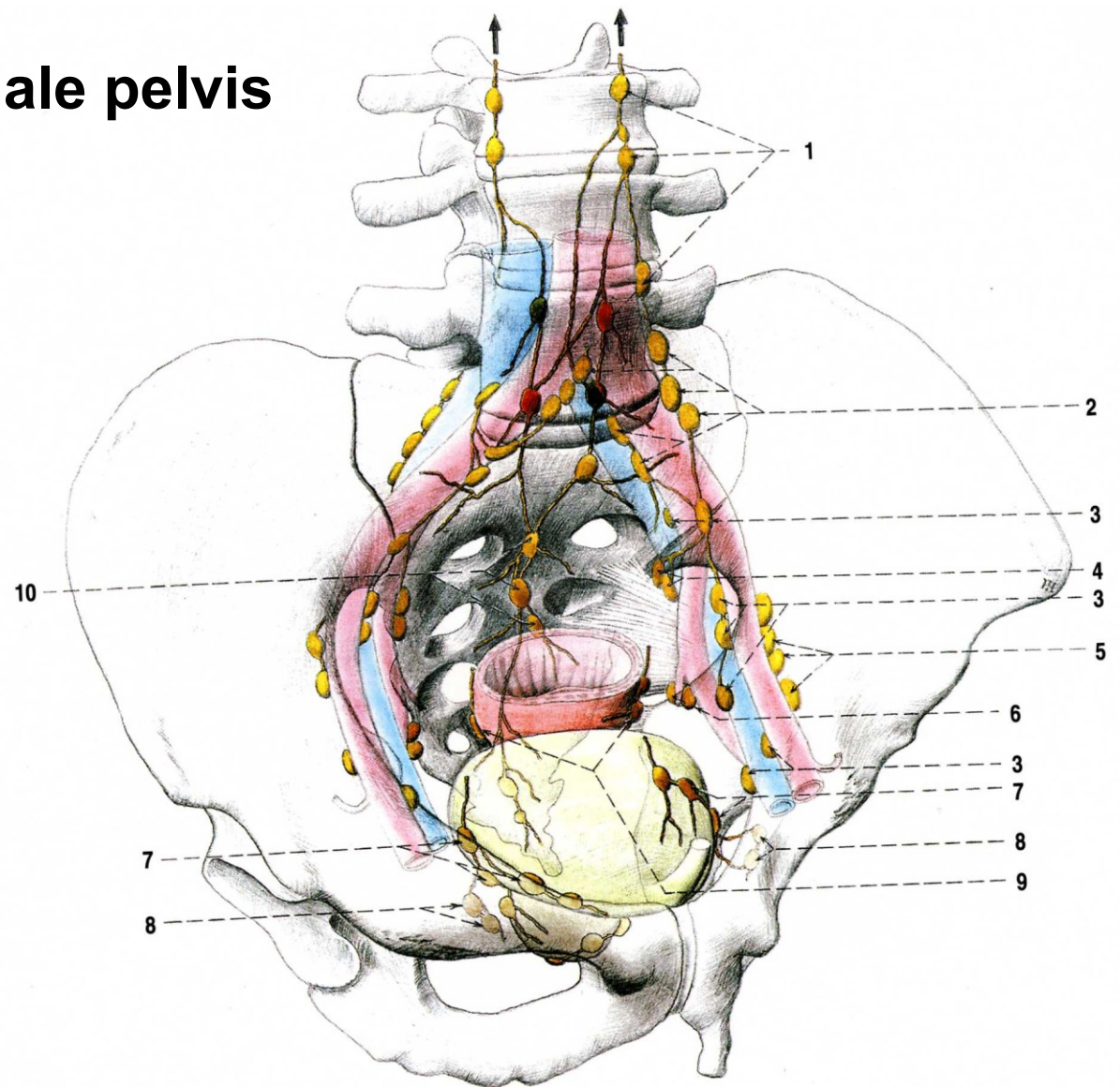
## **NII. lumbales (paraaortici)**

**→ tr. lumbalis dx. et sin.**





# Drainage of the male pelvis

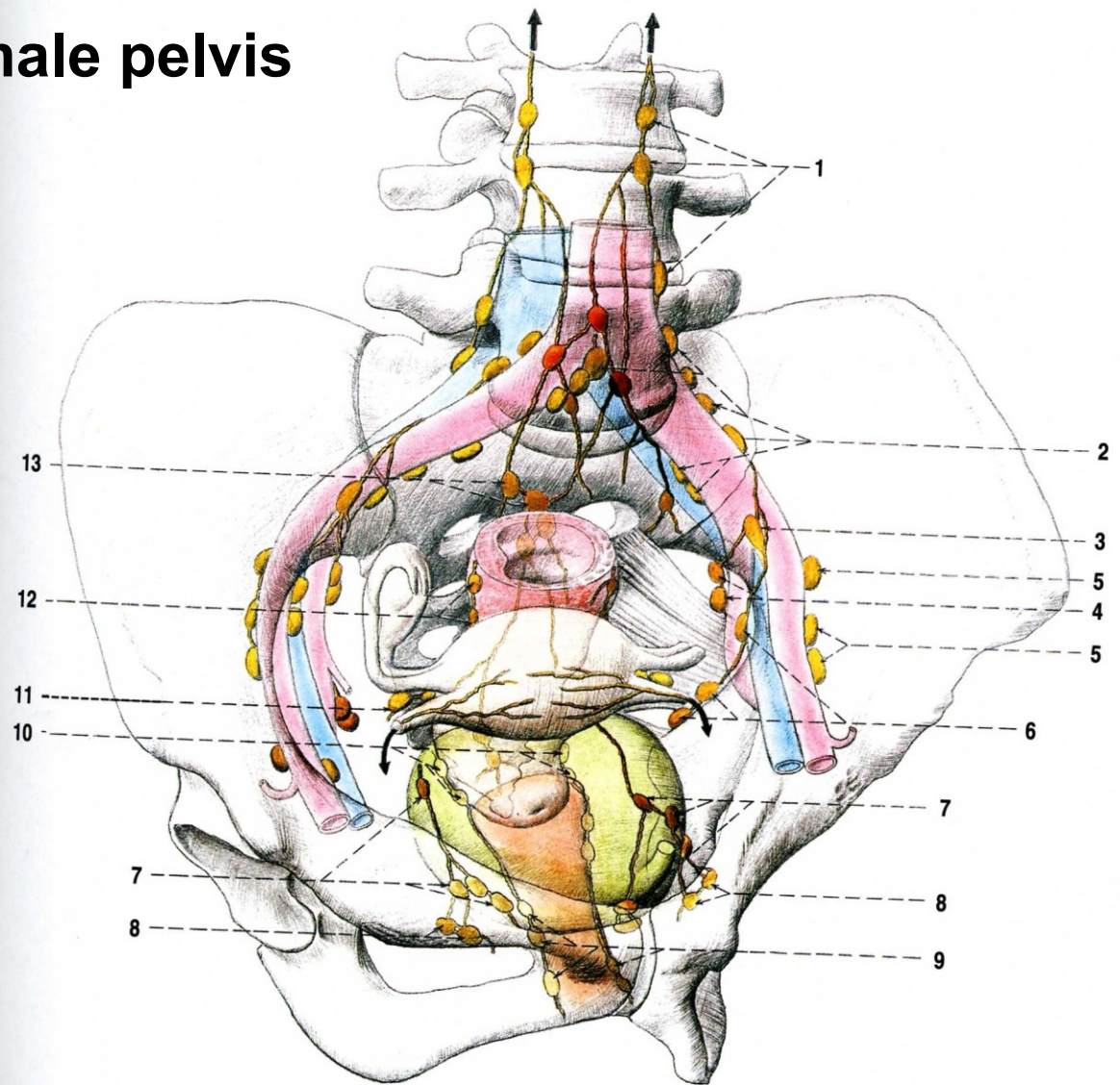


Obr. 139. NODI SACRALES A MÍZNÍ UZLINY PÁNEVNÍCH  
ORGÁNŮ MUŽE

- 1 nodi lumbales
- 2 nodi iliaci communes
- 3 nodi iliaci interni
- 4 nodi glutaei superiores

- 5 nodi iliaci externi
- 6 nodi glutaei inferiores
- 7 nodi paravesicales
- 8 nodi obturatorii
- 9 nodi pararectales
- 10 nodi sacrales

# Drainage of the female pelvis



Obr. 140. NODI SACRALES A MÍZŇÍ UZLINY PÁNEVNÍCH  
ORGÁNŮ ŽENY

- 1 nodi lumbales
- 2 nodi iliaci communes
- 3 nodi iliaci interni
- 4 nodi glutaei superiores
- 5 nodi iliaci externi
- 6 nodi glutaei inferiores

- 7 nodi paravesicales
- 8 nodi obturatorii
- 9 nodi paravaginales
- 10 nodi parauterini
- 11 Bayerova uzlina
- 12 nodi pararectales
- 13 nodi sacrales

# Lymphography



Blue dye is injected  
between the toes  
into the webbing

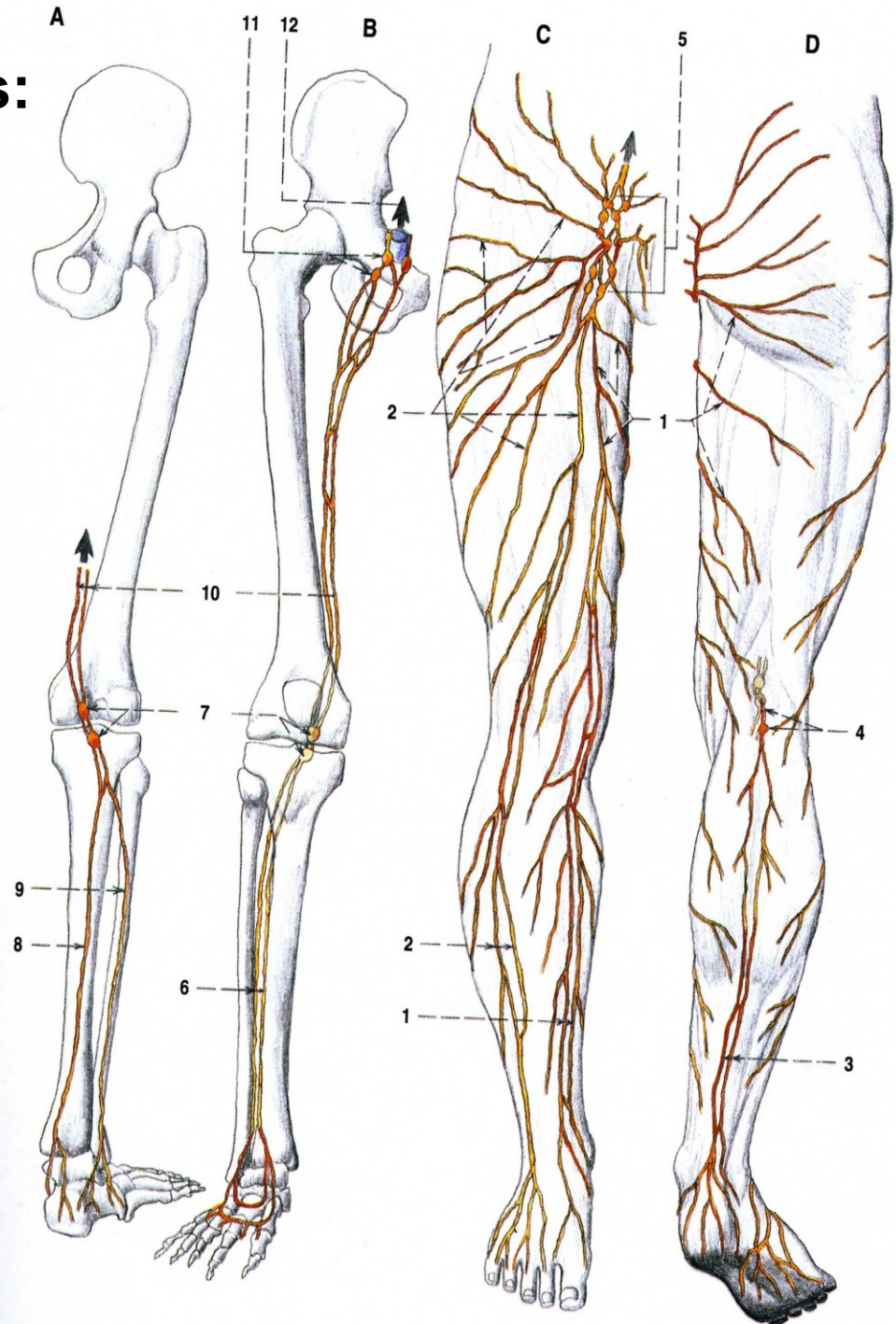




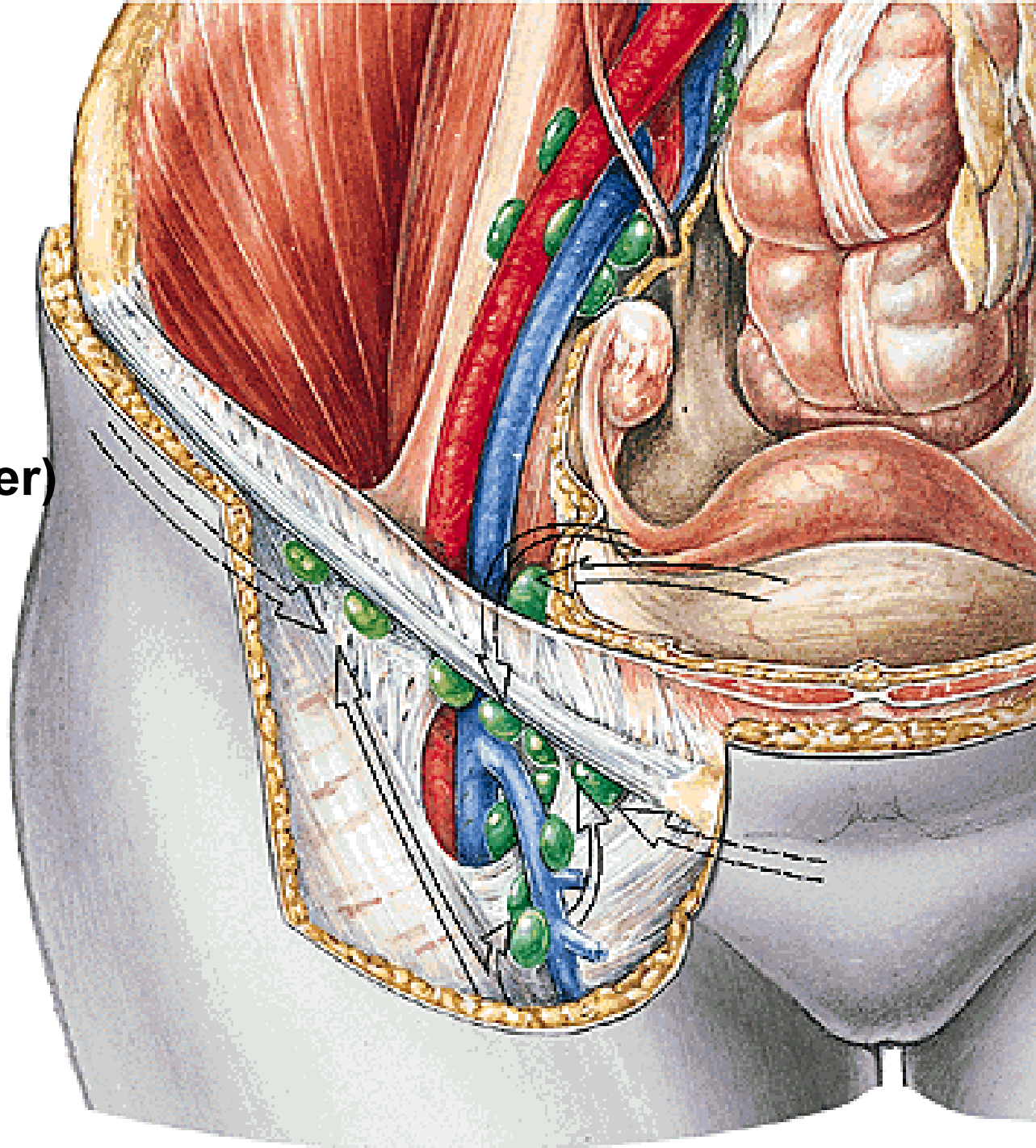
# Superficial lymph vessels:

- collectores mediales
- collectores laterales
- collectores posteriores

## Nll. poplitei spf. et prof.



**Nll. inguinales spf.**  
**Nll. inguinales prof.**  
**(Cloquet-Rosenmüller)**



**Nll. inguinales spf.  
(hiatus saphenus)**

