

* LYMPHATIC SYSTEM

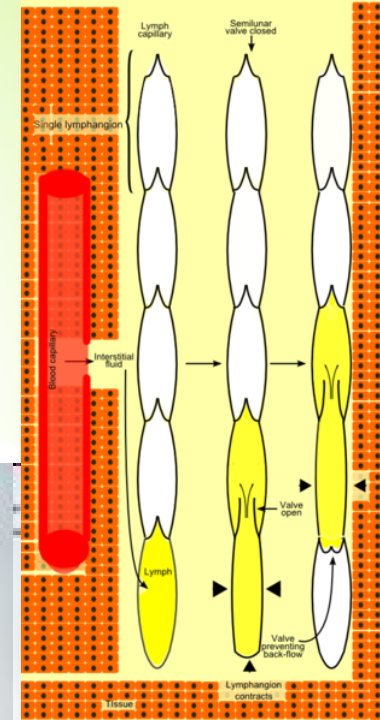
Vasa lymphocapillaria – rete lymphocapillare

Lymphoedema, metastasis

Vasa lymphatica – vas afferens, vas efferens

Trunci lymphatici

Lympha – chylus



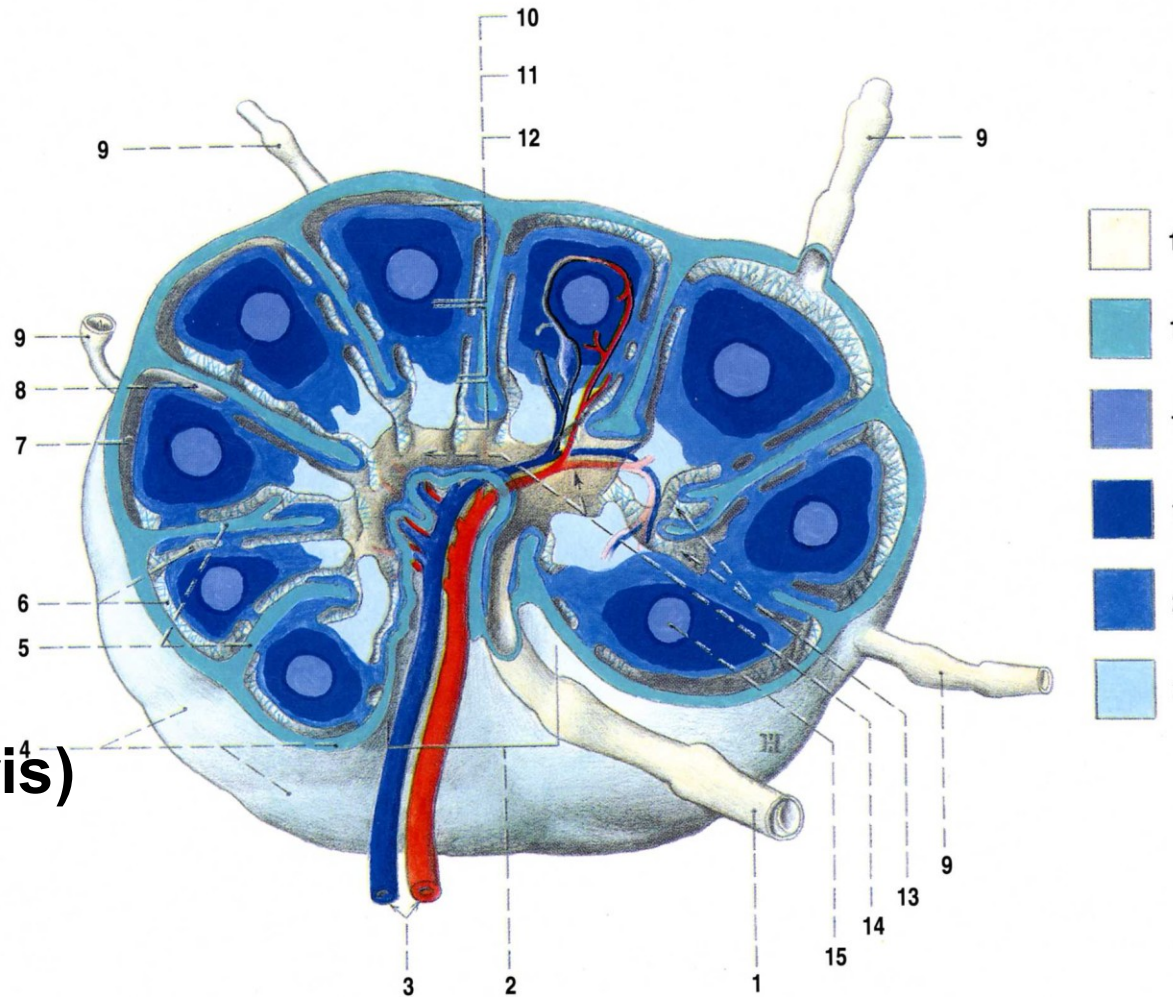
Folliculi lymphoidei, nodi lymphoidei, tonsillae, lien, mucosa-associated lymphoid tissue, thymus

CAPILLARY LYMPH PUMP



Nodus lymphoideus

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



Tributary region
Regional lymph nodes

Sentinel lymph node

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

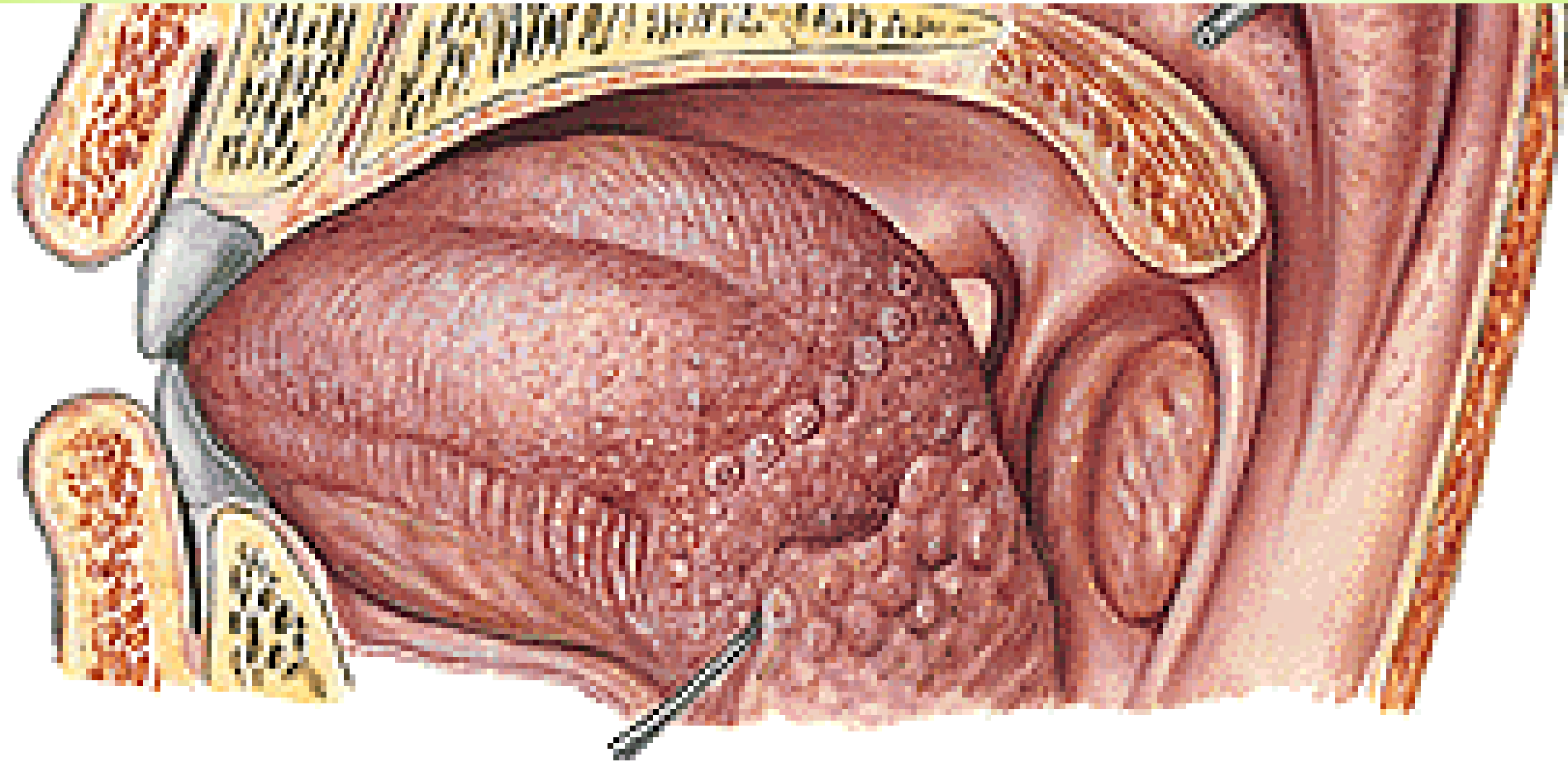
- 1 vas efferens nodi lymphatici
- 2 hilum nodi lymphatici
- 3 krevní cévy uzliny
- 4 capsula nodi lymphatici
- 5 trabeculae
- 6 sinusy uzliny s retikulem
- 7 subkapsulární sinus
- 8 peritrabekulární sinus
- 9 vasa afferentia nodi lymphatici
- 10 cortex uzliny s mízními uzlíky

- 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

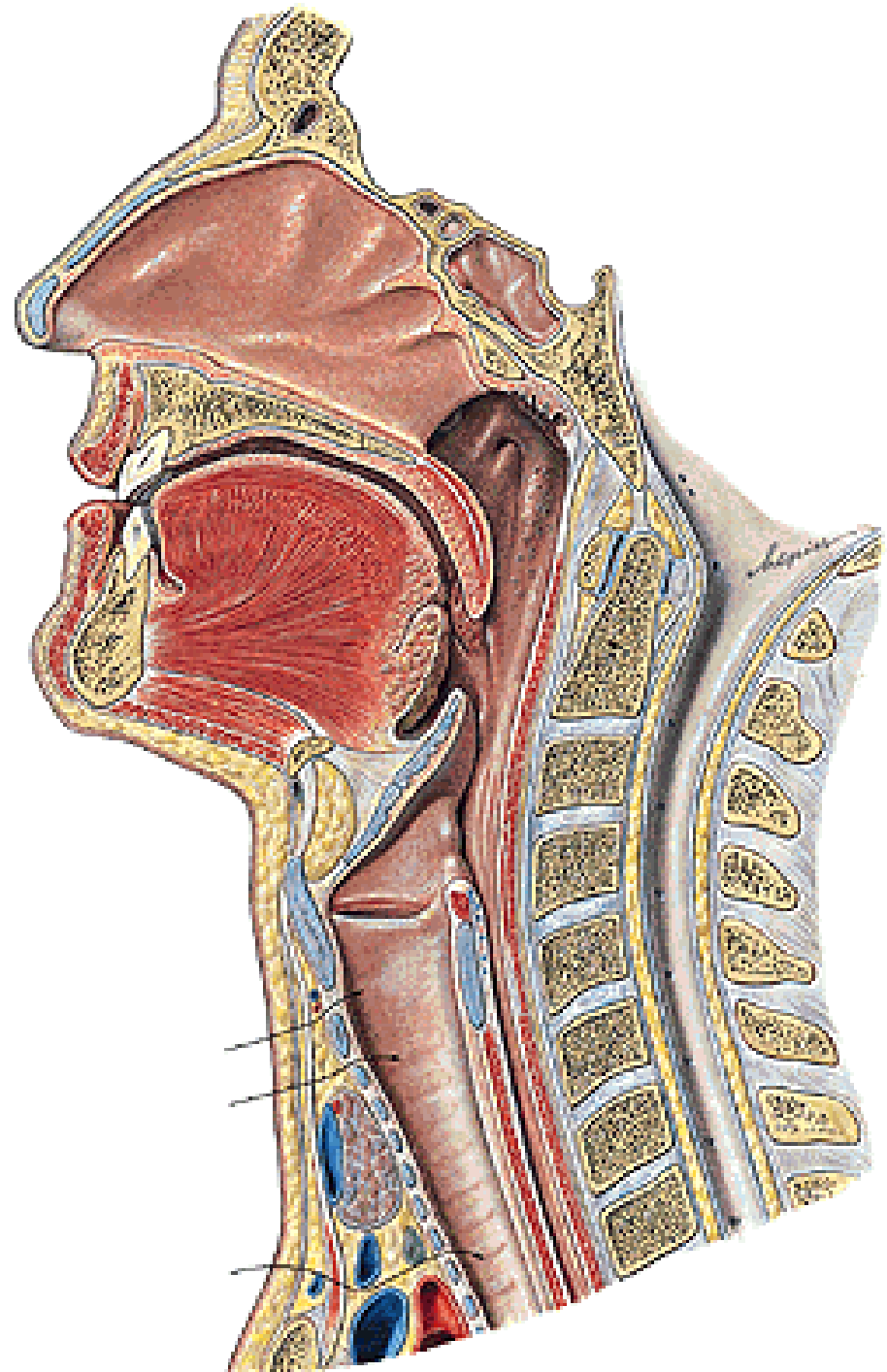


Tonsilla lingualis

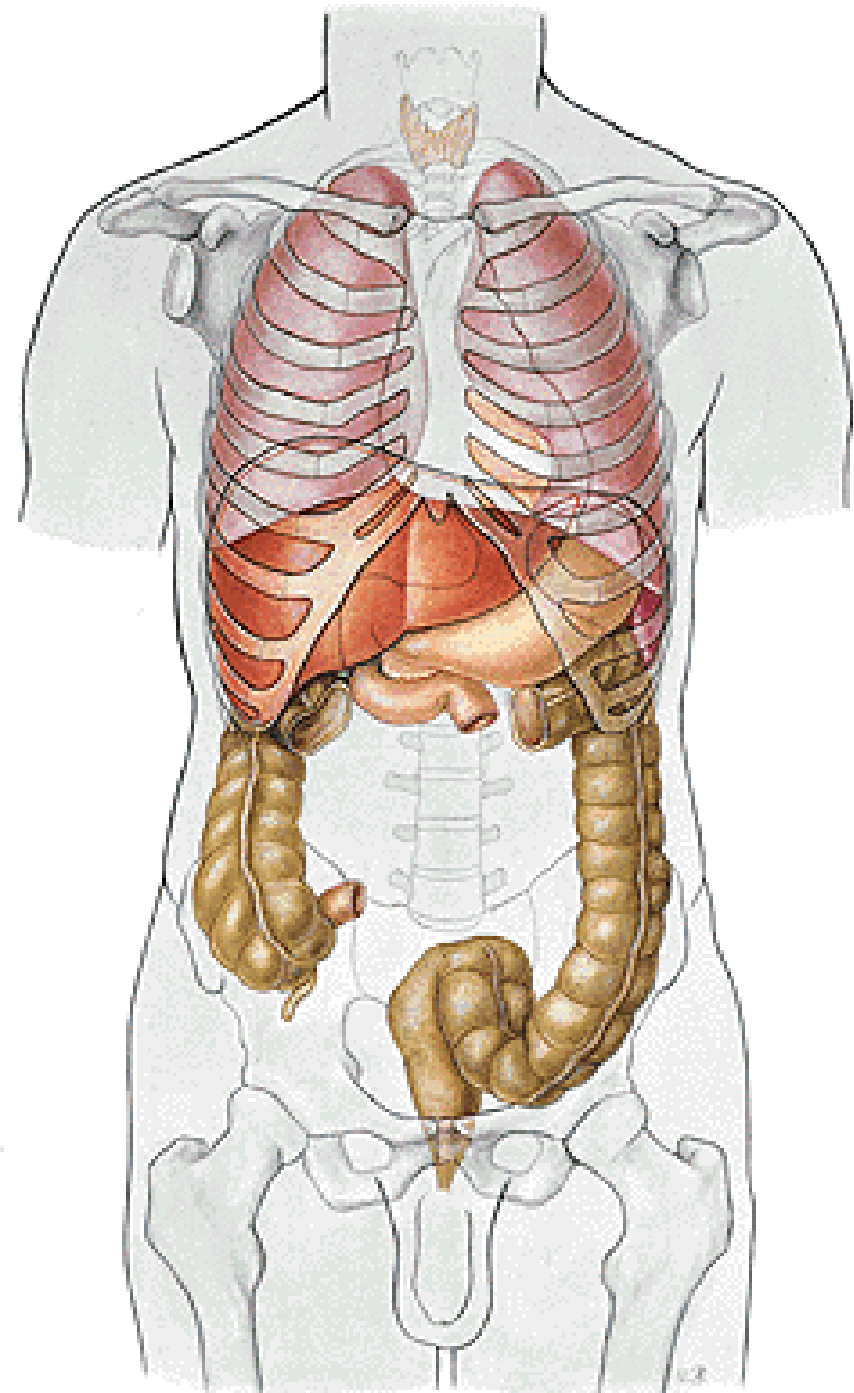


Tonsilla pharyngea
Tonsilla tubaria

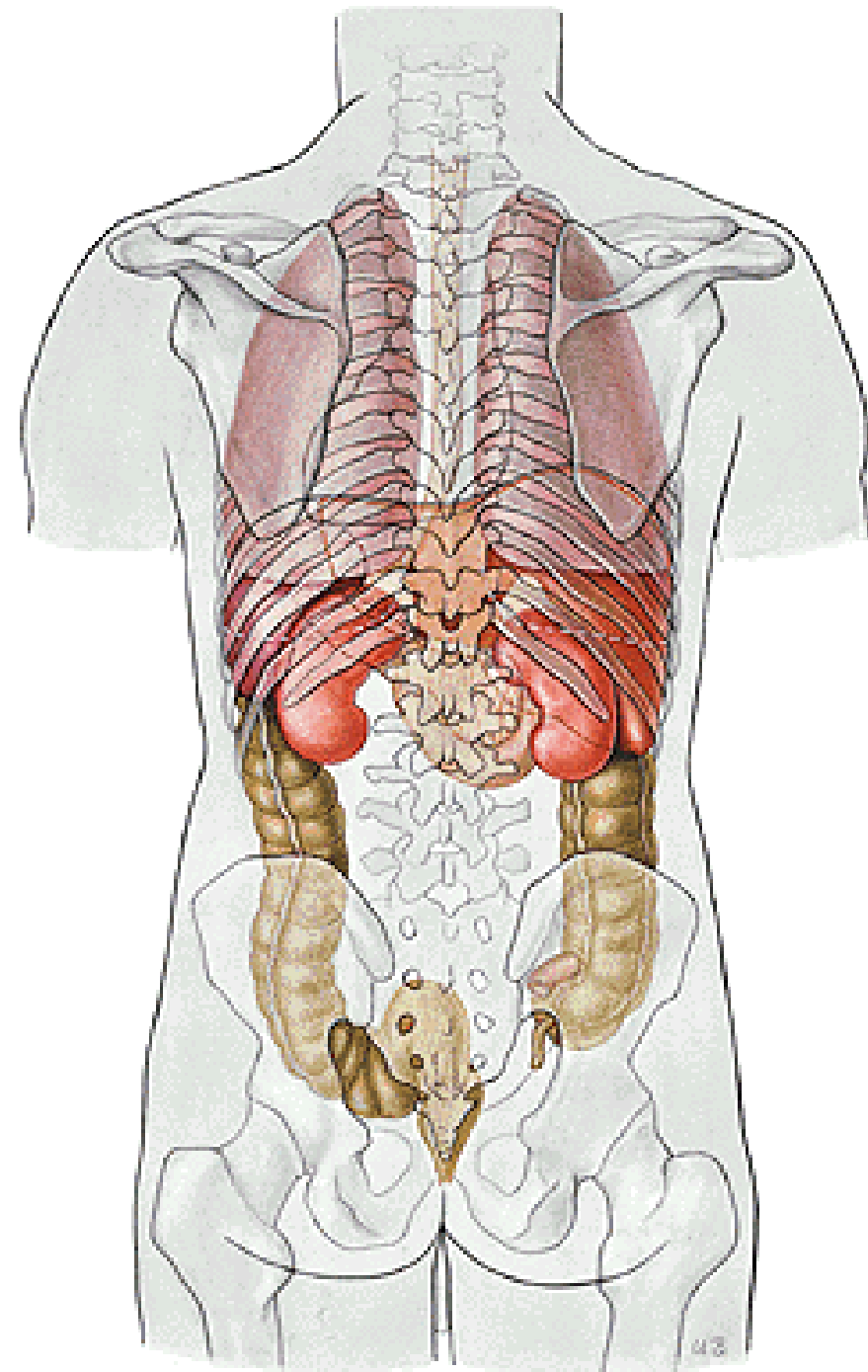
Waldeyer's ring

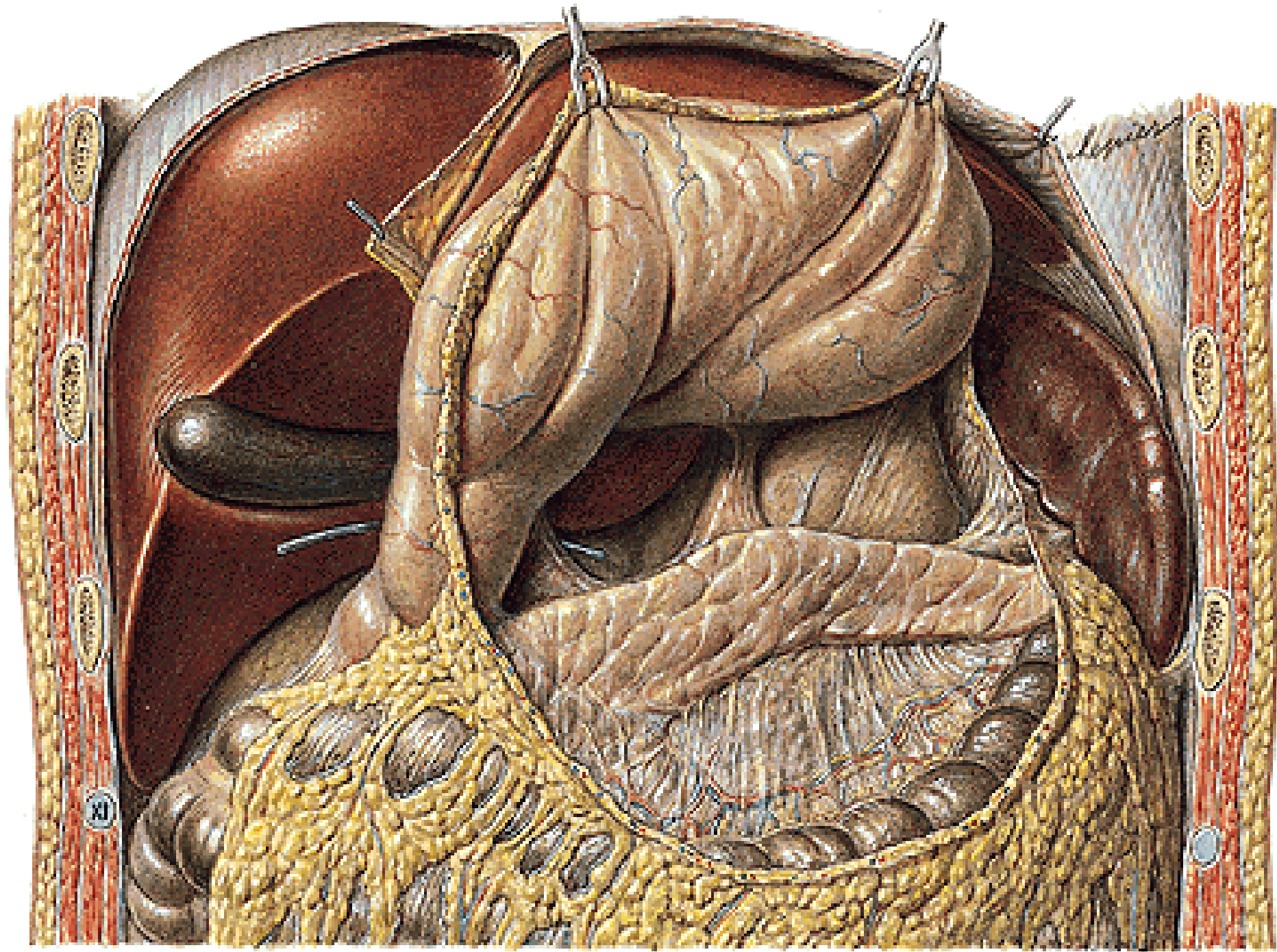


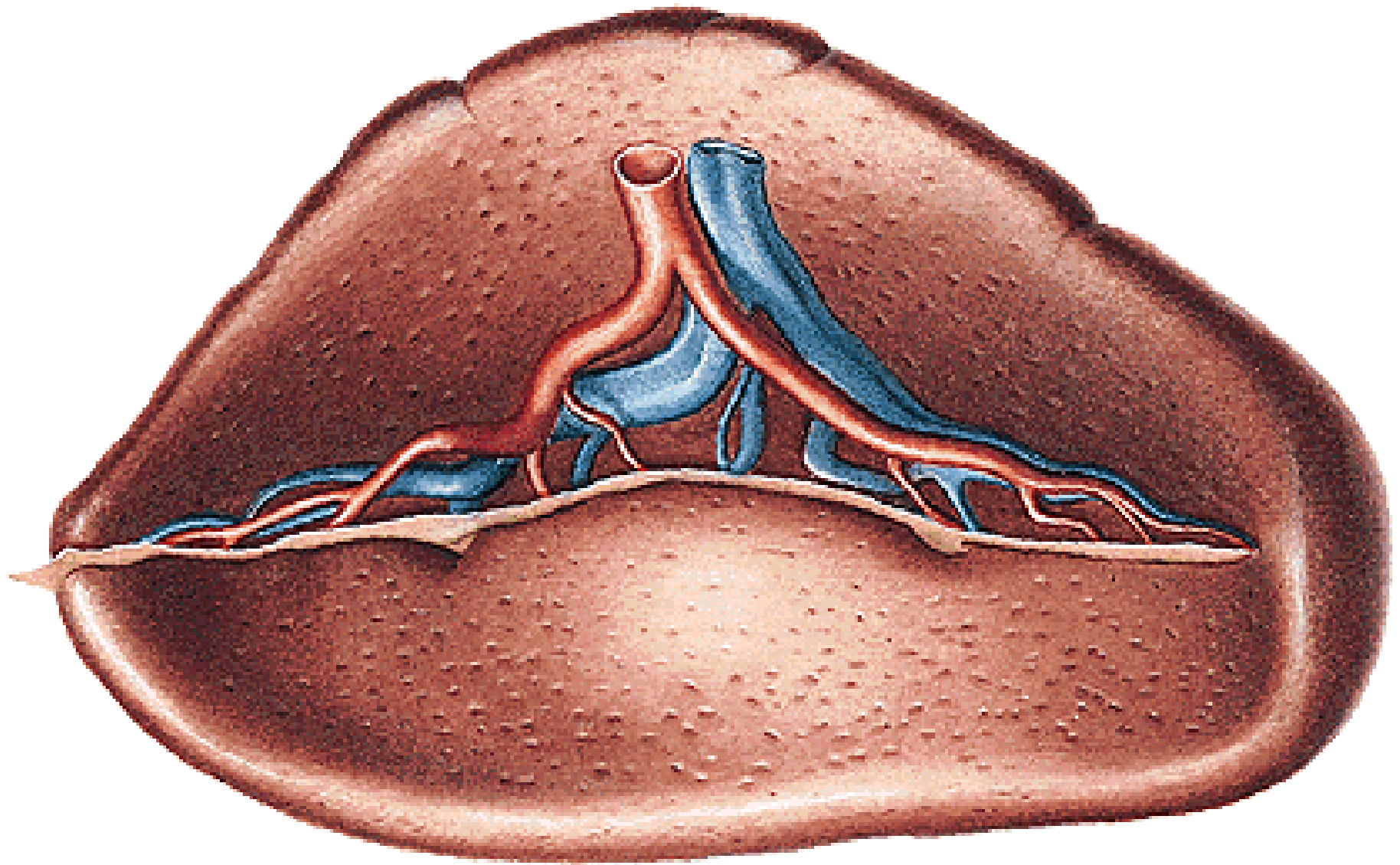
**Tonsilla abdominalis –
appendix vermiformis**



Lien, splen

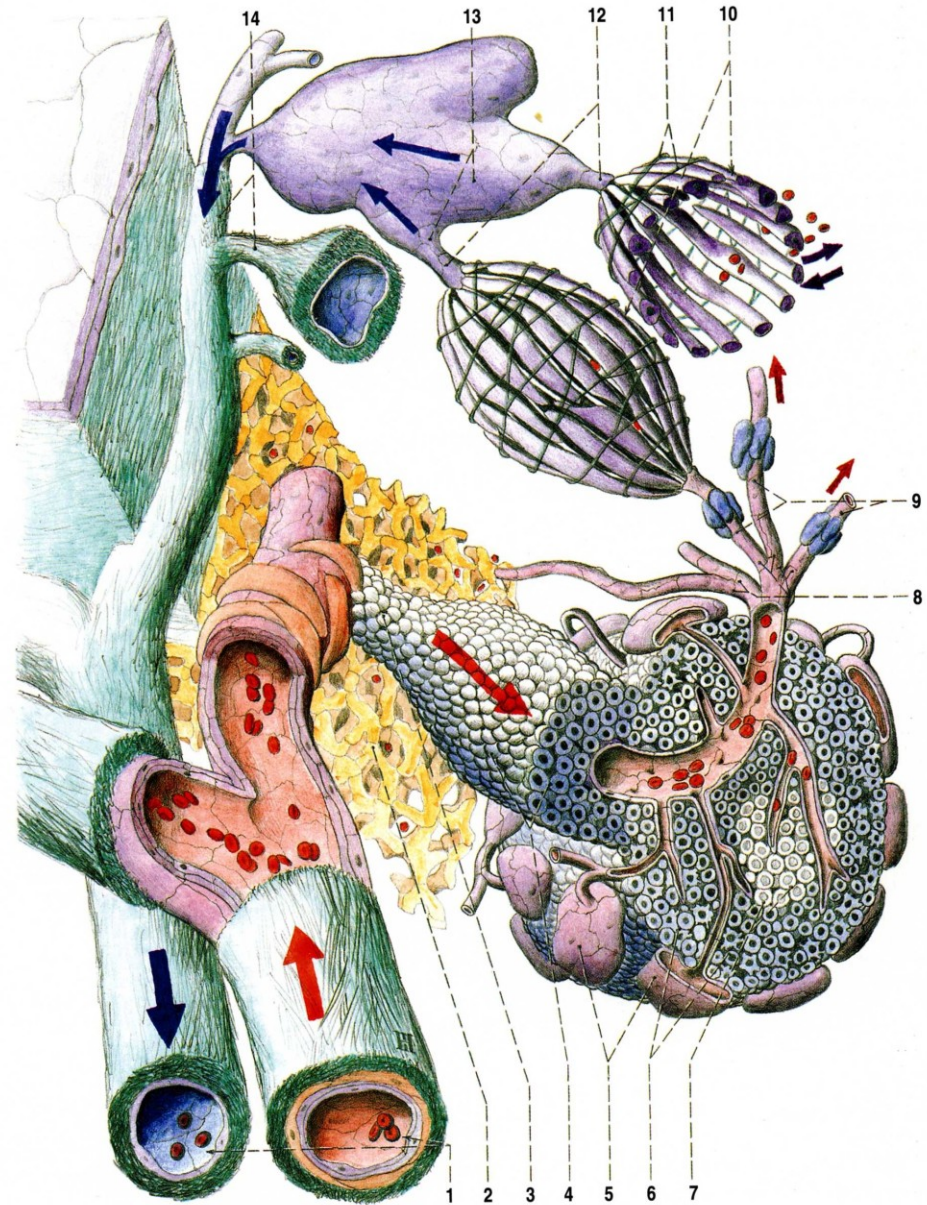








Reticulum Pulpa rubra Pulpa alba

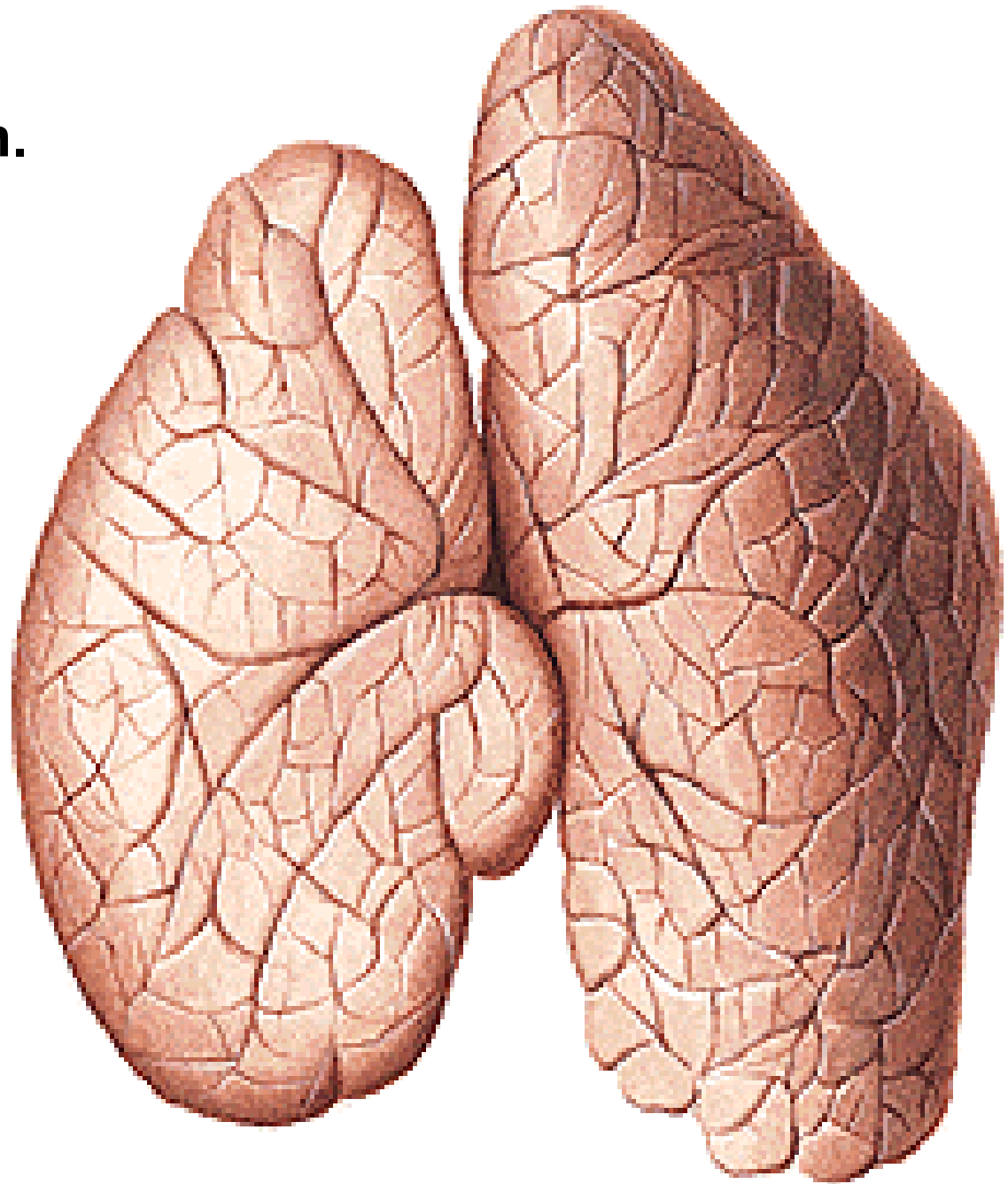


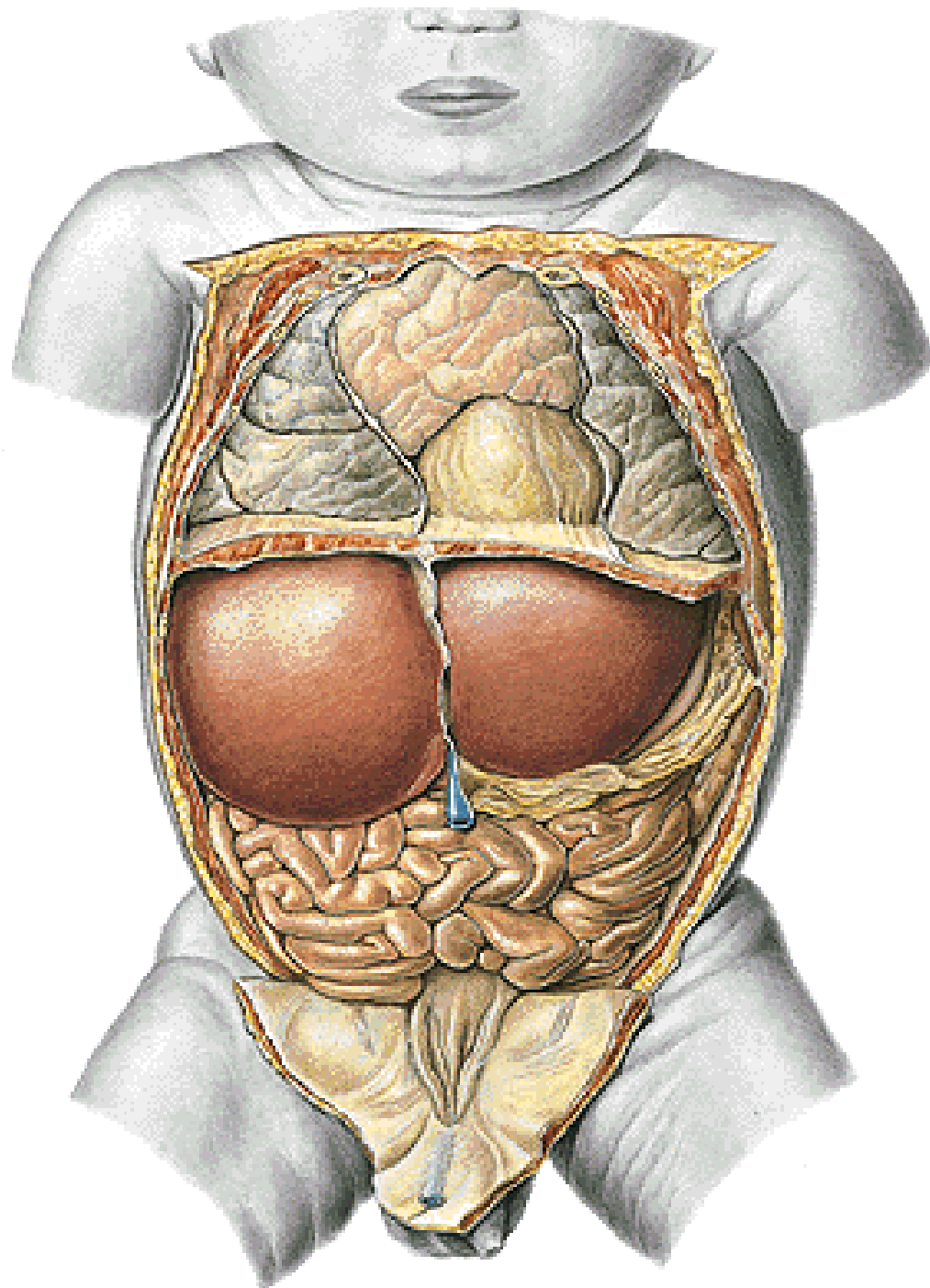
Obr. 123. STAVBA SLEZINY A PRŮTOK KRVE SLEZINOU (schéma); šipky udávají směry toku krve
 1 trabekulární cévy sleziny
 2 červená pulpa sleziny
 3 periarteriální lymfatická pochva
 4 bílá pulpa sleziny – jeden z folliculi lymphatici lienales
 5 sinusy marginální zóny mizního uzlíku
 6 marginální zóna uzlíku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

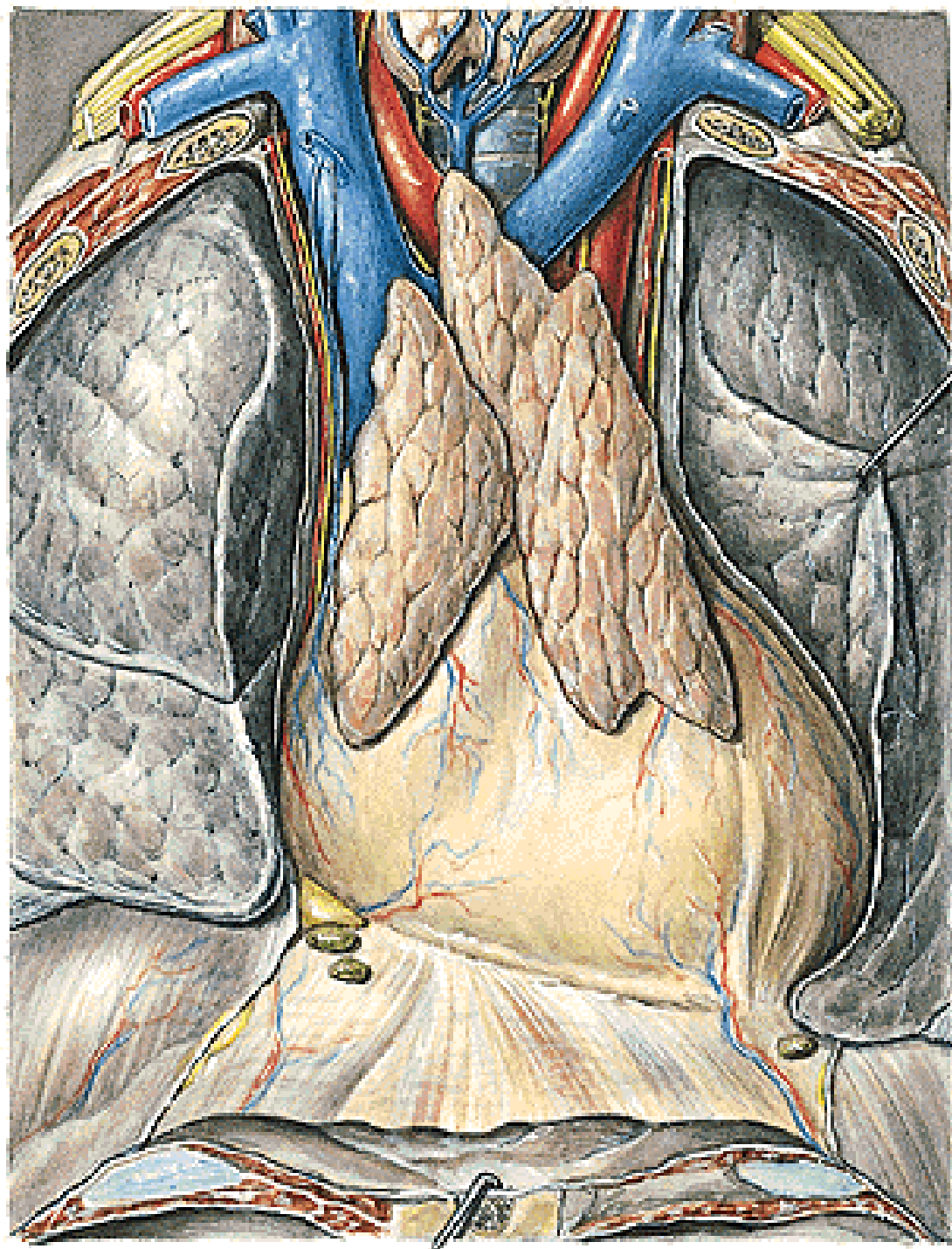
- 7 zárodečné centrum uzlíku
 8 penicillus (aa. penicillatae)
 9 opouzdlé arterky se Schweiggerovým-Seidelovým pouzdrem
 10 slezinové sinusy (sinus lienis)
 11 retikulární vlákna obtačející sinusy
 12 postkapilární žíly
 13 tenkostěnné rozšířené dřeňové žíly
 14 trabekulární žíly

Thymus

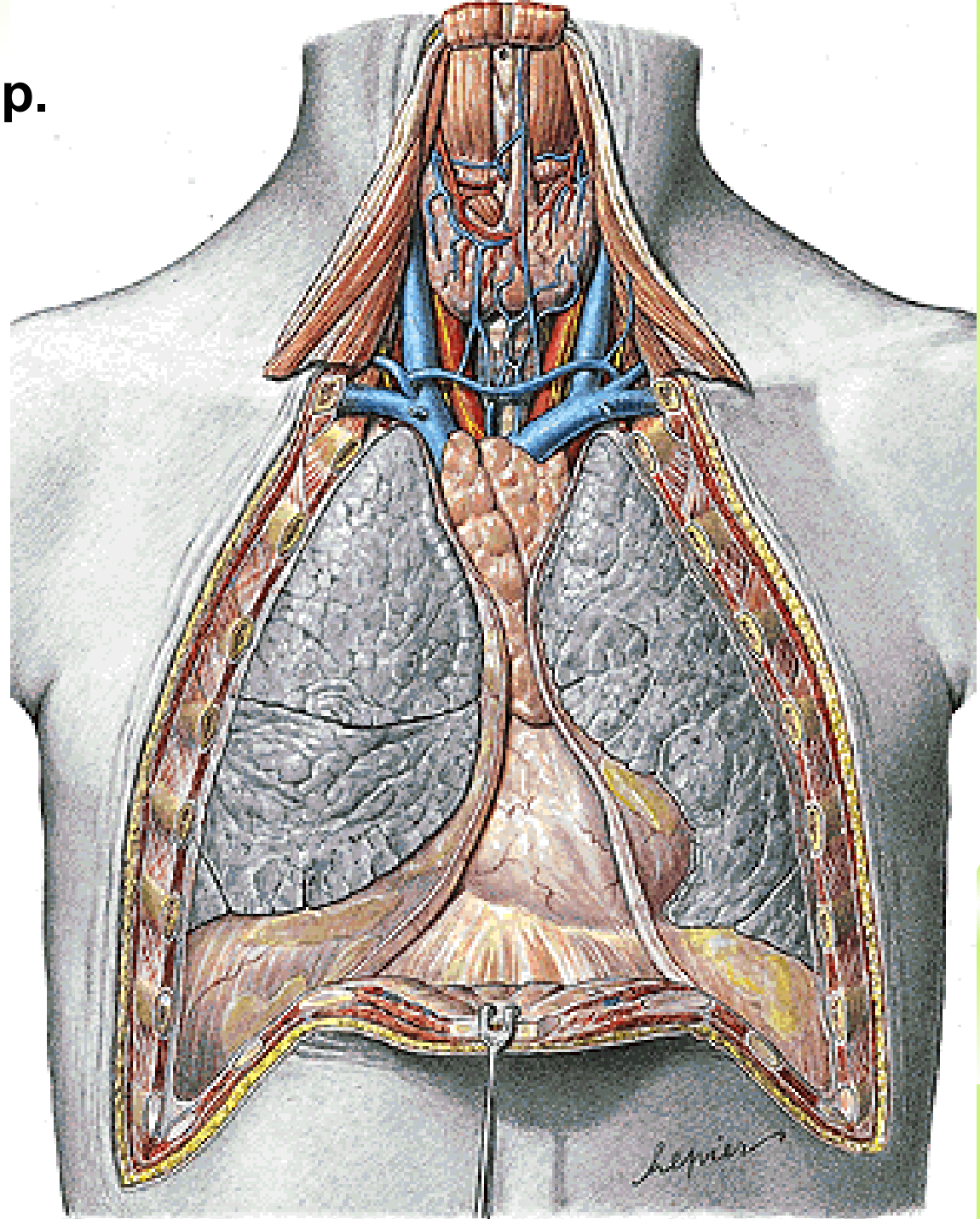
- lobus dx. et sin.





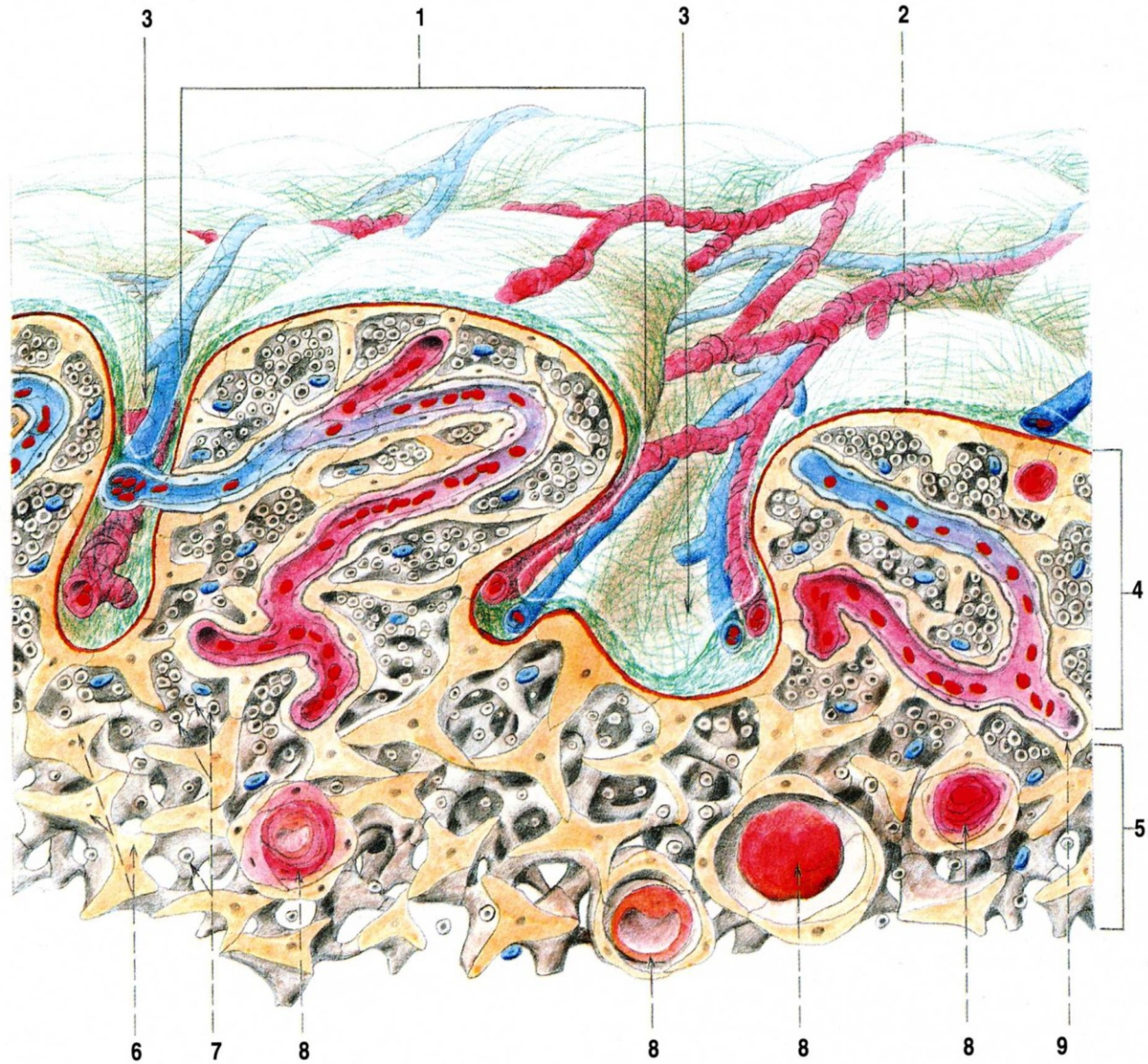


**Area interpleuralis sup.
(thymica)**



Thymus

- capsula
- reticulum
- lobuli
- cortex
- medulla

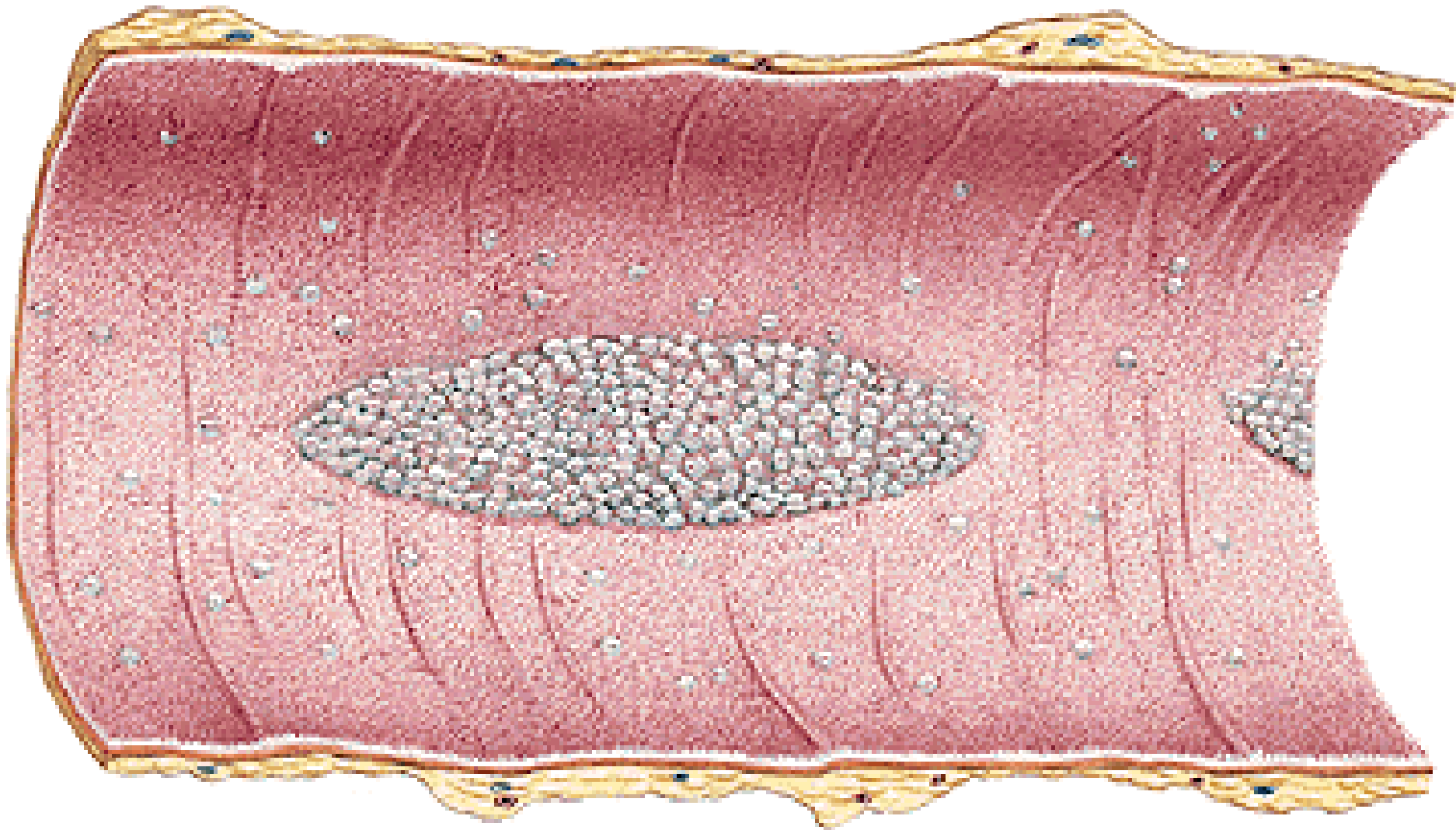


Obr. 128. STAVBA THYMU (schéma)

- 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 lymphoidei solitarii
Folliculi lymphoidei aggregati

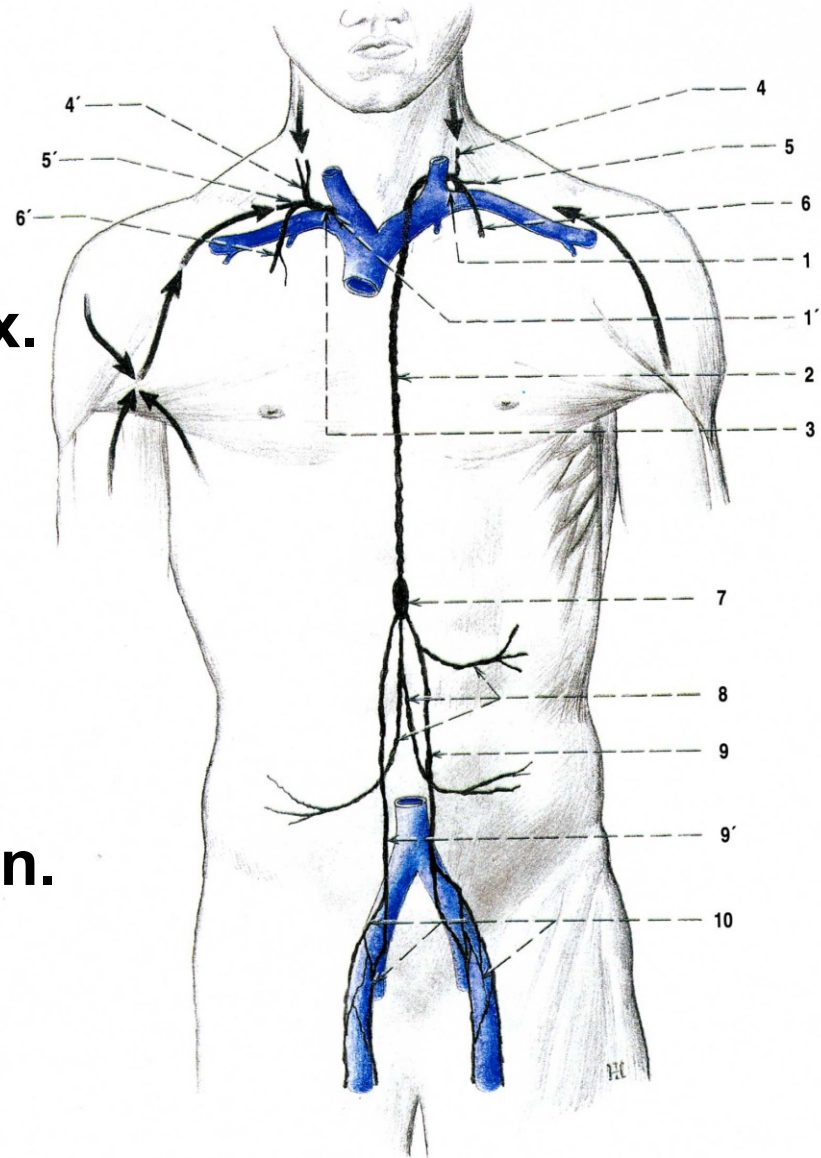


Truncus lymphaticus dexter

- 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.

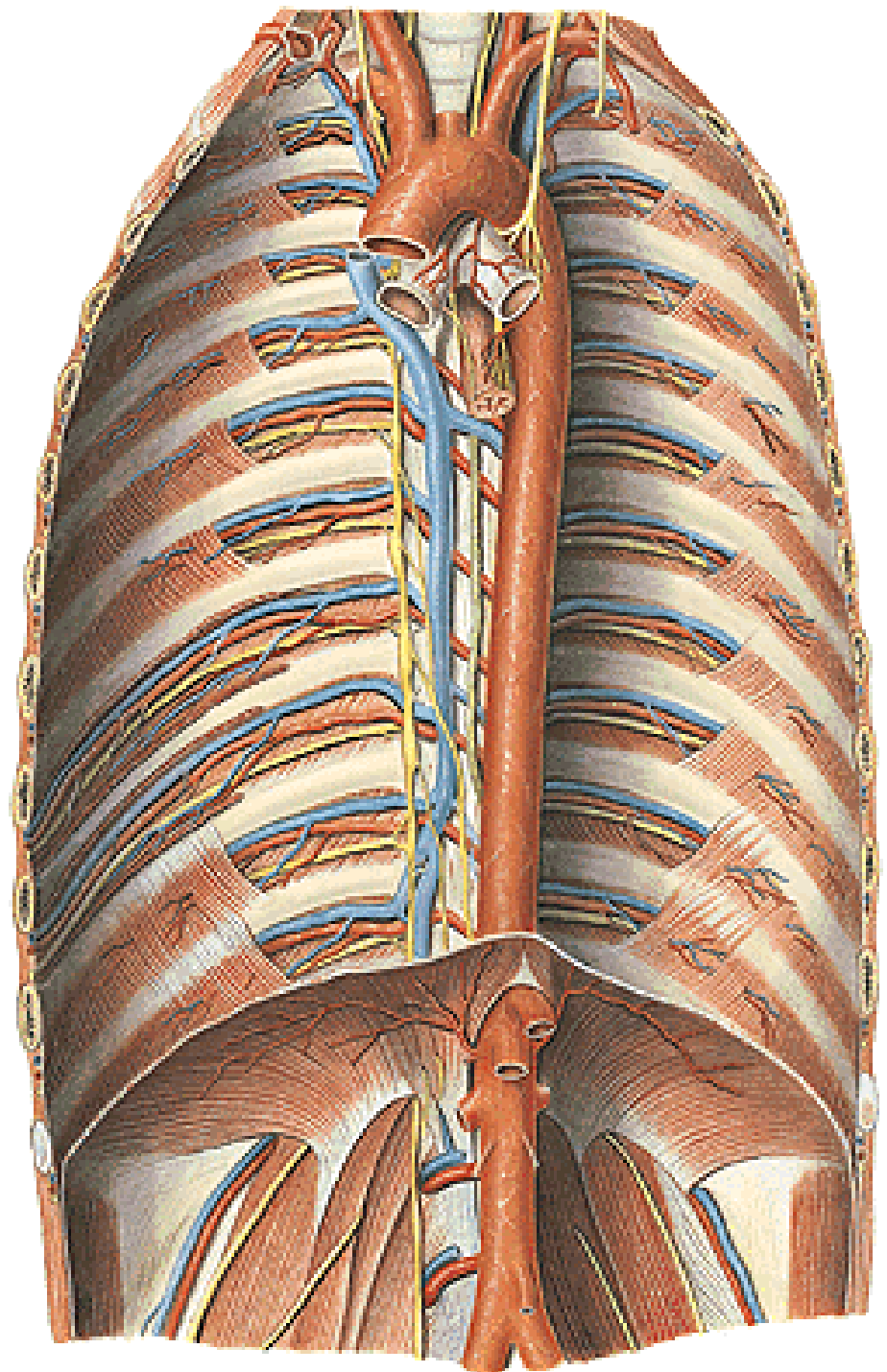


Obr. 129. HLAVNÍ MÍZNÍ KMENY (schéma)

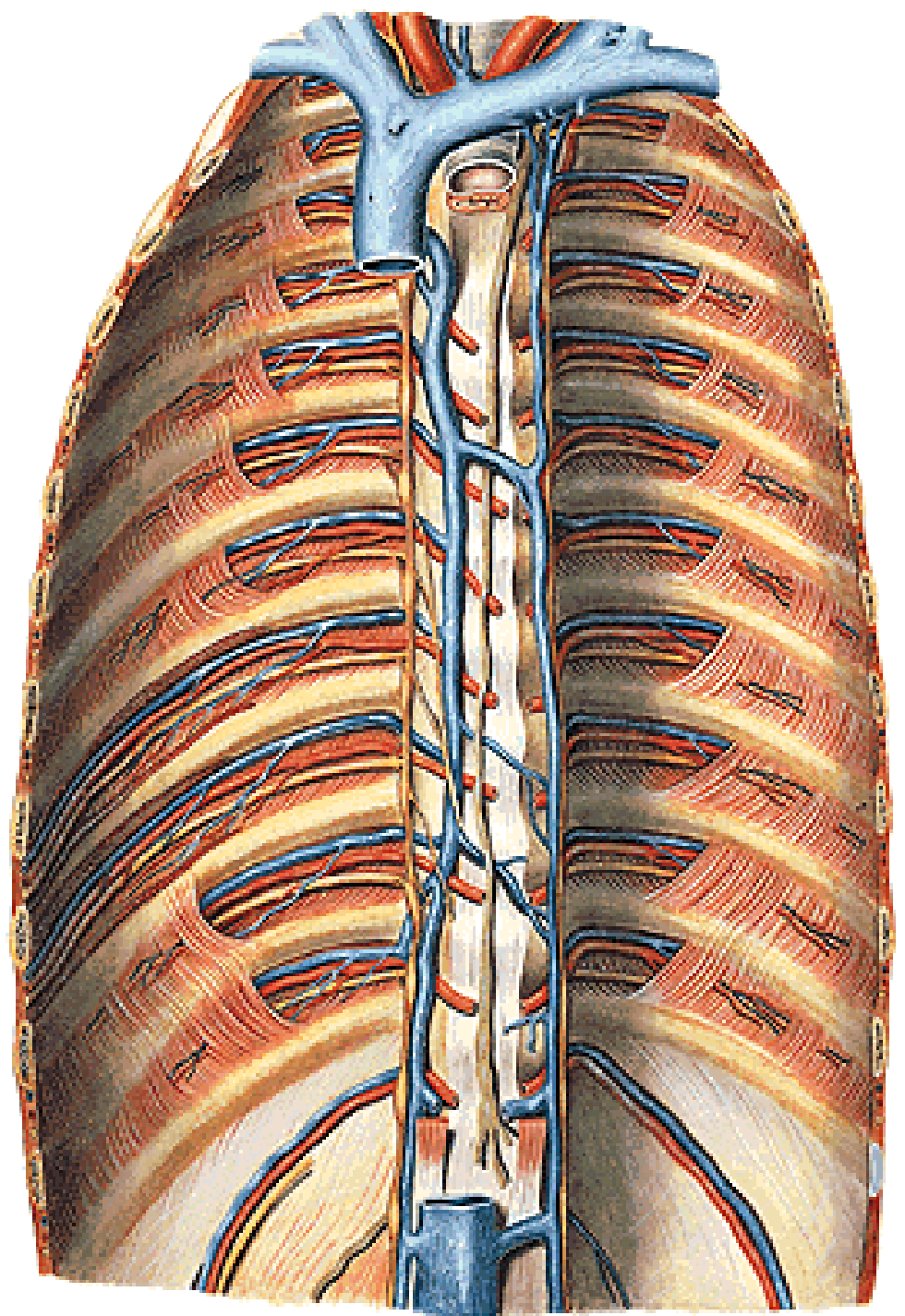
- 1 angulus venosus sinister
- 1' angulus venosus dexter
- 2 ductus thoracicus
- 3 ductus lymphaticus dexter
- 4 truncus jugularis sinister
- 4' truncus jugularis dexter
- 5 truncus subclavius sinister

- 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



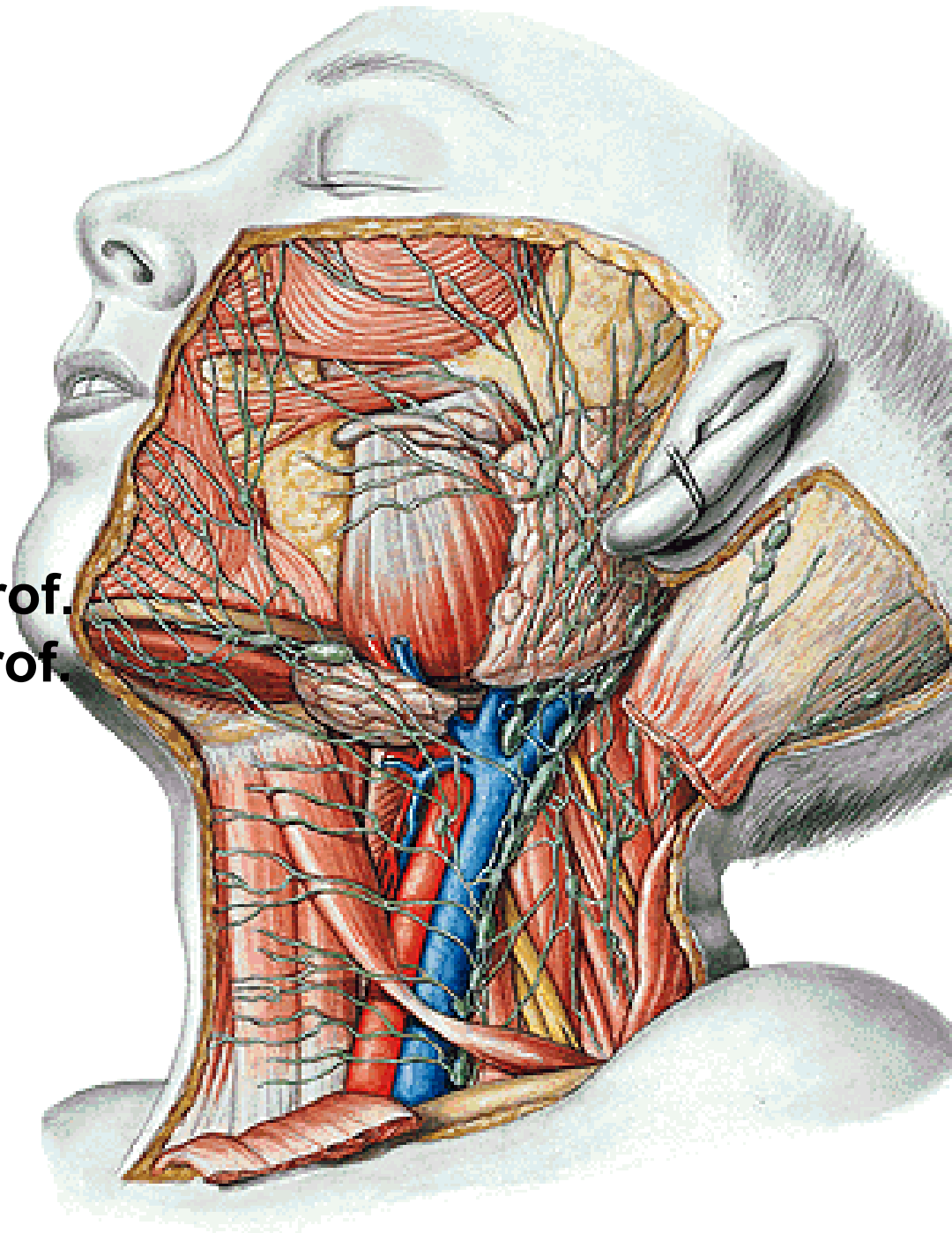
Ductus thoracicus

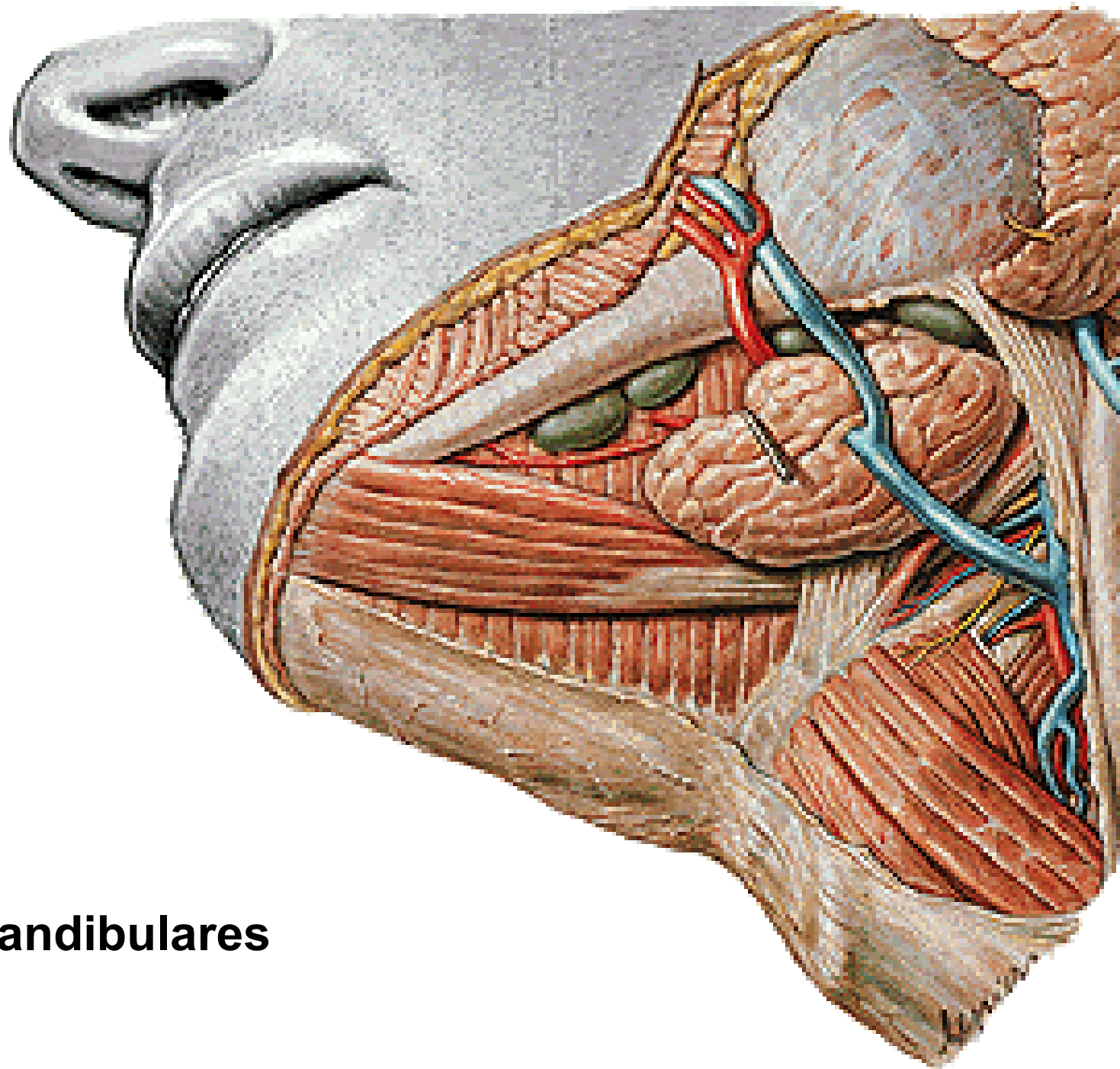


Lymphatic drainage of the head and neck:

Nodi lymph. occipitales
Nll. mastoidei
Nll. parotidei
Nll. submandibulares
Nll. submentales
Nll. cervicales ant.spf. et prof.
Nll. cervicales lat. spf. et prof.
(nll. jugulares int.
nll. supraclaviculares -
Virchow)

→ **tr. jugularis**

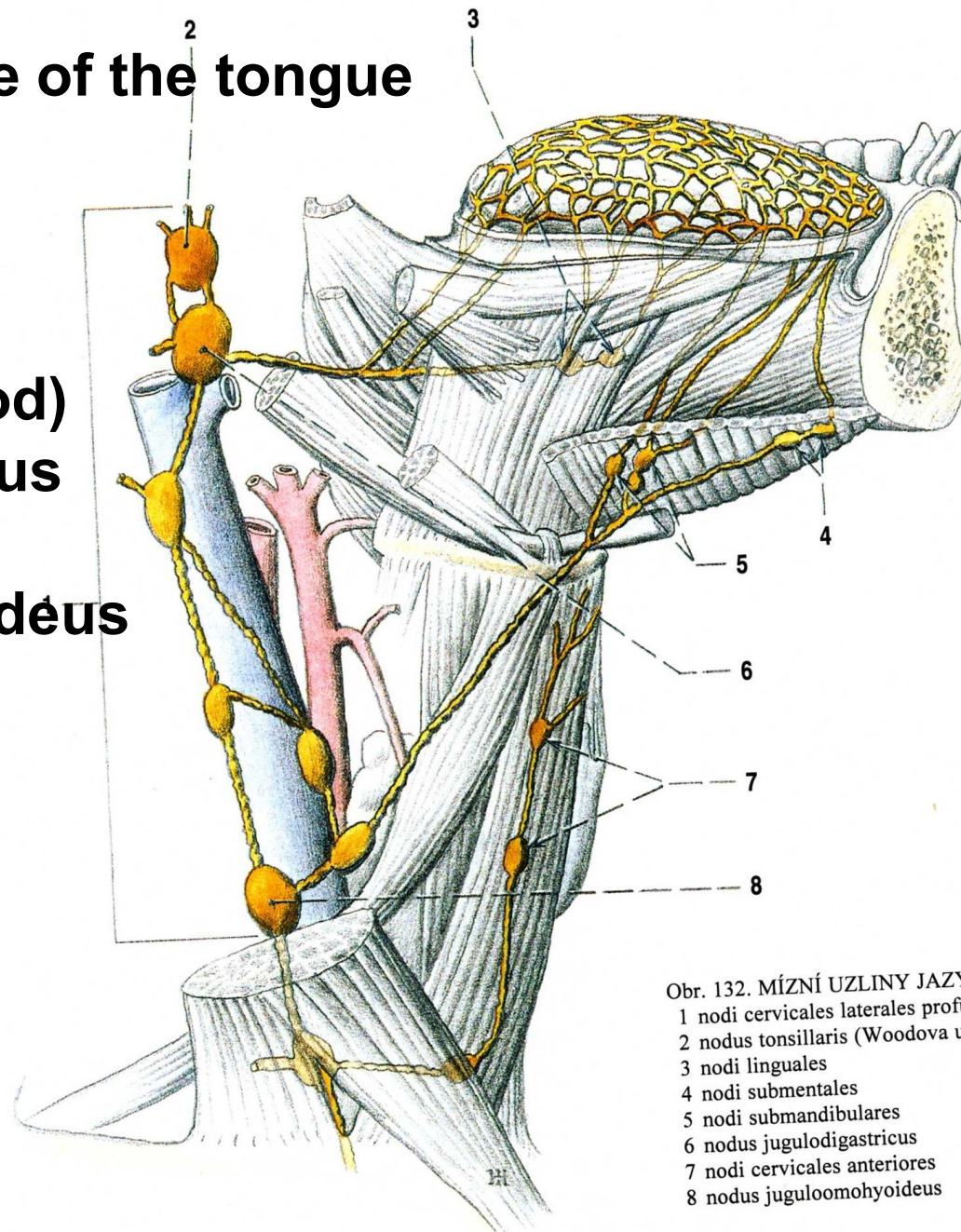




NII. submandibulares

Lymphatic drainage of the tongue

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

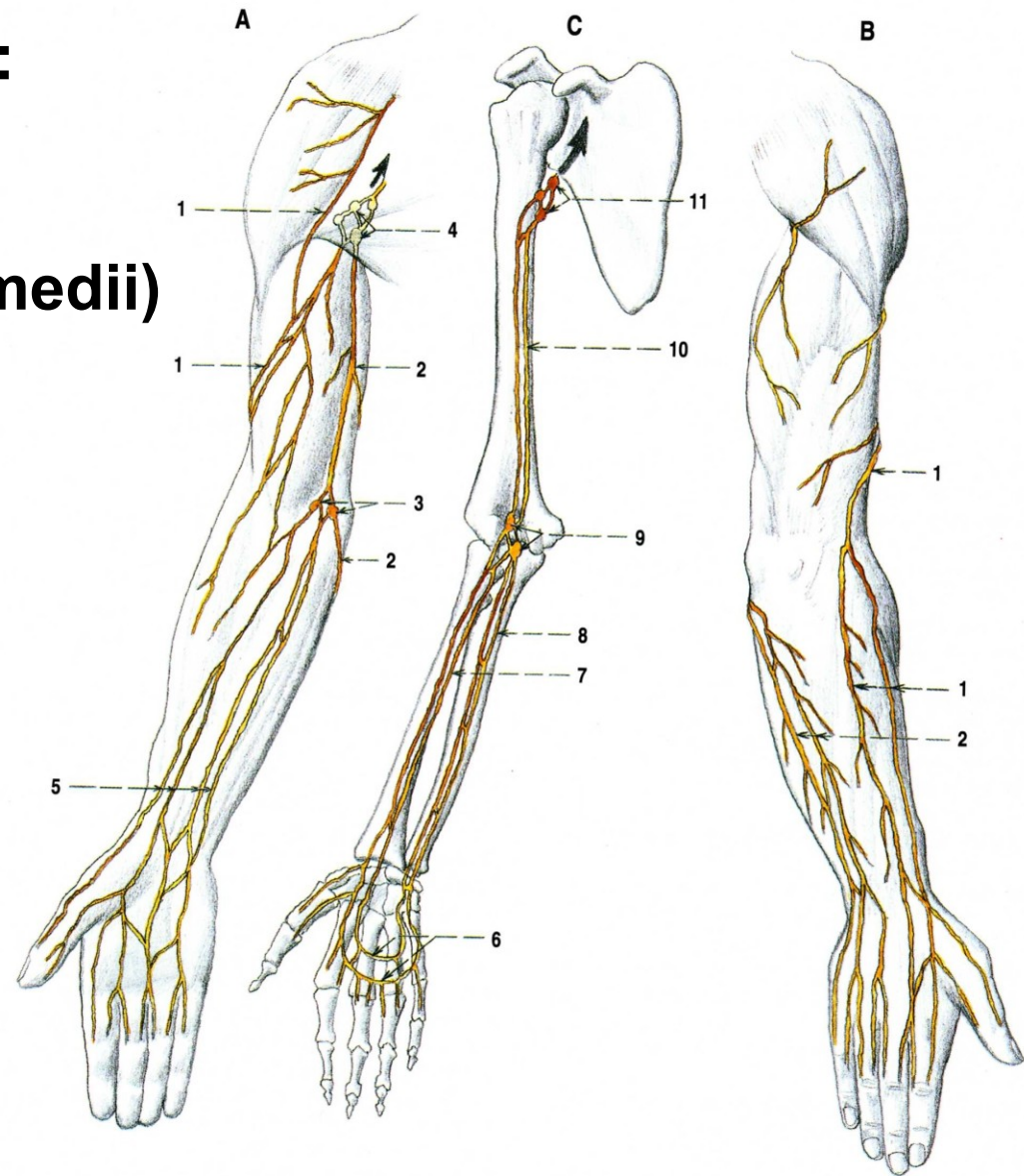


Obr. 132. MÍZNÍ UZLINY JAZYKA (schéma)
1 nodi cervicales laterales profundi superiores
2 nodus tonsillaris (Woodova uzlina)
3 nodi linguales
4 nodi submentales
5 nodi submandibulares
6 nodus jugulodigastricus
7 nodi cervicales anteriores
8 nodus juguloomohyoideus

Superficial lymph vessels:

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

III. cubitales spf. et prof.

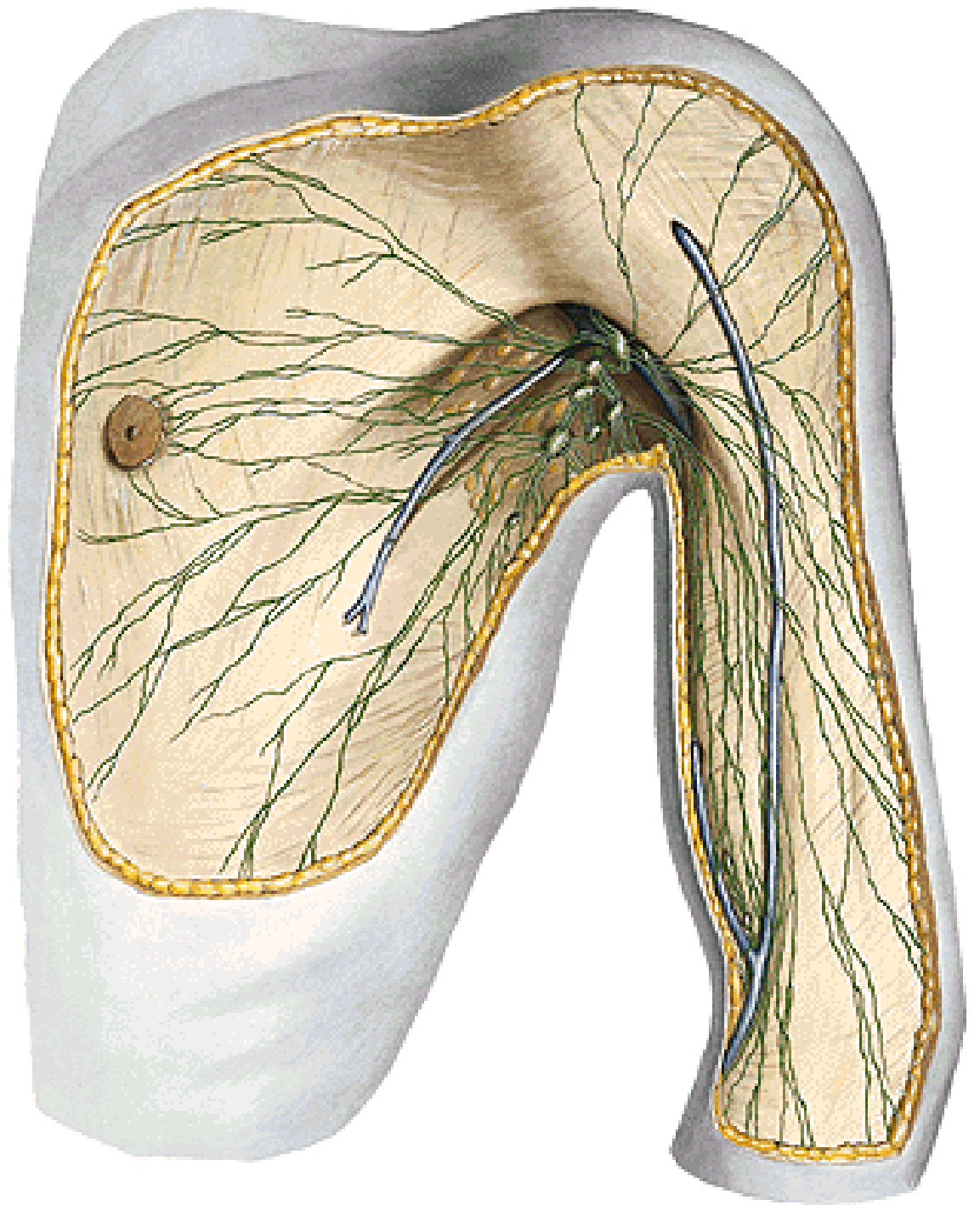


Obr. 133. POVRCHOVÉ A HLUBOKÉ MÍZNÍ CÉVY A UZLINY HORNÍ KONČETINY

- 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 zepředu
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

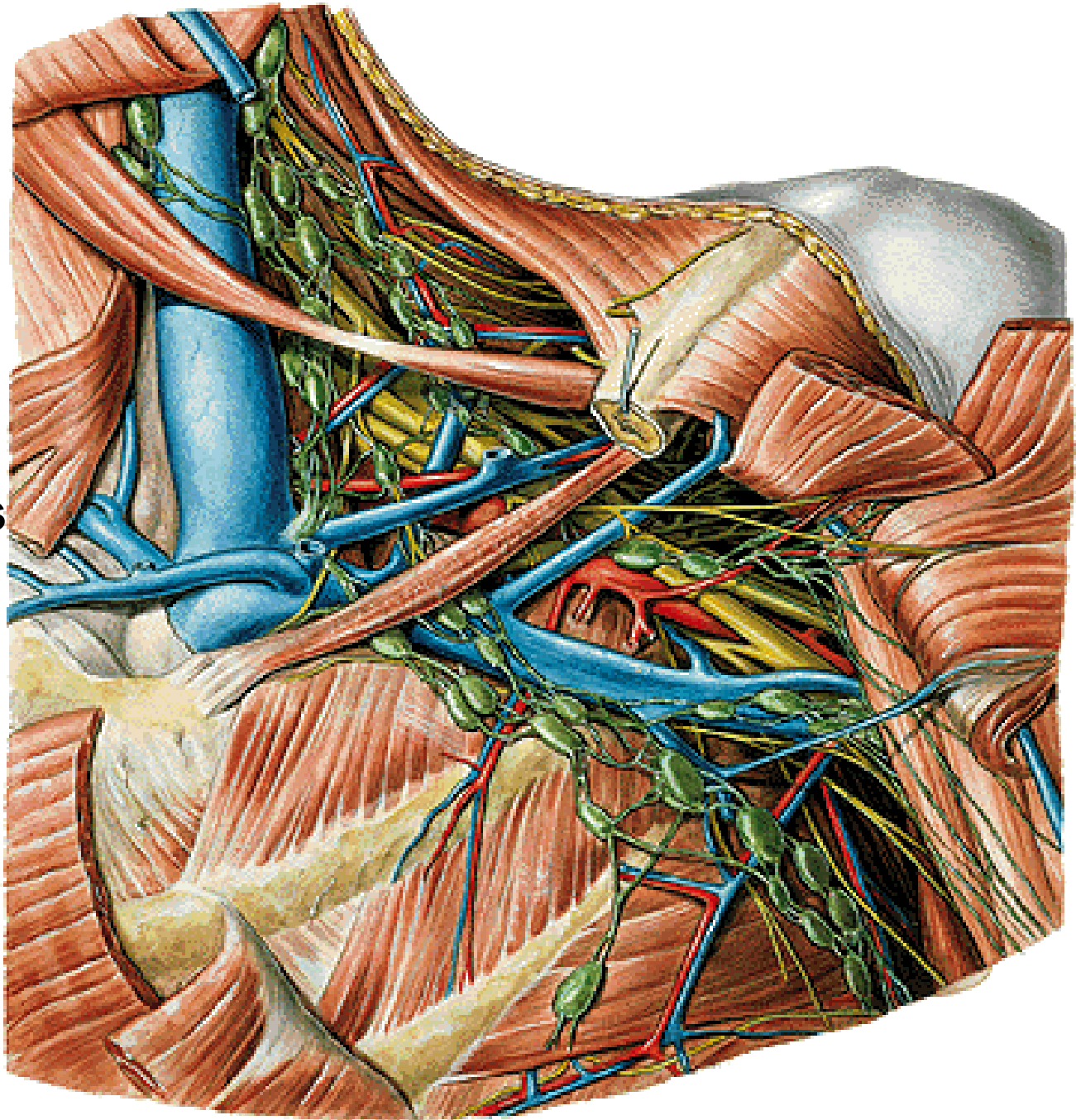
Nll. axillares



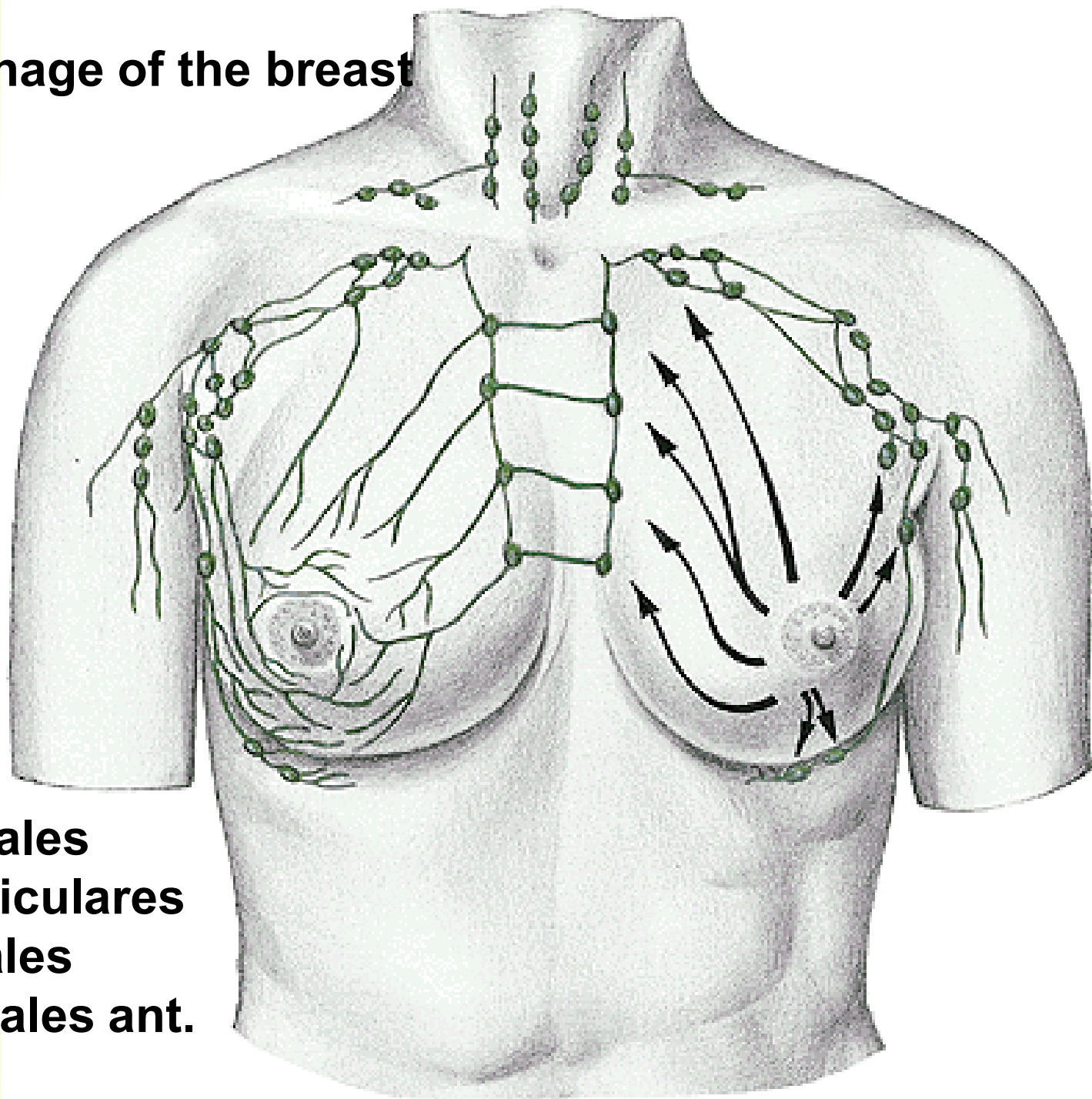
Nodi lymph. axillares:

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

→ tr. subclavius



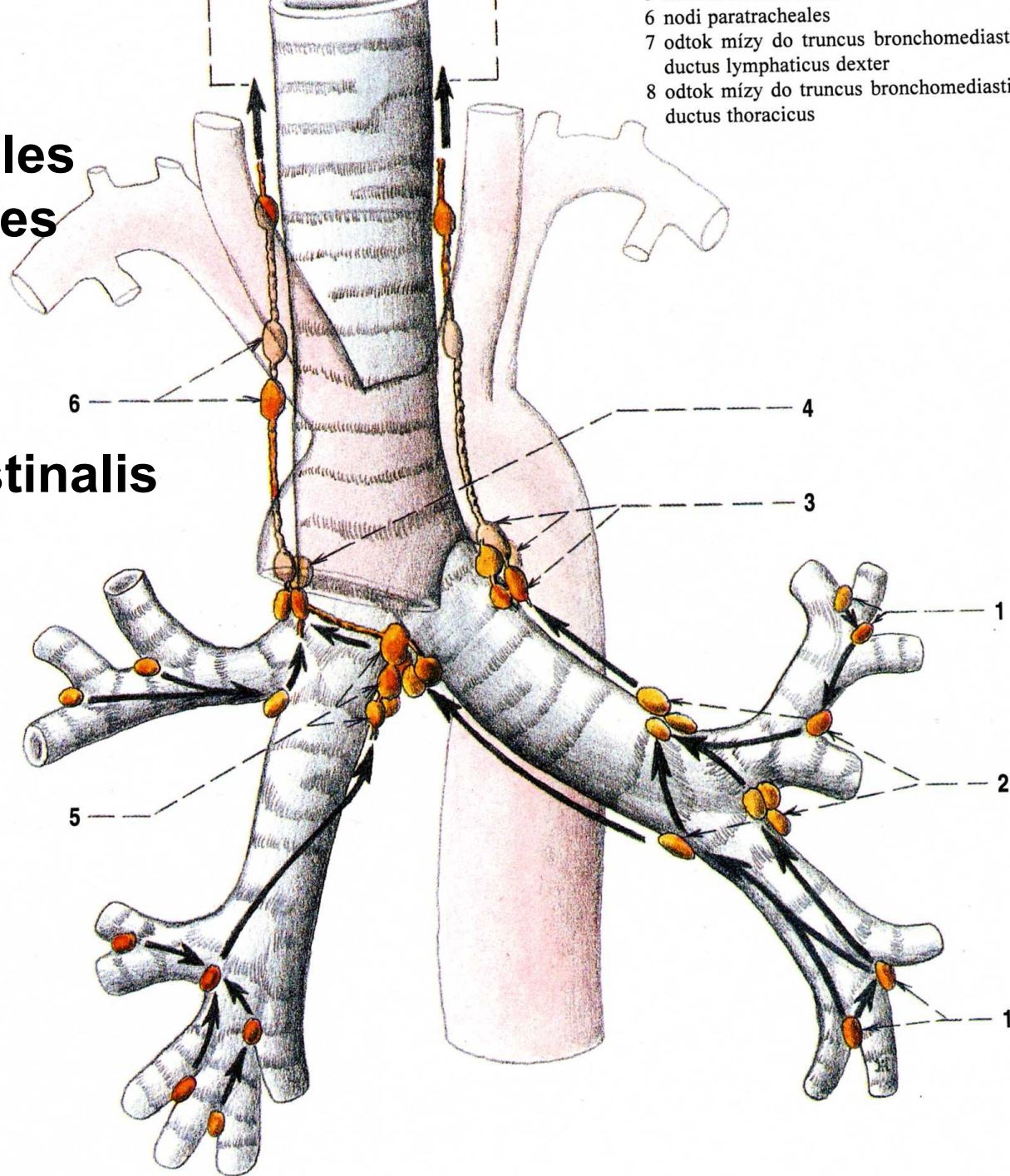
Lymphatic drainage of the breast



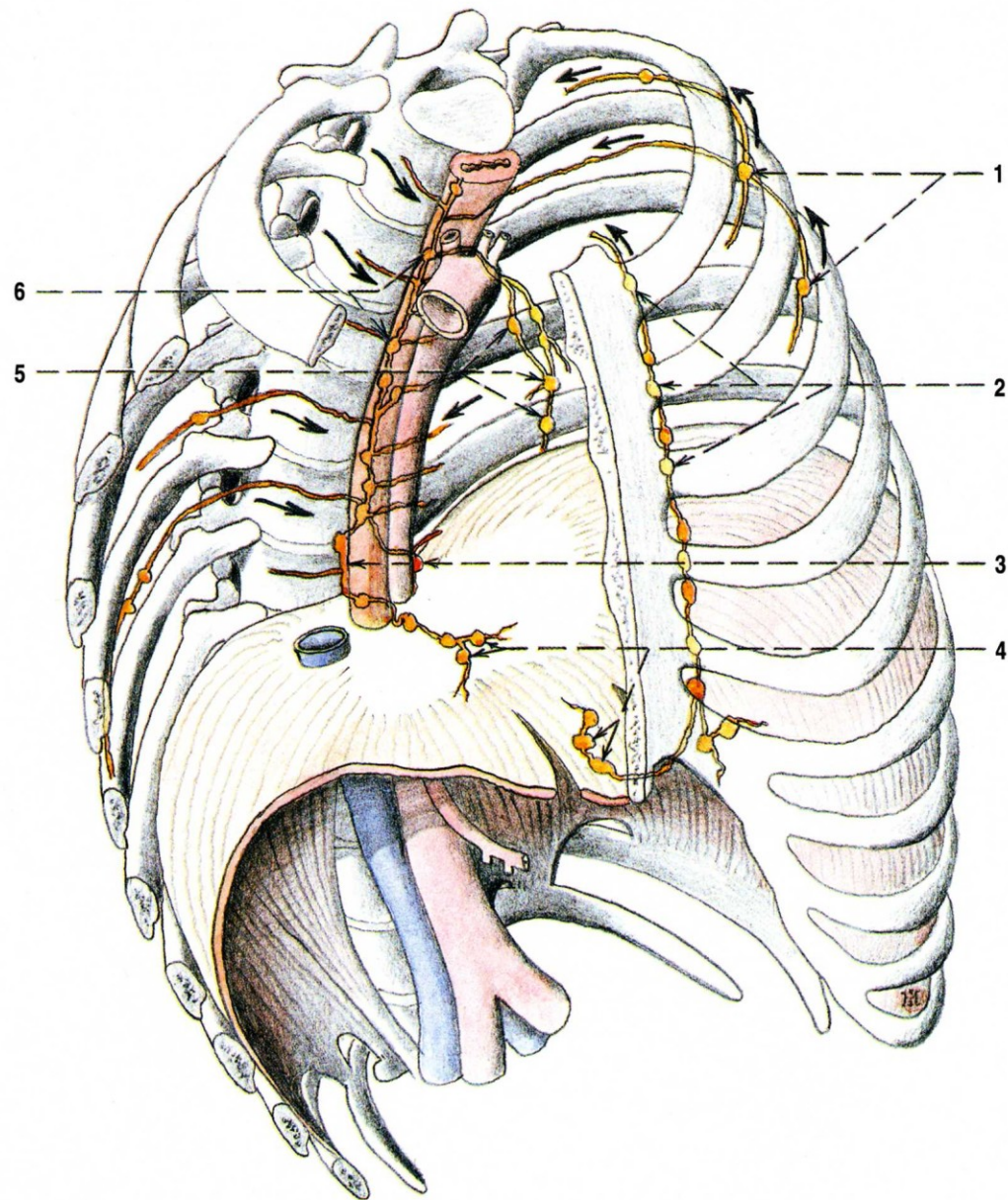
- nll. axillares
- nll. parasternales
- nll. supraclaviculares
- nll. intercostales
- nll. mediastinales ant.

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

→ tr. bronchomediastinalis



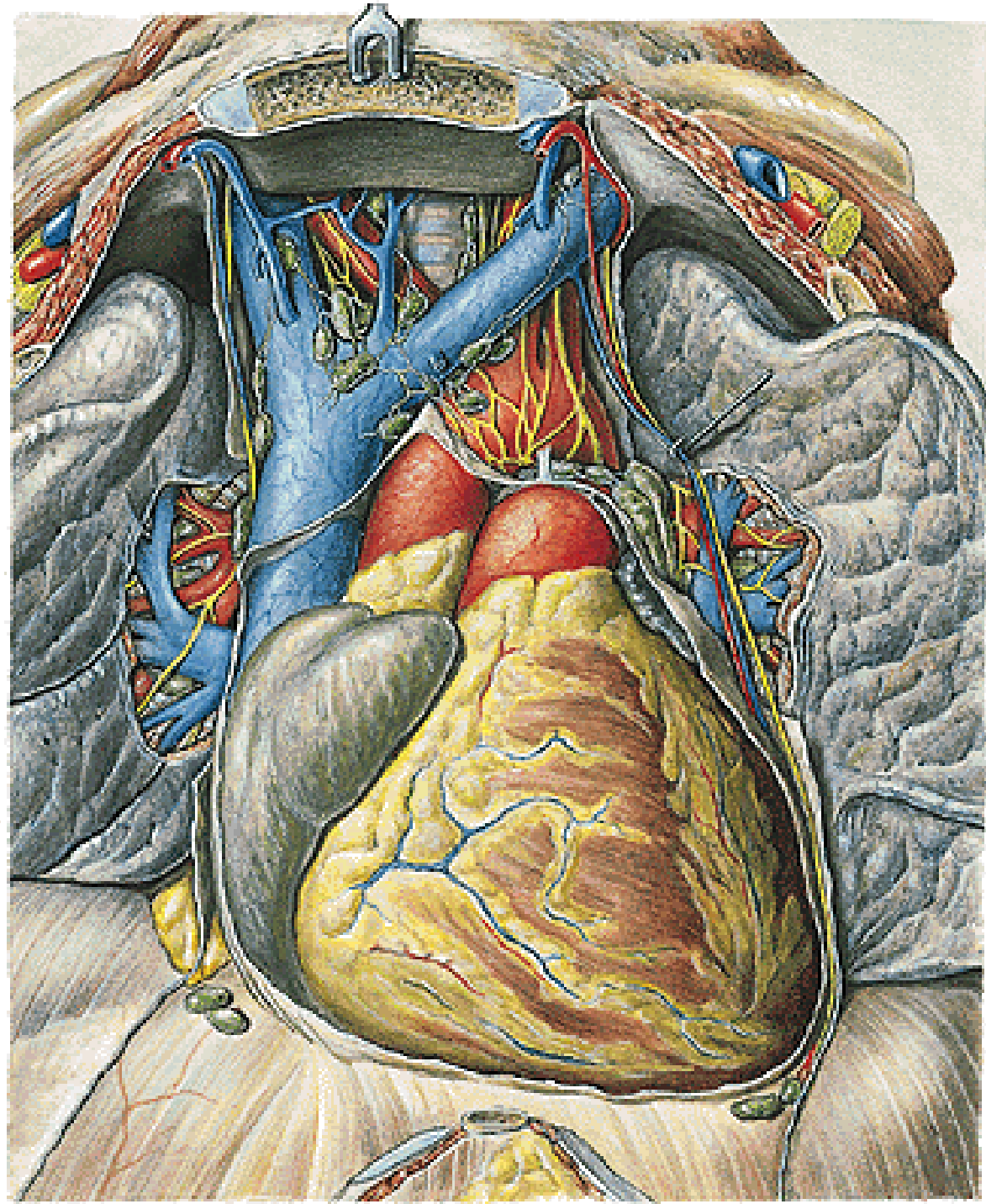
NII. parasternales
NII. intercostales
NII. praevertebrales
NII. phrenici sup.



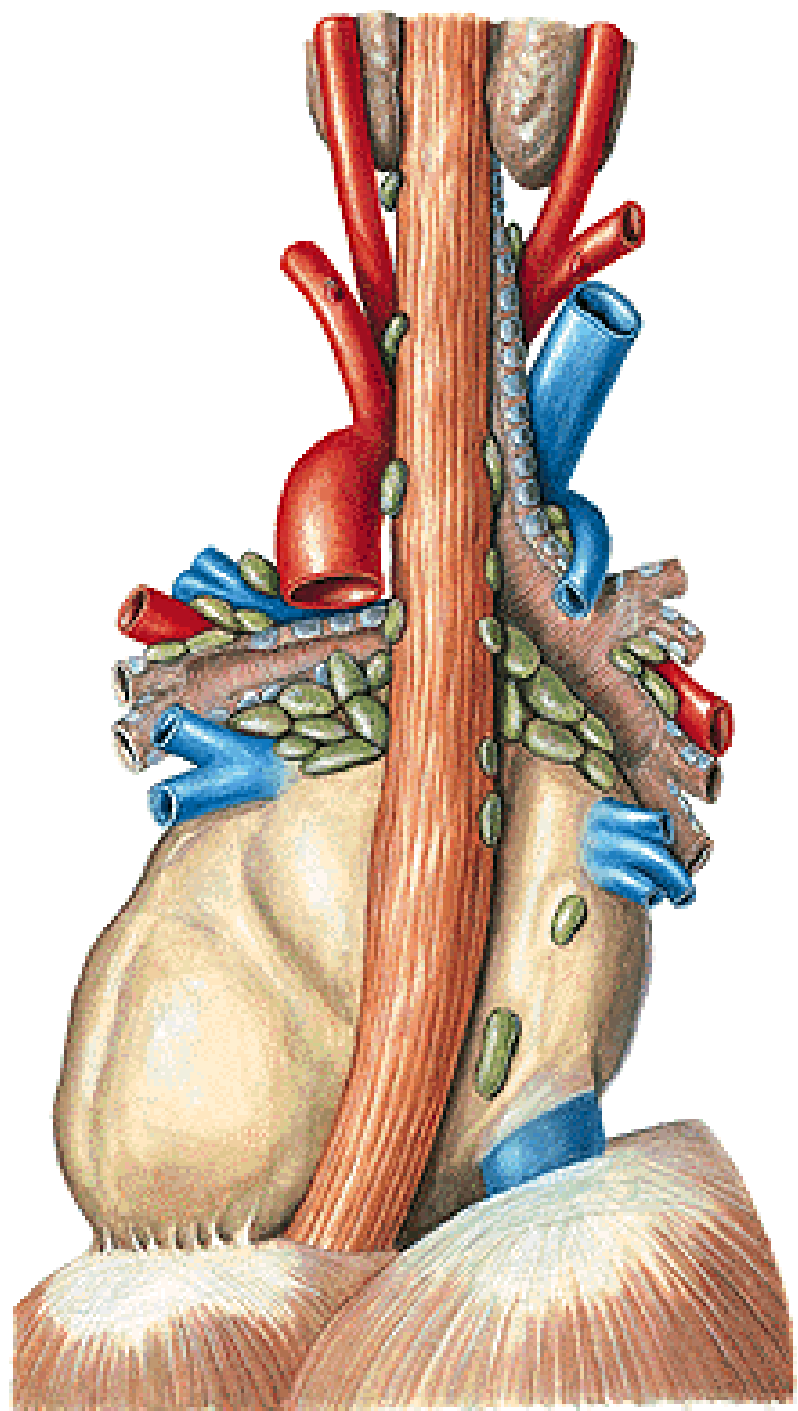
Obr. 135. MÍZNÍ UZLINY HRUDNÍKU; uzliny hrudních stěn a některé orgánové uzliny
1 nodi intercostales
2 nodi parasternales

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

Nll. mediastinales ant.

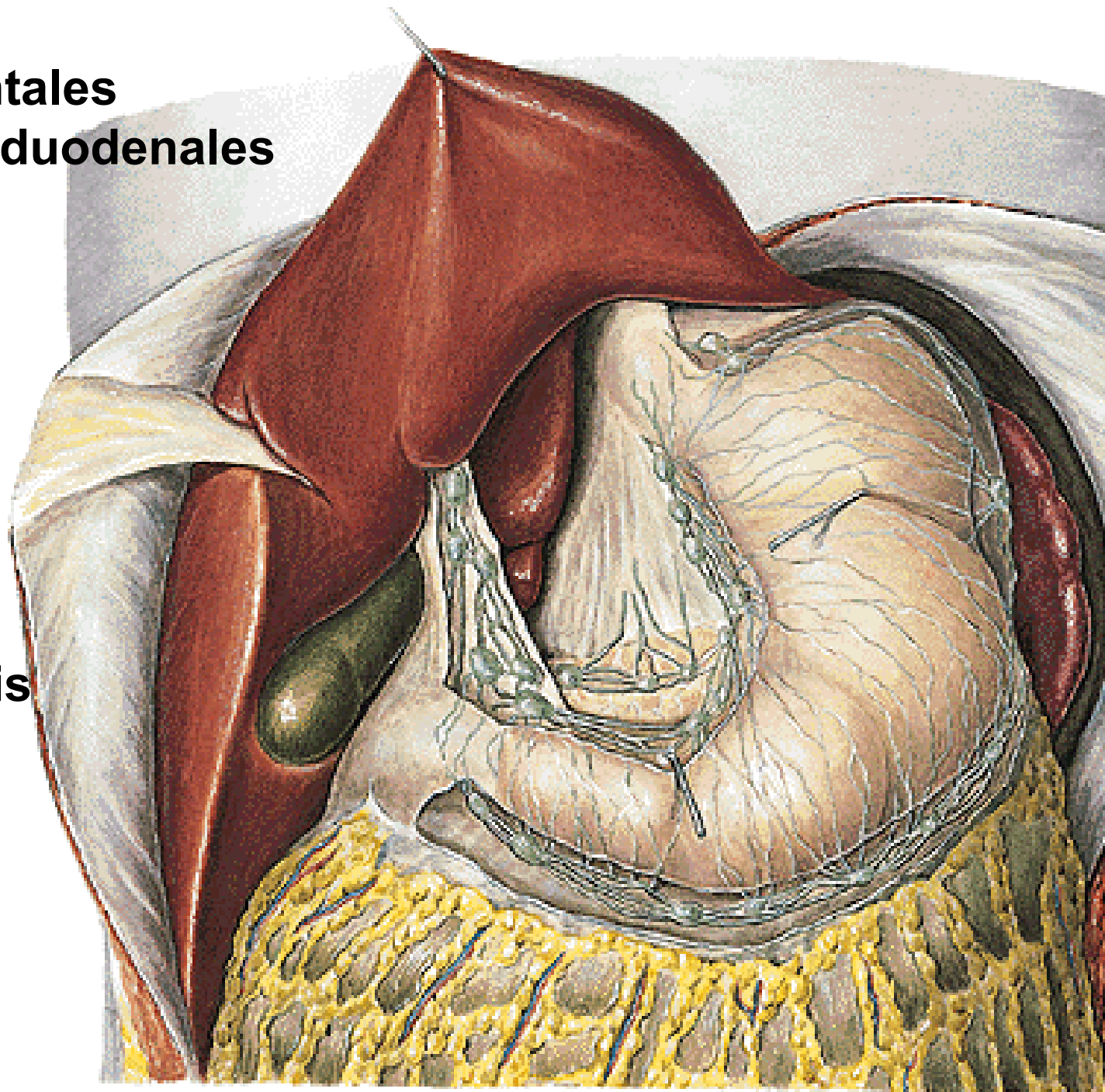


NII. mediastinales post.



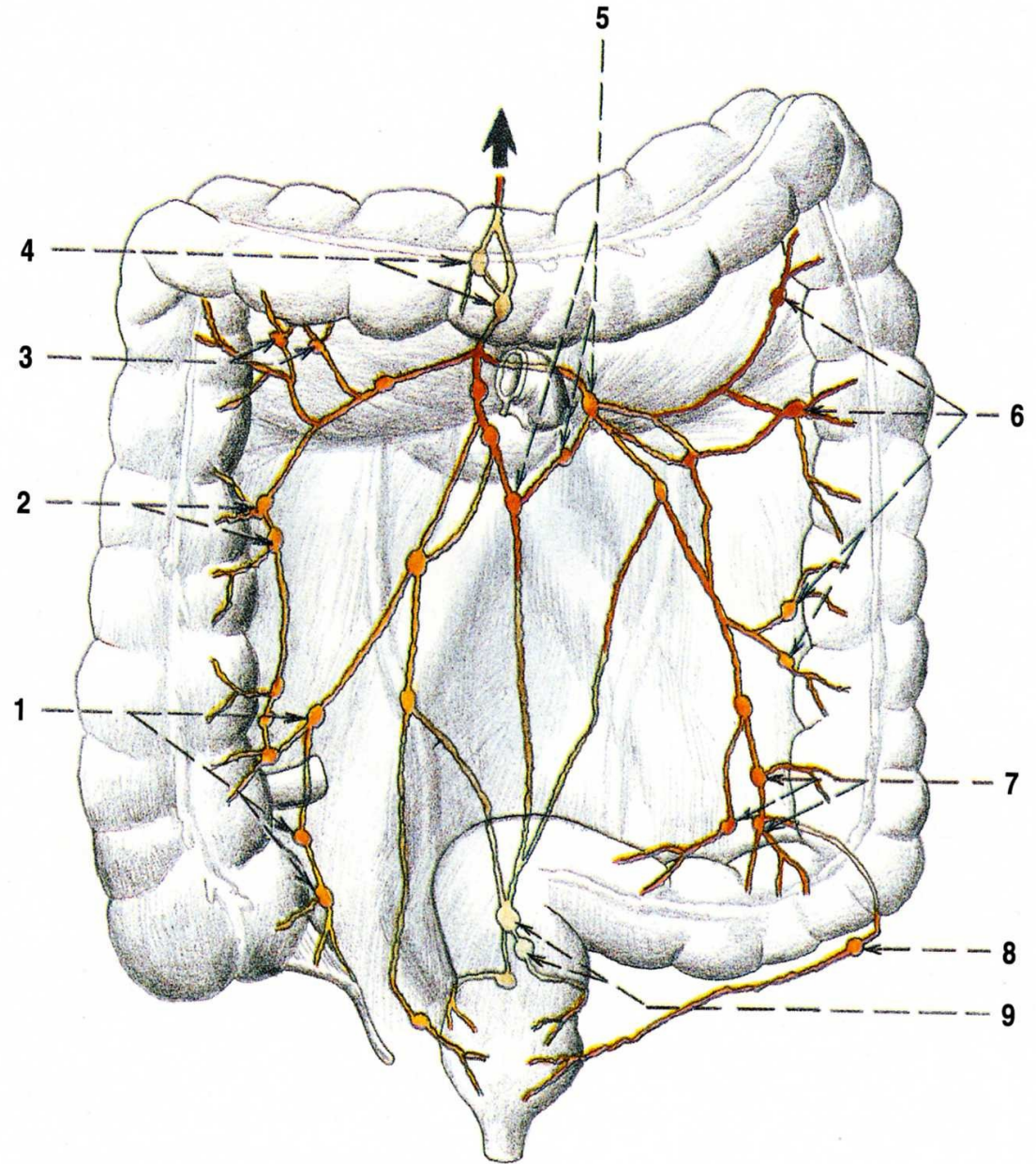
Nll. gastrici
Nll. gastromentales
Nll. pancreaticoduodenales
Nll. lienales
Nll. coeliaci
Nll. hepatici
Nll. pancreatici

→ tr. intestinalis



Nodi mesenterici sup.
Nodi mesenterici inf.

→ **tr. intestinalis**

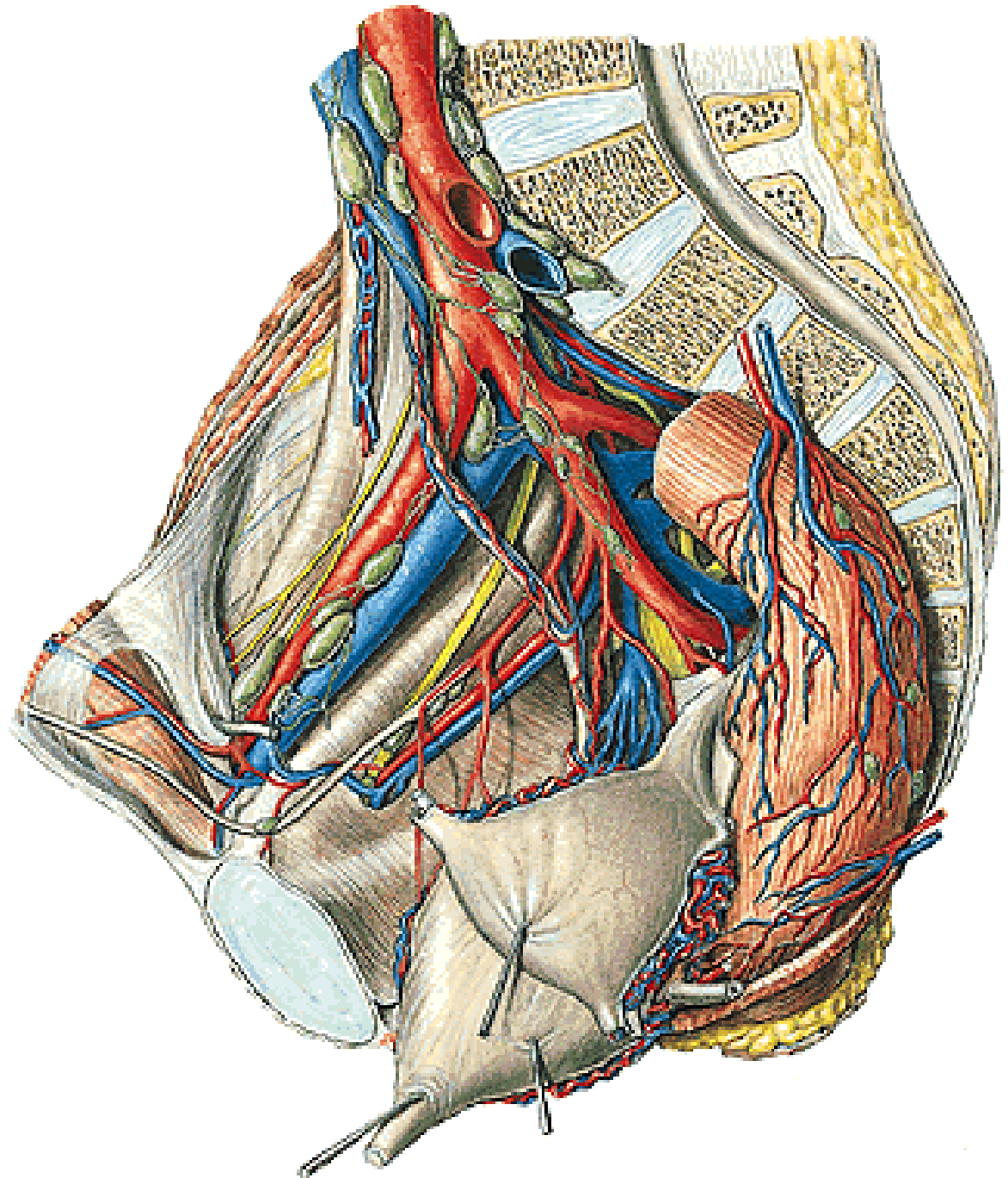


Nll. iliaci interni

- nll. paravesicales
- nll. paravaginales
- nll. parauterini
(Bayer)
- nll. pararectales
- nll. gluteales
- nll. sacrales

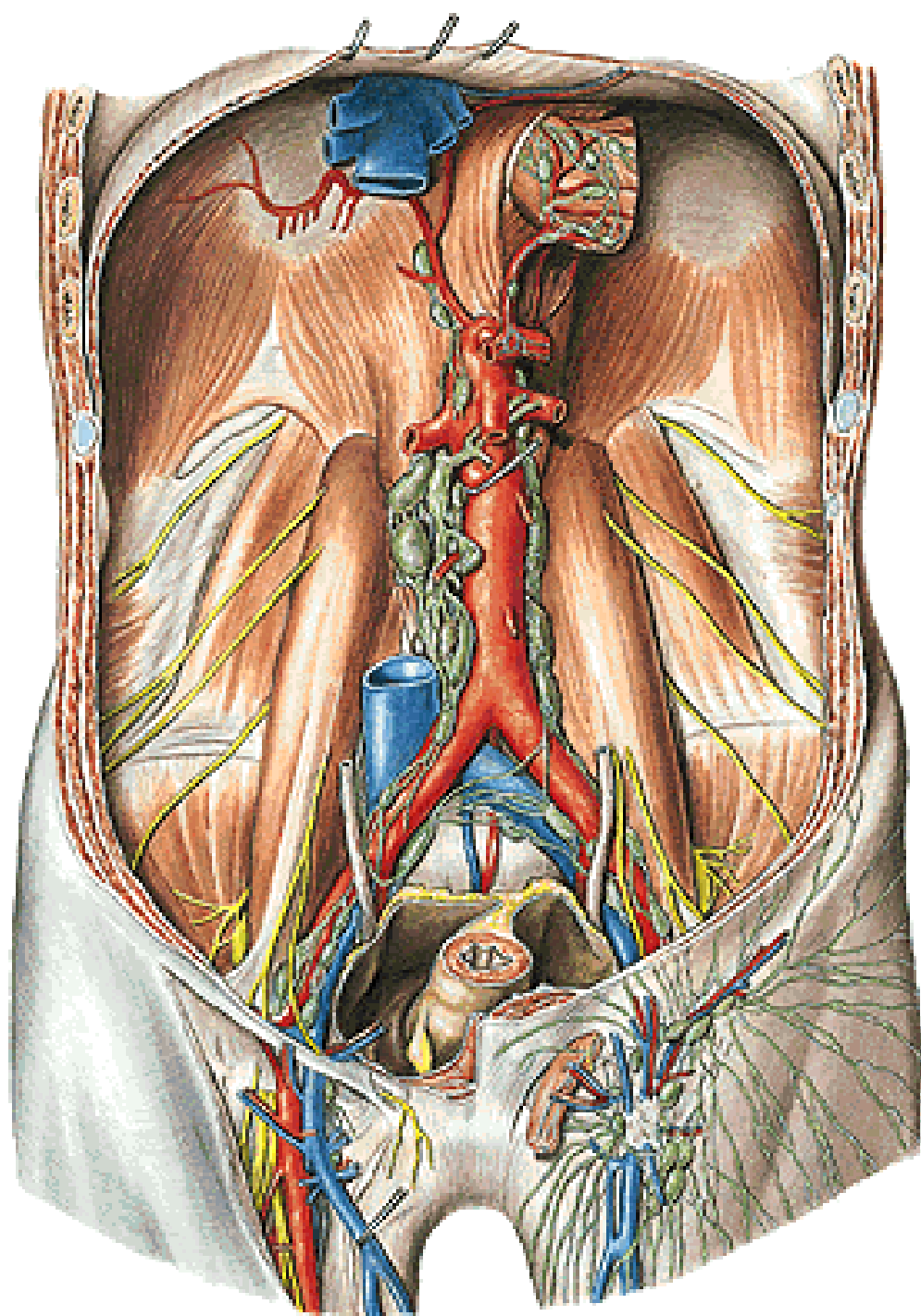
Nll. iliaci externi

Nll. iliaci communes

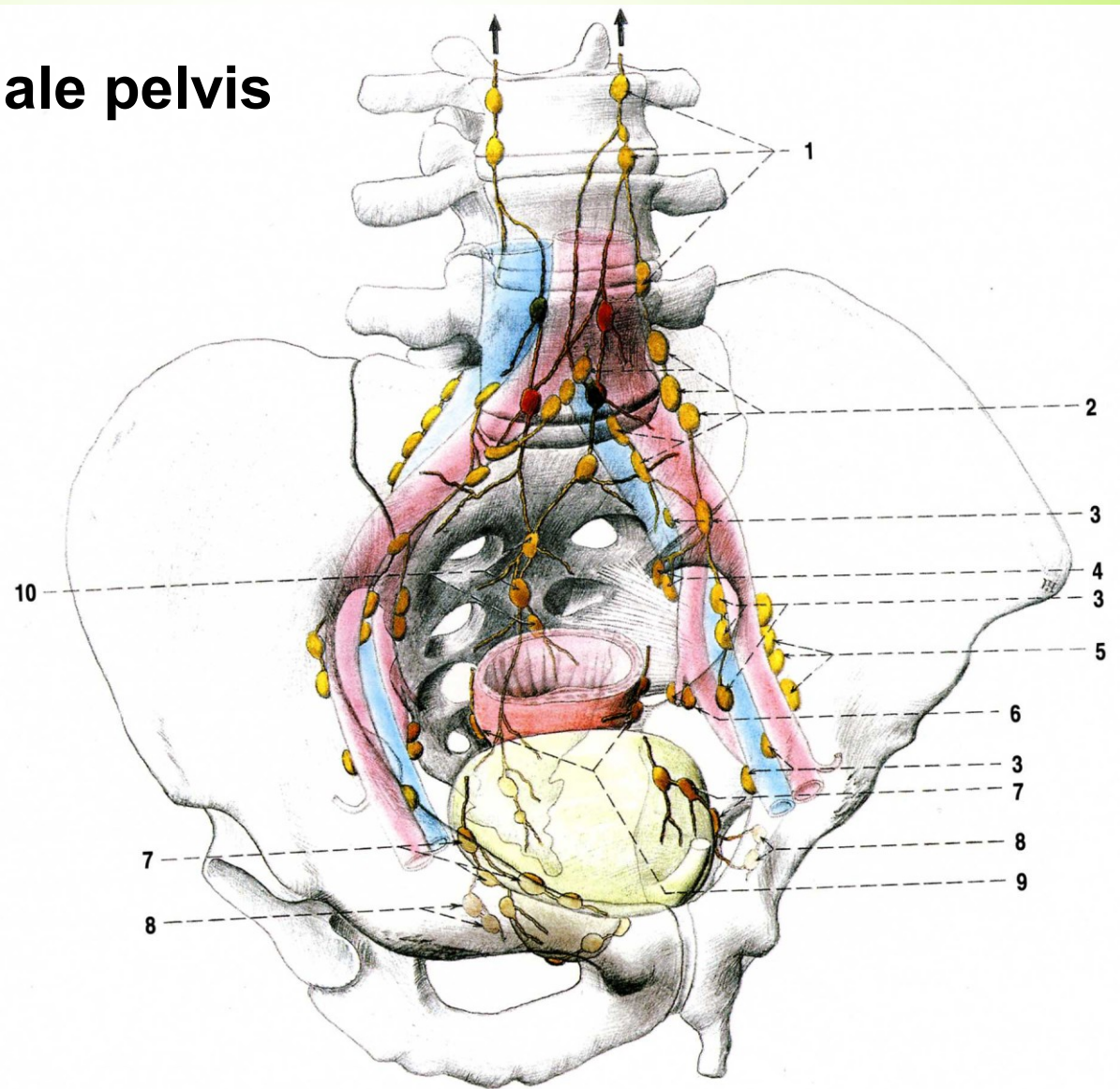


NII. lumbales

→ tr. lumbalis dx. et sin.



Drainage of the male pelvis



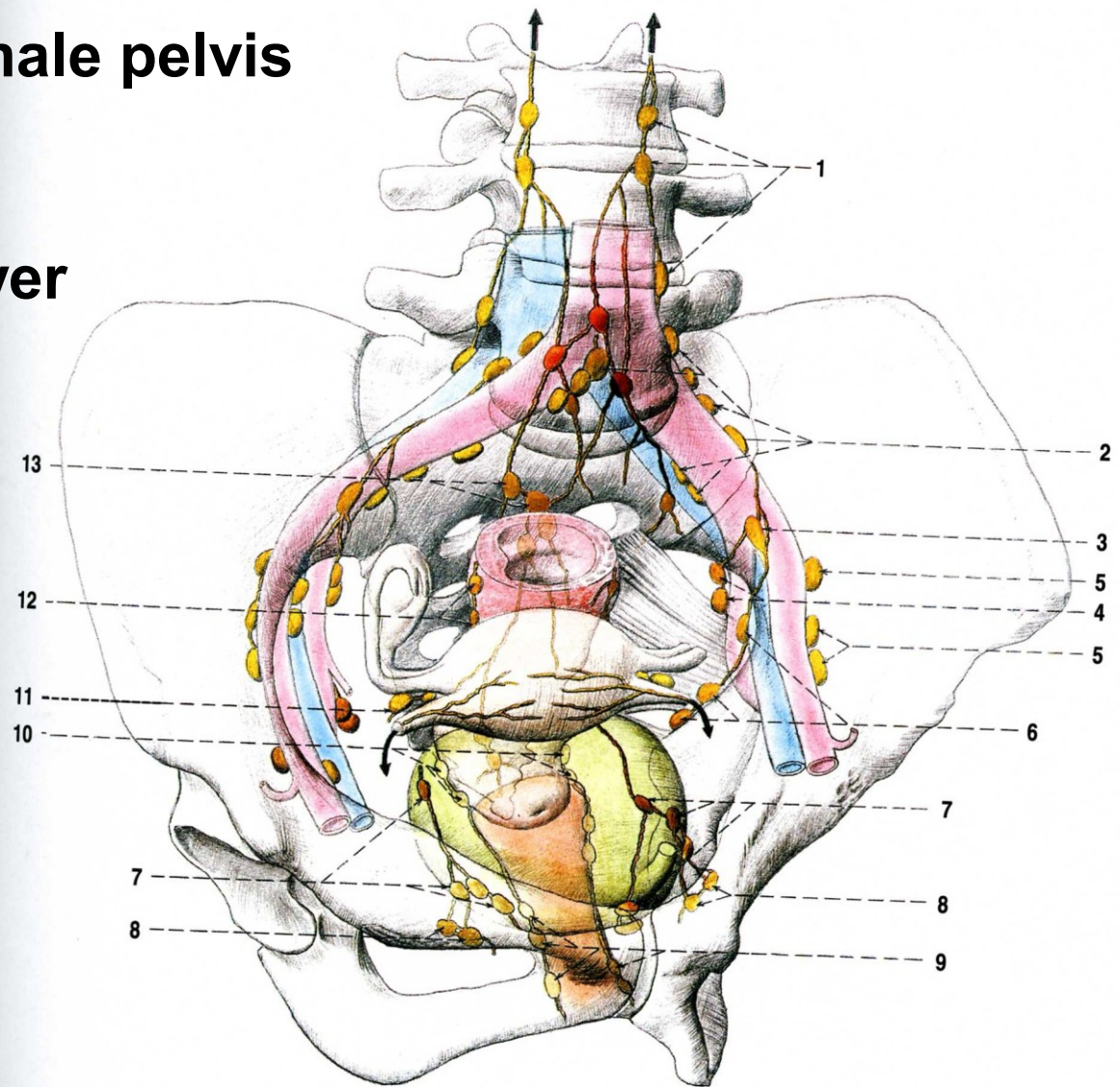
Obr. 139. NODI SACRALES A MÍZNÍ UZLINY PÁNEVNÍCH
ORGÁNŮ MUŽE

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

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

Drainage of the female pelvis

Lymph node of Bayer



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

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

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

Lymphography



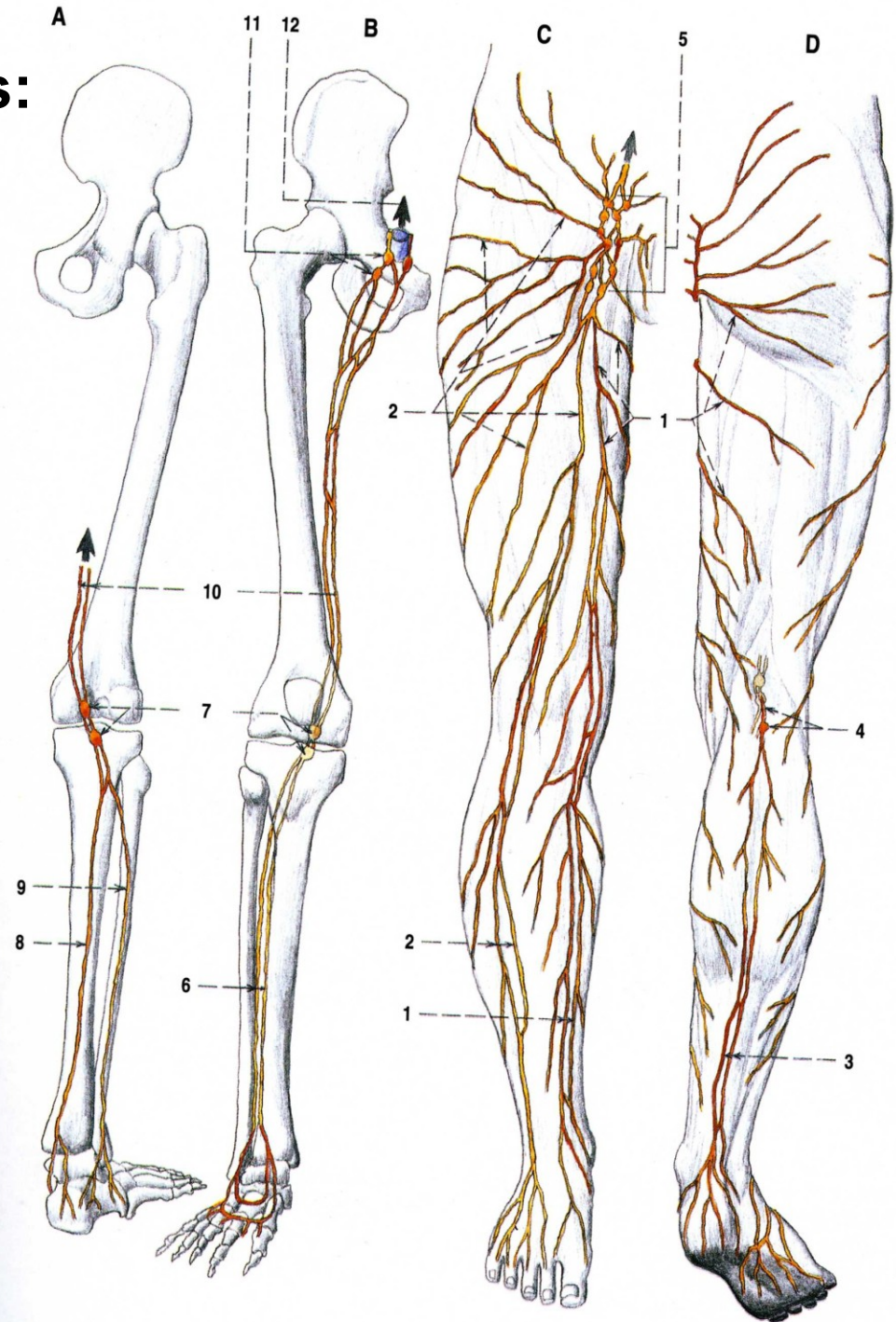
Blue dye is injected
between the toes
into the webbing



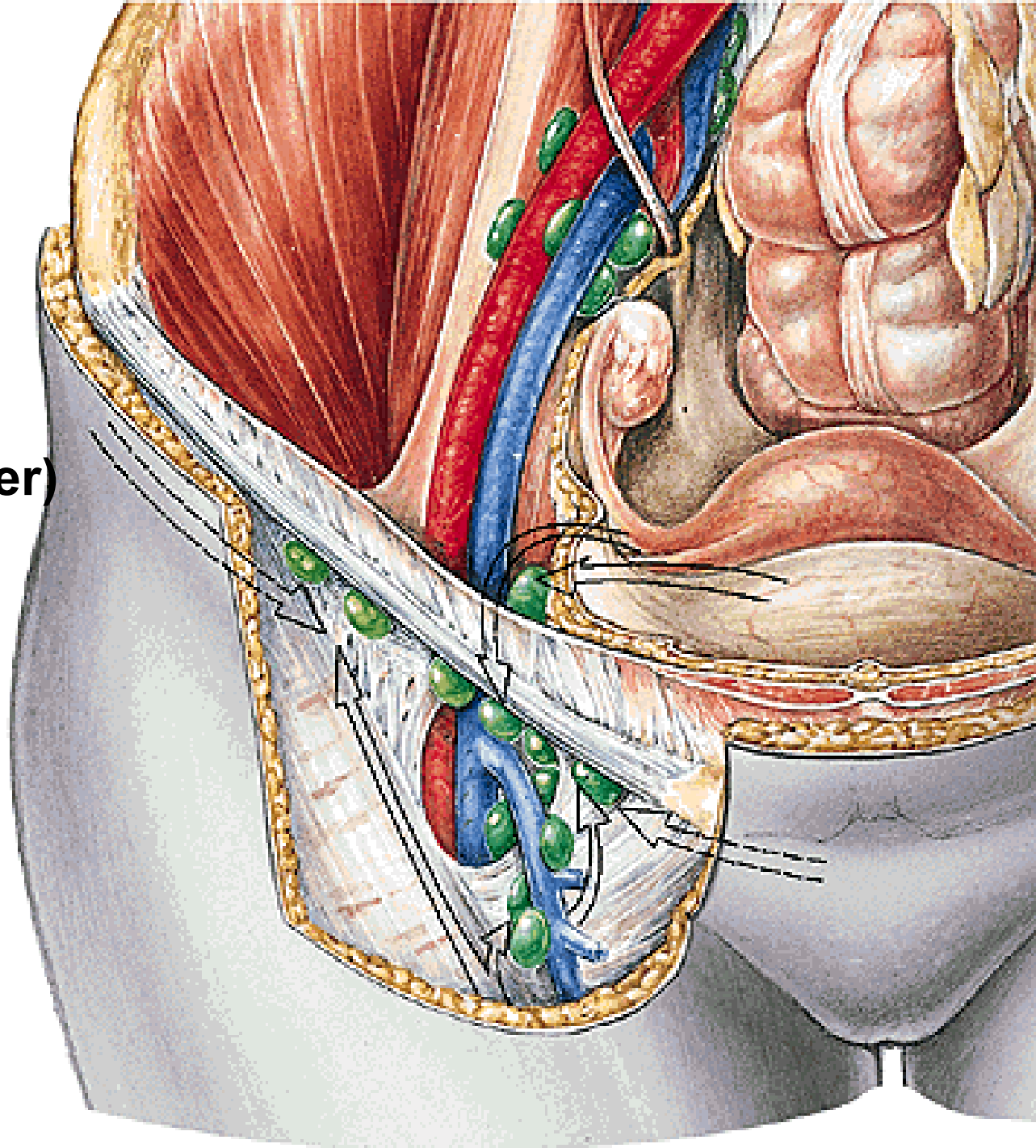
Superficial lymph vessels:

- collectores mediales
- collectores laterales
- collectores posteriores

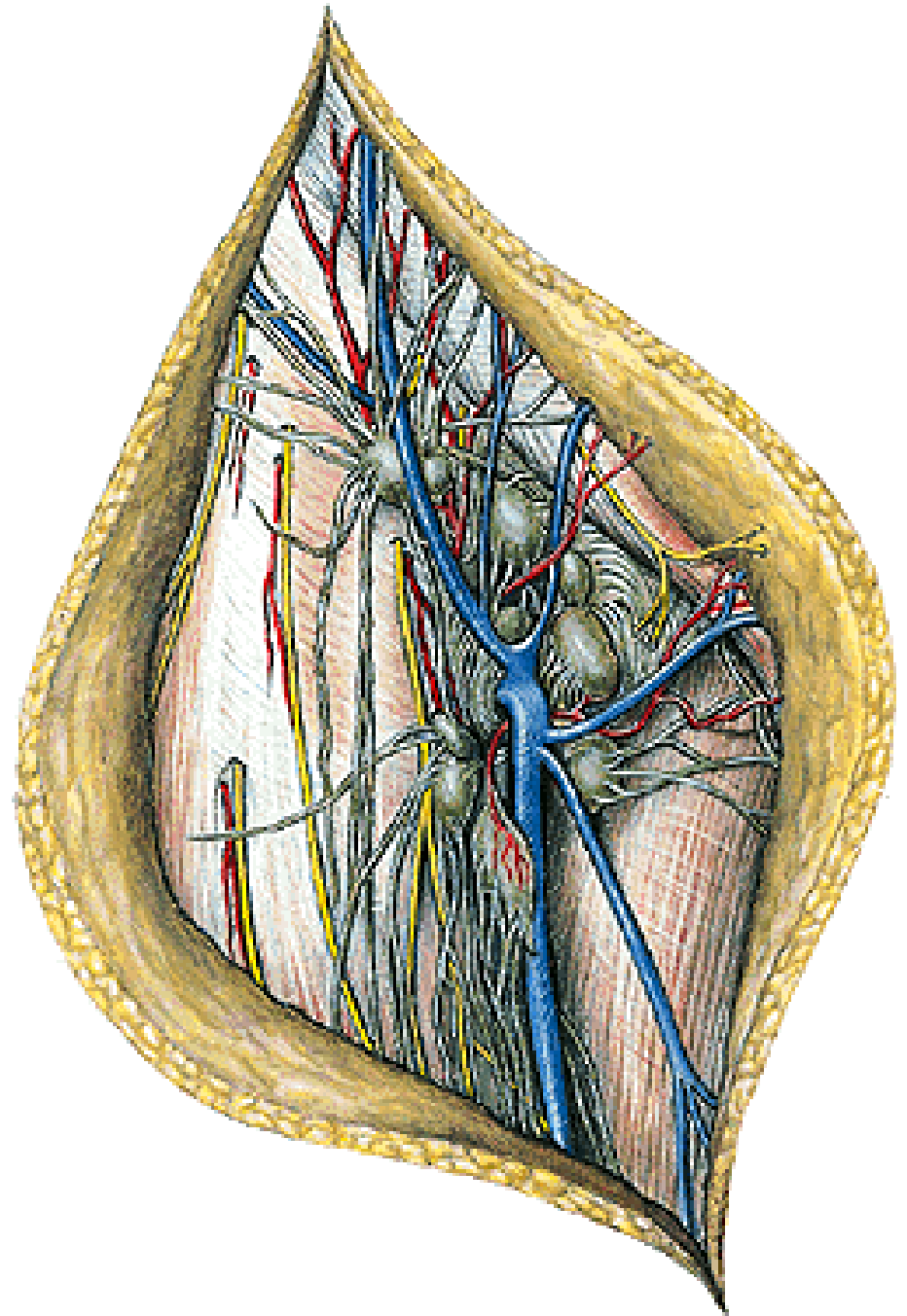
Nll. poplitei spf. et prof.

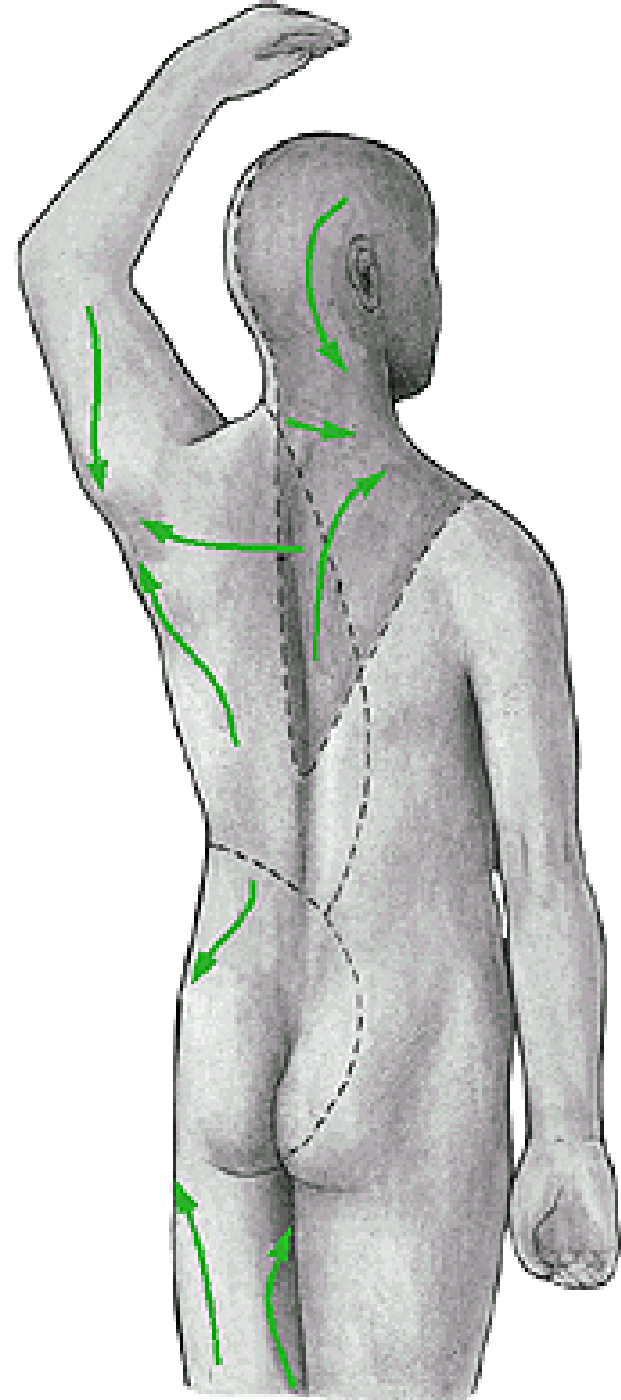
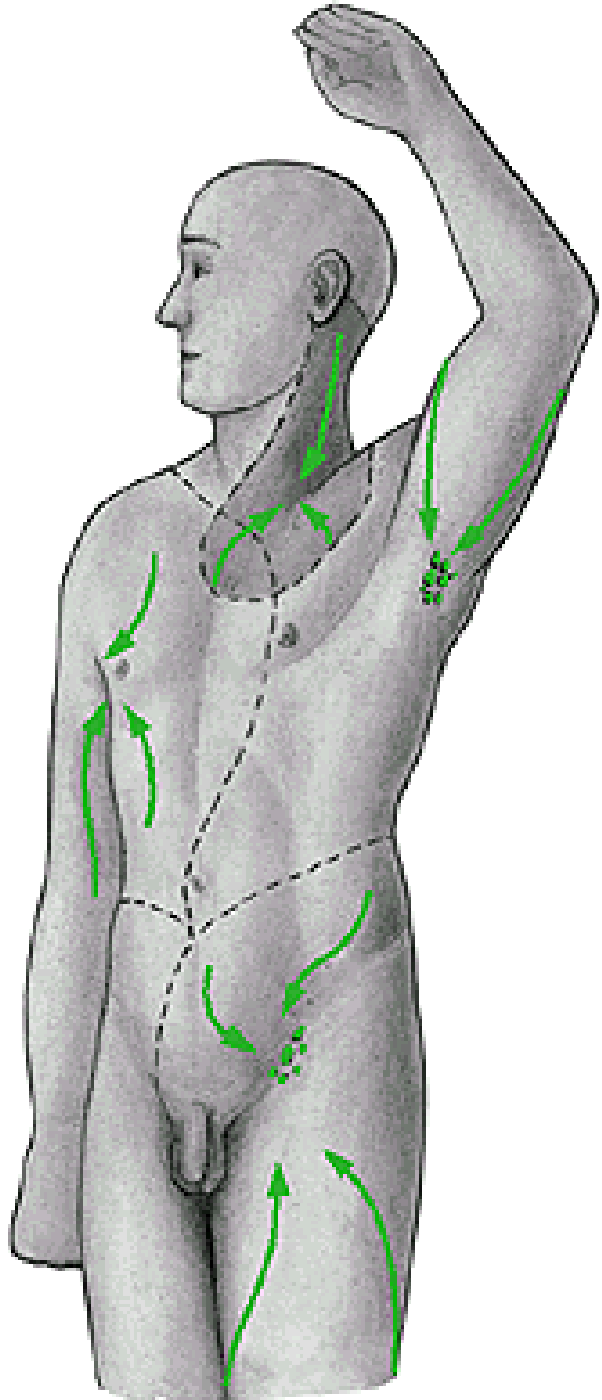


Nll. inguinales spf.
Nll. inguinales prof.
(Cloquet-Rosenmüller)



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





Illustrations were copied from:

**Atlas der Anatomie des Menschen/Sobotta.
Putz,R., und Pabst,R. 20. Auflage. München:
Urban & Schwarzenberg, 1993)**

**Netter: Interactive Atlas of Human Anatomy.
Windows Version 2.0**

Čihák R: Anatomie 3. Grada, Praha, 1997.