

LYMPHATIC SYSTEM

Vasa lymphocapillaria – rete lymphocapillare

Lymphoedema, metastasis

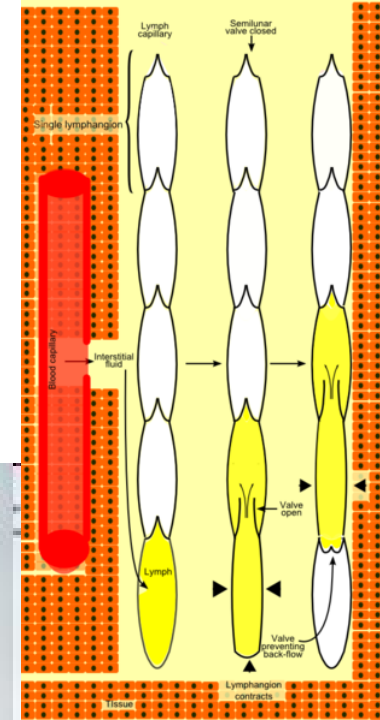
Vasa lymphatica – vas afferens, vas efferens

Lymphangion

Trunci lymphatici

Lympha – chylus

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

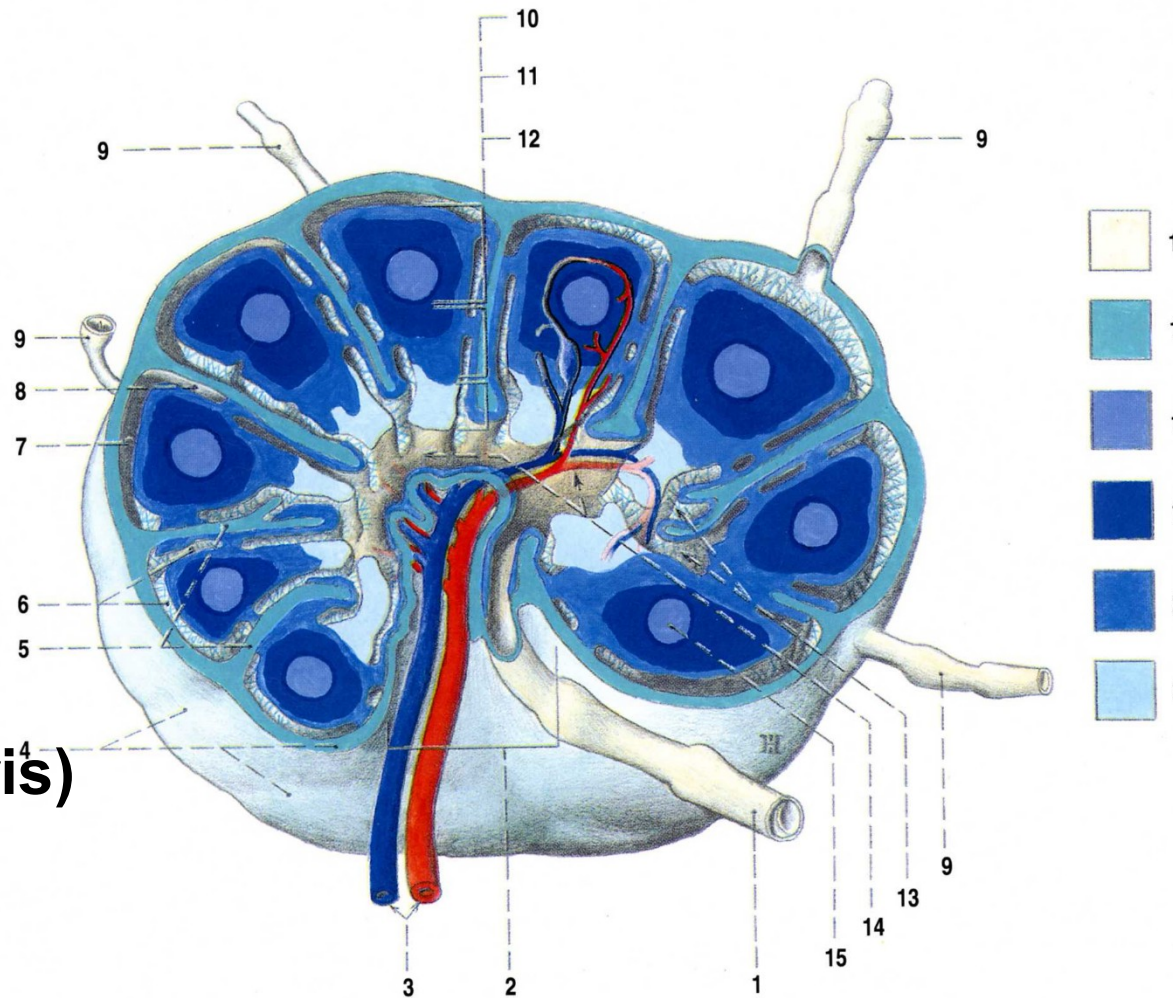


CAPILLARY LYMPH PUMP



Nodus lymphaticus

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



Tributary region
Regional lymph nodes
Sentinel lymph node

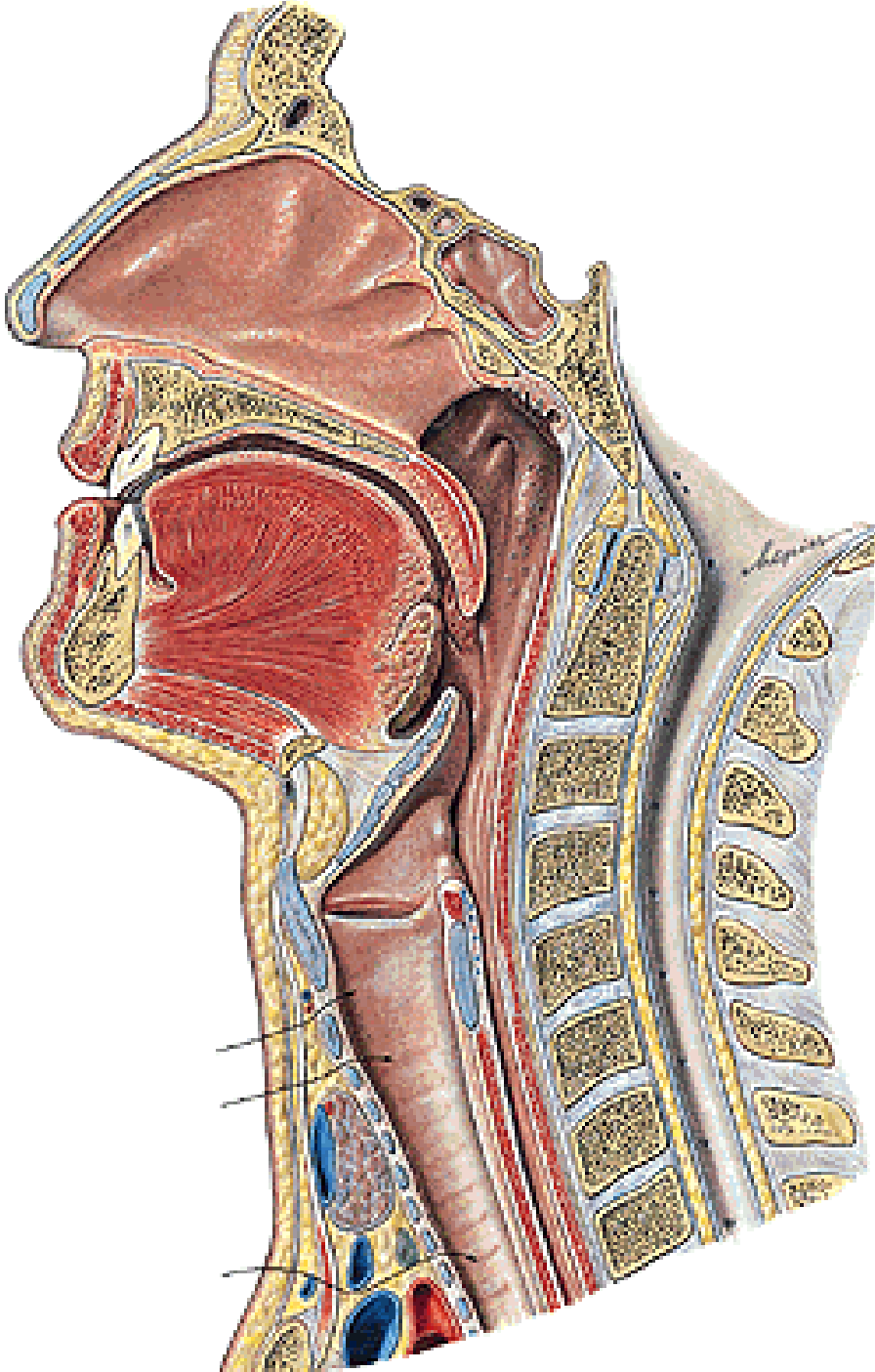
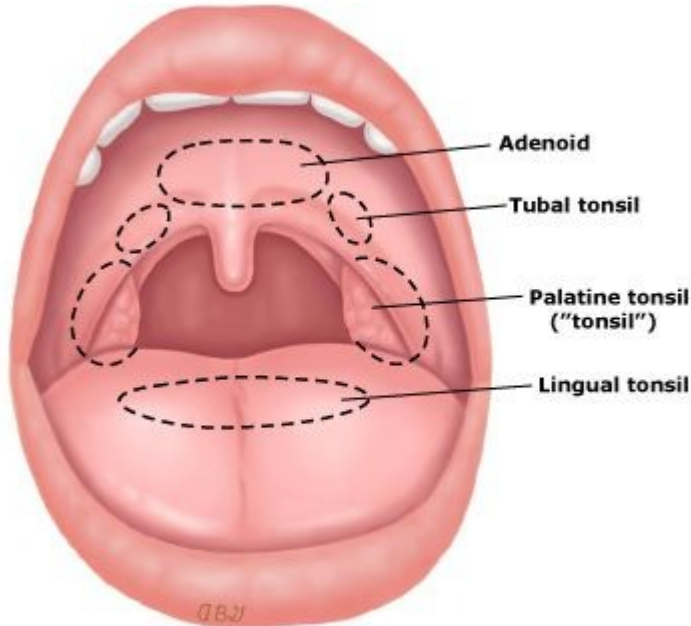
Obr. 124. STAVBA MÍZNÍ UZLINY (schéma); krevní cévy znázorněny jen v jednom mízním uzlíku

- 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

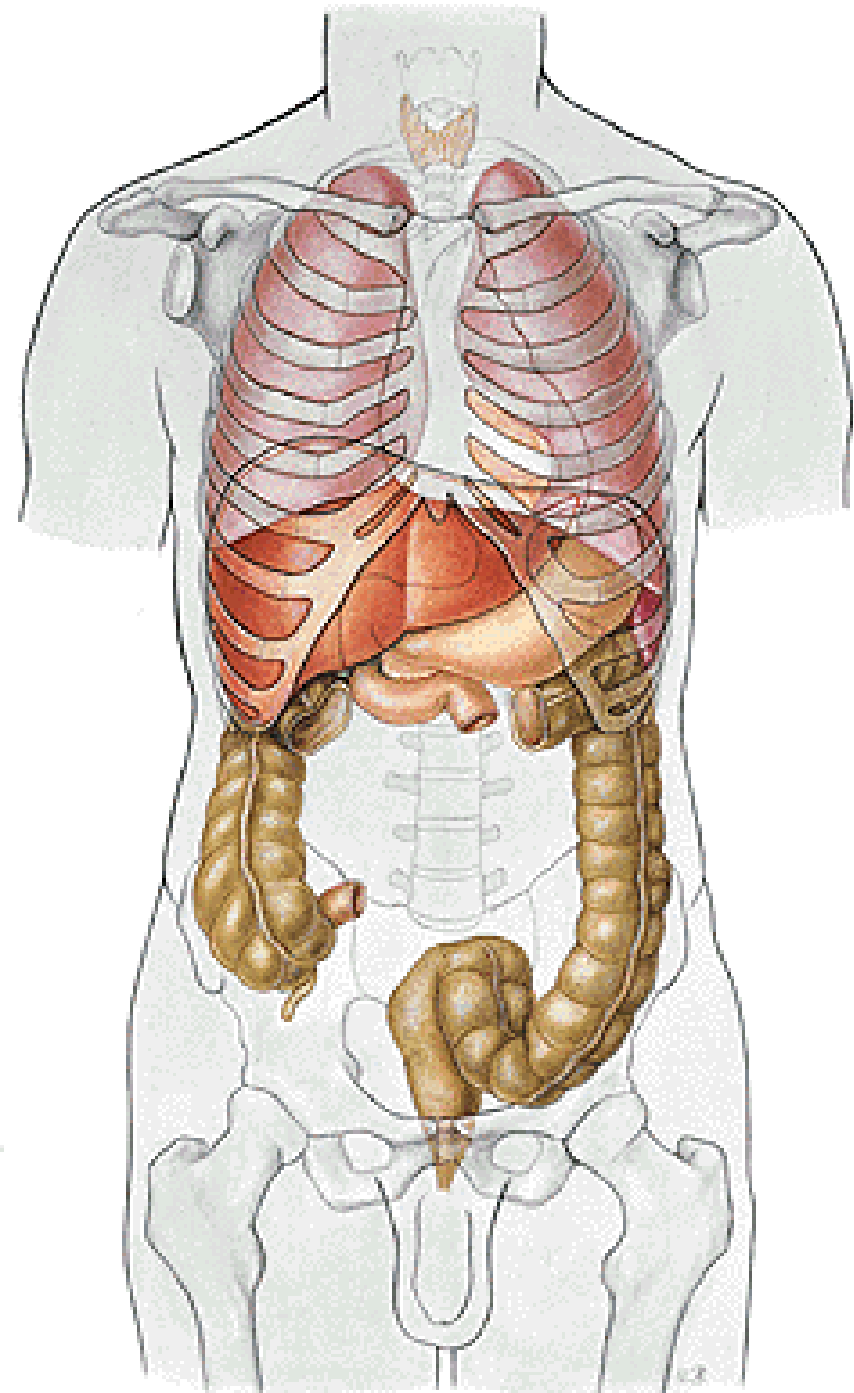
- 11 parakortikální zóna uzliny
- 12 medulla
- 13 medulární sinus
- 14 terminální sinus
- 15 zárodečné centrum mízního uzlíku
- 16 mízní cévy a sinusy v uzlině
- 17 capsula et trabeculae nodi lymphatici
- 18 zárodečné centrum mízního uzlíku
- 19 intermediární zóna uzlíku obkládající zárodečné centrum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

- Tonsilla palatina**
- Tonsilla lingualis**
- Tonsilla pharyngea**
- Tonsilla tubaria**

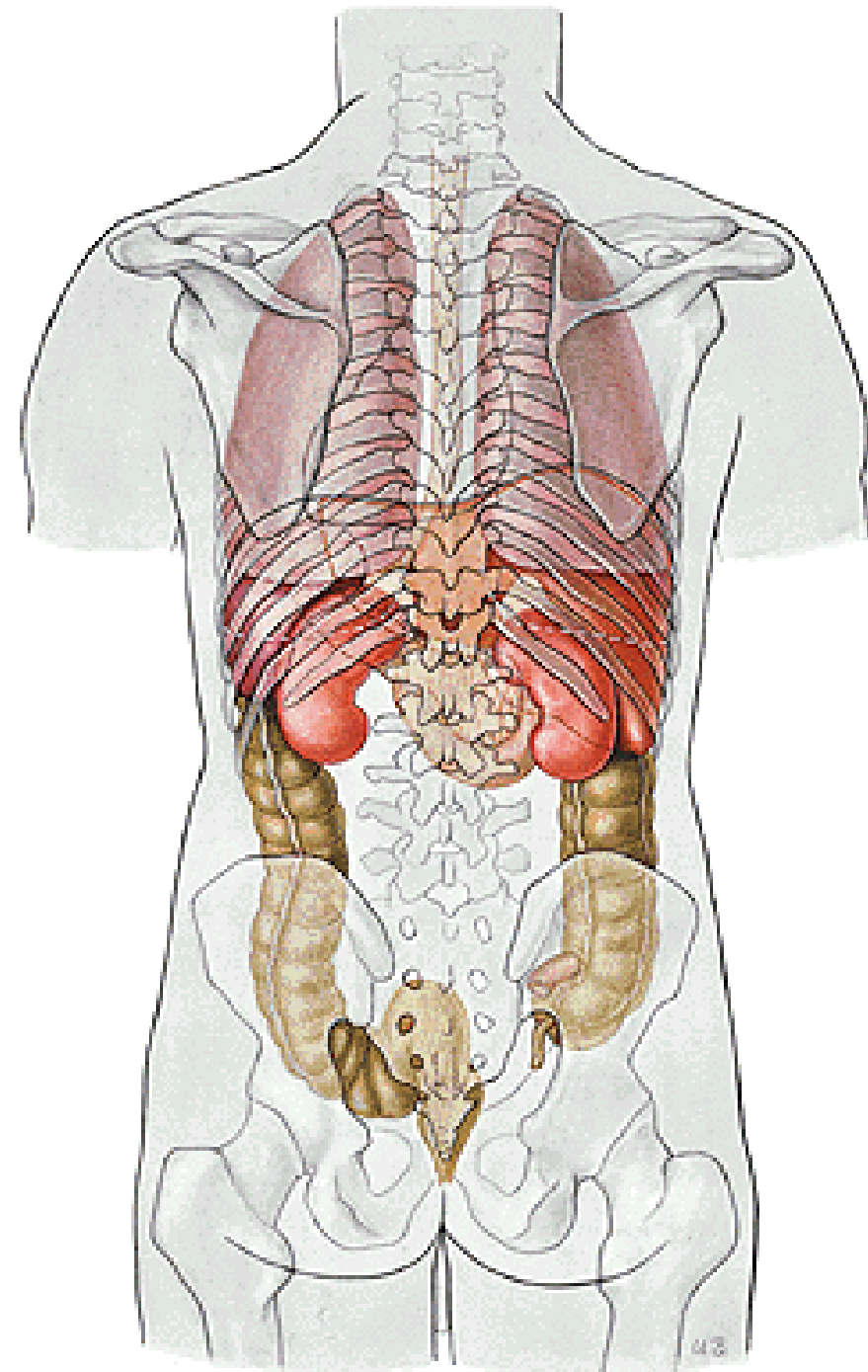
Waldeyer's tonsillar ring

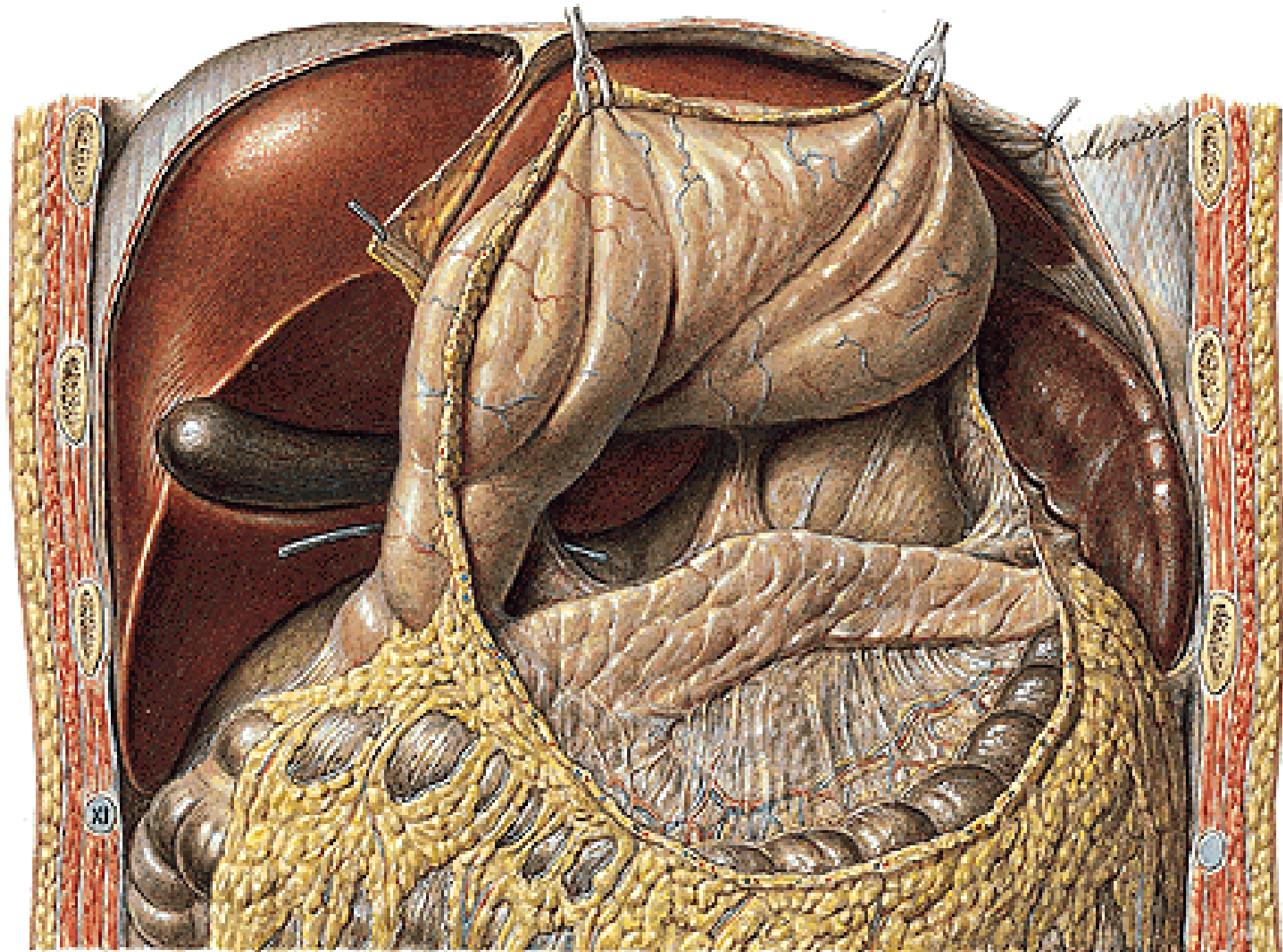


**Tonsilla abdominalis –
appendix vermiformis**



Lien, splen

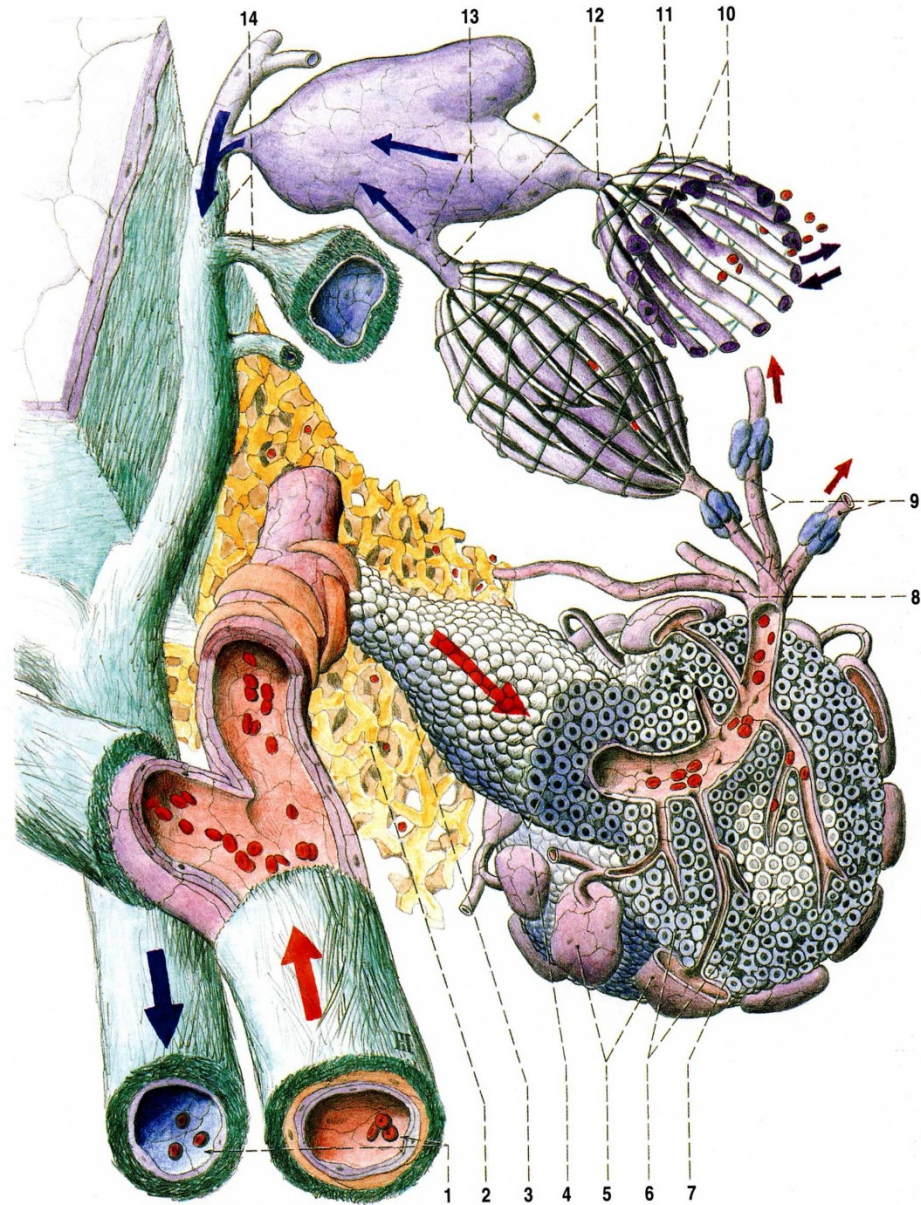




Reticulum

Pulpa rubra

Pulpa alba



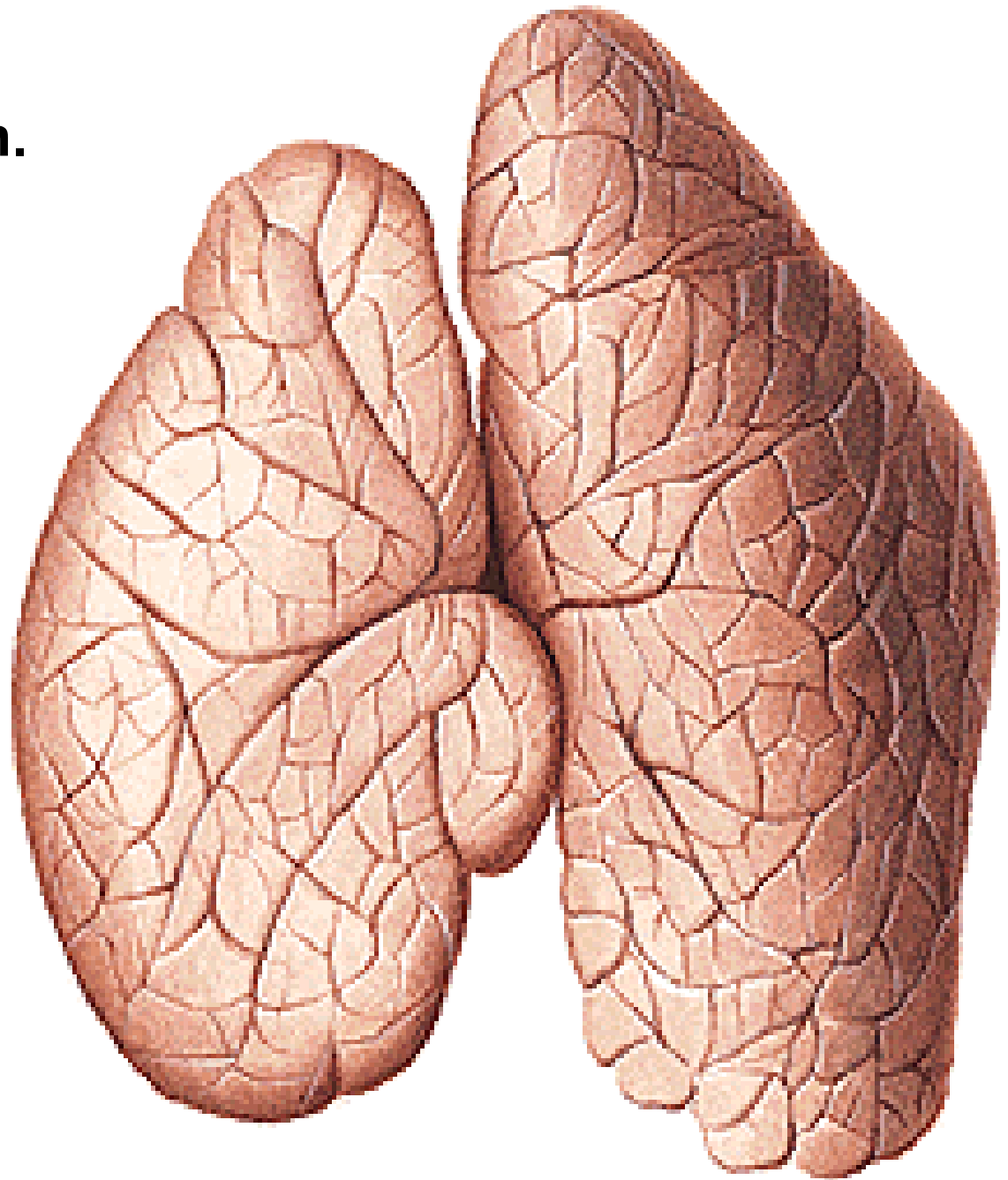
Obr. 123. STAVBA SLEZINY A PRÚTOK KRVE SLEZINOU (schéma); šipky udávají směry toku krve

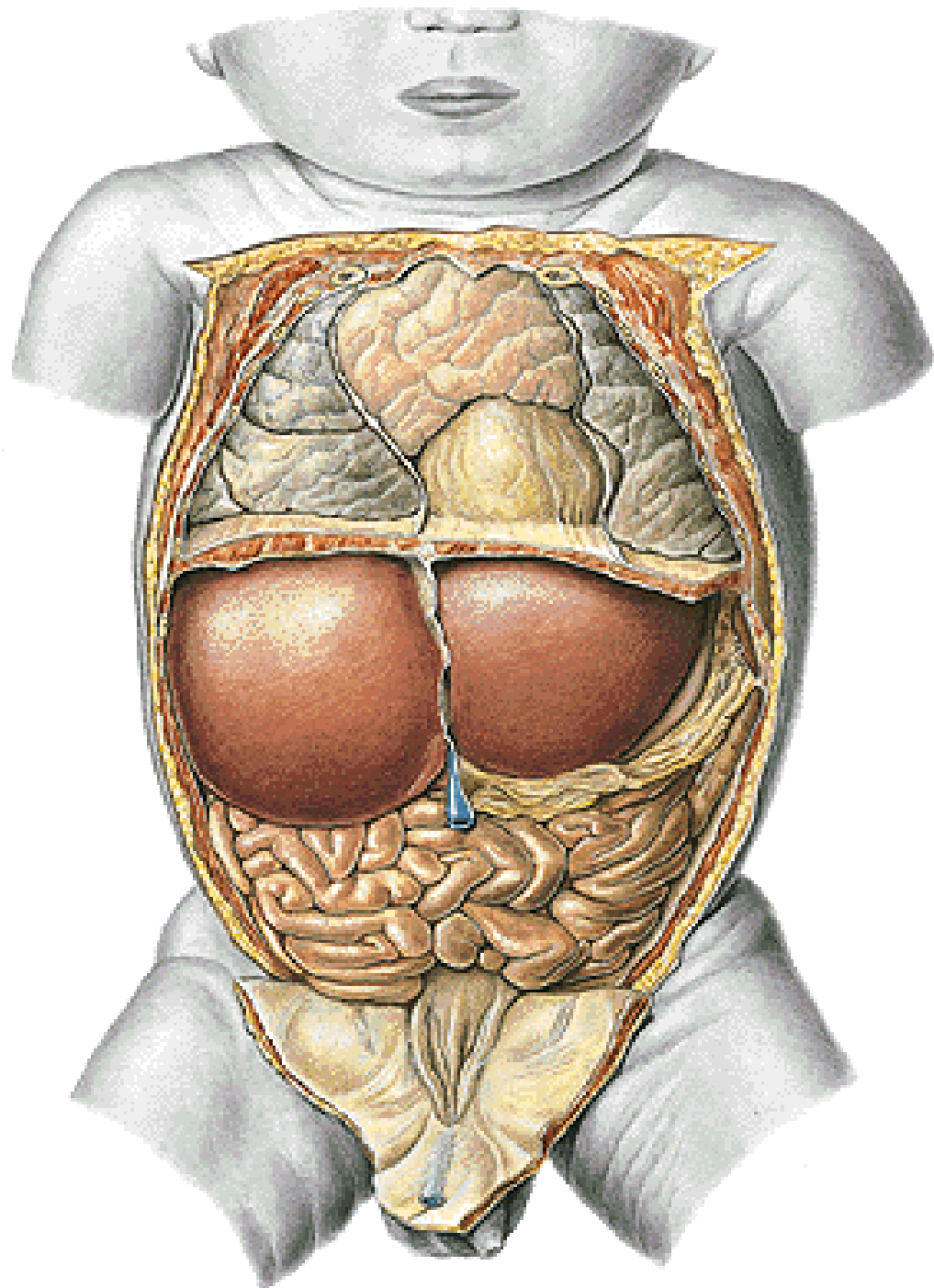
- 1 trabekulární cévy sleziny
- 2 červená pulpa sleziny
- 3 periarteriální lymfatická pochva
- 4 bílá pulpa sleziny – jeden z folliculi lymphatici lienales
- 5 sinusy marginální zóny mízního uzlíku
- 6 marginální zóna uzlíku s dendritickými buňkami

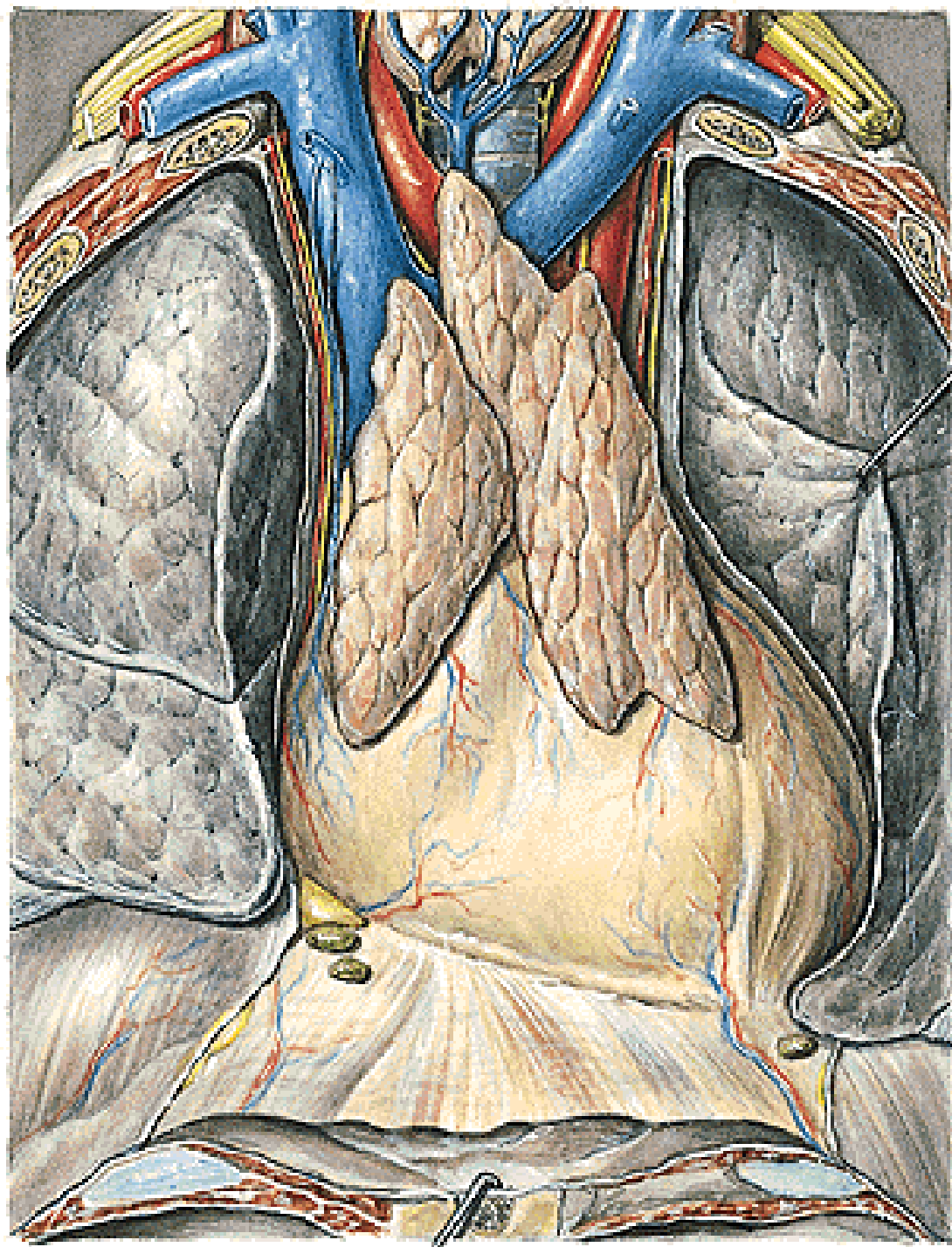
- 7 zárodečné centrum uzlíku
- 8 penicillus (aa. penicillatae)
- 9 opouzdřené arterky se Schweiggerovým-Seidelovým pouzdrém
- 10 slezinové sinusy (sinus lienis)
- 11 retikulární vlákna obtáčeující sinusy
- 12 postkapilární žíly
- 13 tenkostěnné rozšířené dřeňové žíly
- 14 trabekulární žíly

Thymus

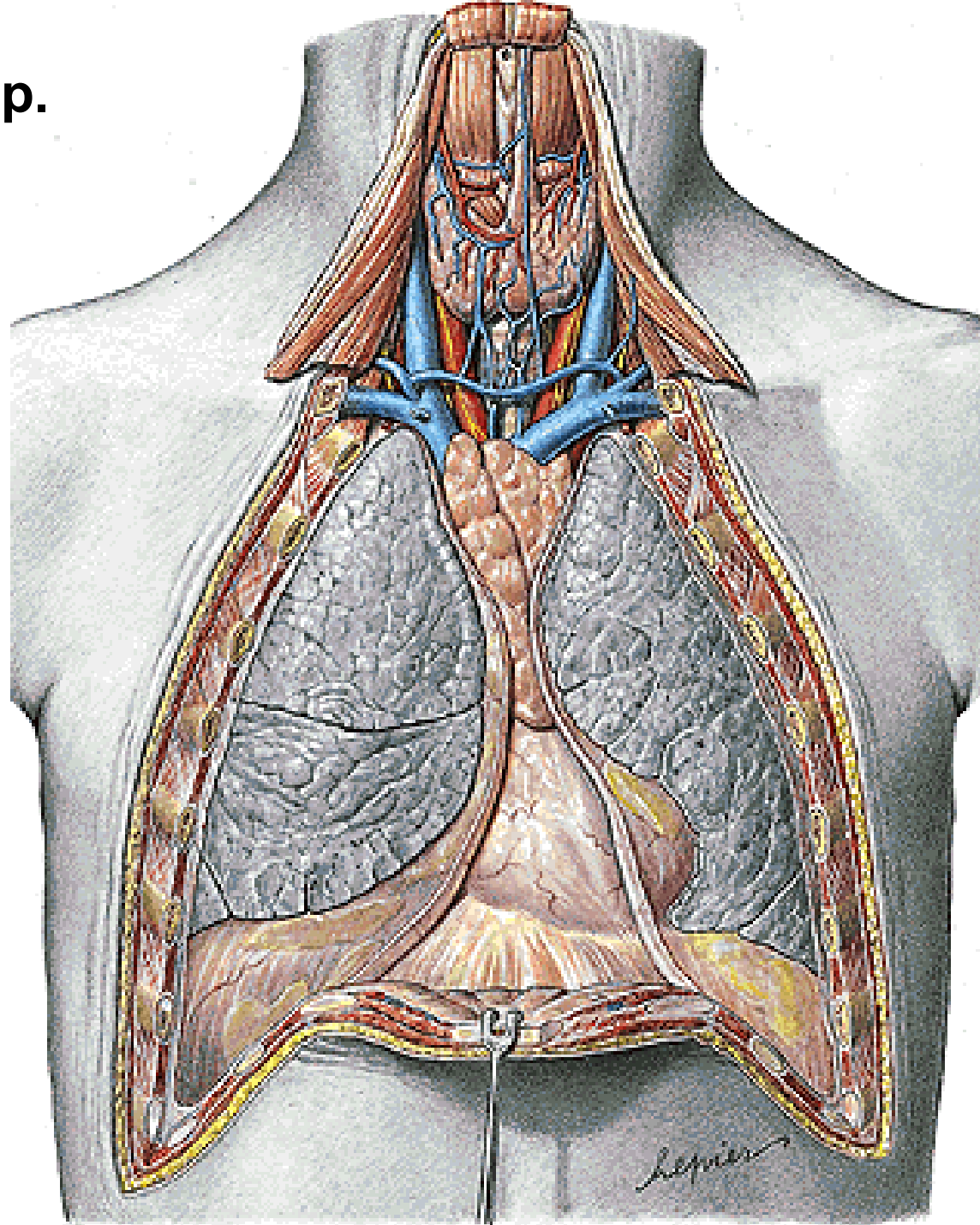
- lobus dx. et sin.





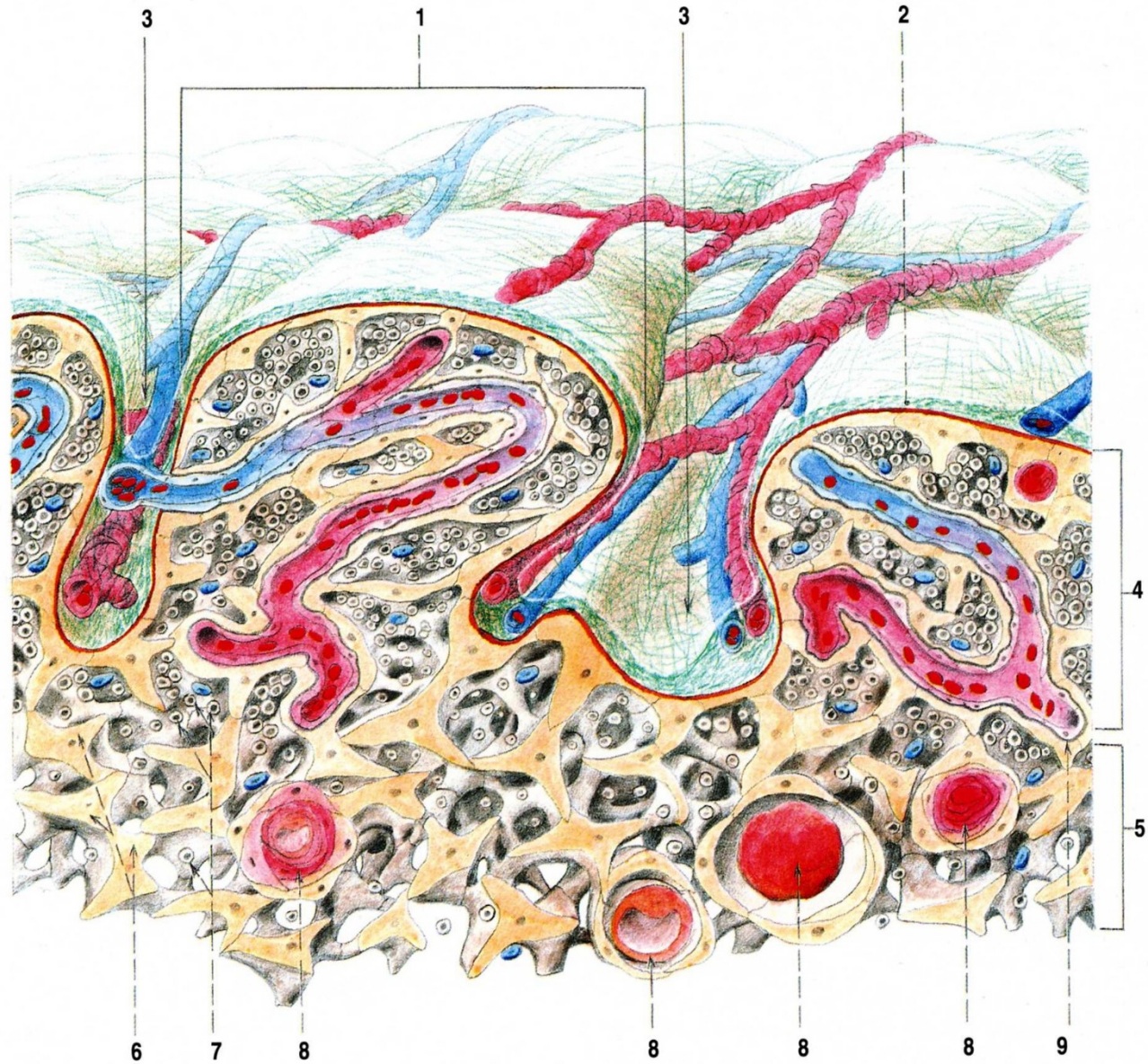


**Area interpleuralis sup.
(thymica)**



Thymus

- capsula
- reticulum
- lobuli
- cortex
- medulla



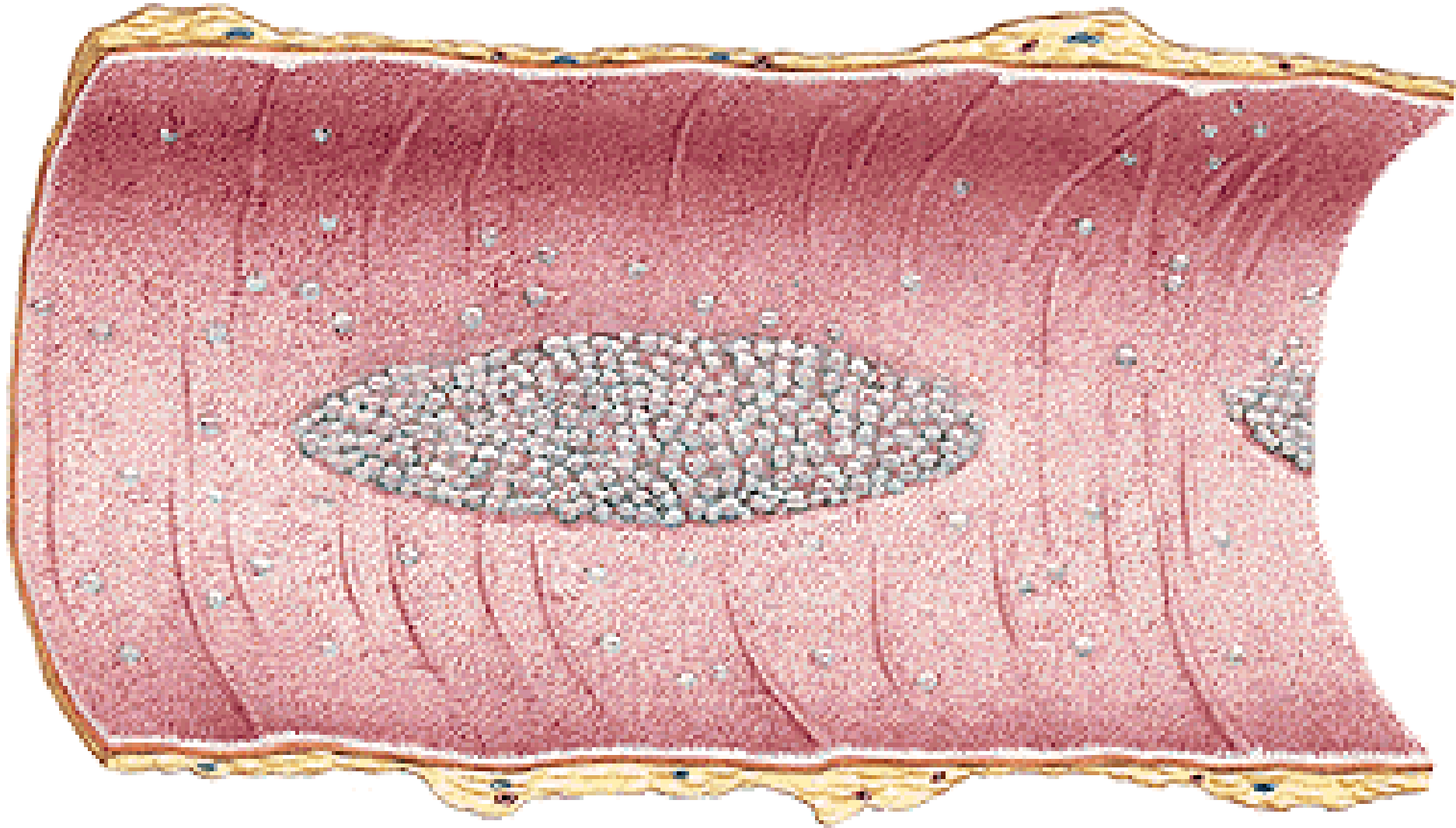
Obr. 128. STAVBA THYMU (schéma)

- 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 (Peyer's patches)



Truncus lymphaticus dexter

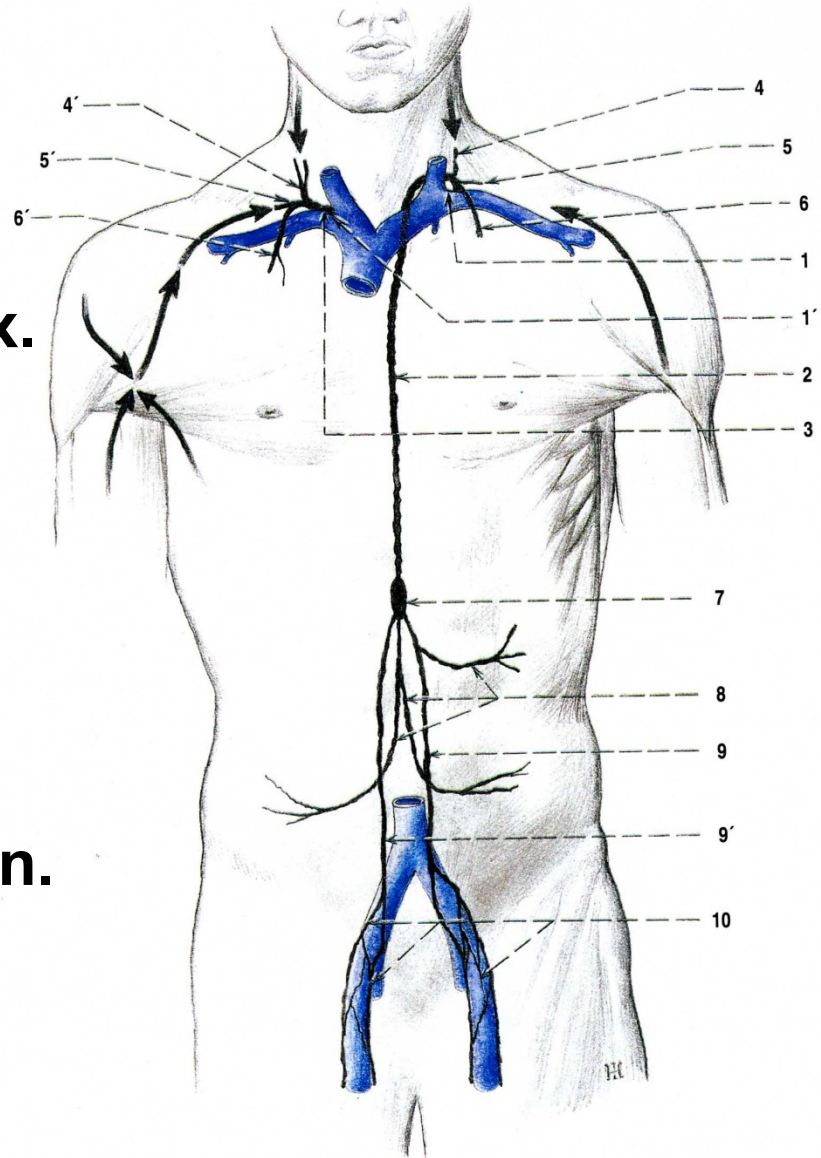
- tr. jugularis dexter
- tr. subclavius dx.
- tr. bronchomediastinalis dx.

Ductus thoracicus

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

(cisterna chyli)

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

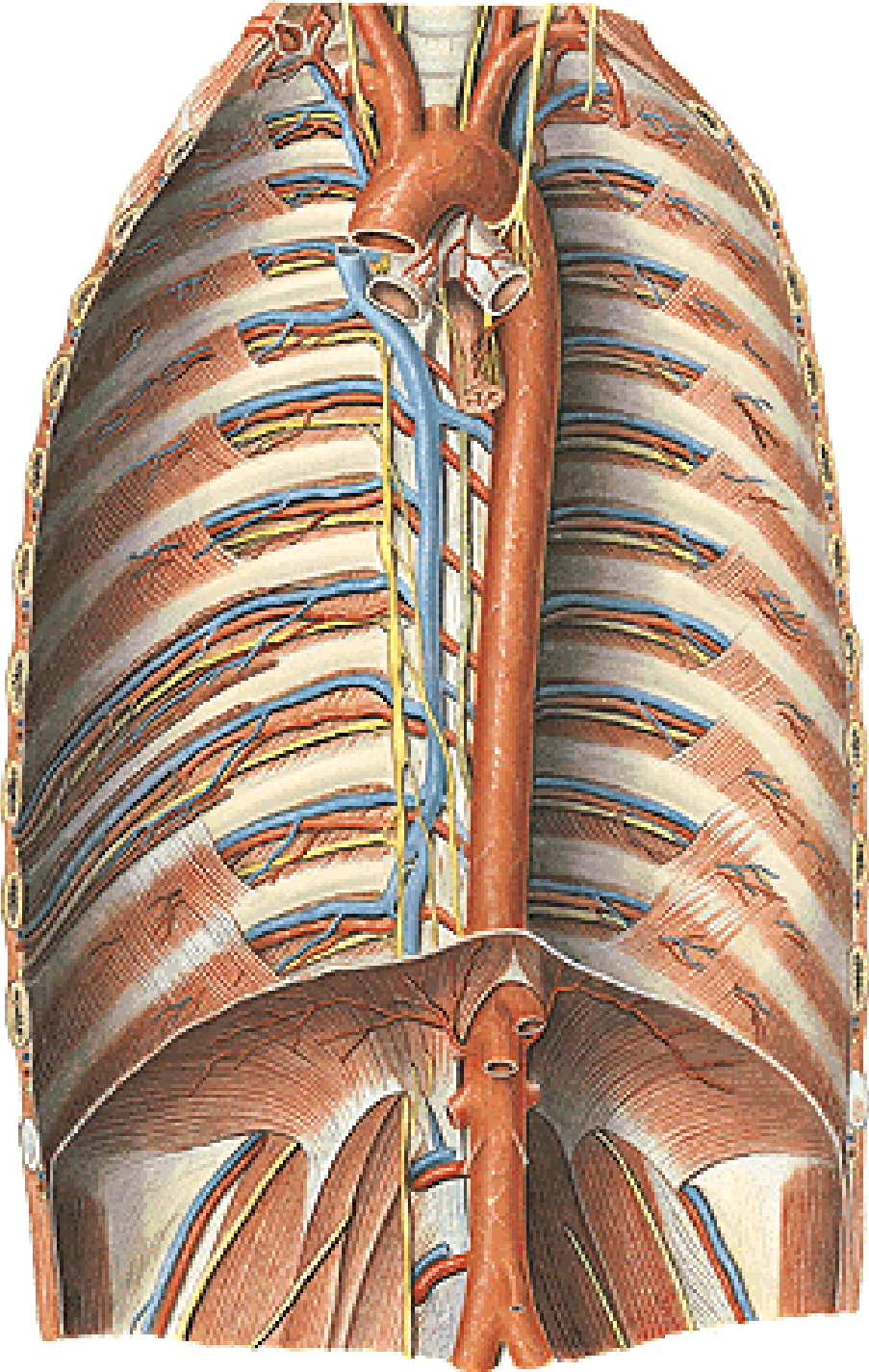


Obr. 129. HLAVNÍ MÍZNÍ KMENY (schéma)

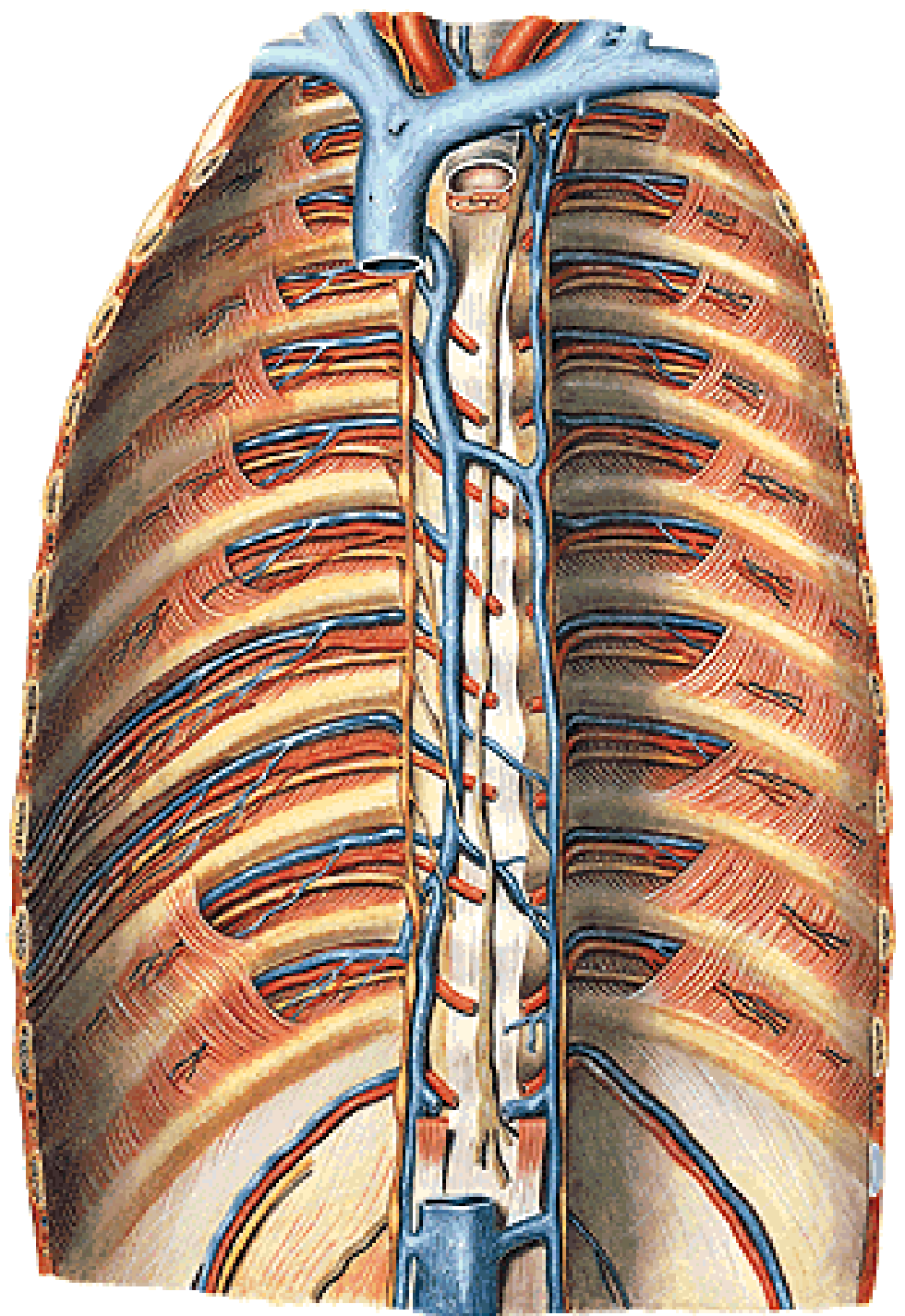
- 1 angulus venosus sinister
- 1' angulus venosus dexter
- 2 ductus thoracicus
- 3 ductus lymphaticus dexter
- 4 truncus jugularis sinister
- 4' truncus jugularis dexter
- 5 truncus subclavius sinister

- 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

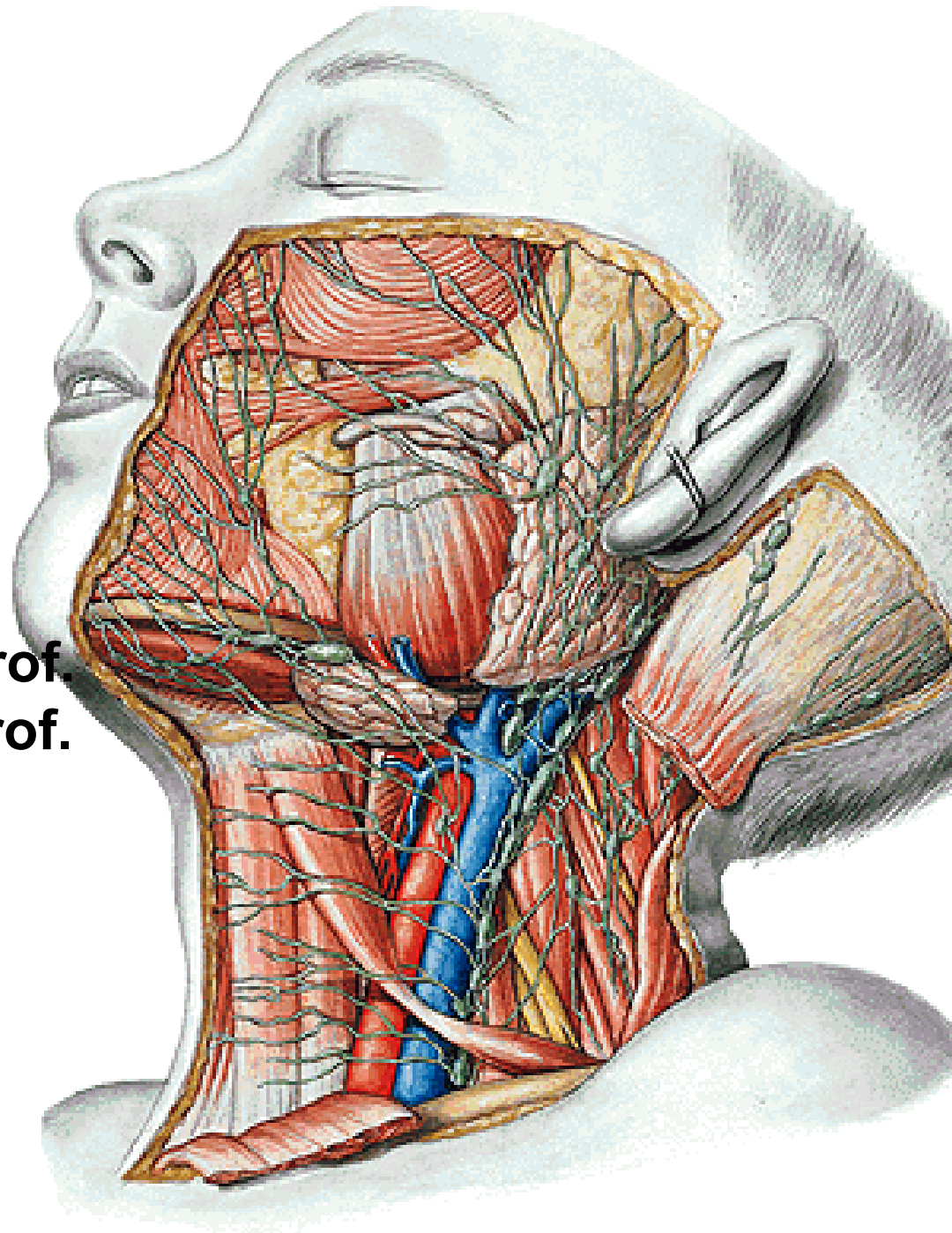
Nll. cervicales ant.spf. et prof.

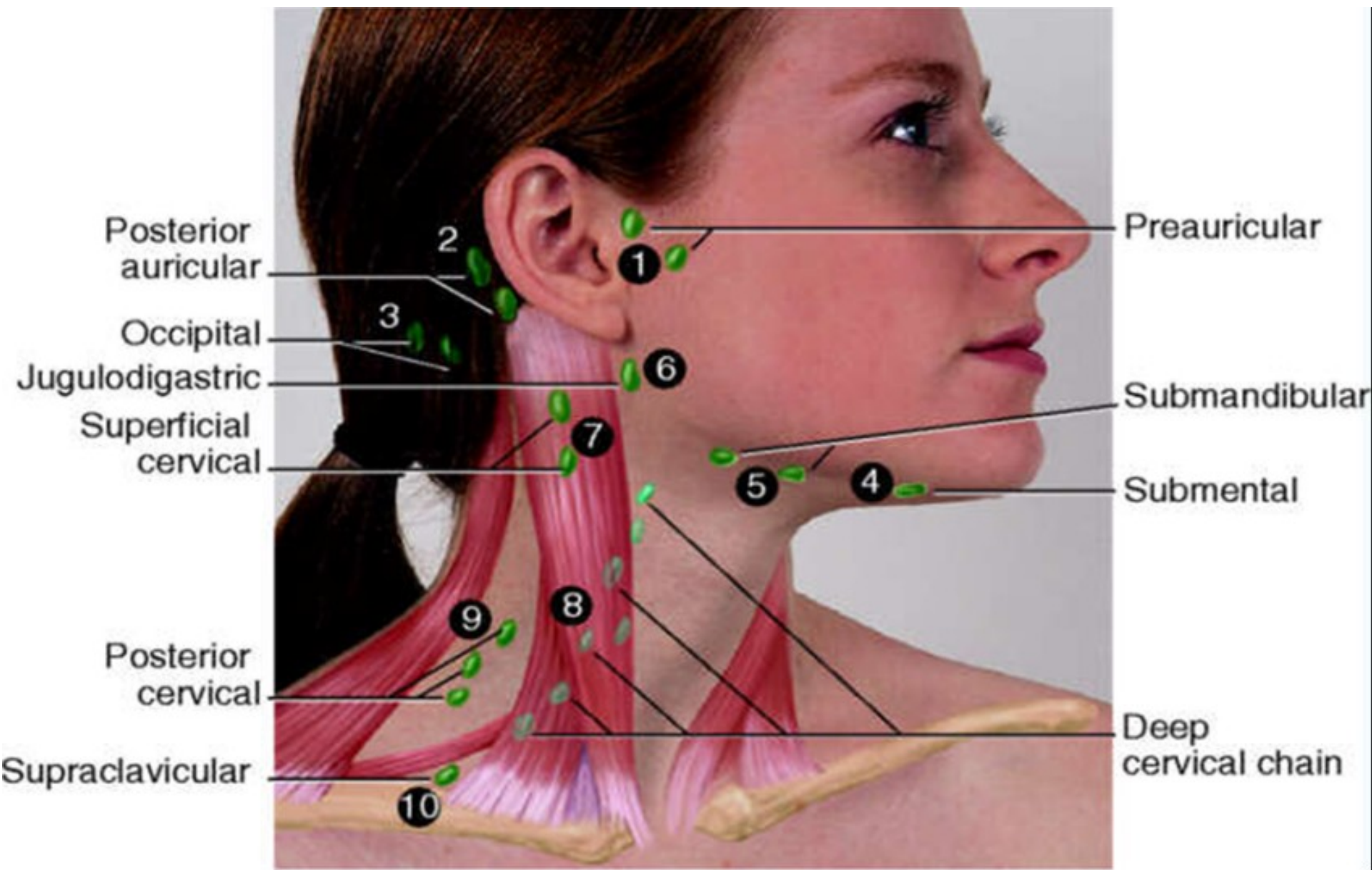
Nll. cervicales lat. spf. et prof.

(nll. jugulares int.

nll. supraclaviculares)

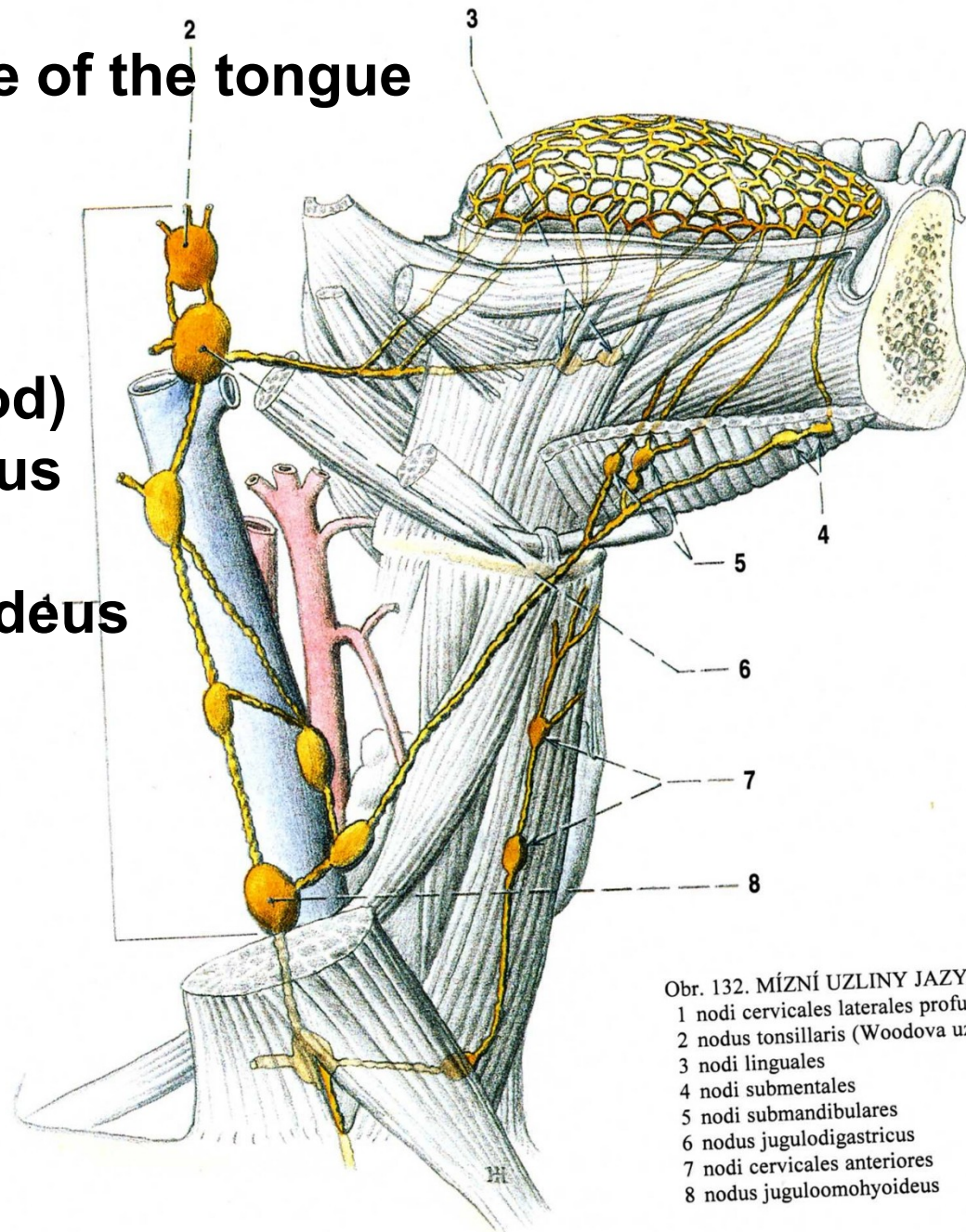
→ **tr. jugularis**





Lymphatic drainage of the tongue

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

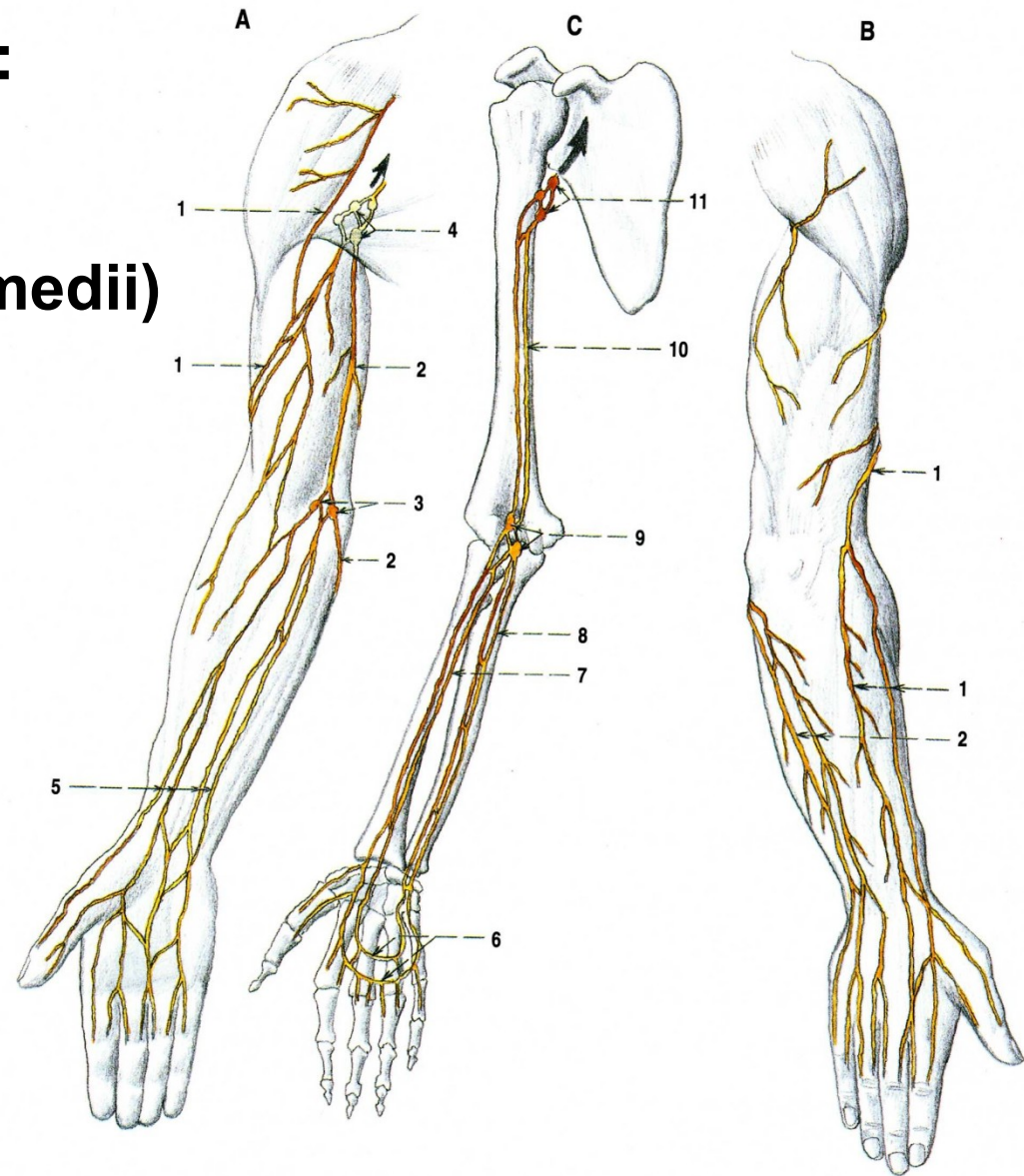


Obr. 132. MÍZNÍ UZLINY JAZYKA (schéma)
1 nodi cervicales laterales profundi superiores
2 nodus tonsillaris (Woodova uzlina)
3 nodi linguales
4 nodi submentales
5 nodi submandibulares
6 nodus jugulodigastricus
7 nodi cervicales anteriores
8 nodus juguloomohyoideus

Superficial lymph vessels:

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

III. cubitales spf. et prof.

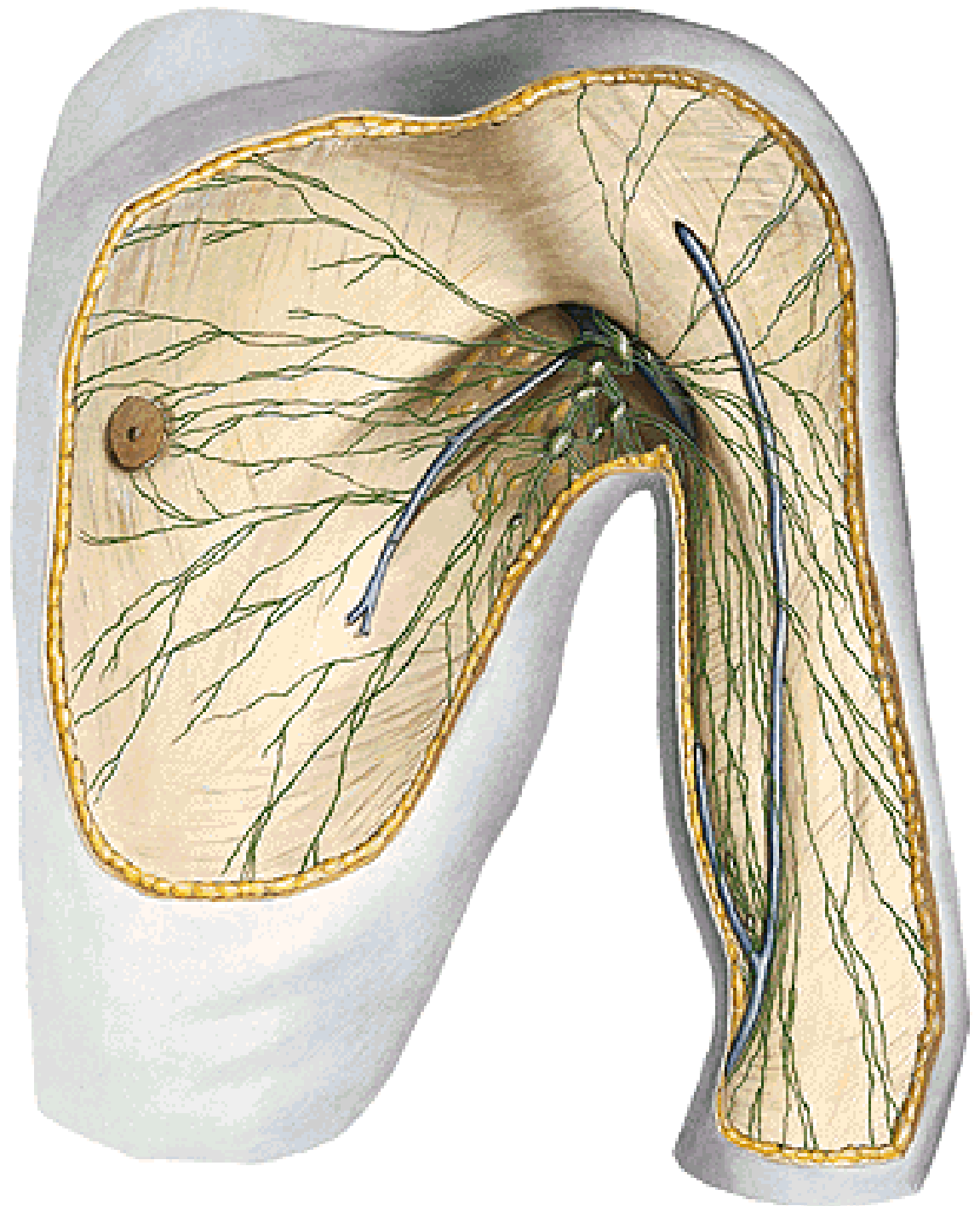


Obr. 133. POVRCHOVÉ A HLUBOKÉ MÍZNÍ CÉVY A UZLINY HORNÍ KONČETINY

- 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

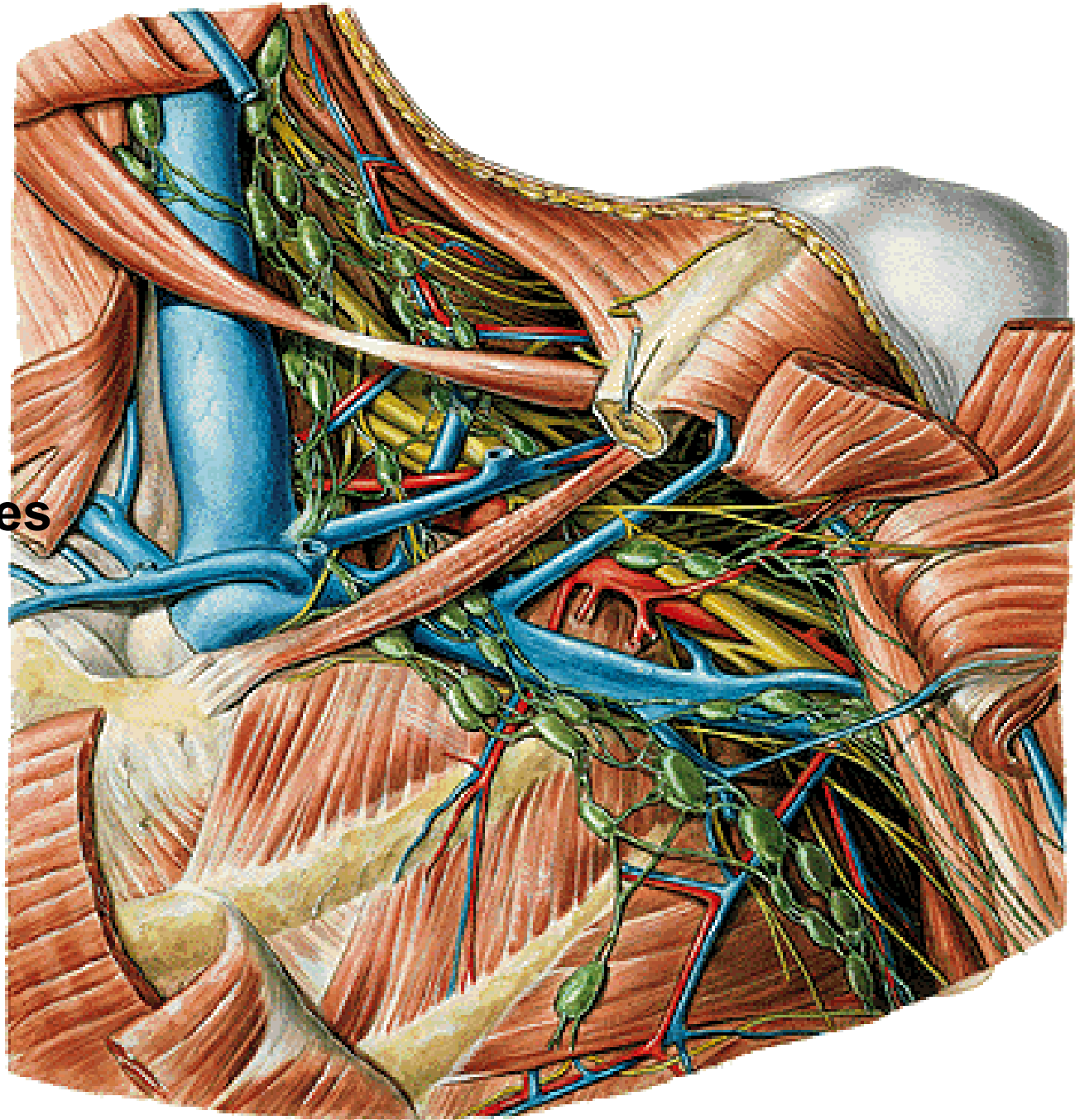
Nll. axillares



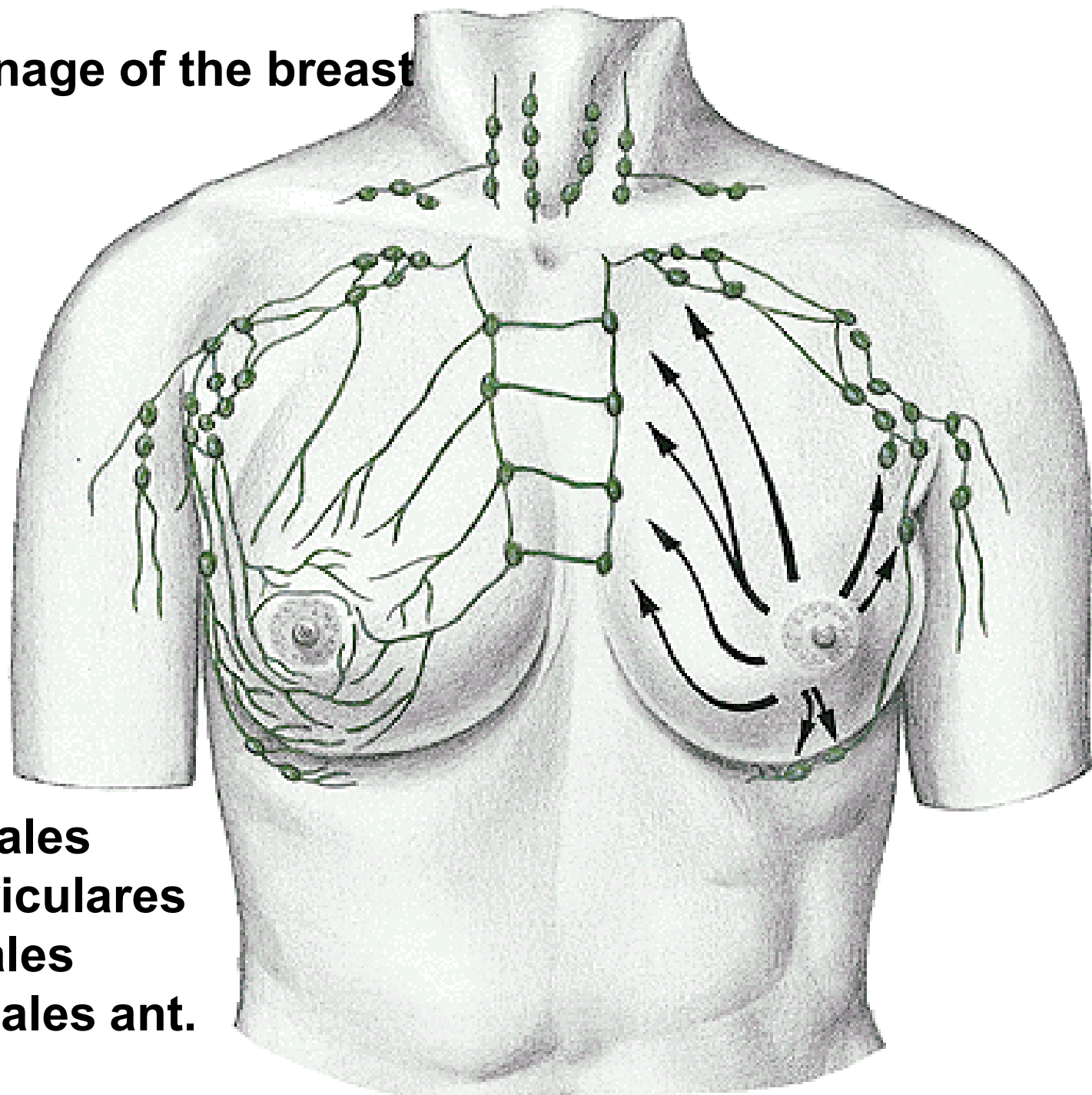
Nodi lymph. axillares:

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

→ tr. subclavius



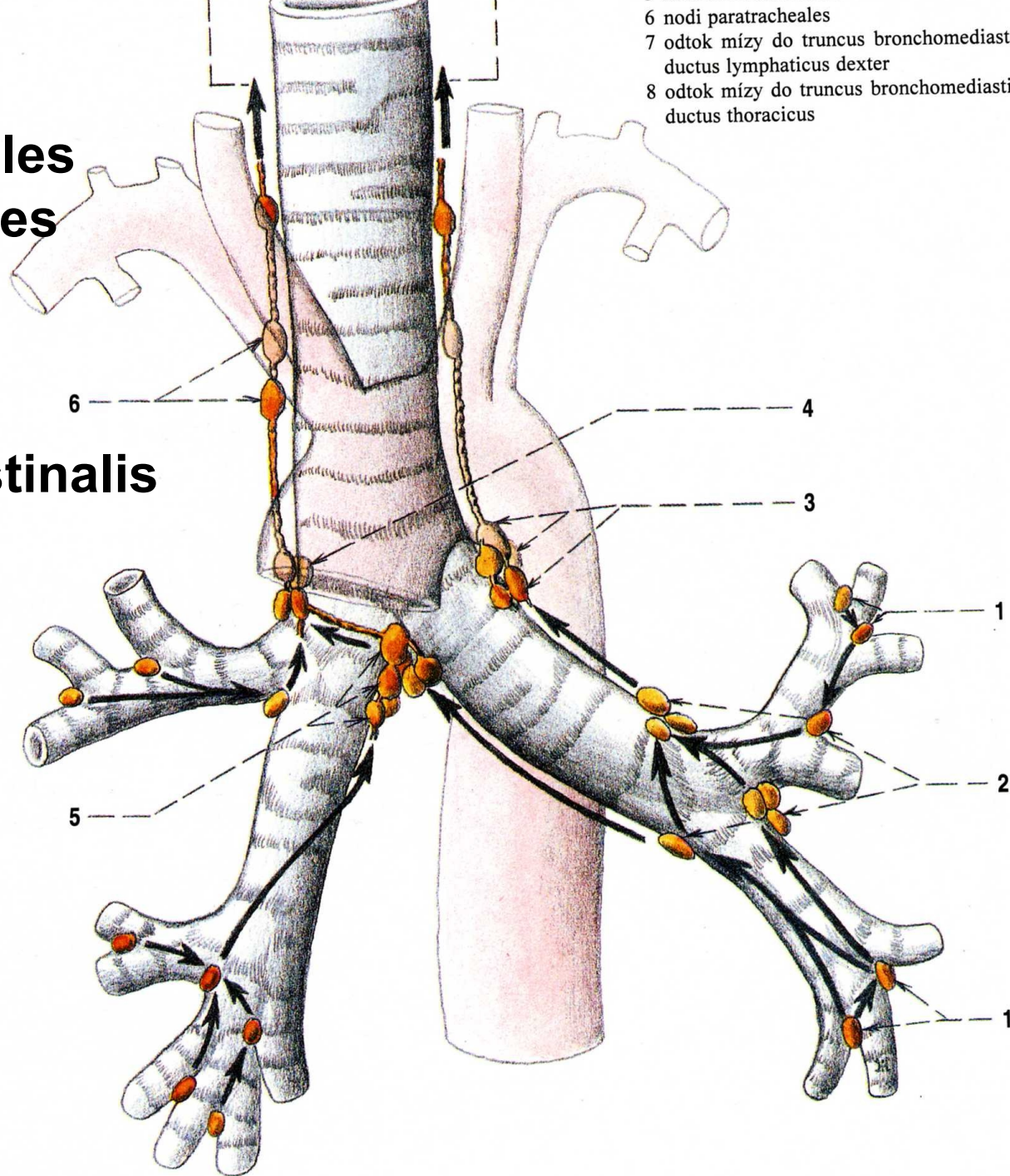
Lymphatic drainage of the breast



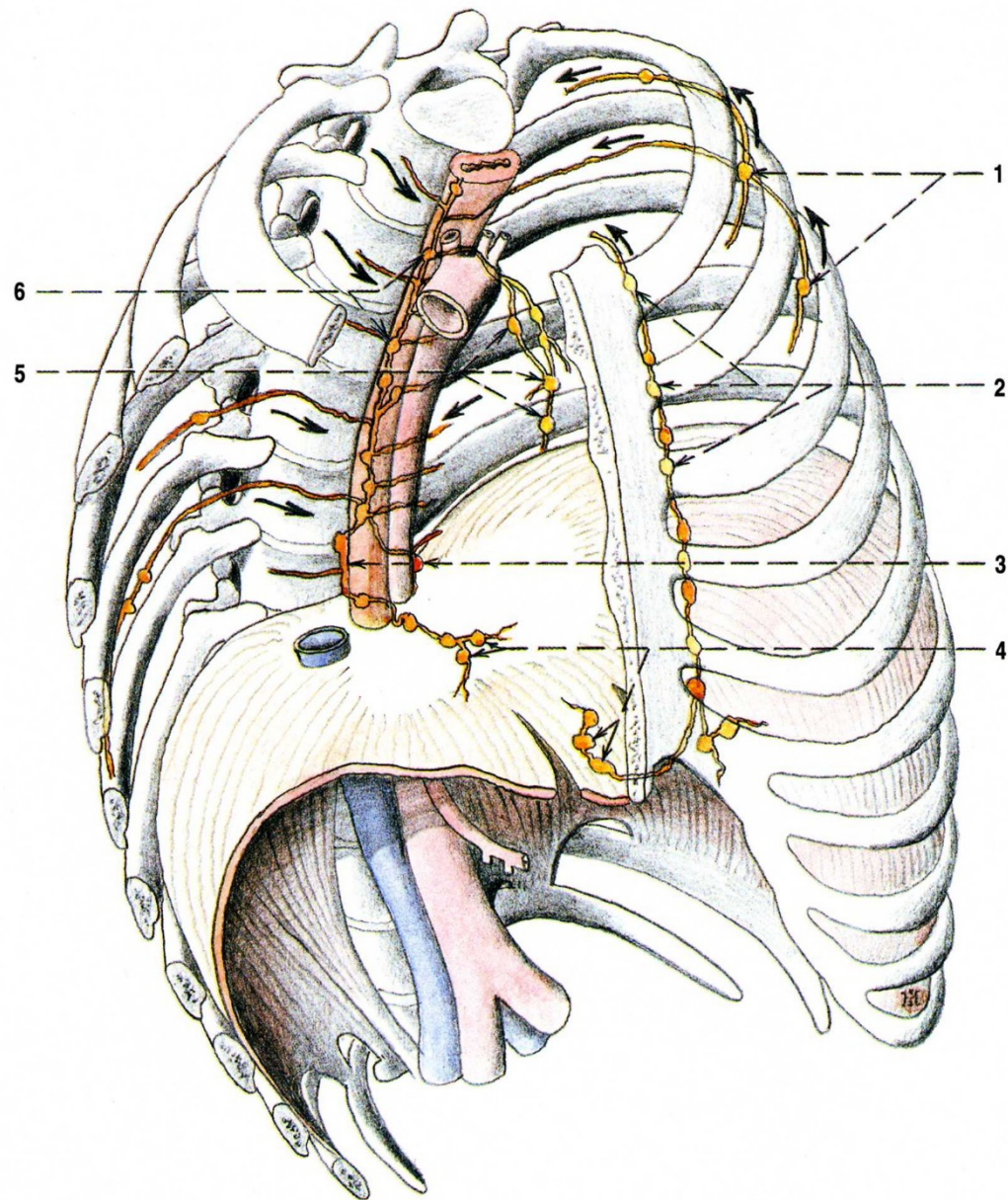
- nll. axillares
- nll. parasternales
- nll. supraclaviculares
- nll. intercostales
- nll. mediastinales ant.

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

→ tr. bronchomediastinalis



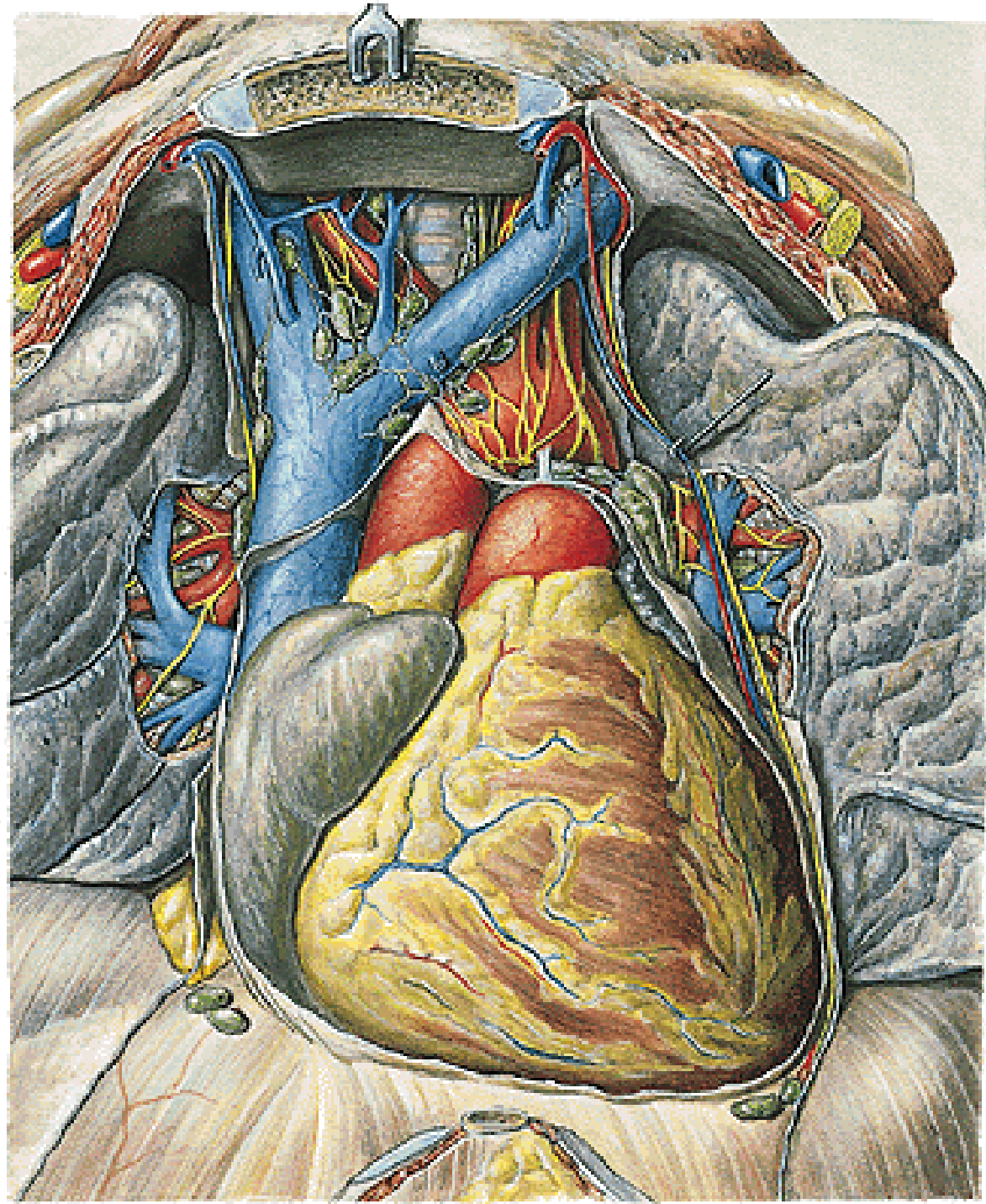
NII. parasternales
NII. intercostales
NII. praevertebrales
NII. phrenici sup.



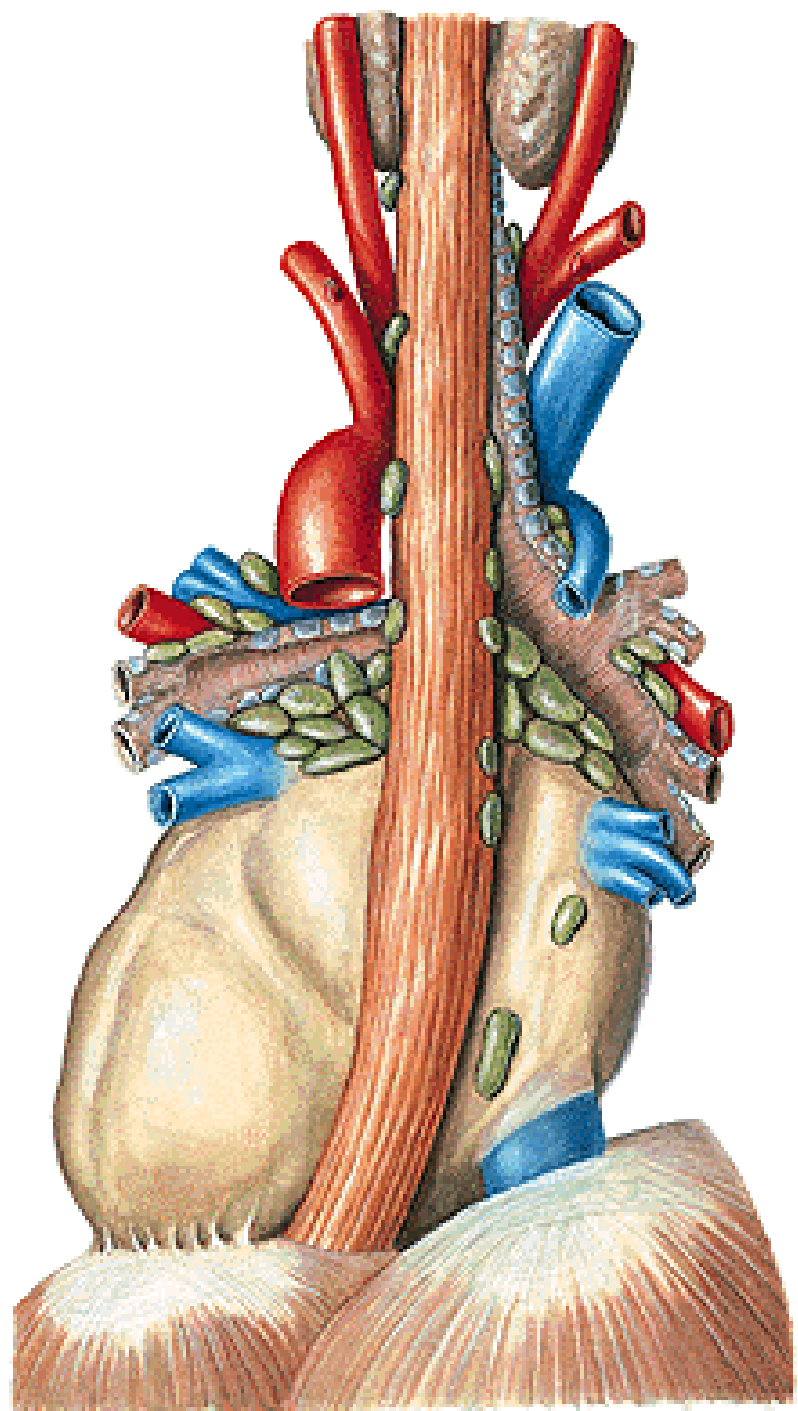
Obr. 135. MÍZNÍ UZLINY HRUDNÍKU; uzliny hrudních stěn a
 některé orgánové uzliny
 1 nodi intercostales
 2 nodi parasternales

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

Nll. mediastinales ant.

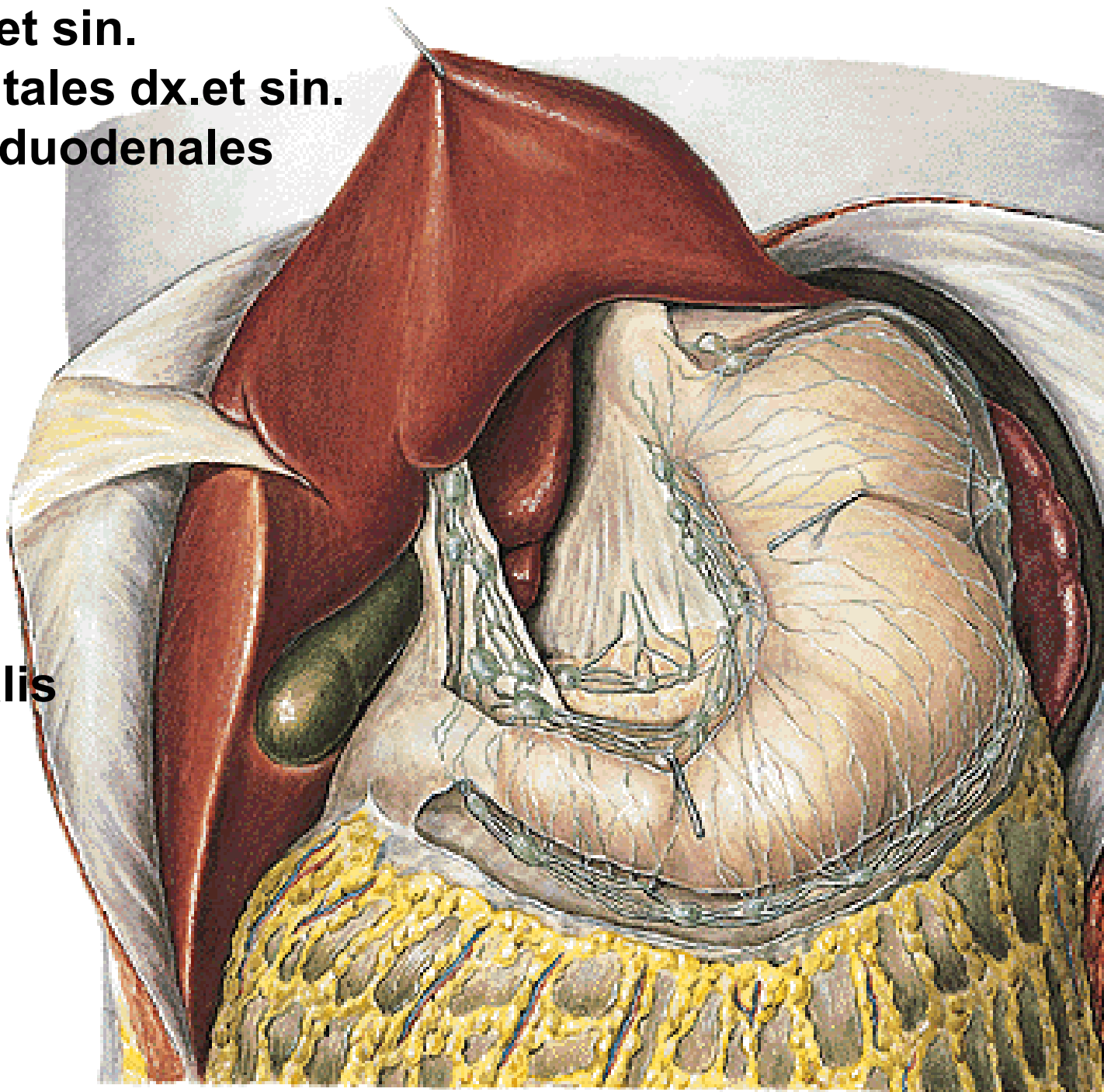


NII. mediastinales post.



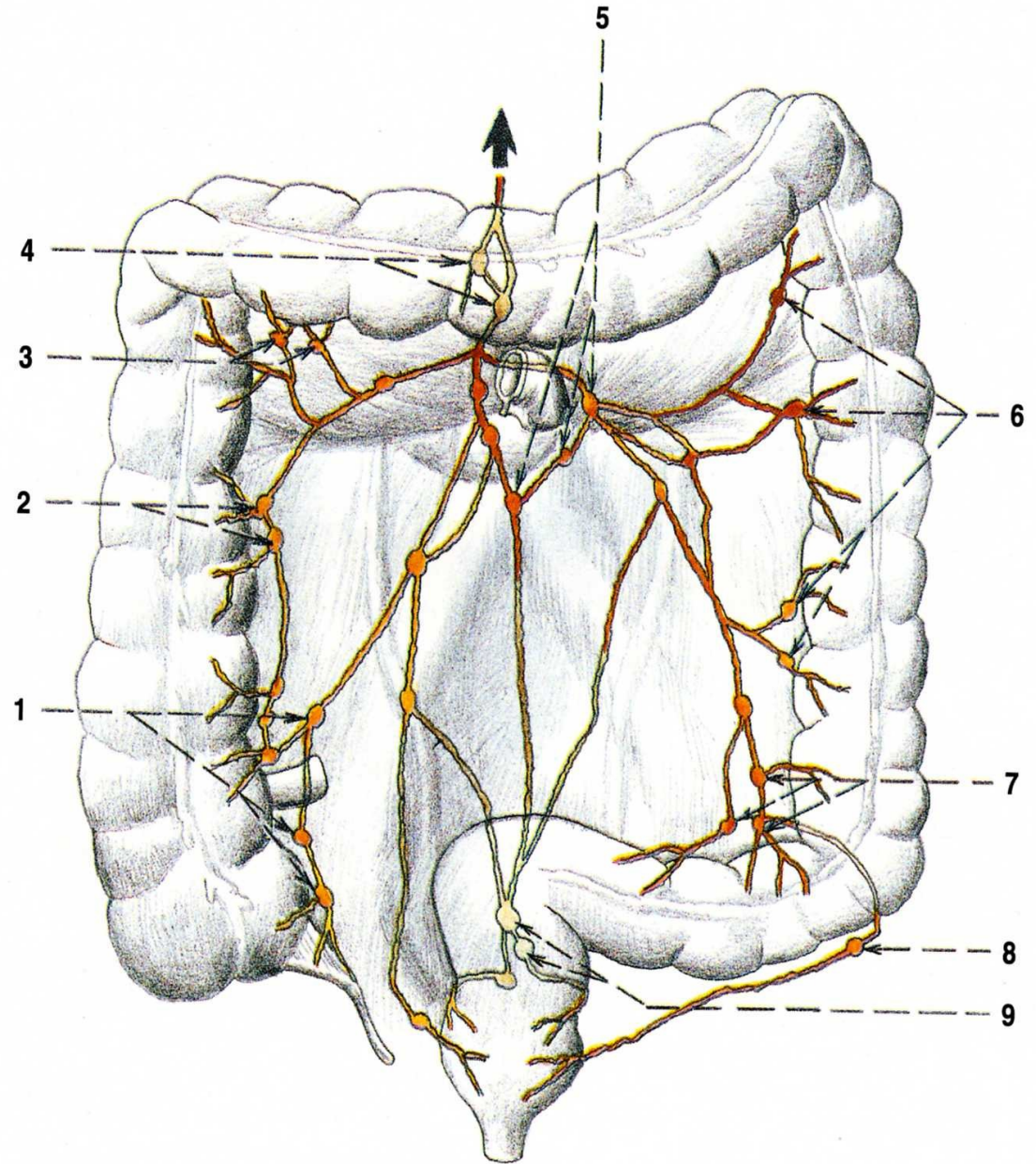
Nll. gastrici dx. et sin.
Nll. gastromentales dx. et sin.
Nll. pancreaticoduodenales
sup. et inf.
Nll. lienales
Nll. coeliaci
Nll. hepatici
Nll. pancreatici
sup. et inf.

→ tr. intestinalis



Nodi mesenterici sup.
Nodi mesenterici inf.

→ **tr. intestinalis**

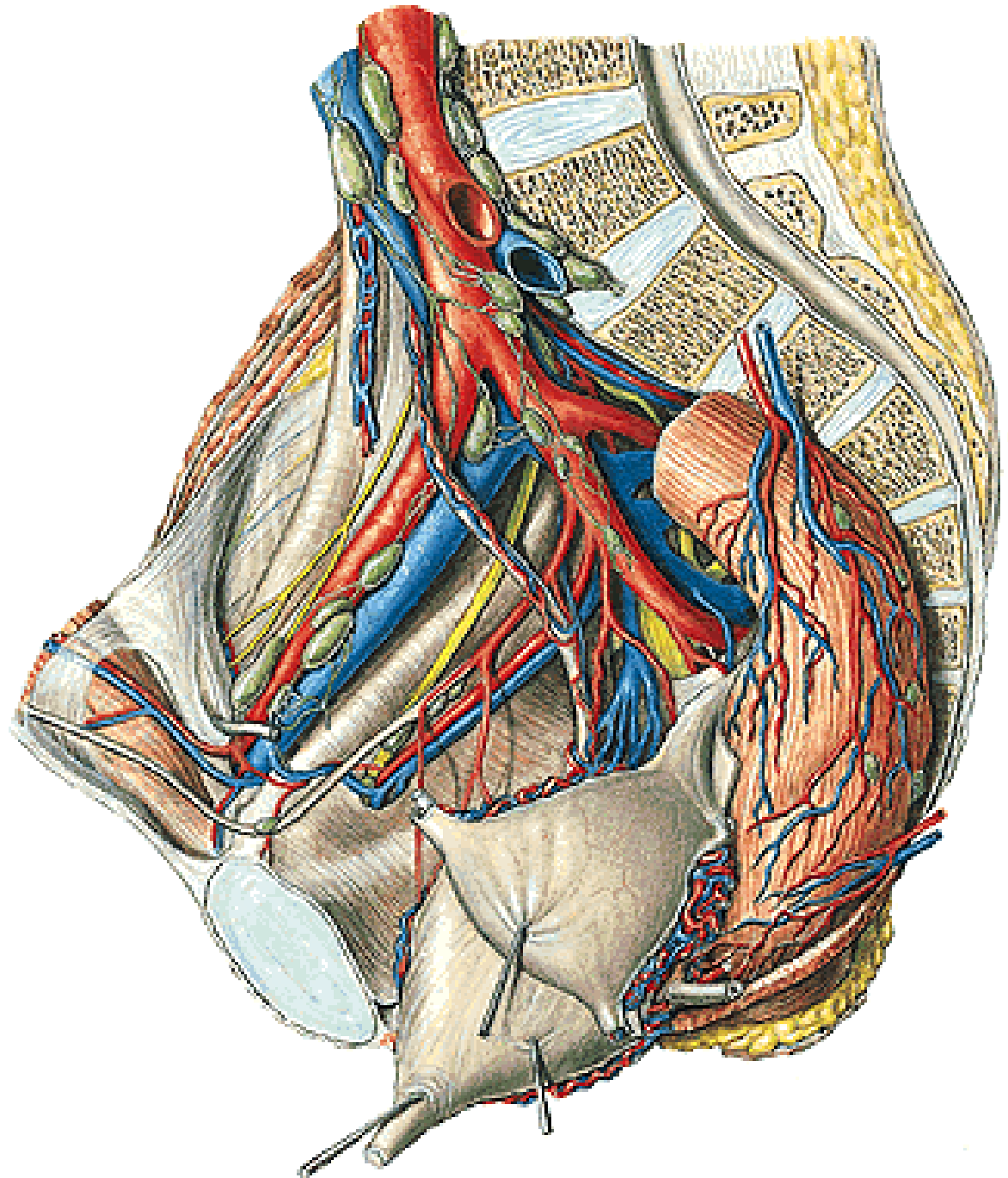


Nll. iliaci interni

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

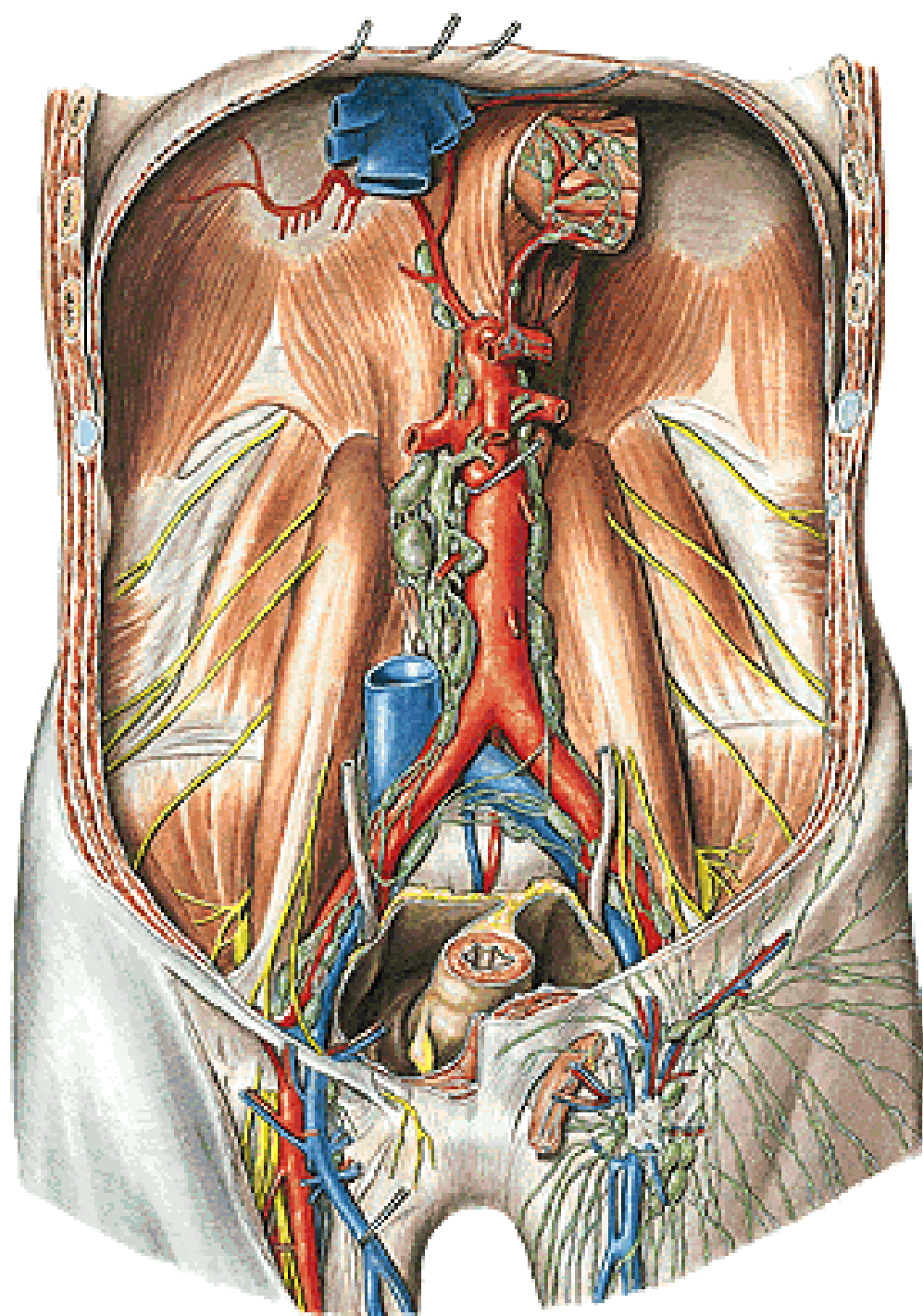
Nll. iliaci externi

Nll. iliaci communes

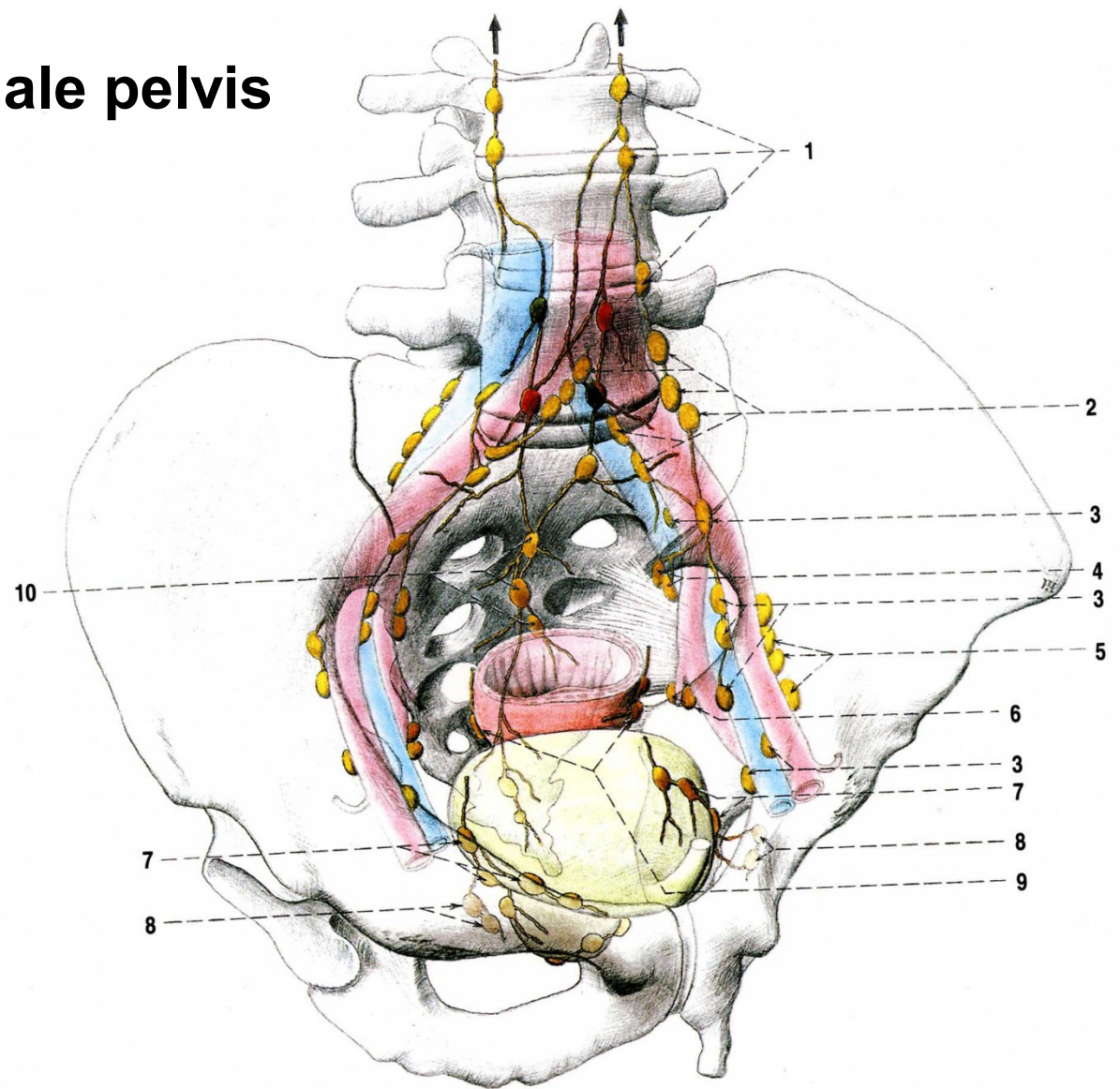


NII. lumbales (paraaortici)

→ tr. lumbalis dx. et sin.



Drainage of the male pelvis

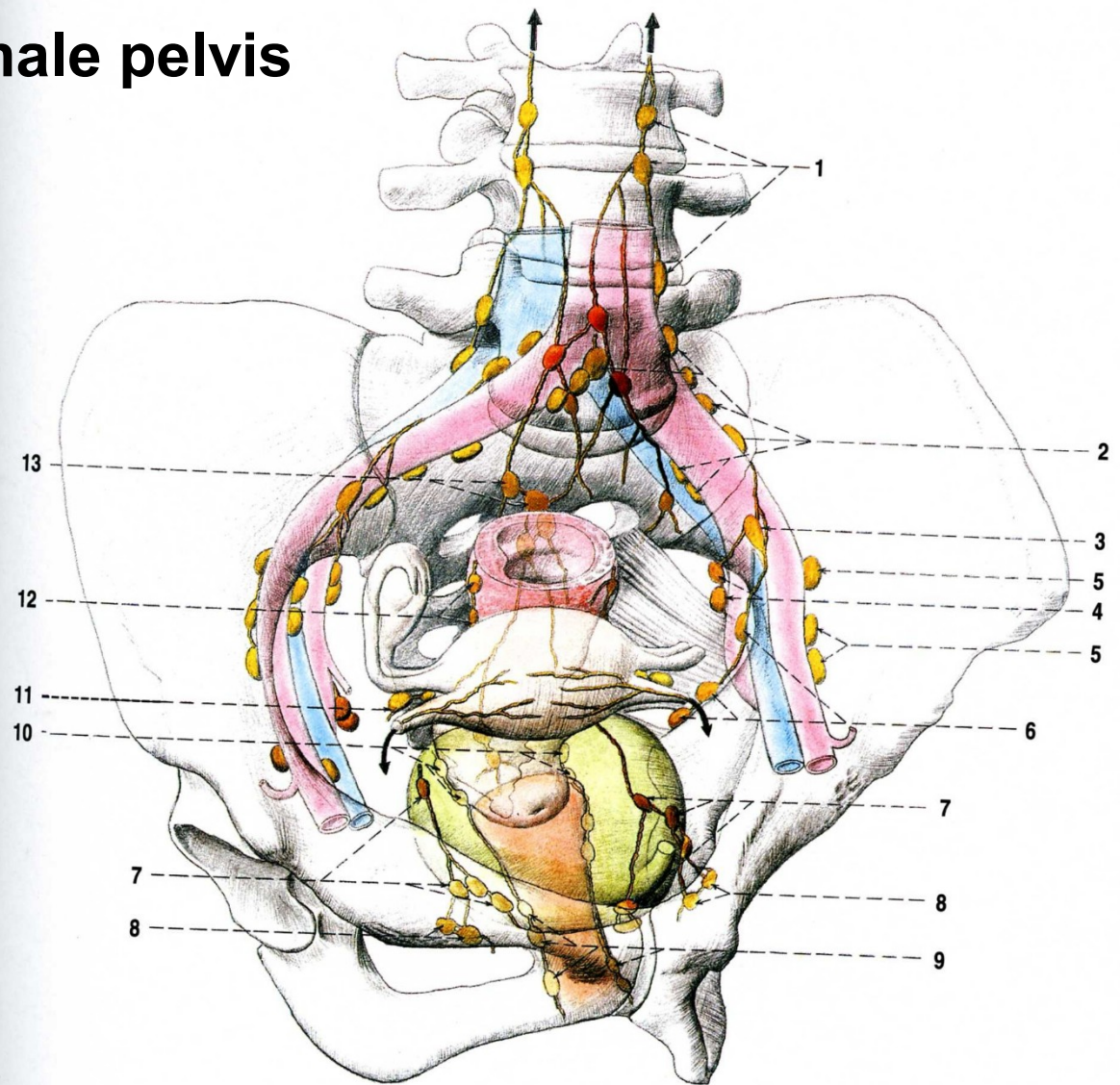


Obr. 139. NODI SACRALES A MÍZNÍ UZLINY PÁNEVNÍCH
ORGÁNŮ MUŽE

- 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



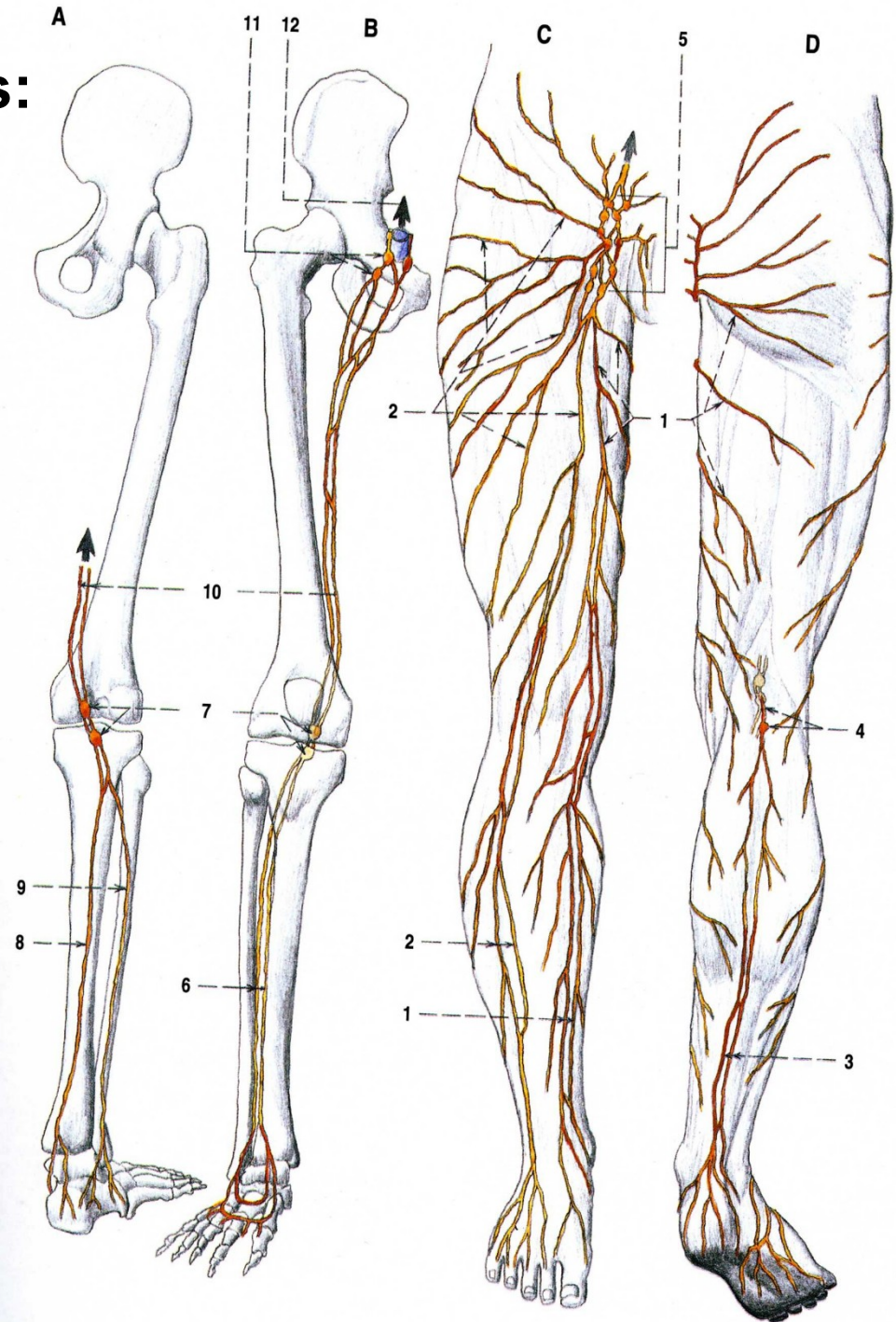
Blue dye is injected
between the toes
into the webbing



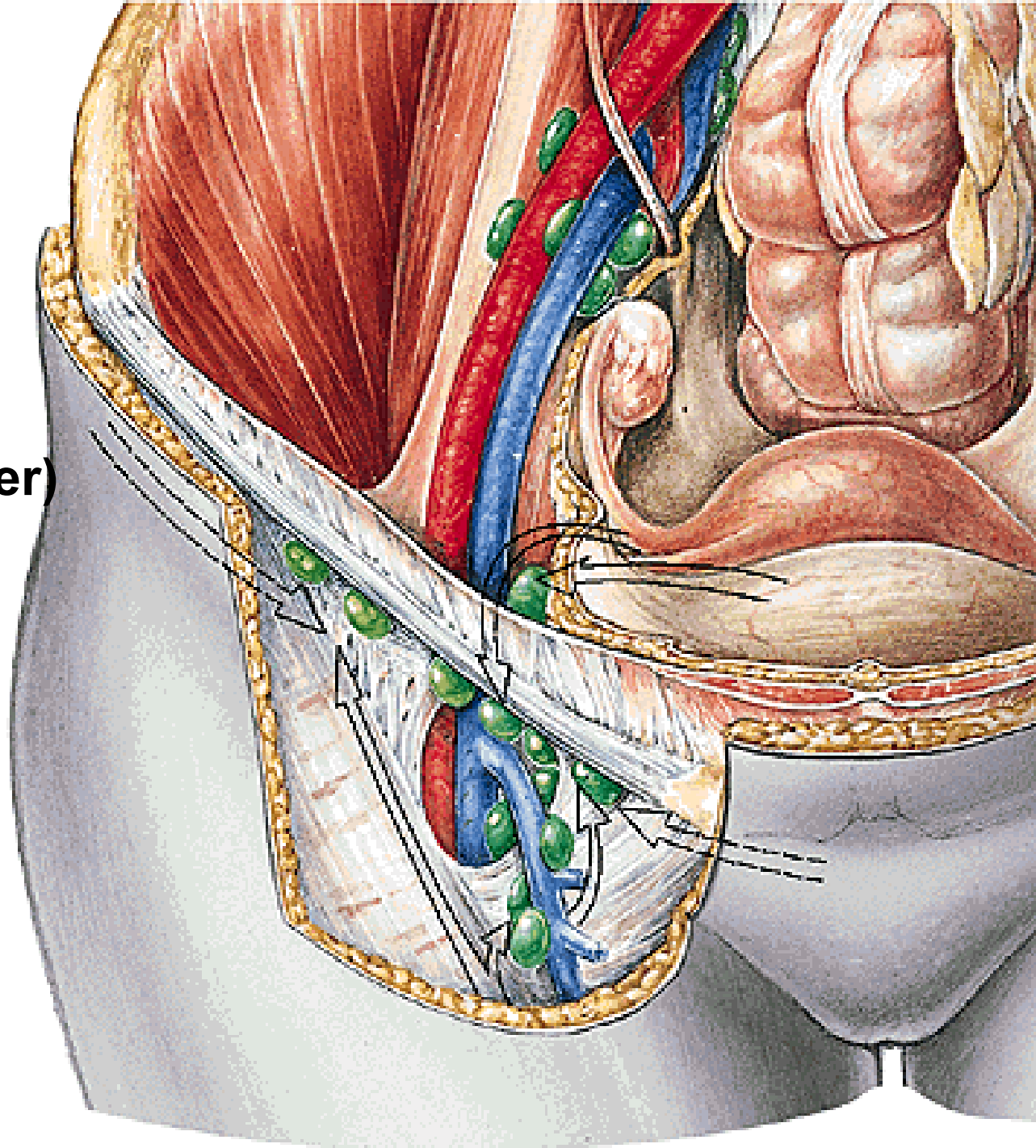
Superficial lymph vessels:

- collectores mediales
- collectores laterales
- collectores posteriores

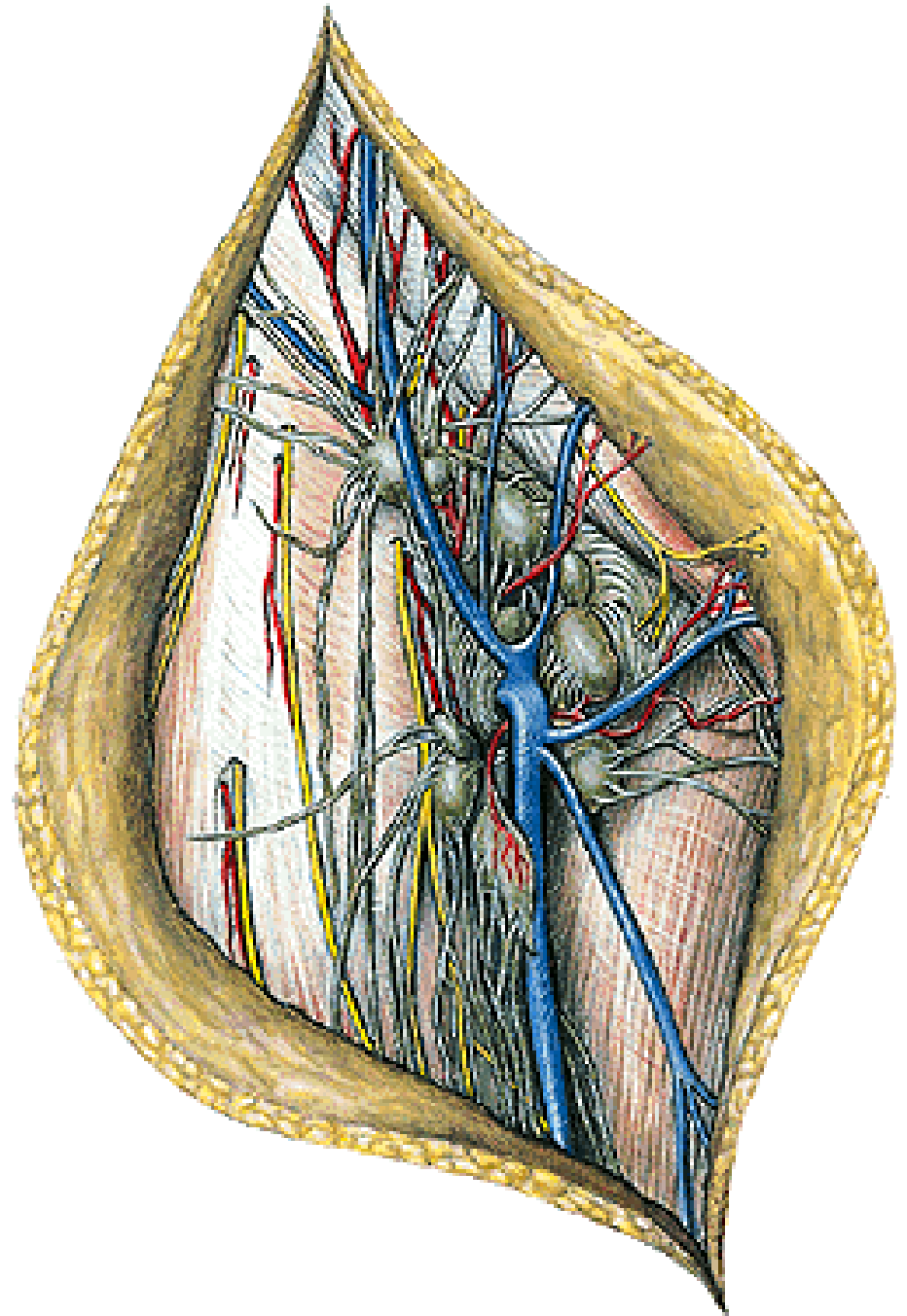
Nll. poplitei spf. et prof.

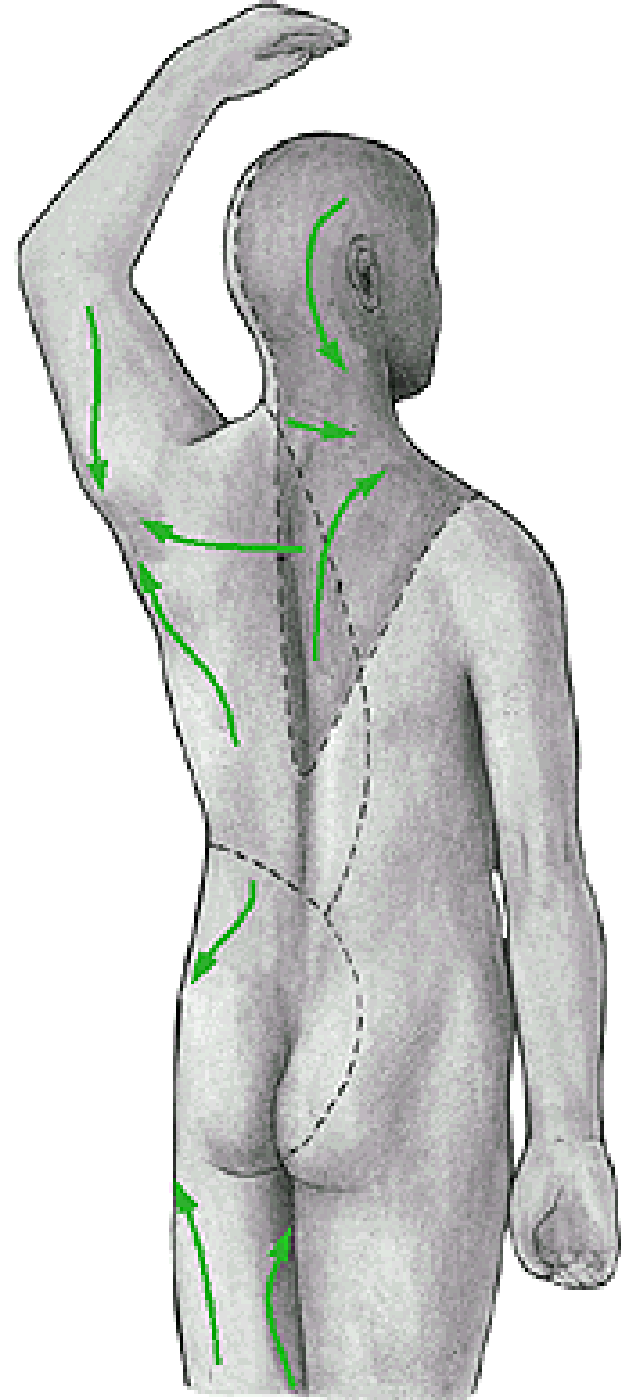
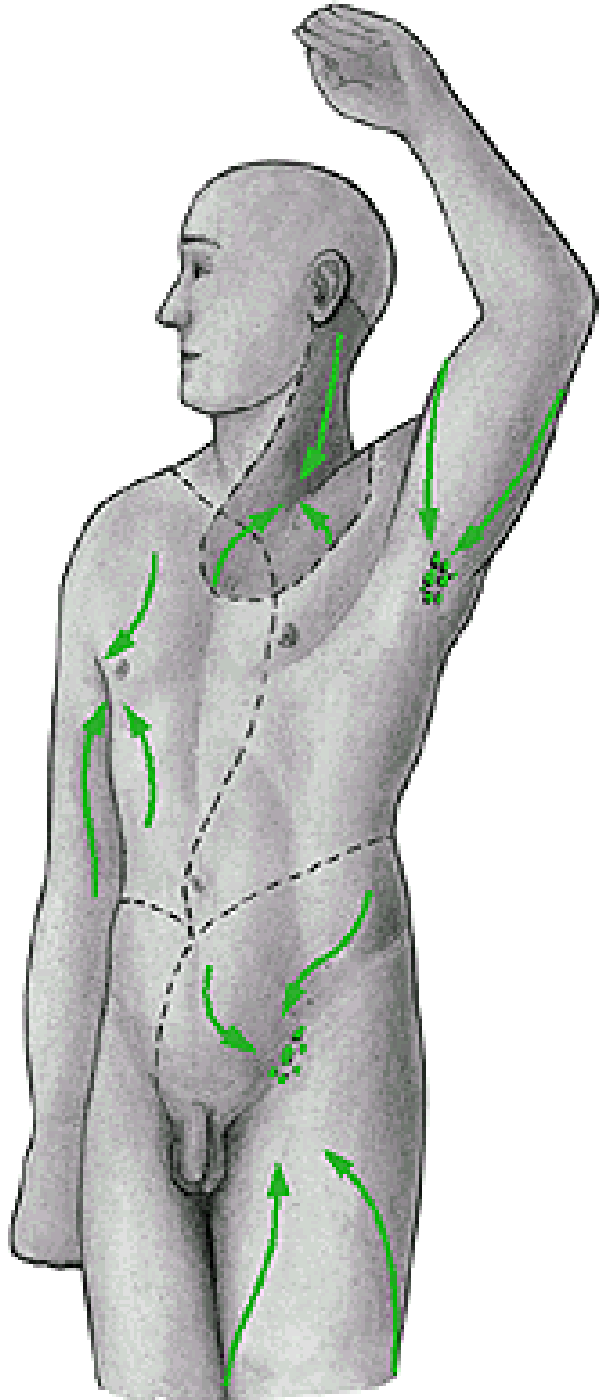


Nll. inguinales spf.
Nll. inguinales prof.
(Cloquet-Rosenmüller)



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





Illustrations, photographs, and radiographs 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