



# L'Anatomie à l'aide des lombalgiques

Roger ROBERT

# Two kinds of pain

- Somatic pain:
  - well defined
  - metameric
  - radicular or truncular
- Vegetative pain:
  - plurimetameric, diffuse
  - with sympathetic signs

# Douleur végétative

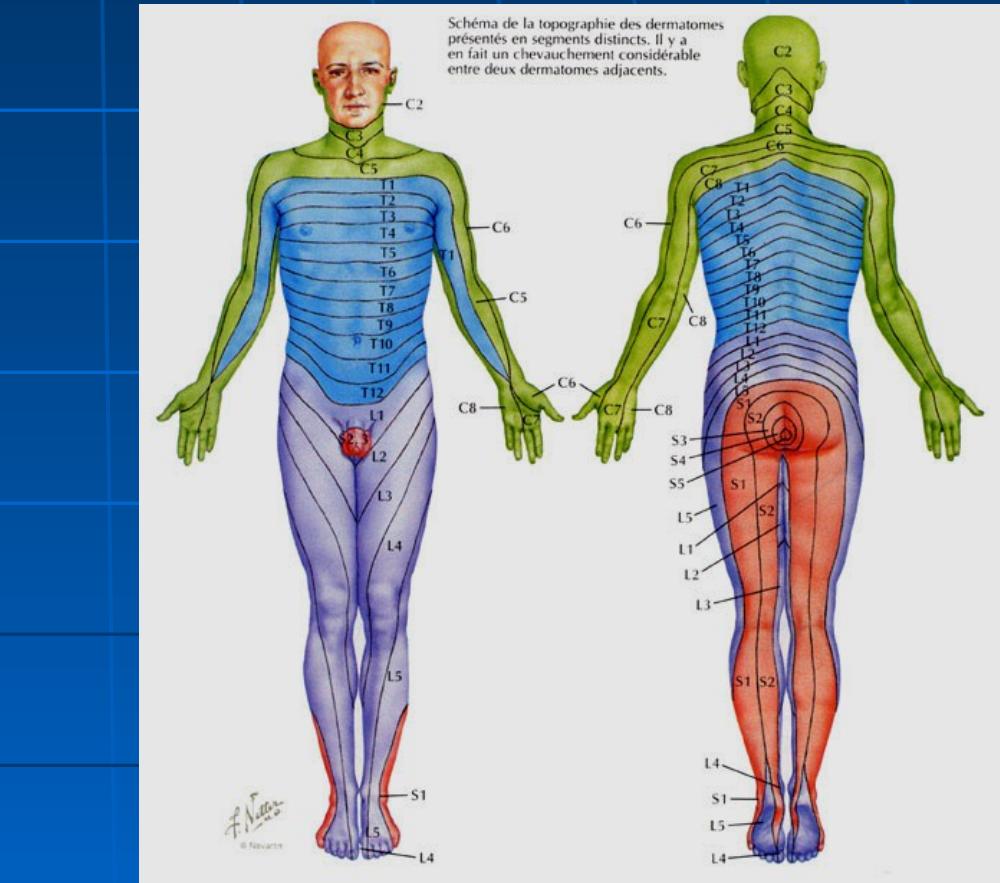
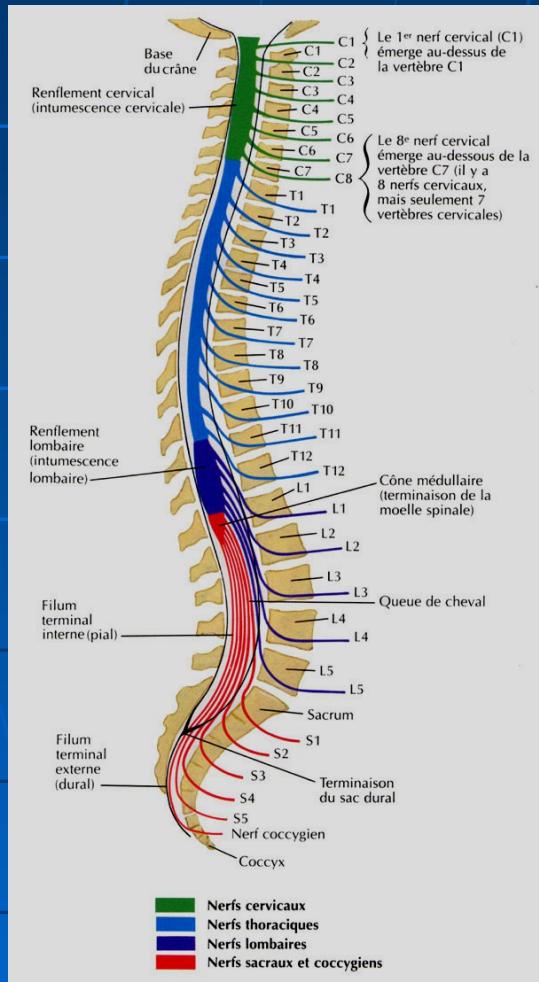
- Plurimétamérique
- Neurogène
- Contractures réflexes
- Signes végétatifs

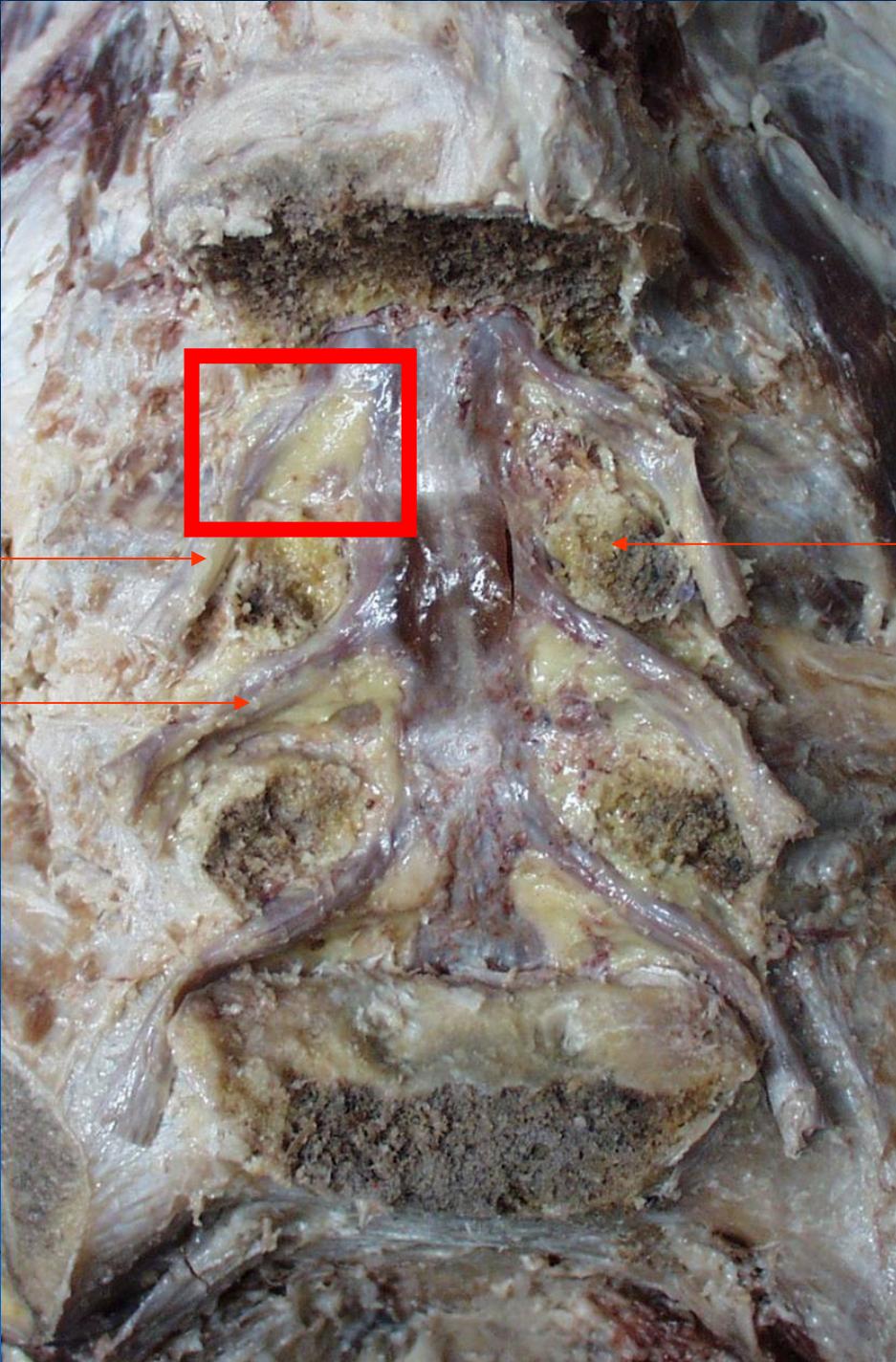
# DOULEURS SOMATIQUES

- Souffrance des processus articulaires
- Sont innervés par le système somatique
- Entraînent des douleurs ponctuelles
- Majorées en extension
- Sont trop infiltrés, rhizolysés, etc...

**Qu'en est – il?**

# Metameric disposition DEJERINE





L3 root

L4 spinal  
ganglia

L4 pedicle

# L2 root

L2 spinal  
ganglia

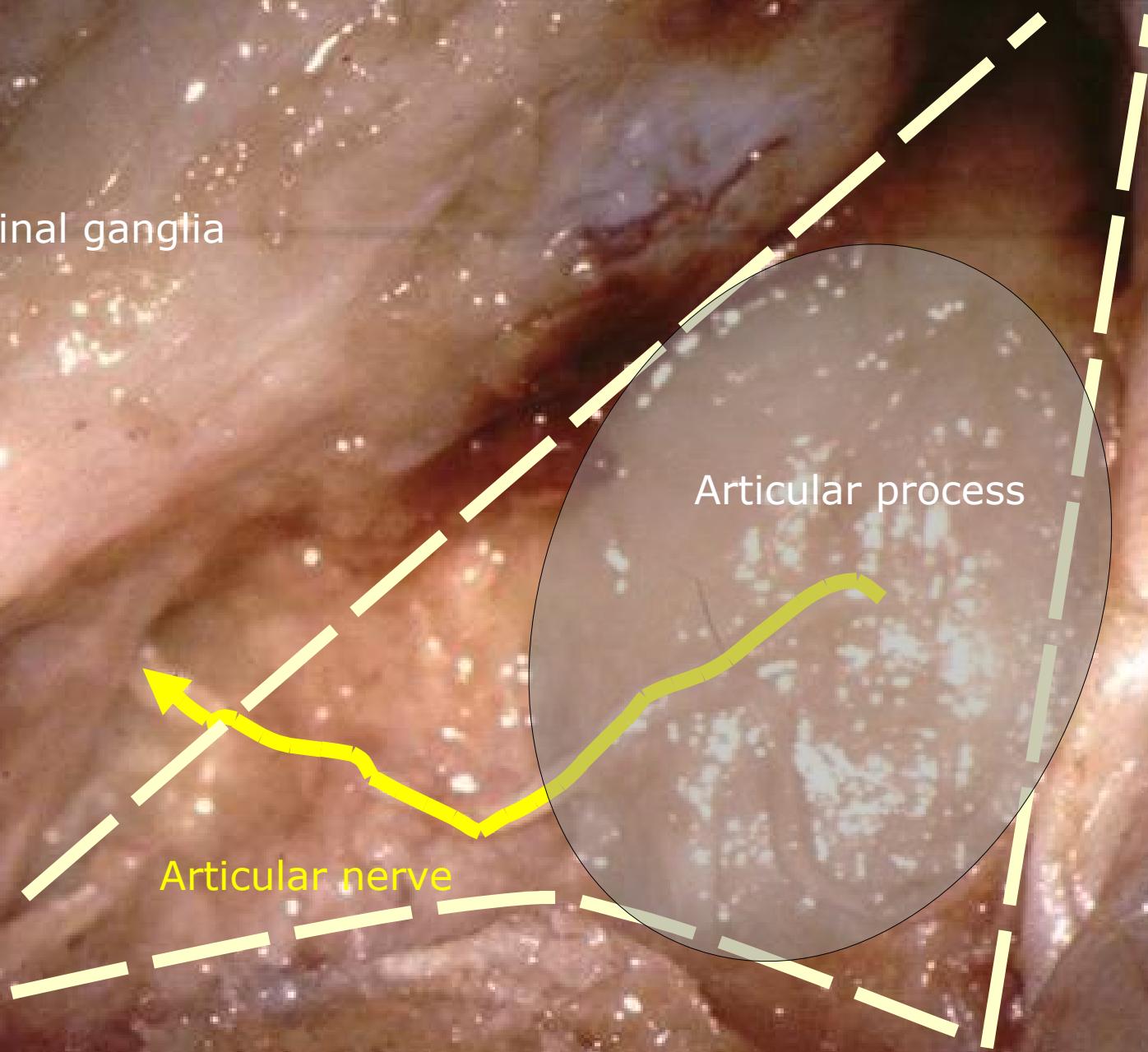
L3 pedicle

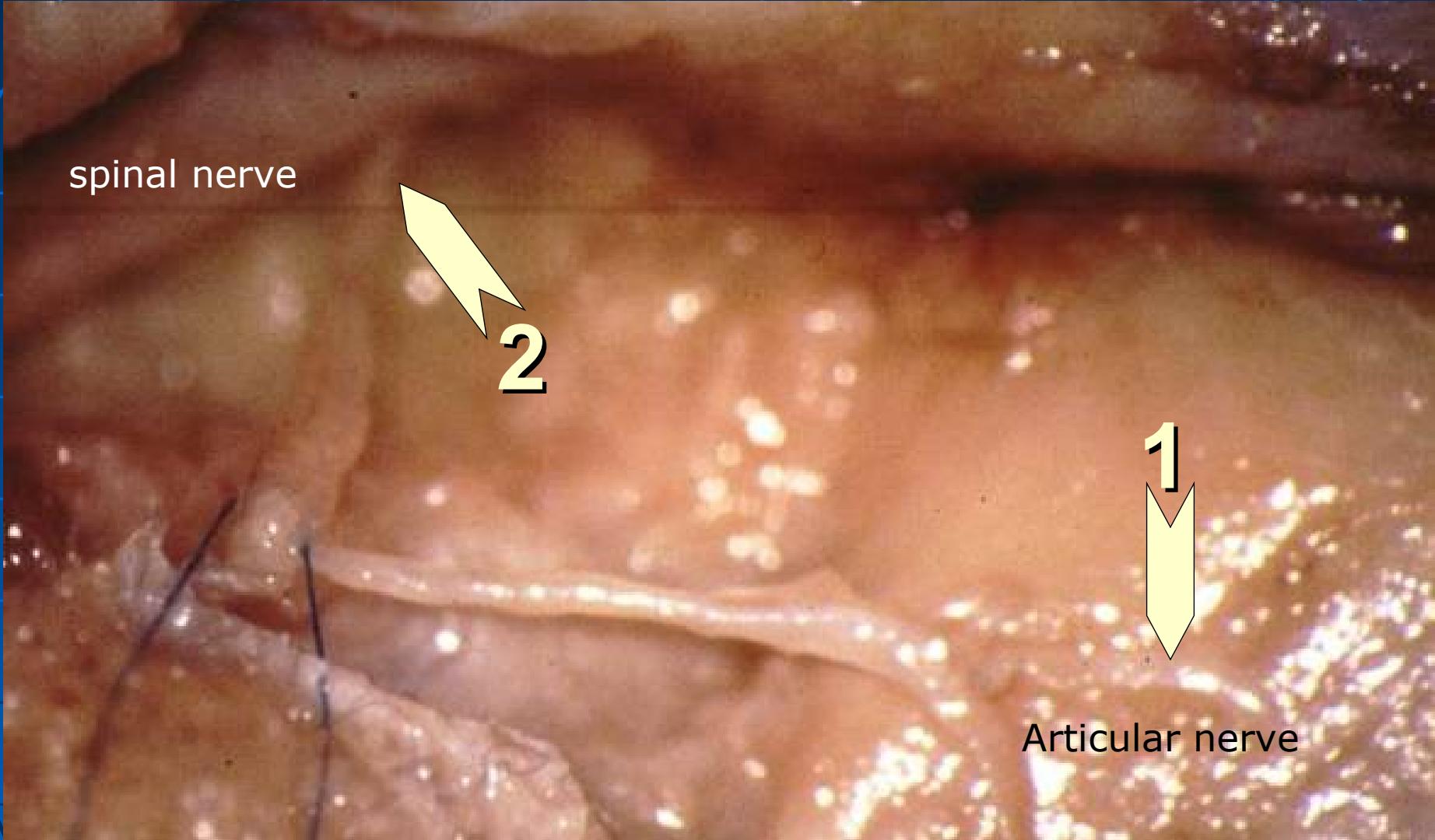


Spinal ganglia

Articular process

Articular nerve





spinal nerve

2

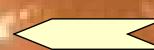
1

Articular nerve

# **1. Capsular origin of the nerve**

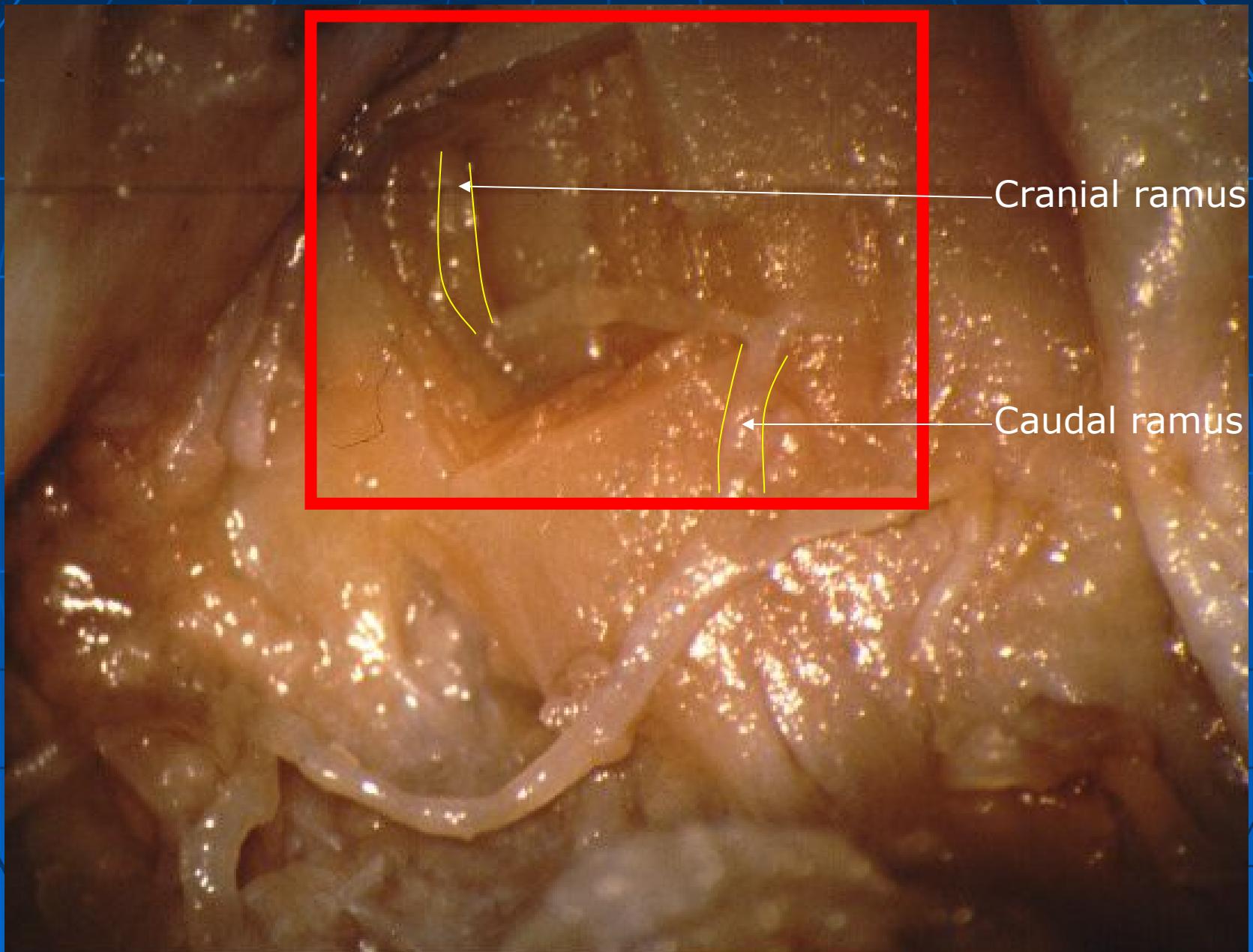
Capsula

Articular ramus

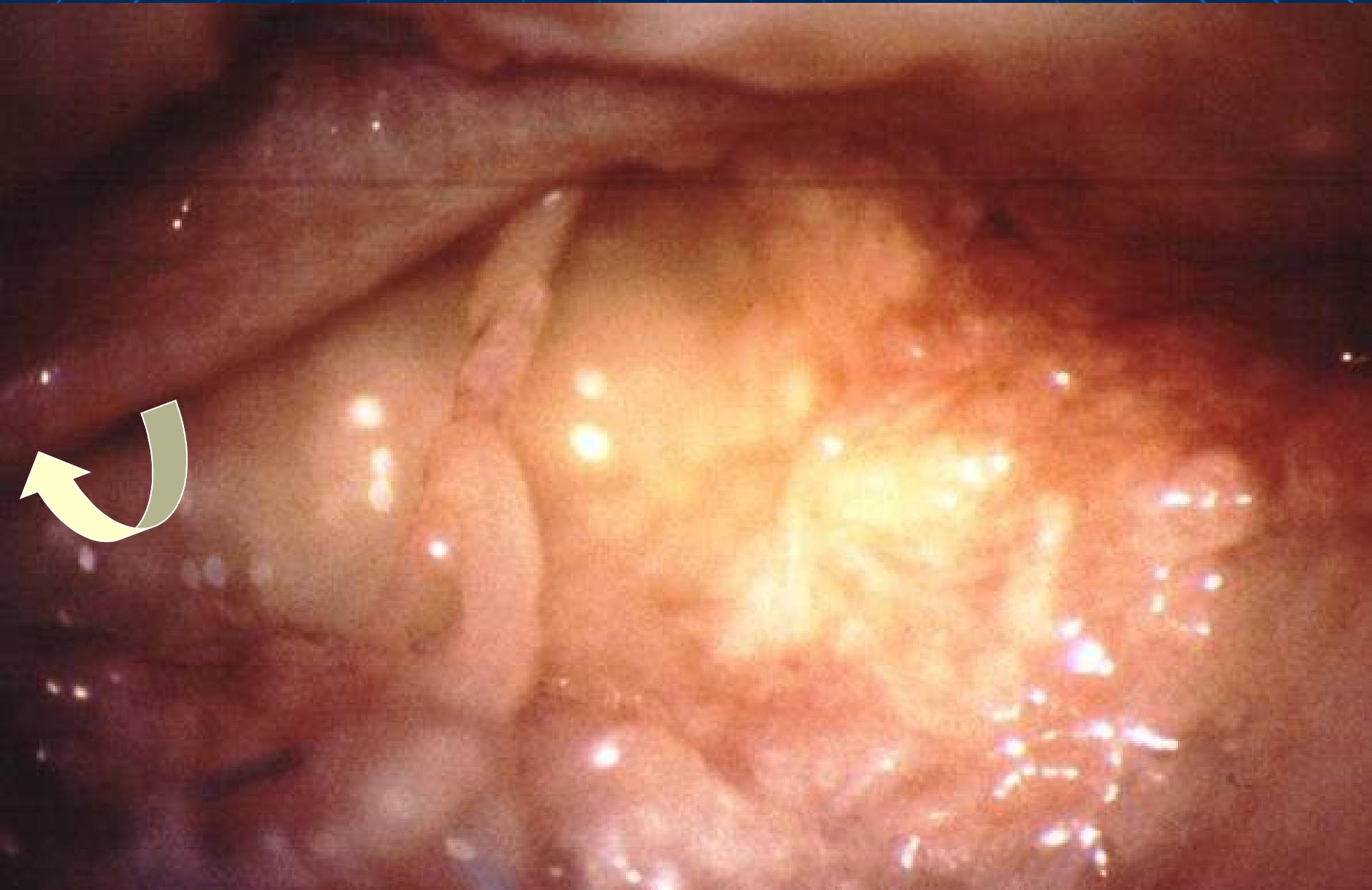


Articular ramus

# Opening of the capsula. Anastomosis

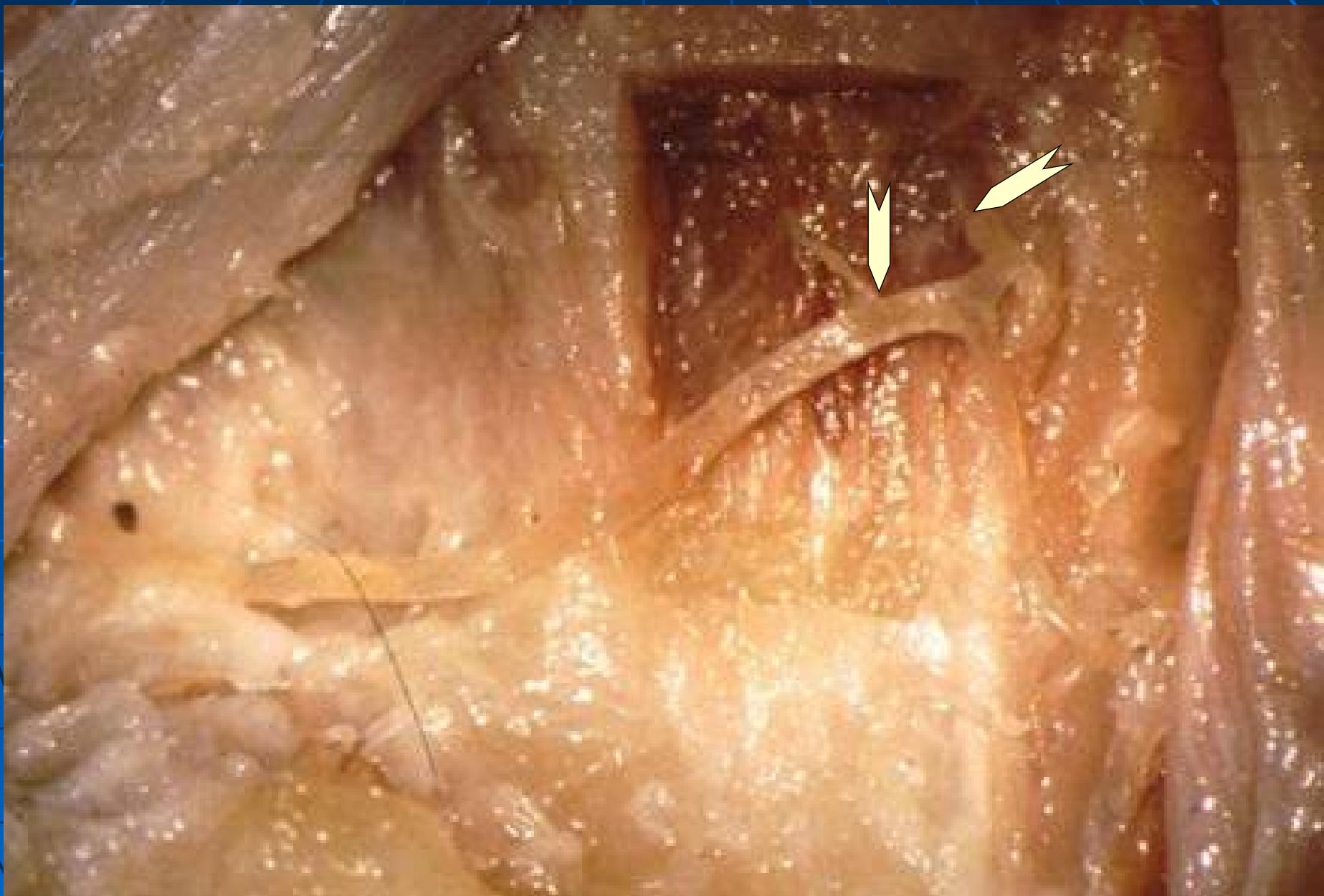


# **2. SOMATIC ENDING OF THE NERVE**



**A plurimetameric  
distribution**

# The nerve at the L3 level



# **CONCLUSION**

- **Somatic sensitive structure**
- **Endocapsular origin**
- **Plurimetameric distribution**
- **Facet syndrom:**

**a rare clinical condition**

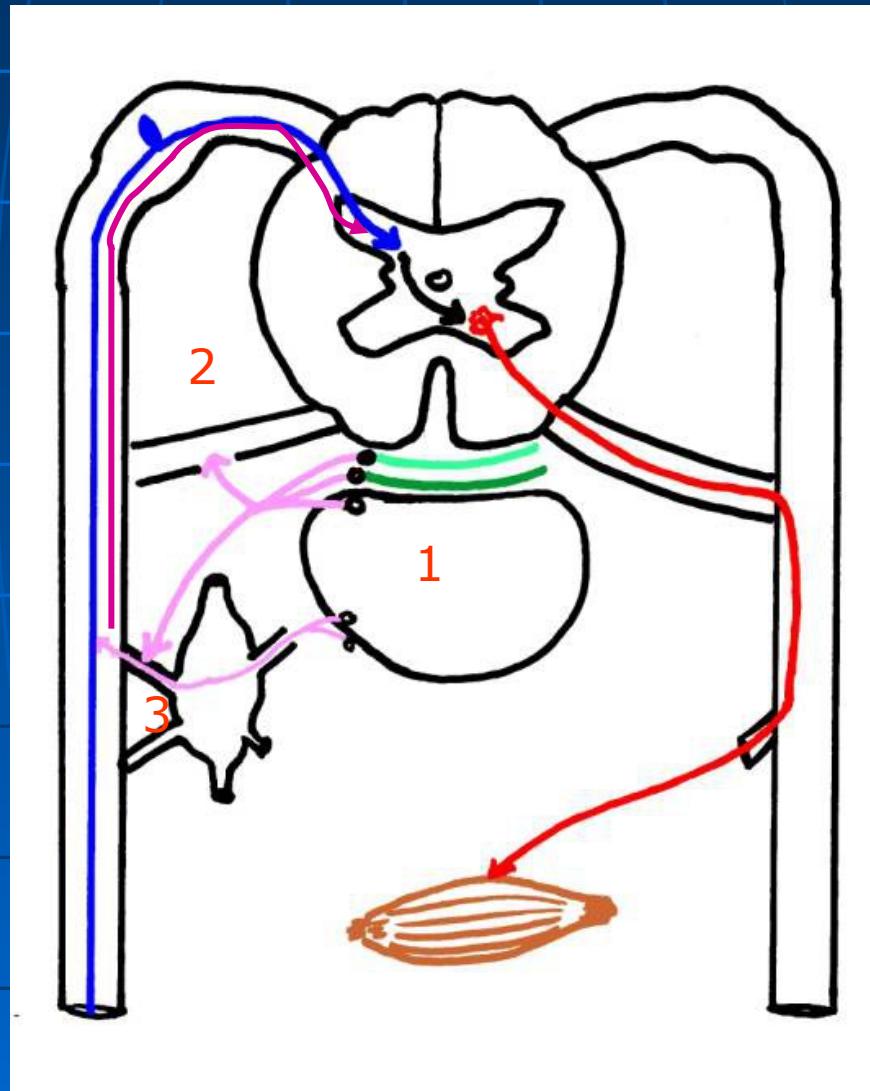
# Structures algogènes disco- vertébrales

- Bien décrites dès 1850 par Lushka
- Disque intervertébral
- Ligament longitudinal dorsal
- Face ventrale de la dure-mère

# Lumbalgias: a vegetative pain

- Low back pain
- Bilateral
- Plurimetameric
- With reflex plurimetameric contractures

# Vegetative metamere

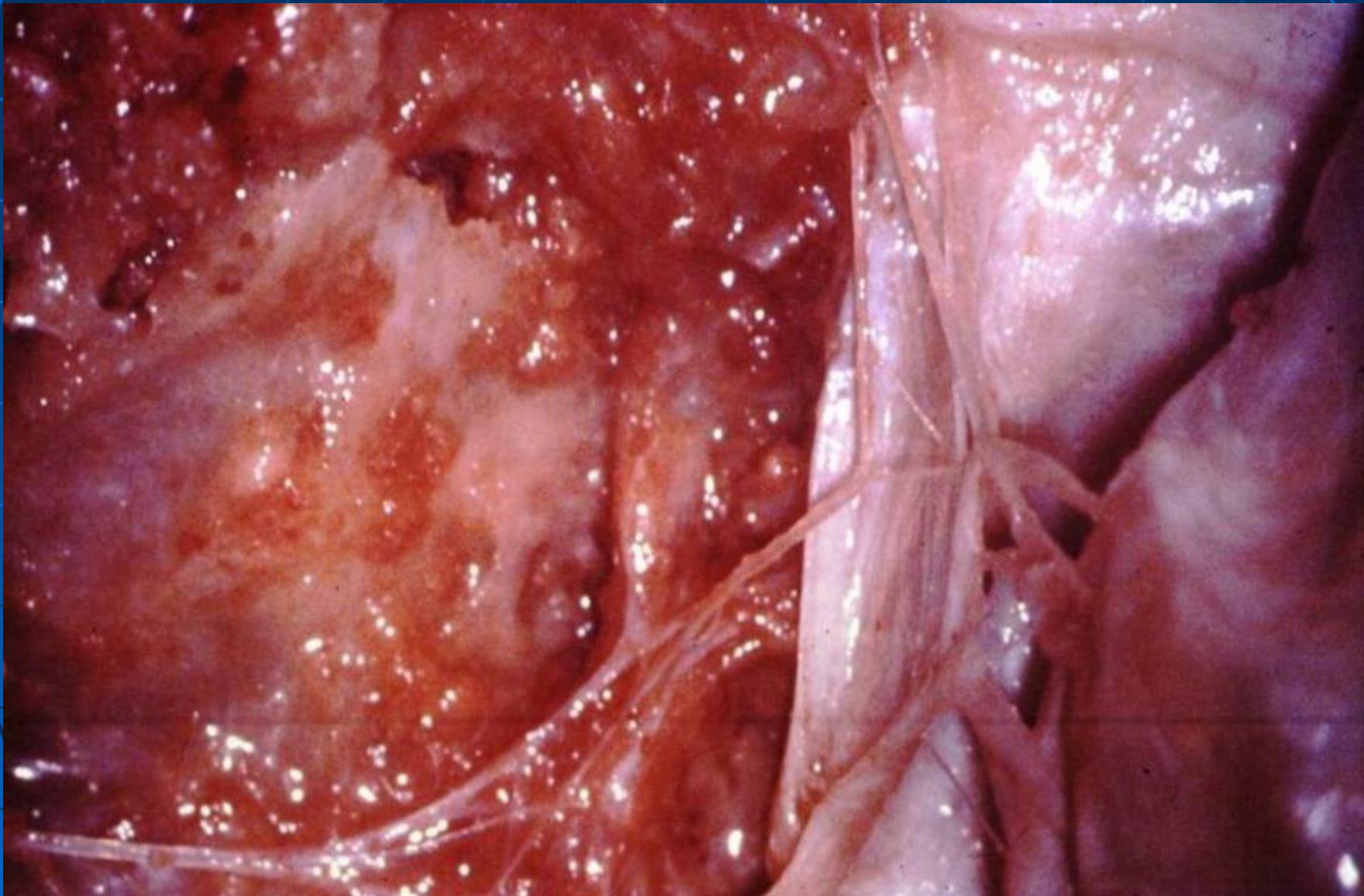


# Anatomical basis of lumbalgias according to the vegetative supply

# Dissection of the sinu-vertébral nerve

# Origin of the sinu-vertebral nerve

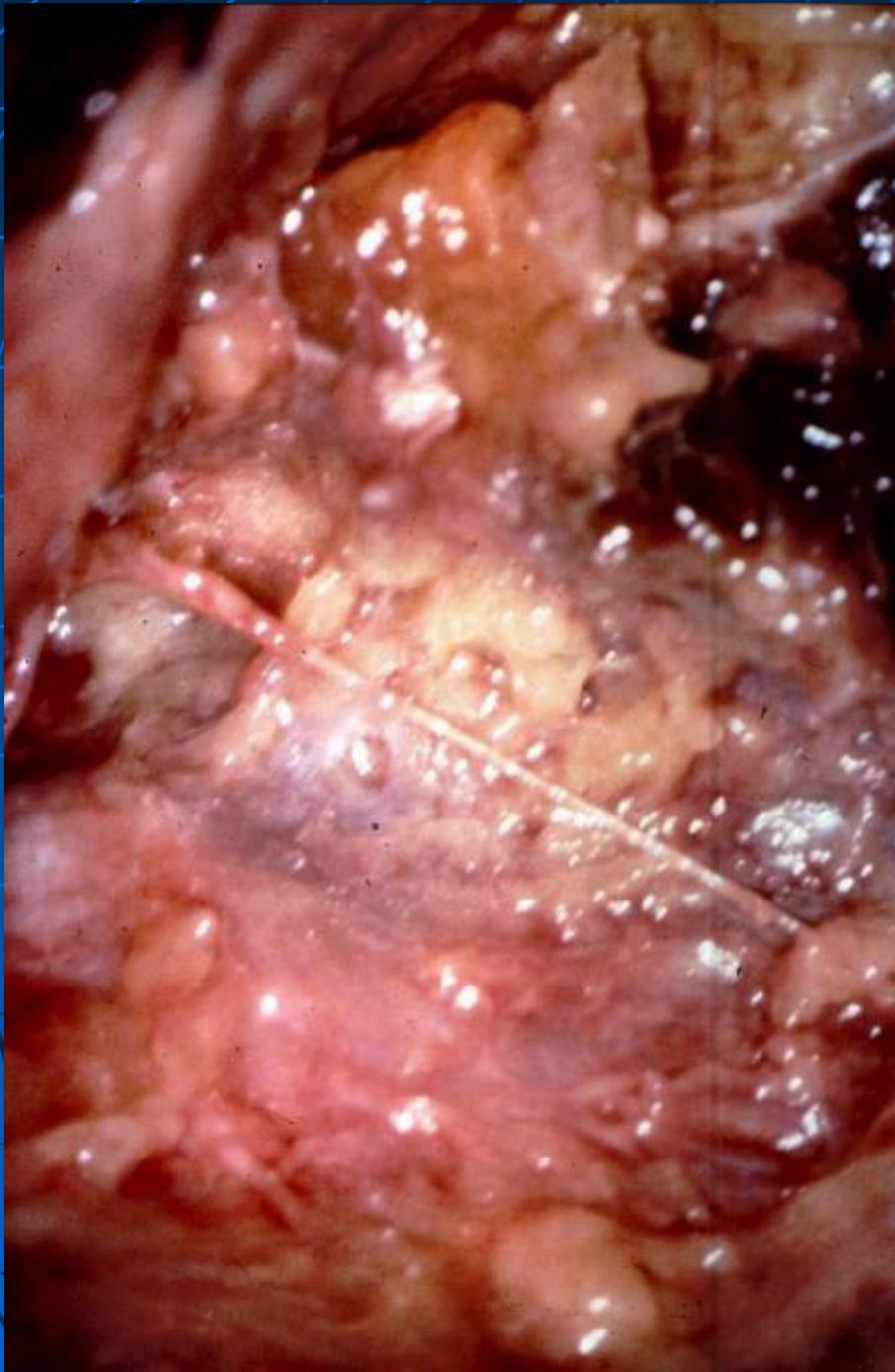
Dorsal longitudinal ligament and dura





Origin of the sinu-vertebral nerve

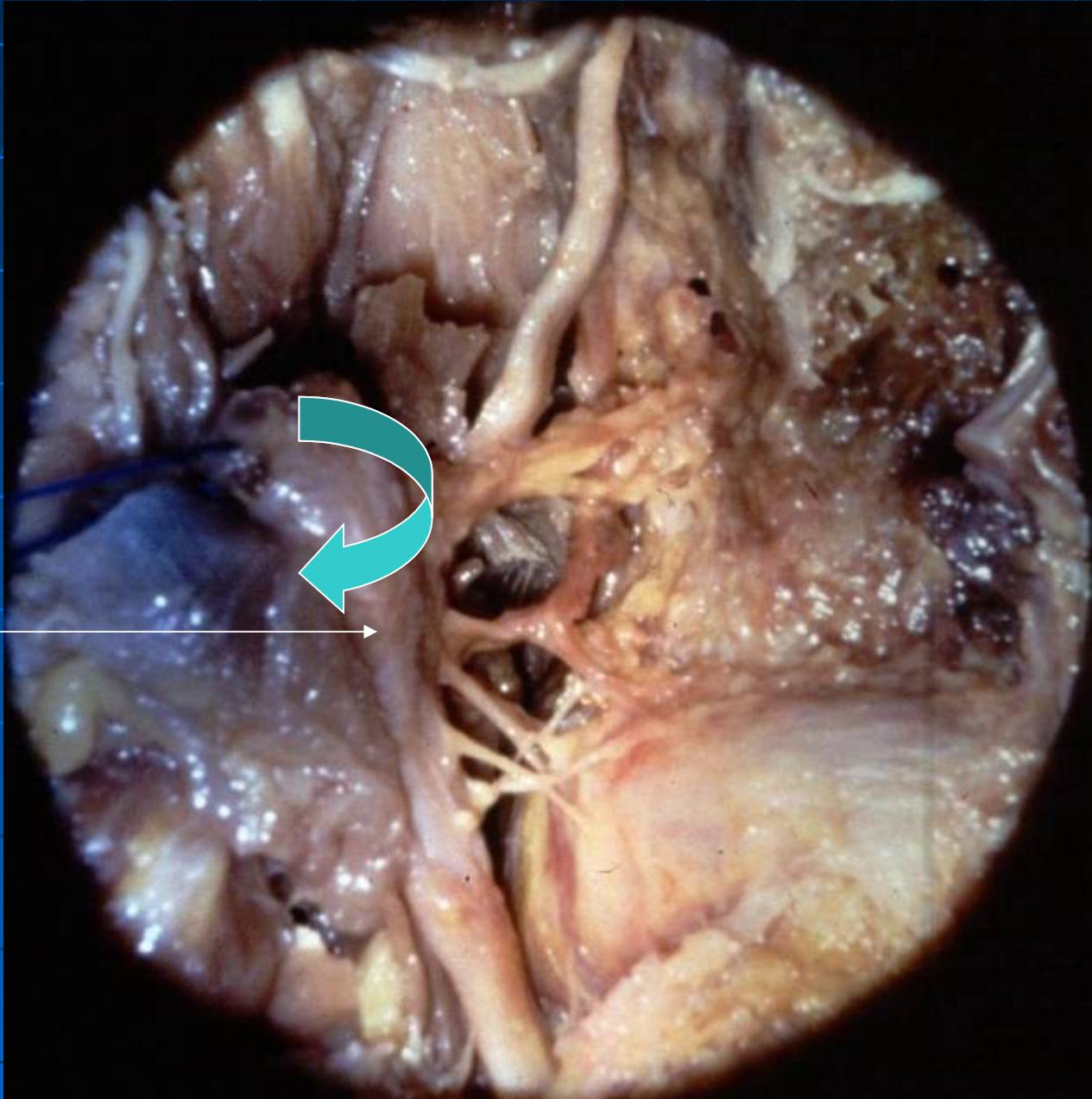
DLL + dura + Disc



## Caudal lumbar spine:

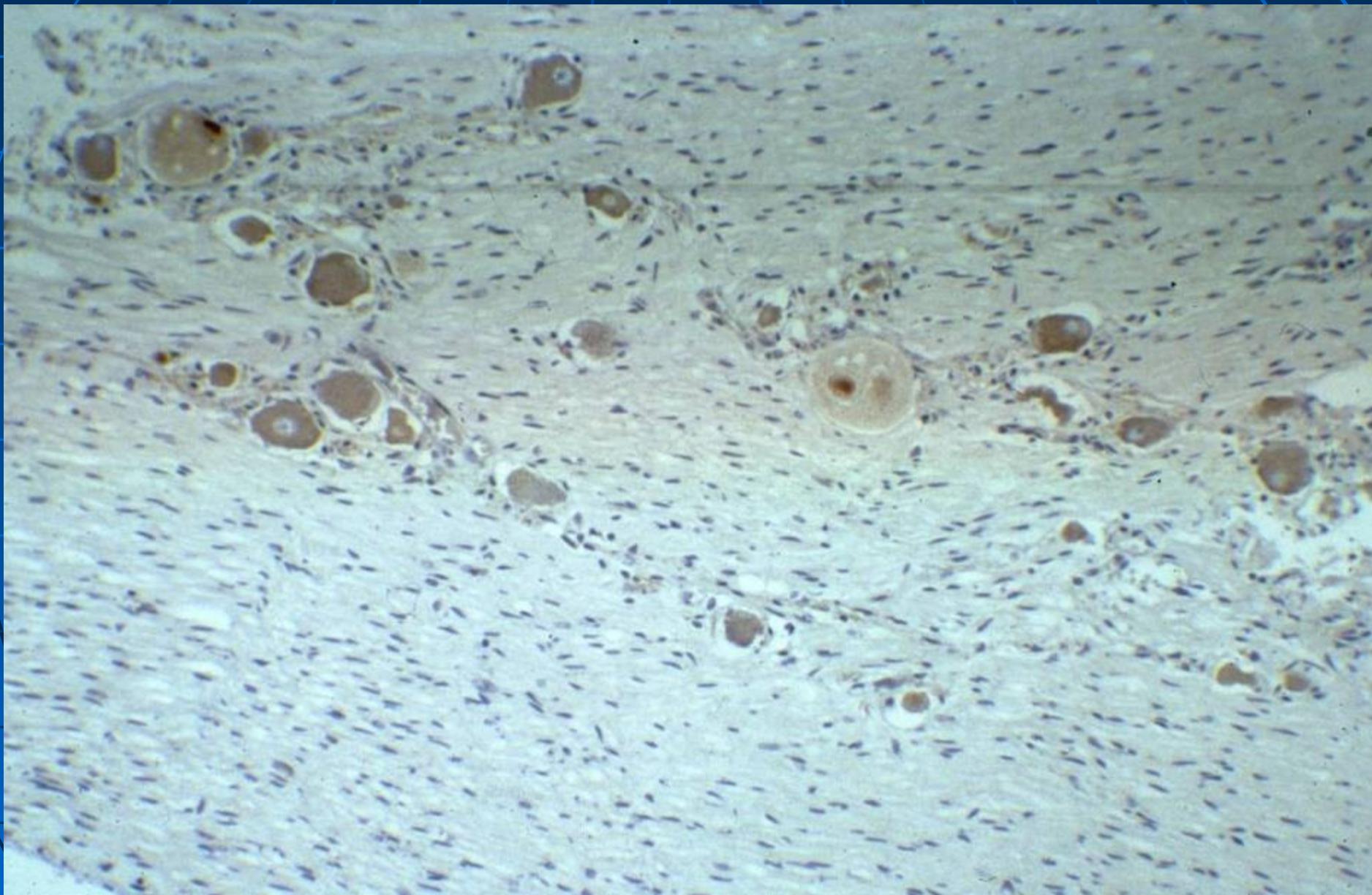
The sinu-vertebral nerve  
joins the somatic root

Dorsal  
root

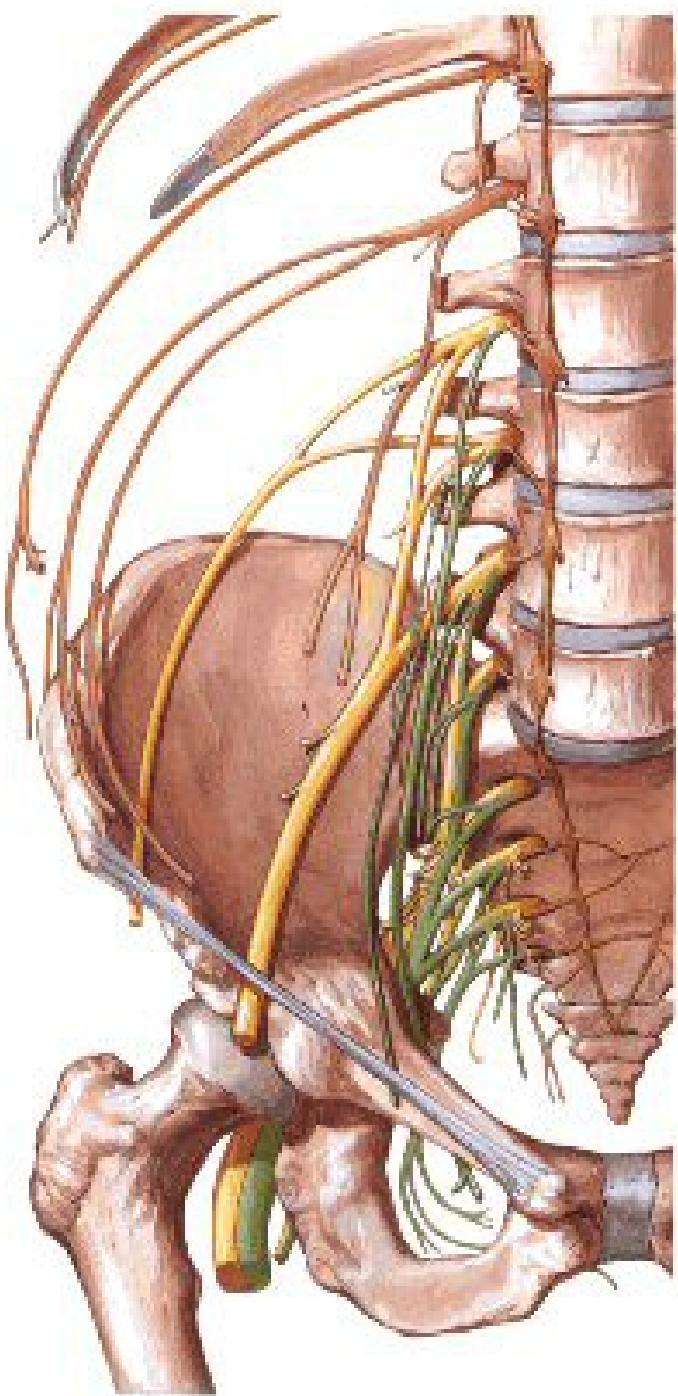


Ending of the SVN = RC + Root

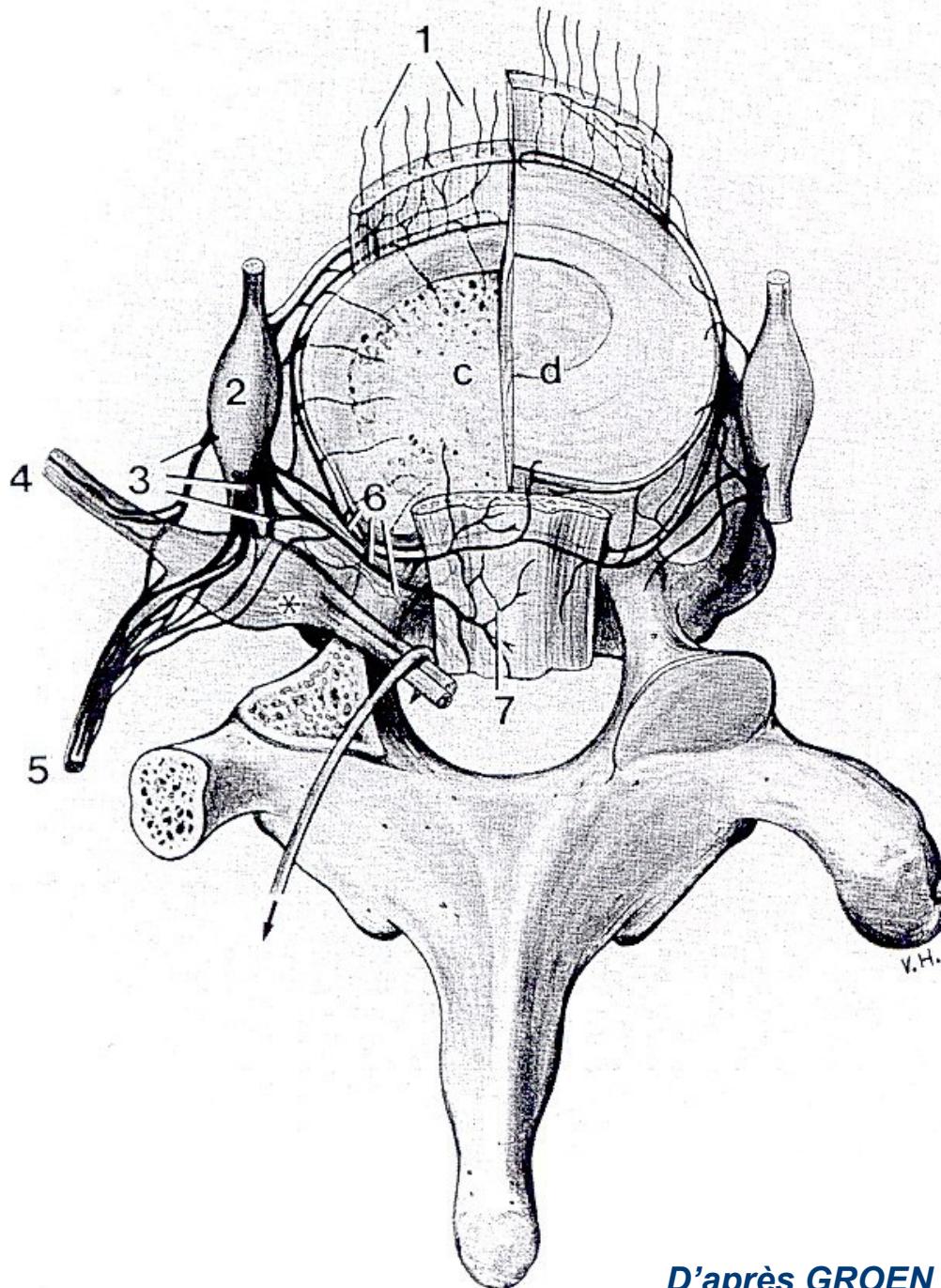
# Vegetative fibers in the SVN



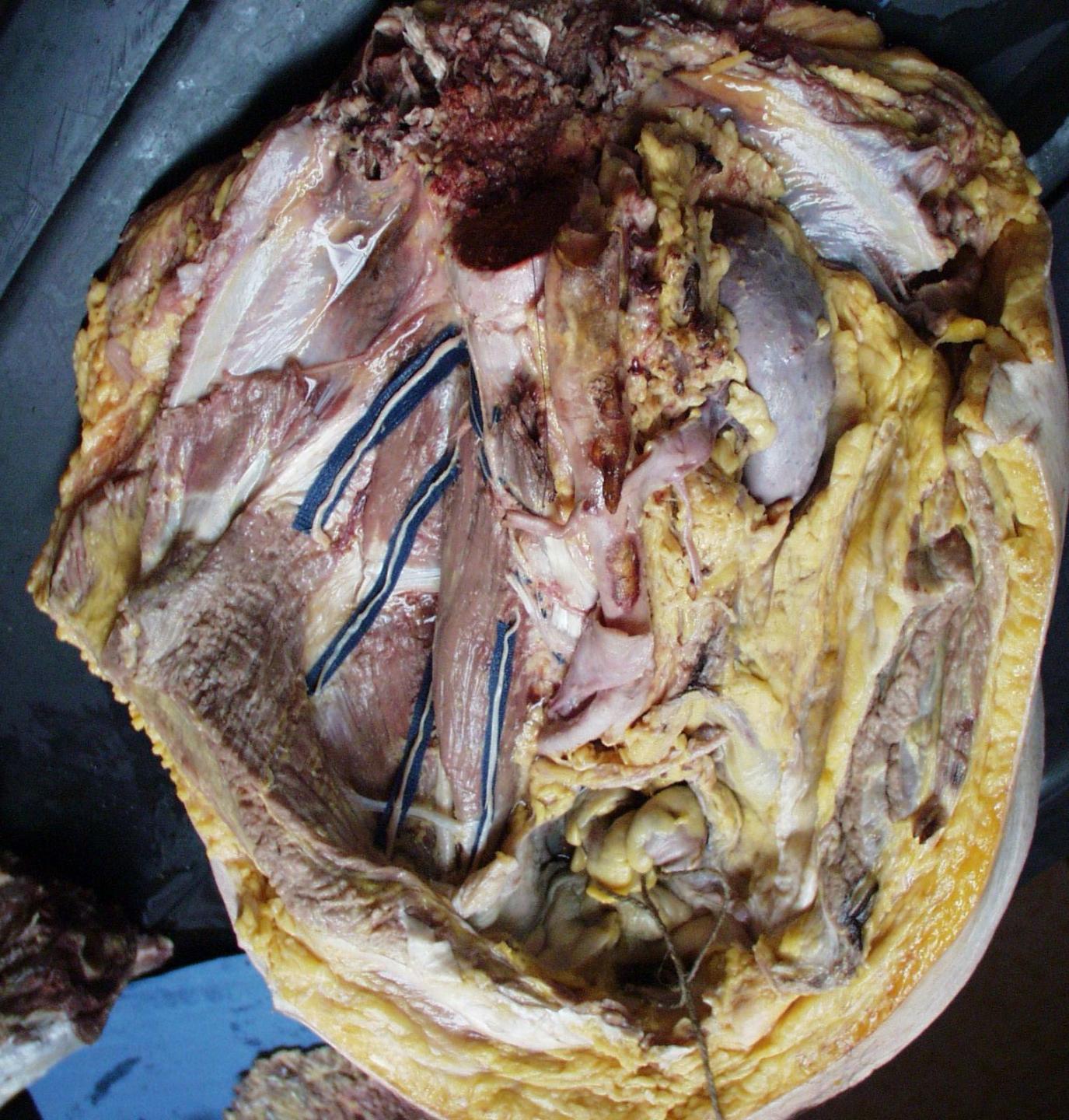
# **Dissection of the rami communicantes**



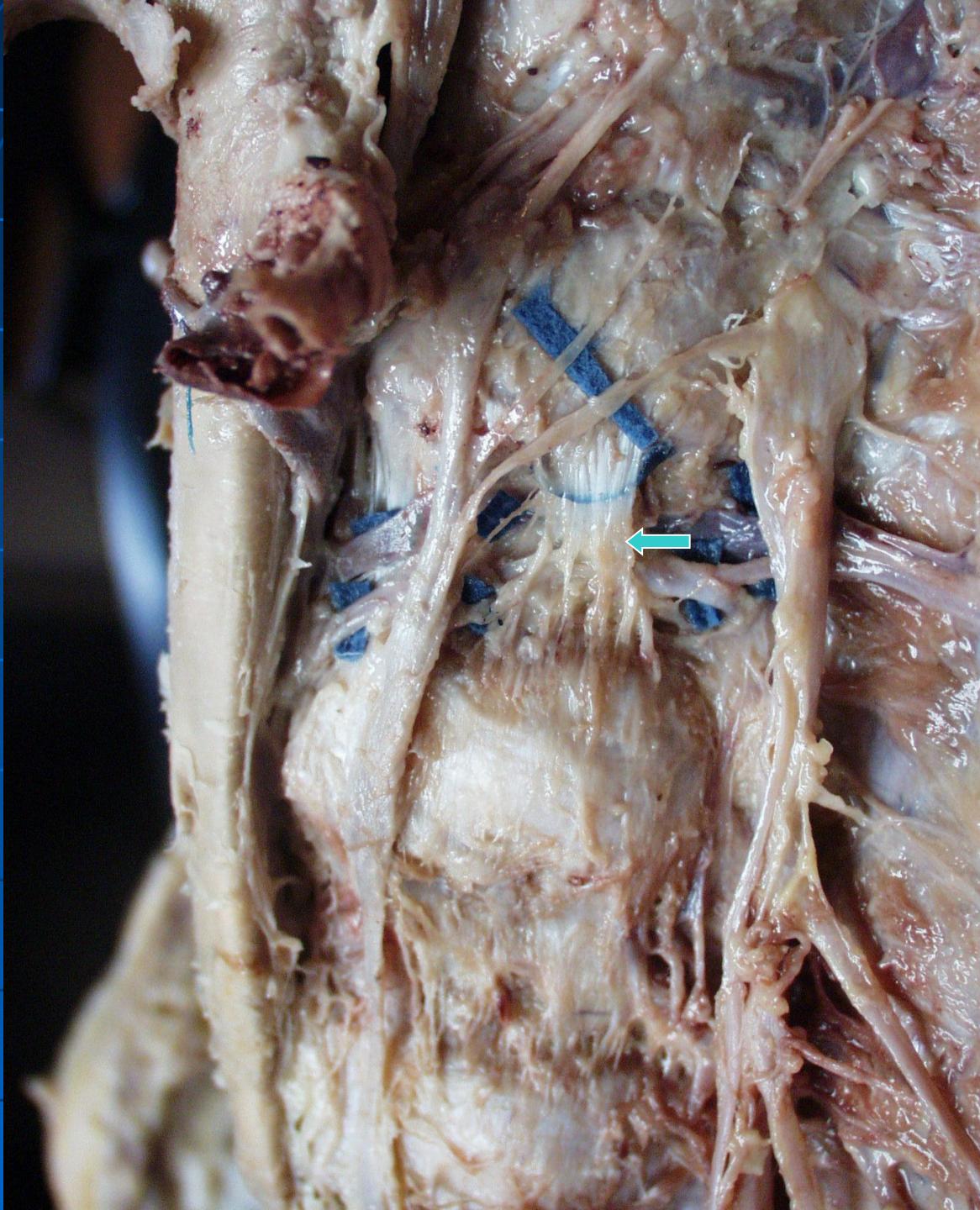
*D'après NETTER.F*



*D'après GROEN*

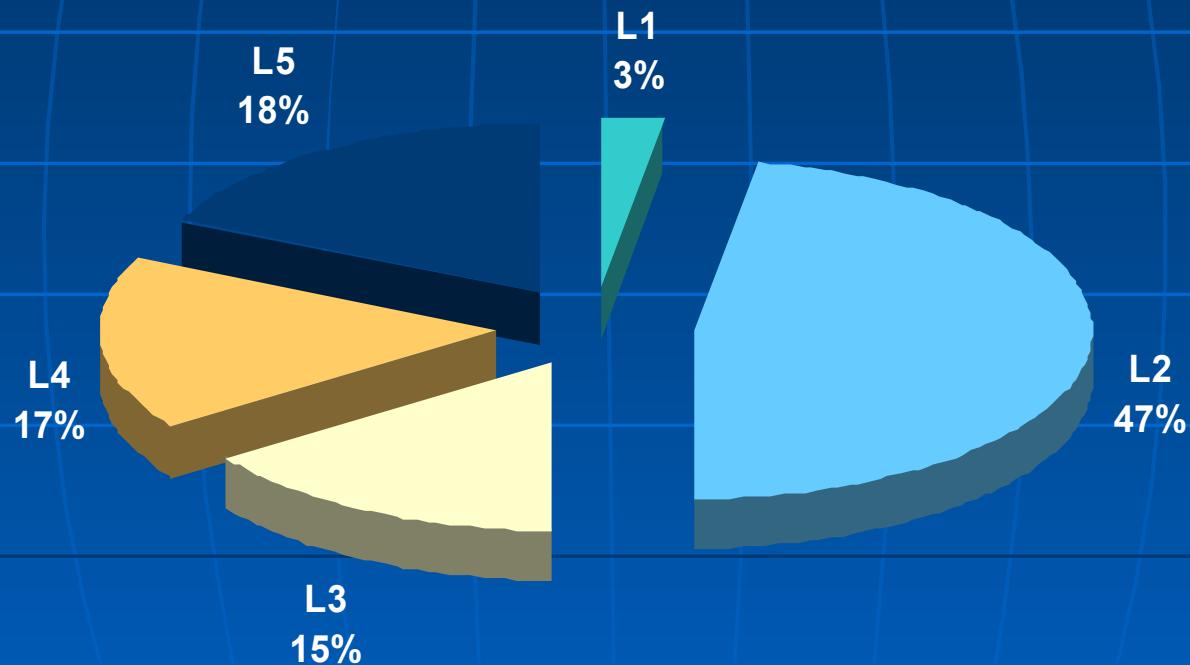




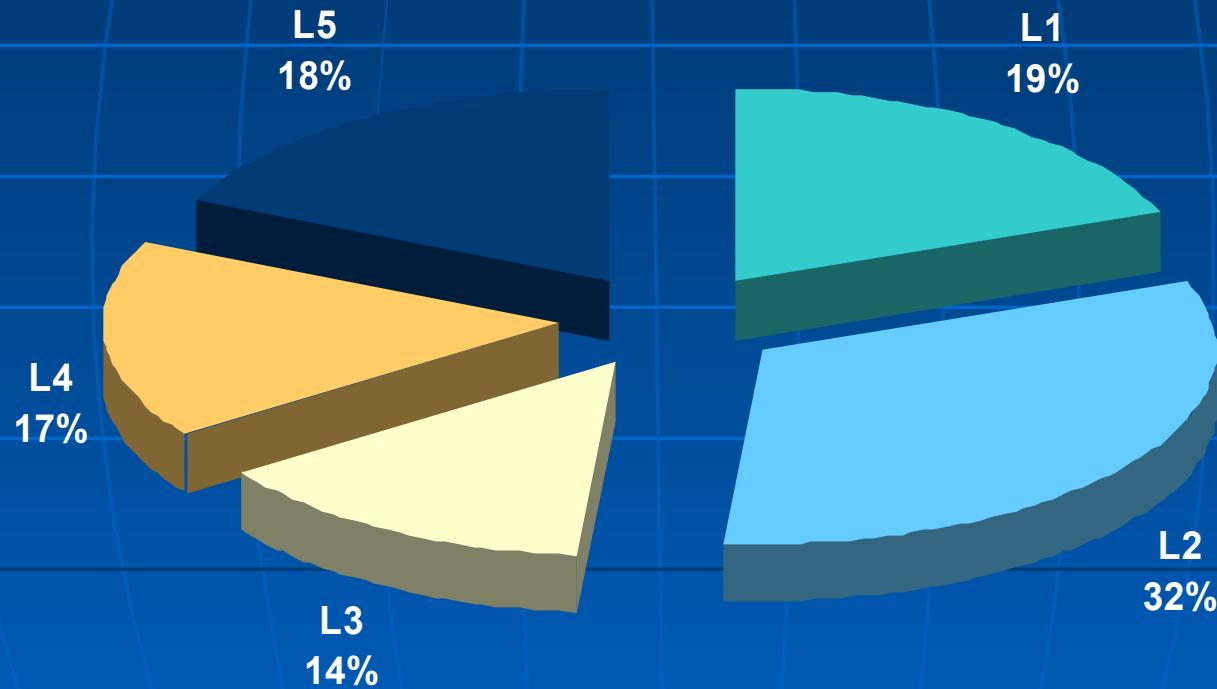




# Répartition des Rameaux Communicants (Chaîne)

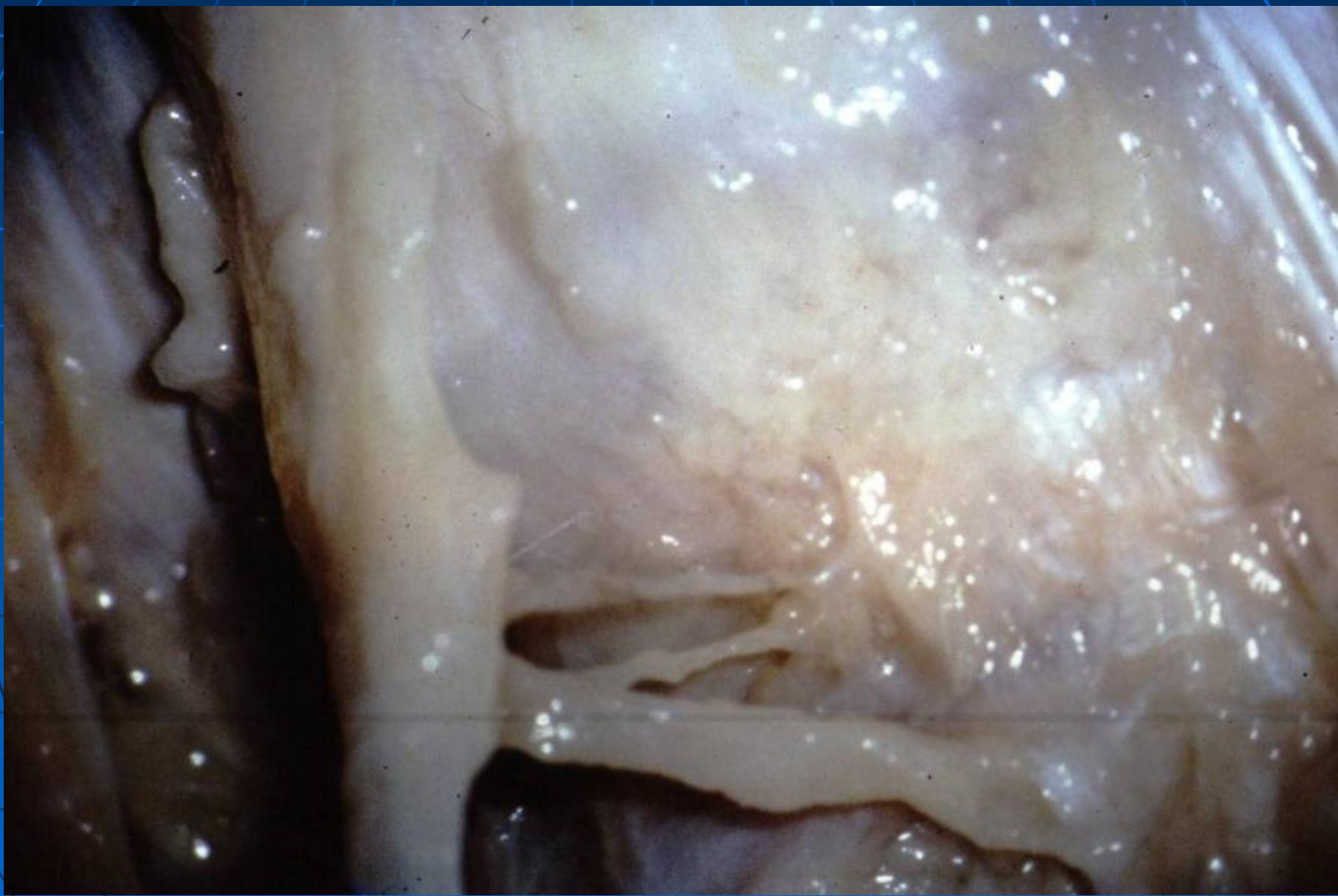


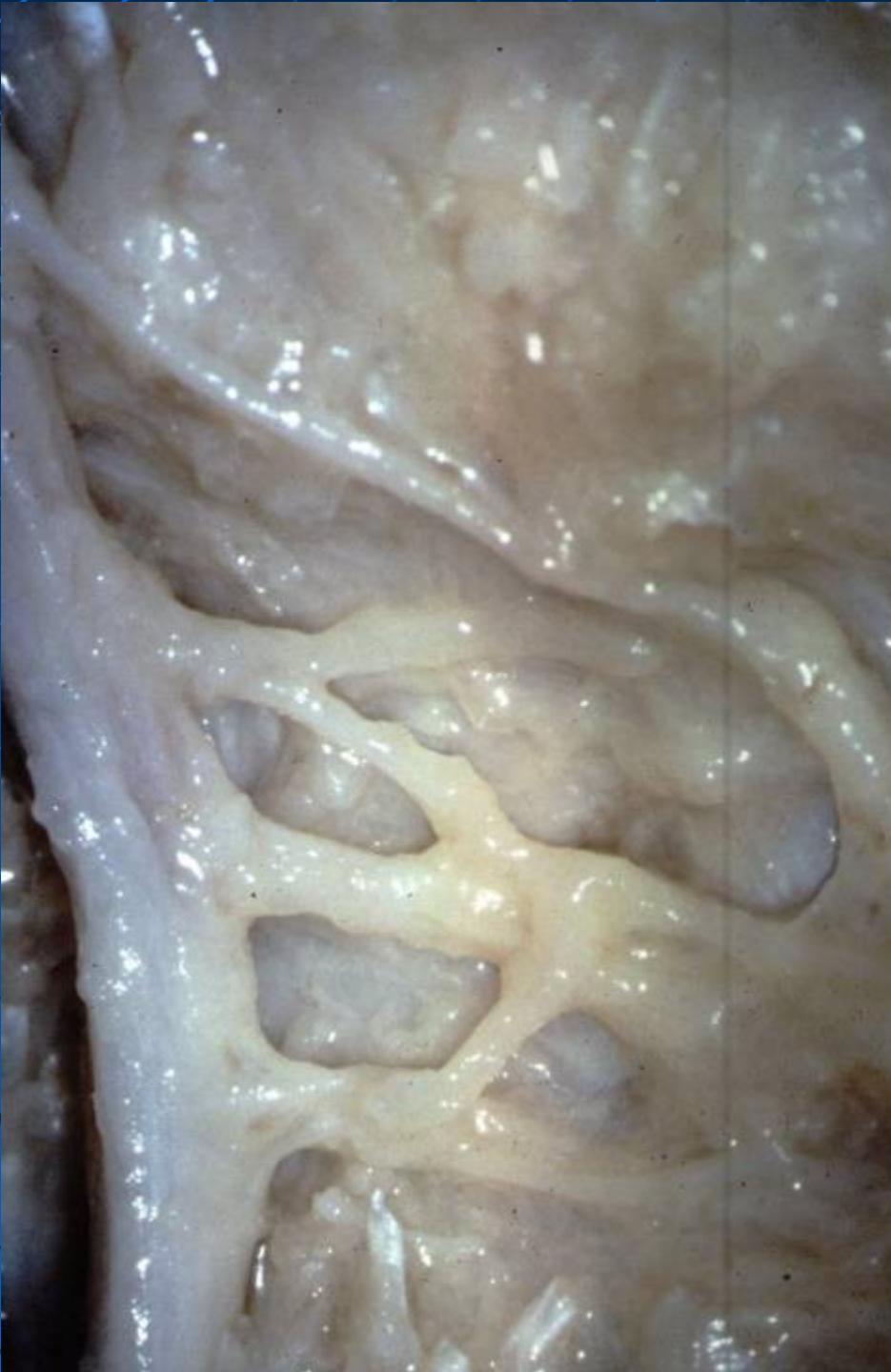
# Répartition des Rameaux Communicants (Racines)



# Left anterior caudal view: tiny innervation

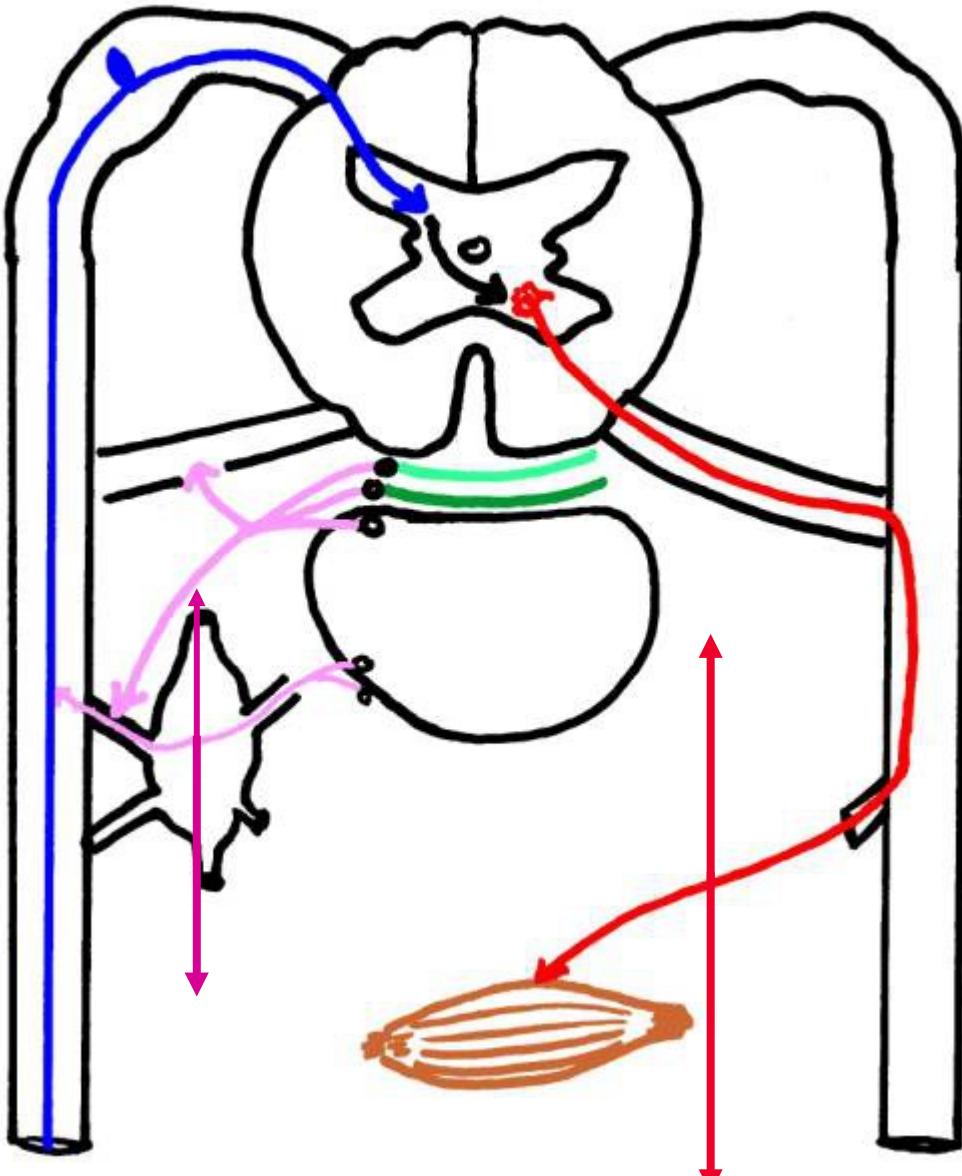
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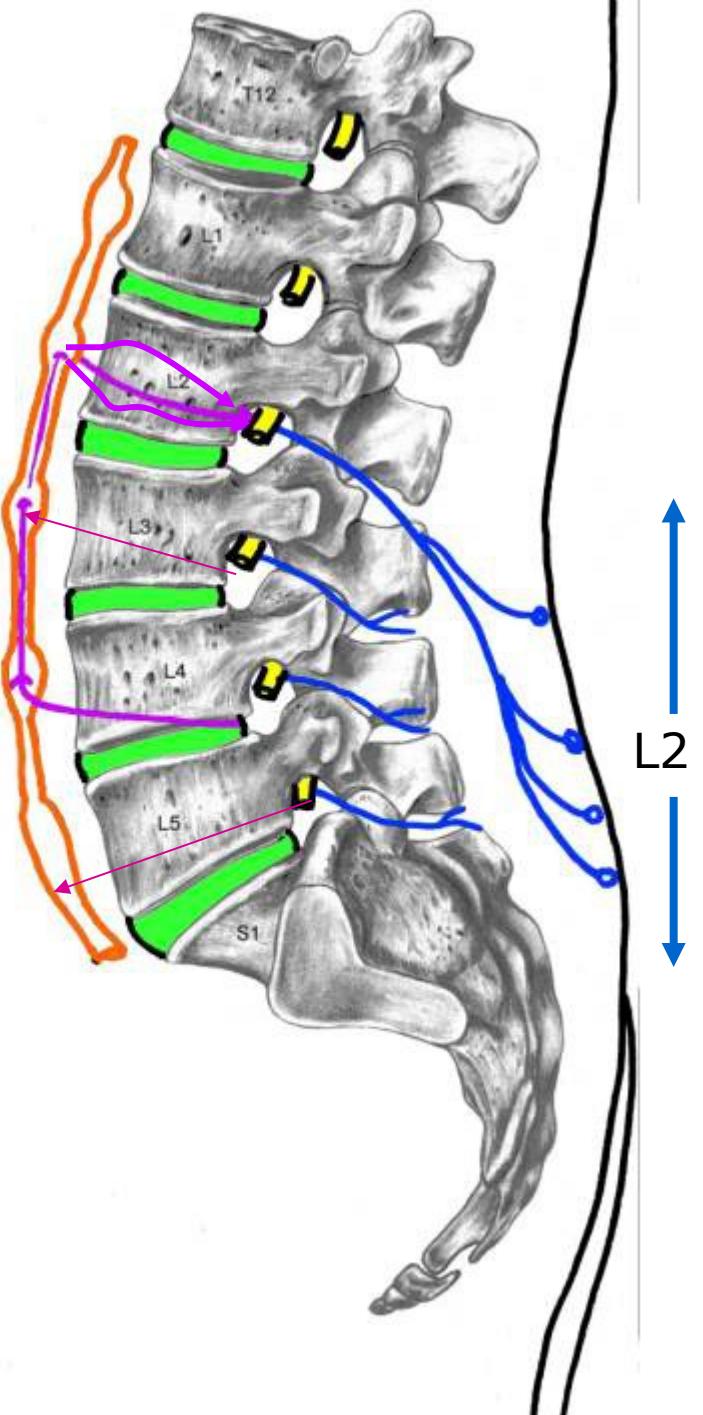


L 2 level  
Anterior view  
Rich innervation

# Lumbar vegetative metamere

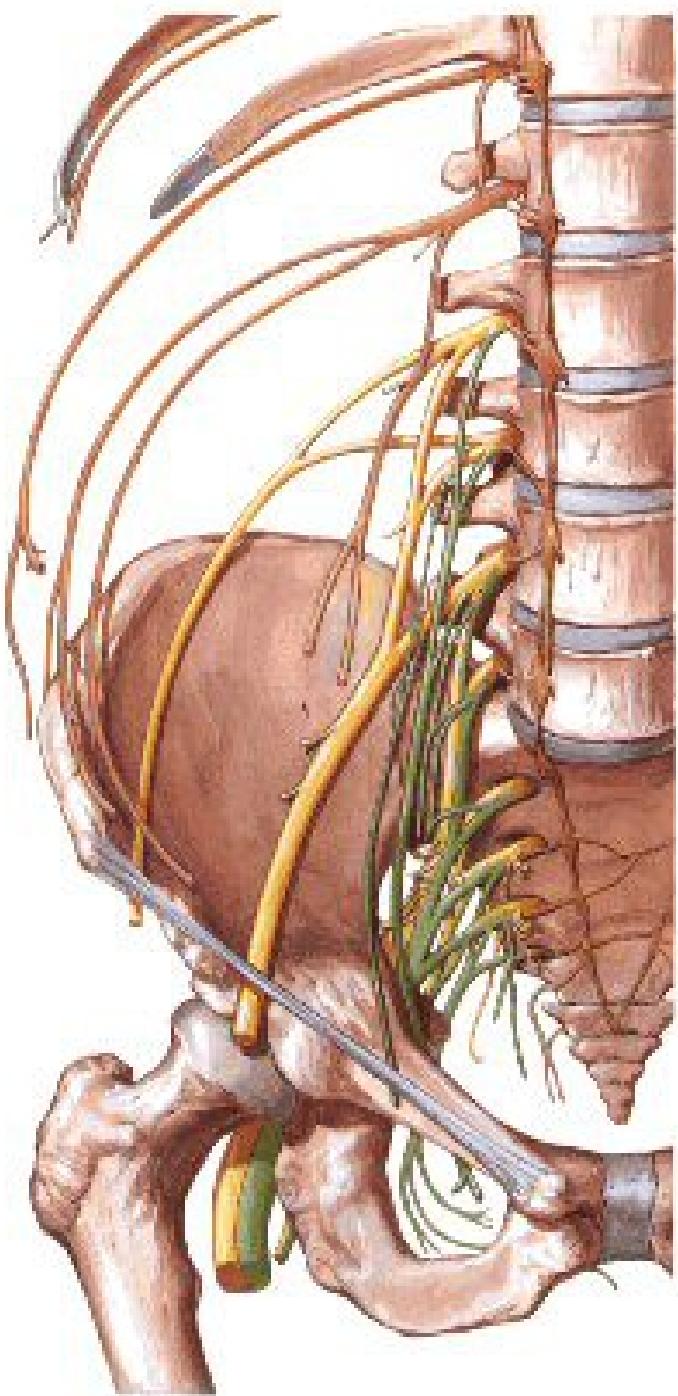


Pluri  
metameric



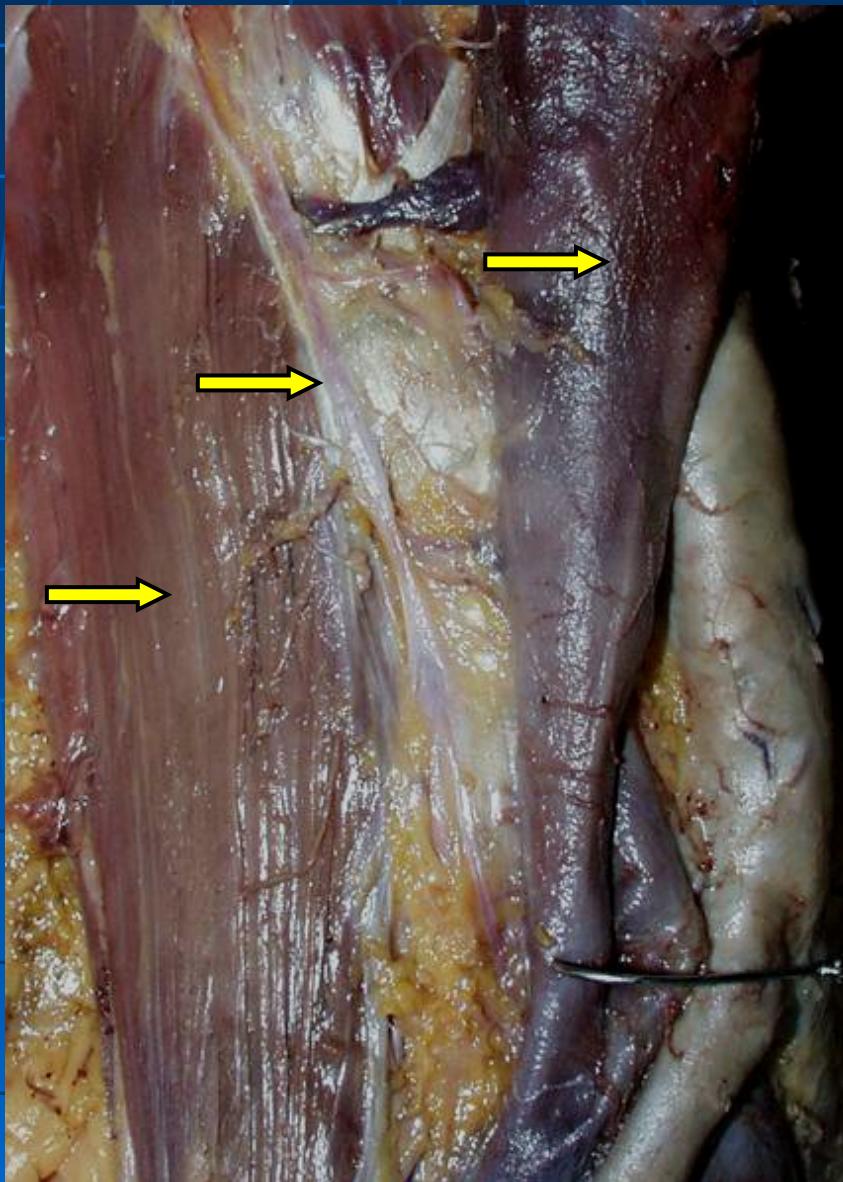
Sympathetic fibers joint  
the L2 somatic root

# Radiological approach

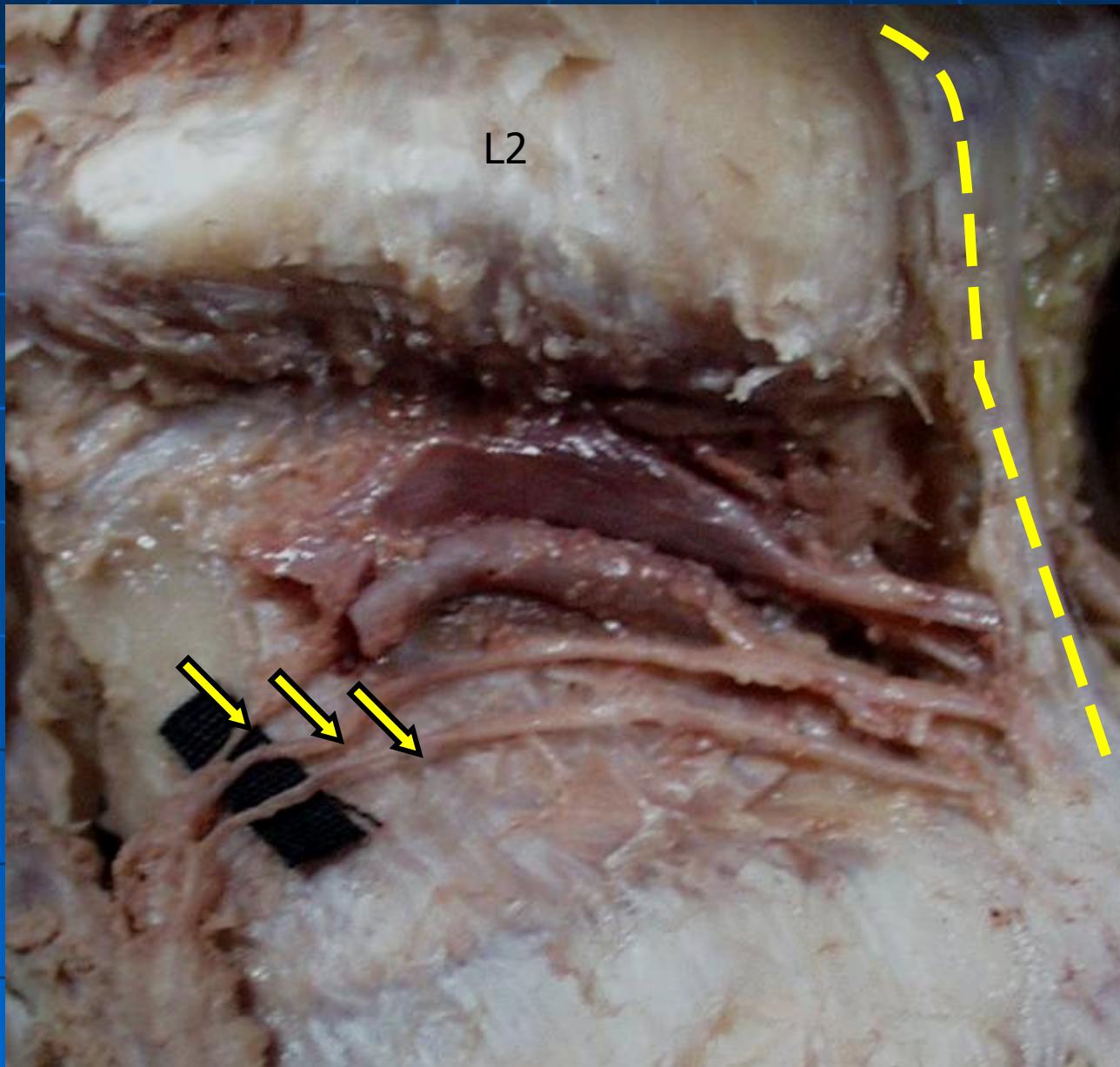


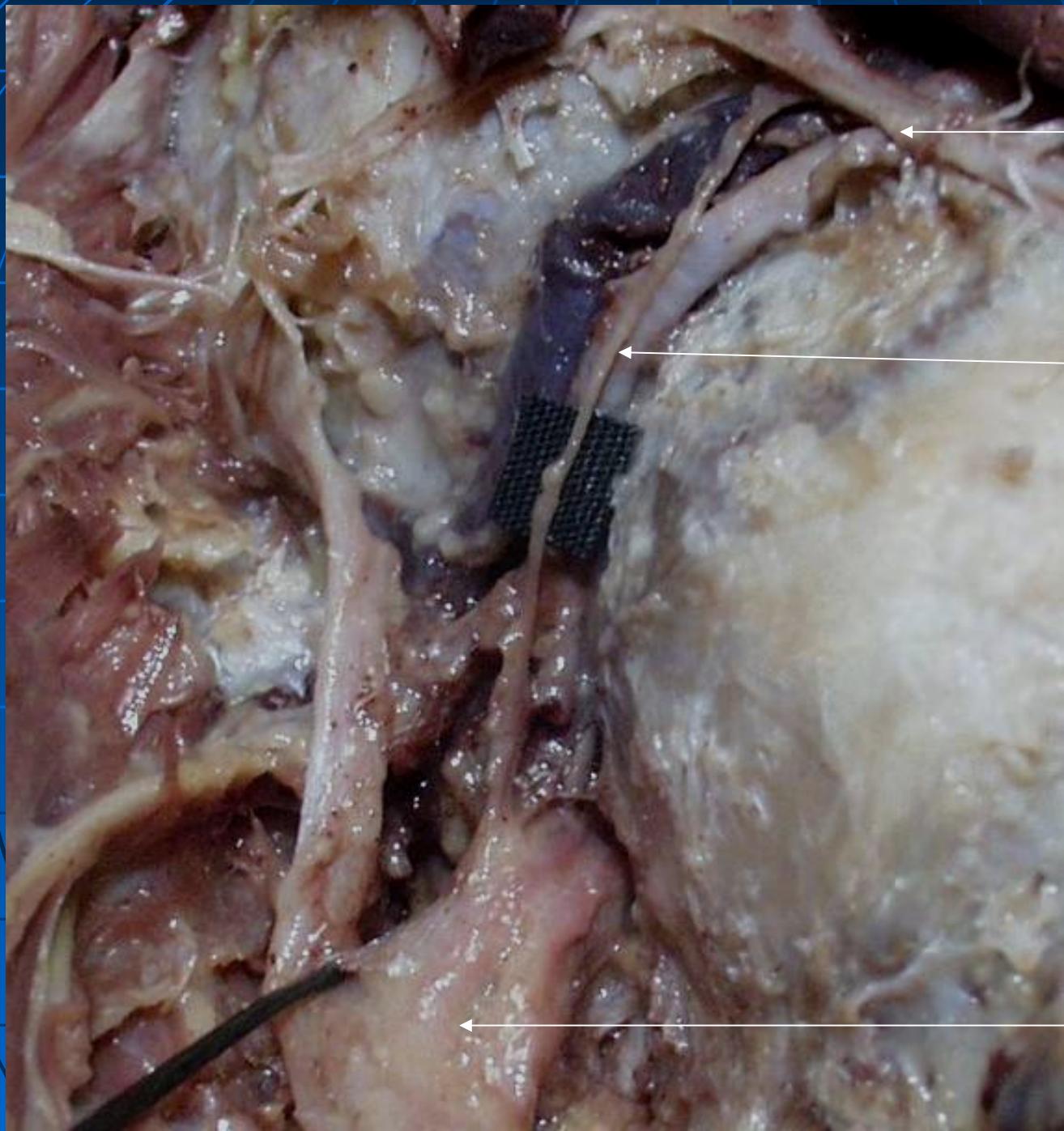
*D'après NETTER.F*

# Sympathetic lumbar ganglia



# Rami communicantes



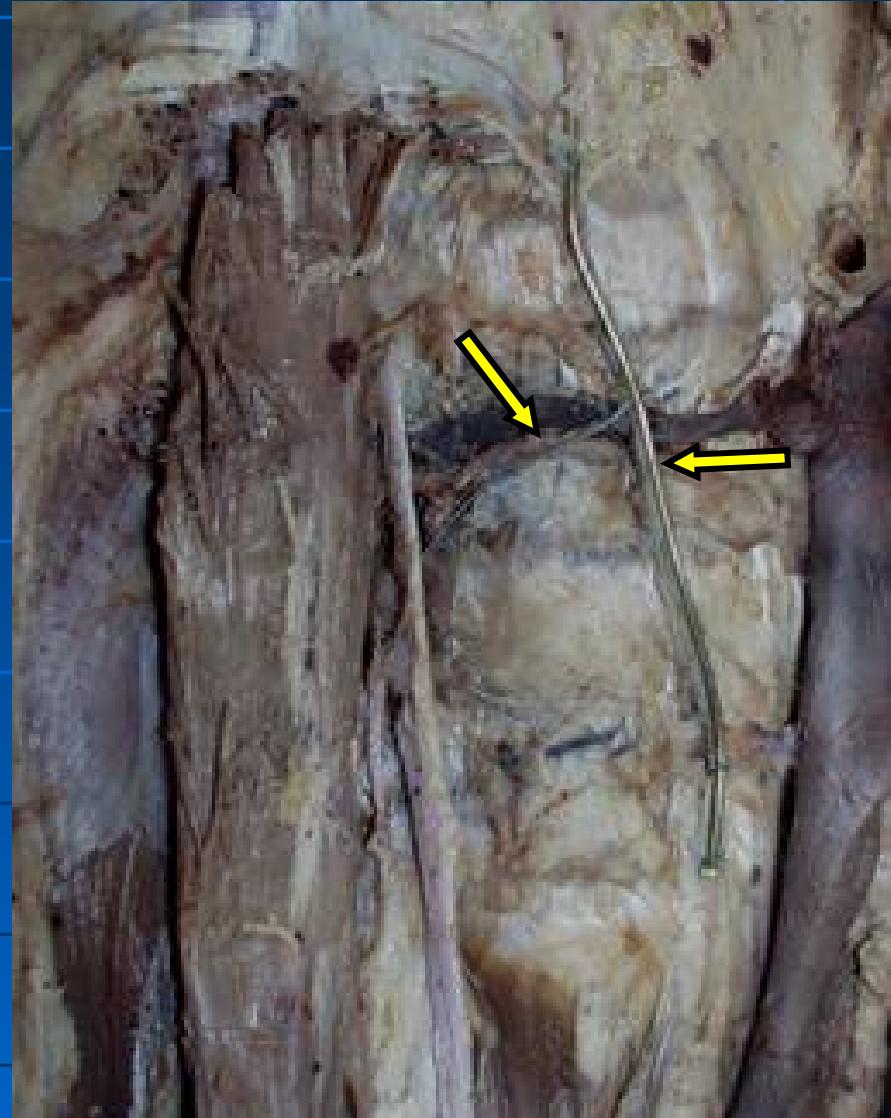
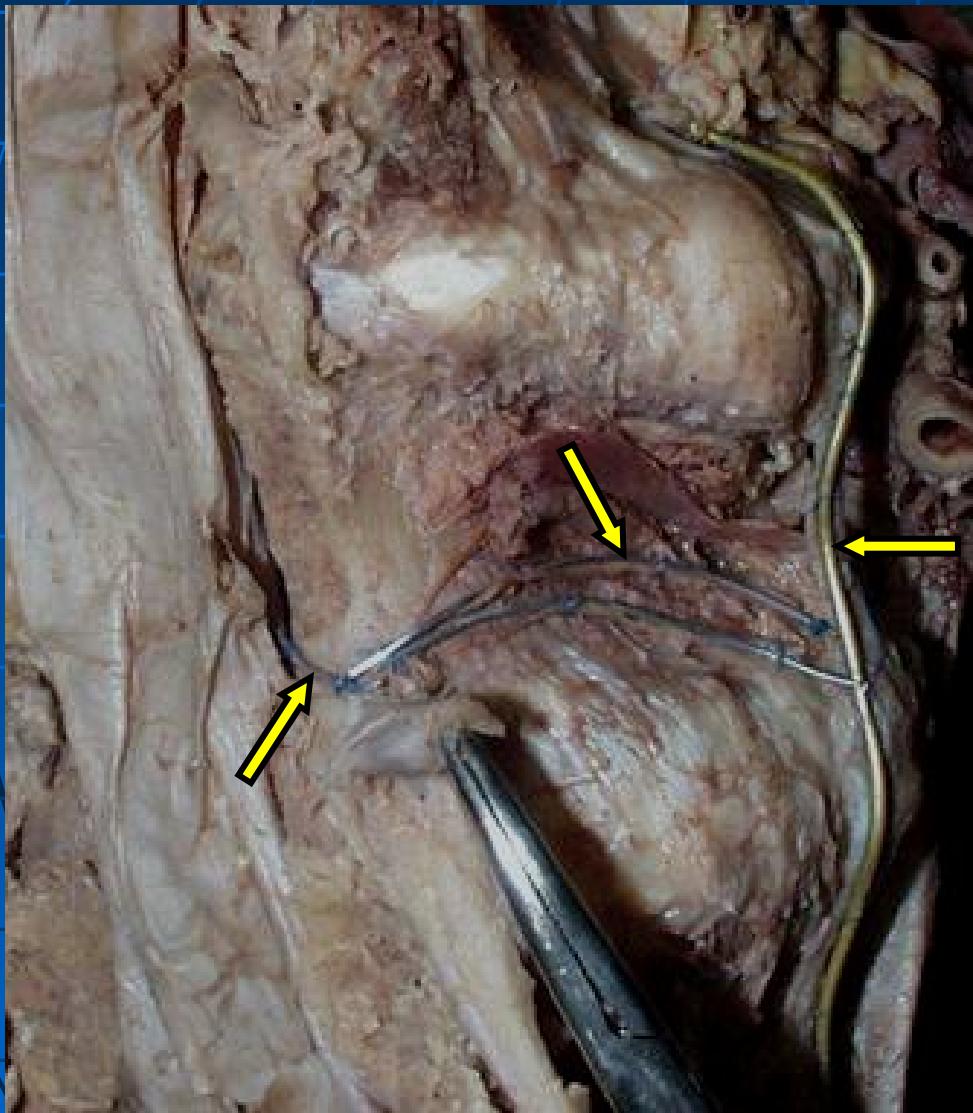


Sympathetic ganglia

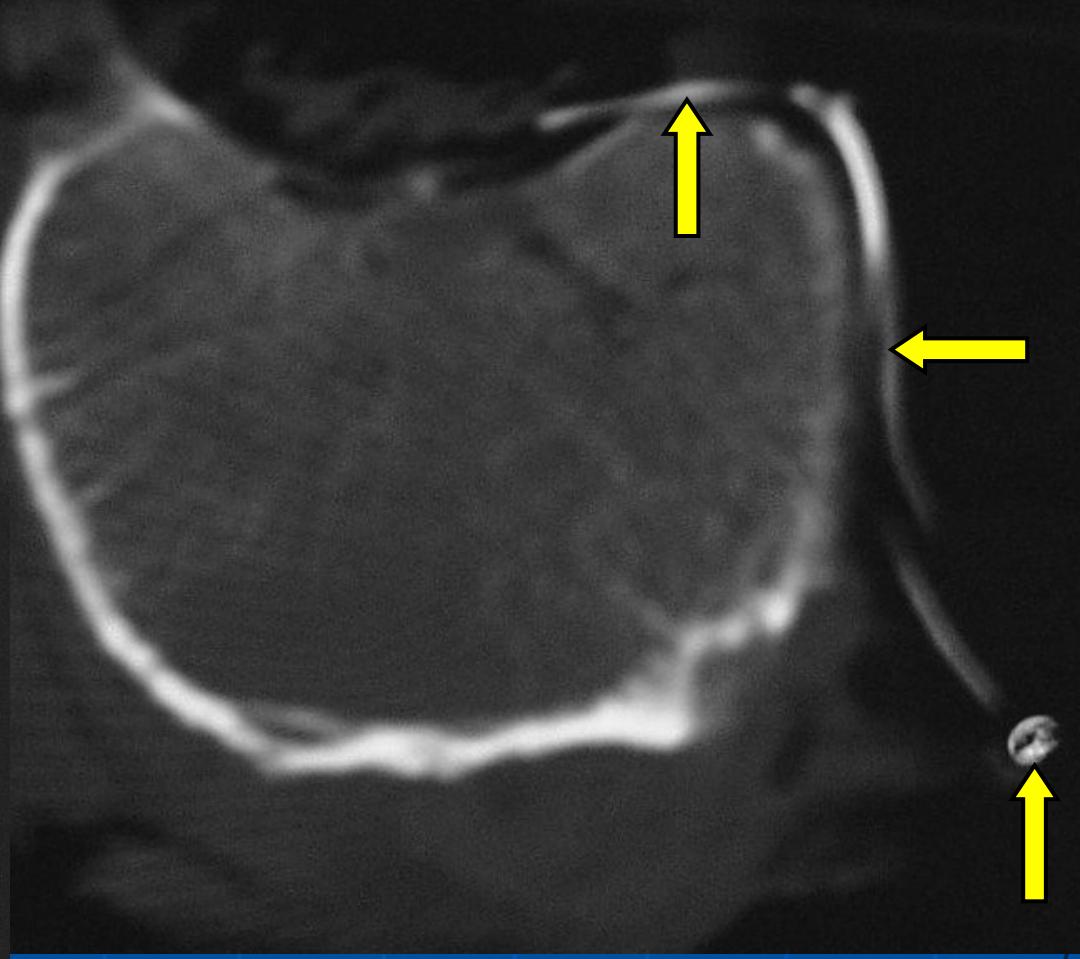
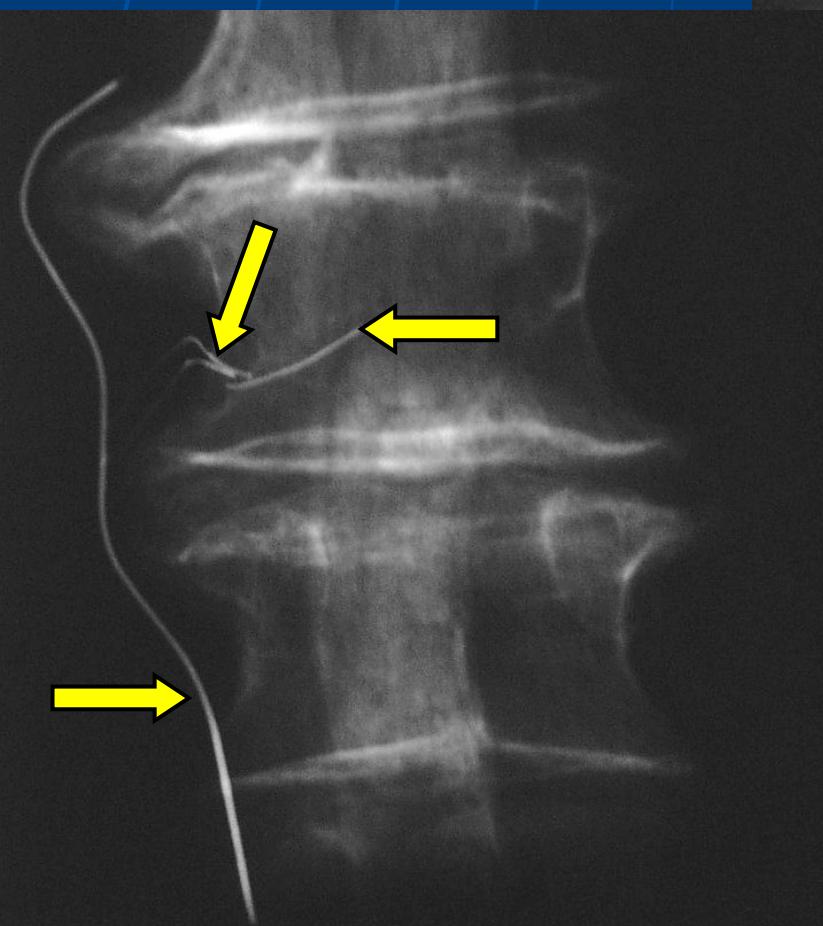
Ramus communicans

Somatic root

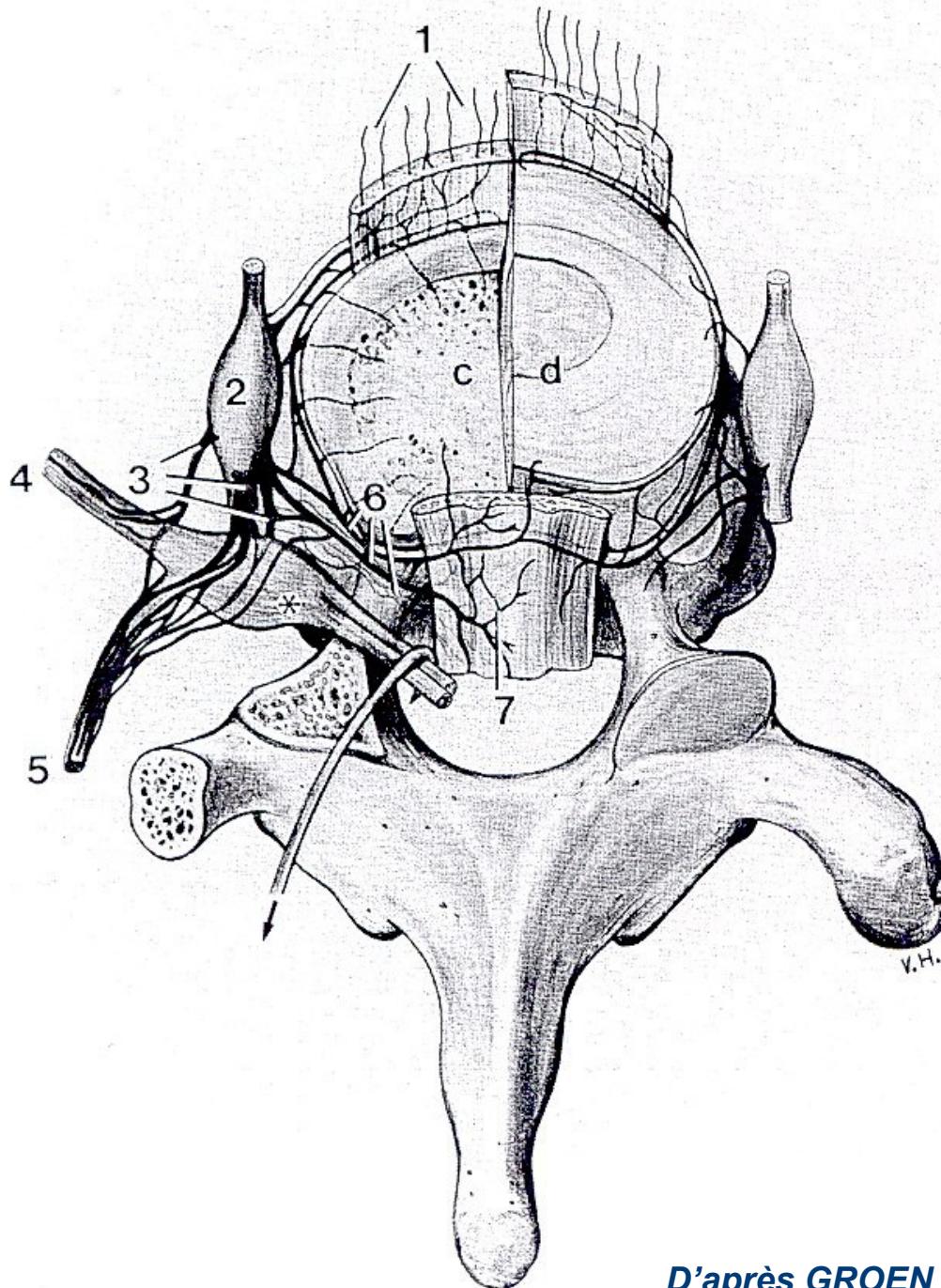
# Metallic support for X rays study



Front view

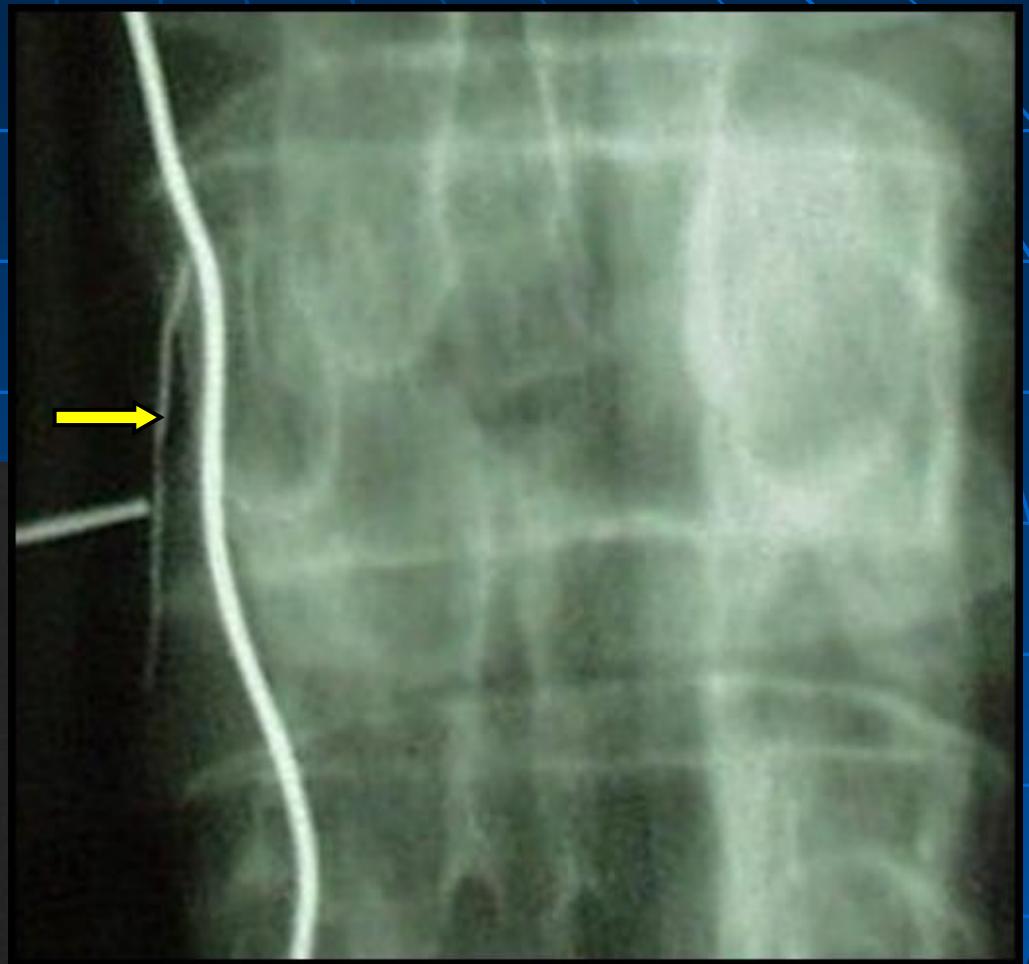
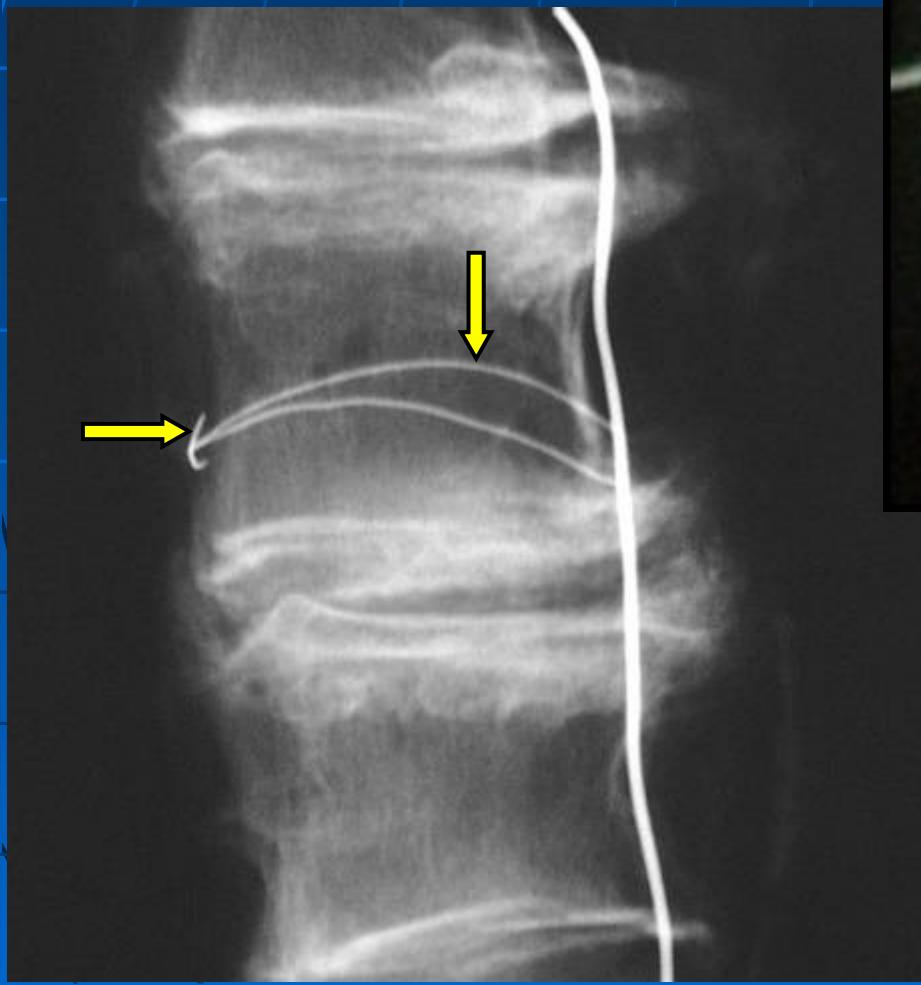


Transversal cut in L2



*D'après GROEN*

Lateral view



front view

# Lack of somatic innervation

- Major roots must supply
- Explanation for « ectopic » pain
- L2 is the main somatic root
- C4 and T2 for the cervical area  
(inter scapular pain with cervicalgias)

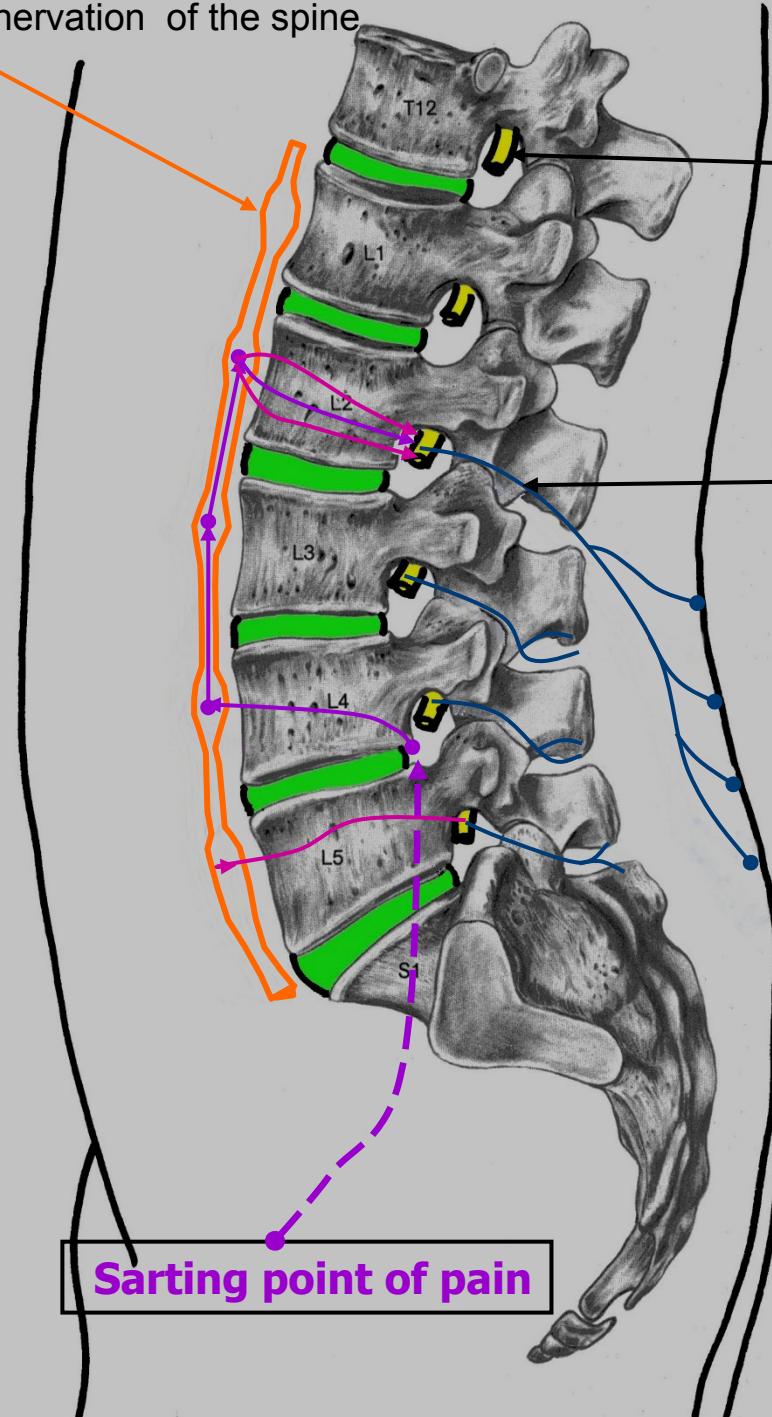
sympathetic  
ganglia

Innervation of the spine

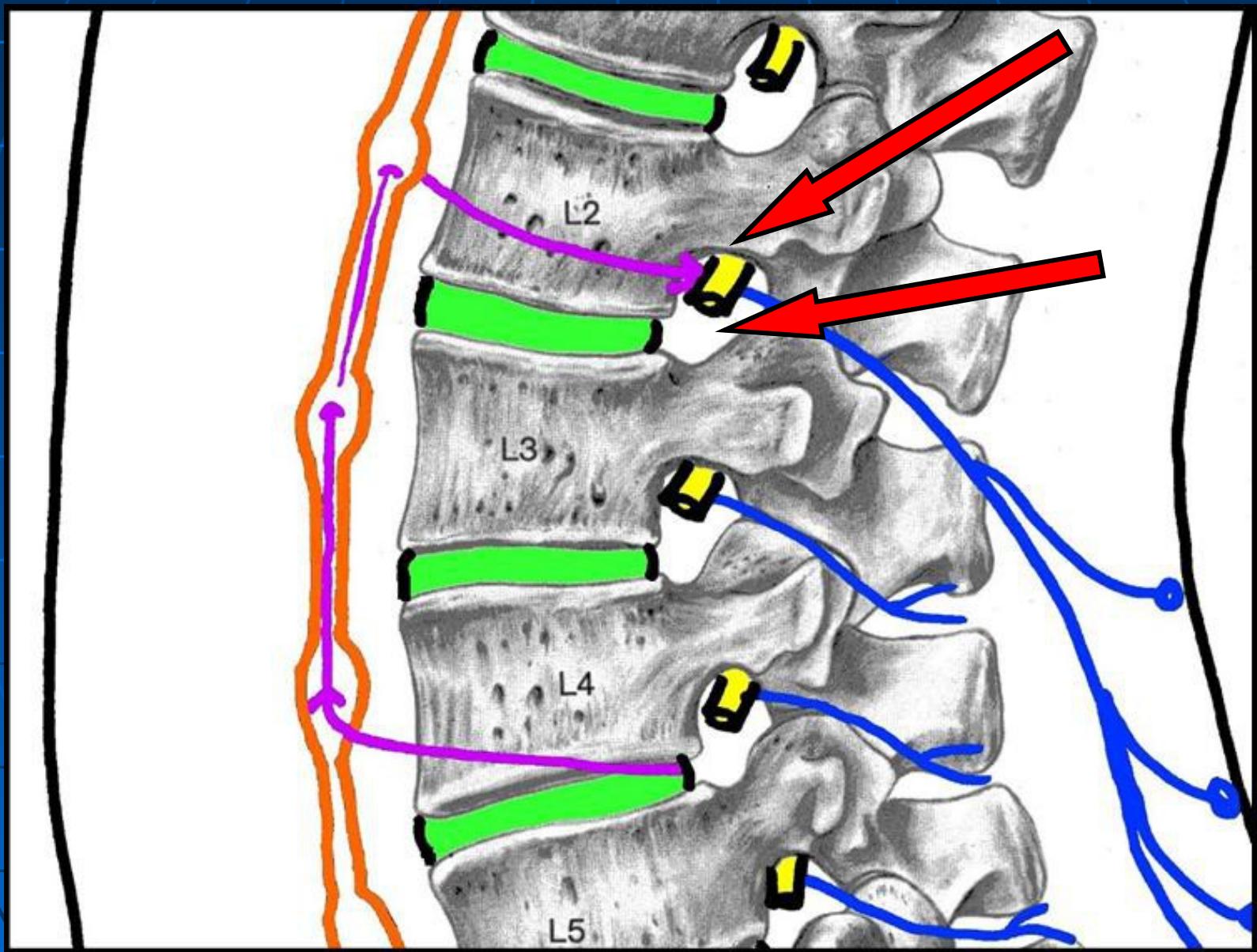
Spinal  
dorsal  
root

Dorsal L2  
root

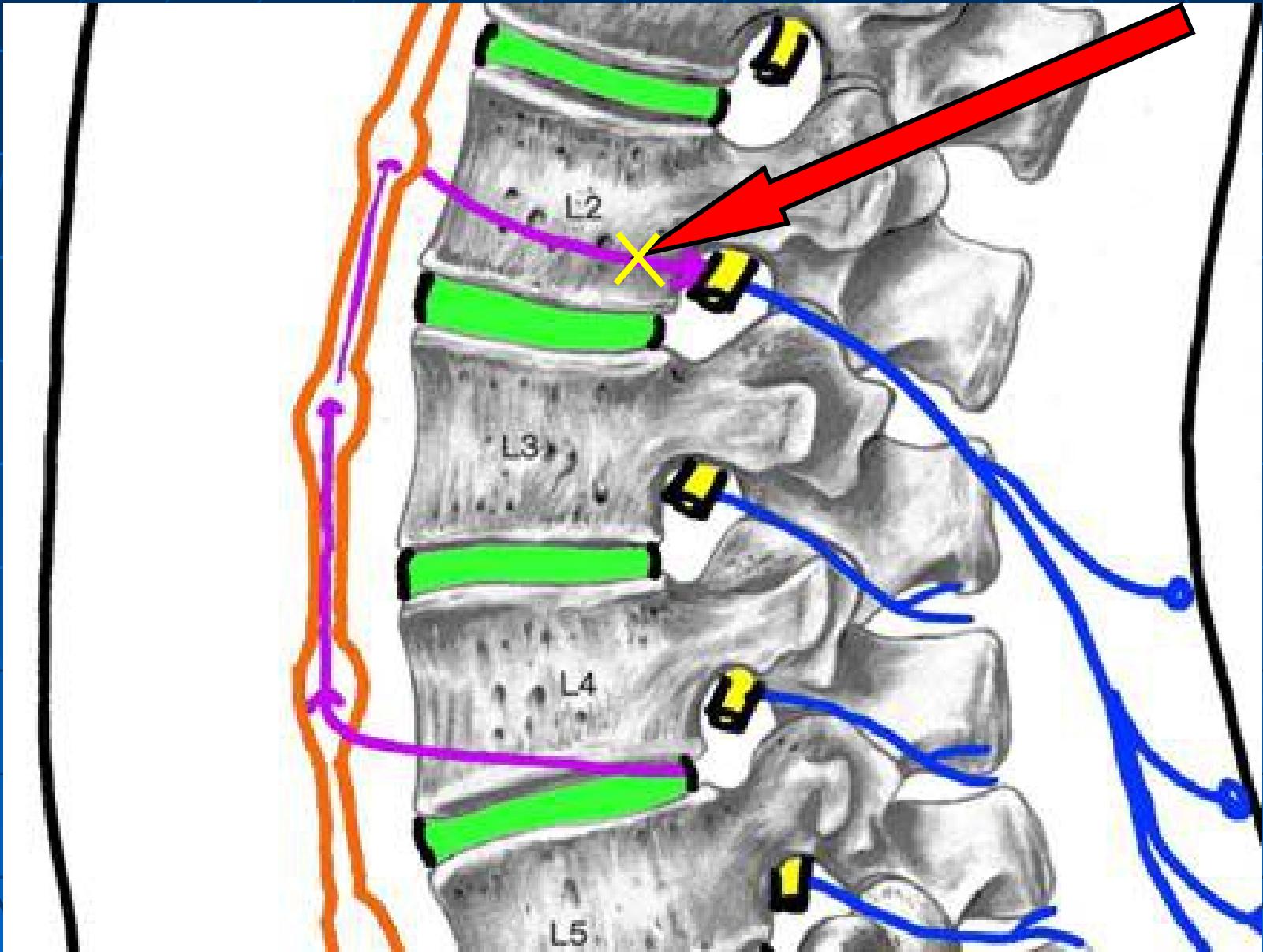
Sarting point of pain



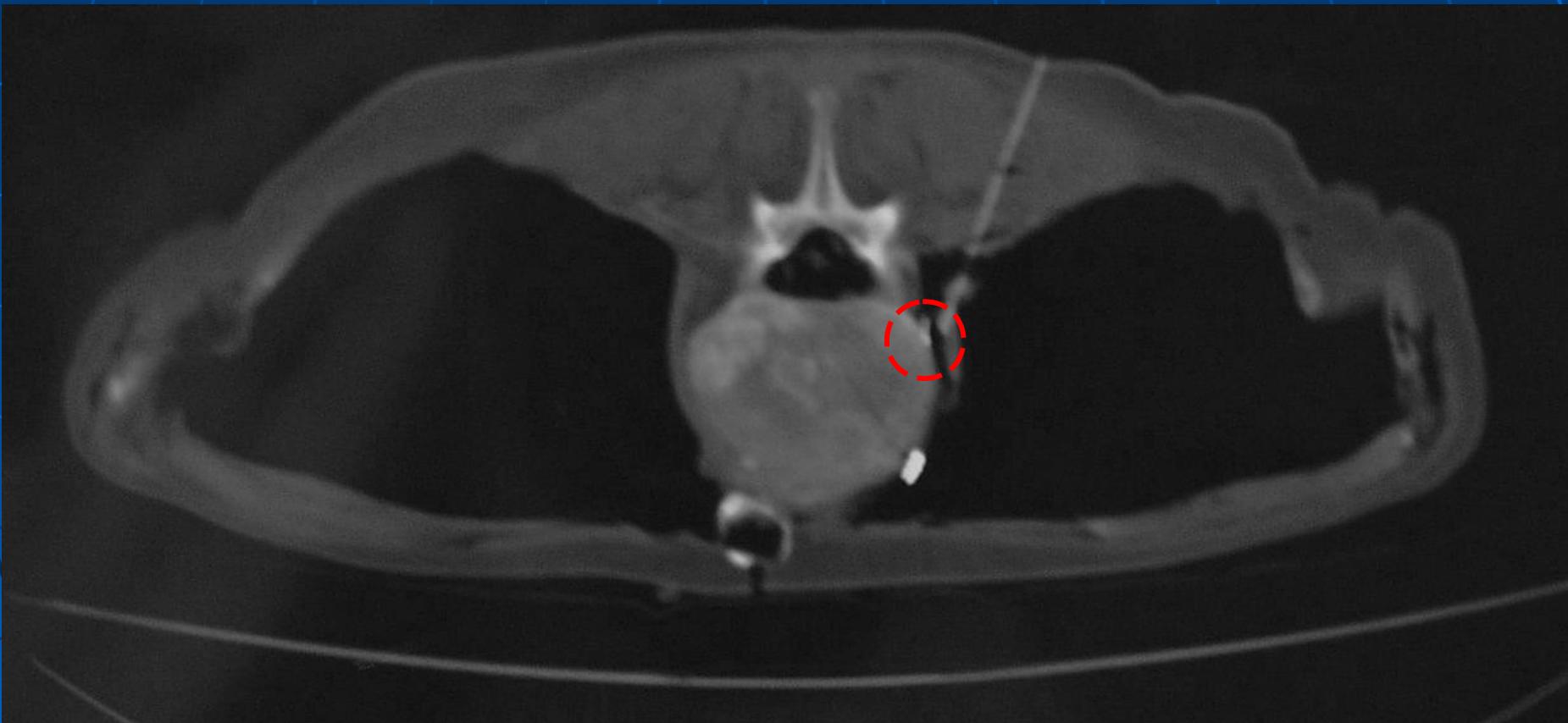
# Traditional Shot



# Rami communicantes shot



Under CT scan or  
Xrays





Position des aiguilles sous TDM

Injection des anesthésiques locaux  
+ Produit de contraste



# Results of blocks in the rami communicantes

- Bad results 23%
- Mild/Good results 40%
- Excellent results 37%

But no duration with time

# Results of blocks

- New technics must be used:

Thermo-coagulation

Radio frequency

**SURGERY**

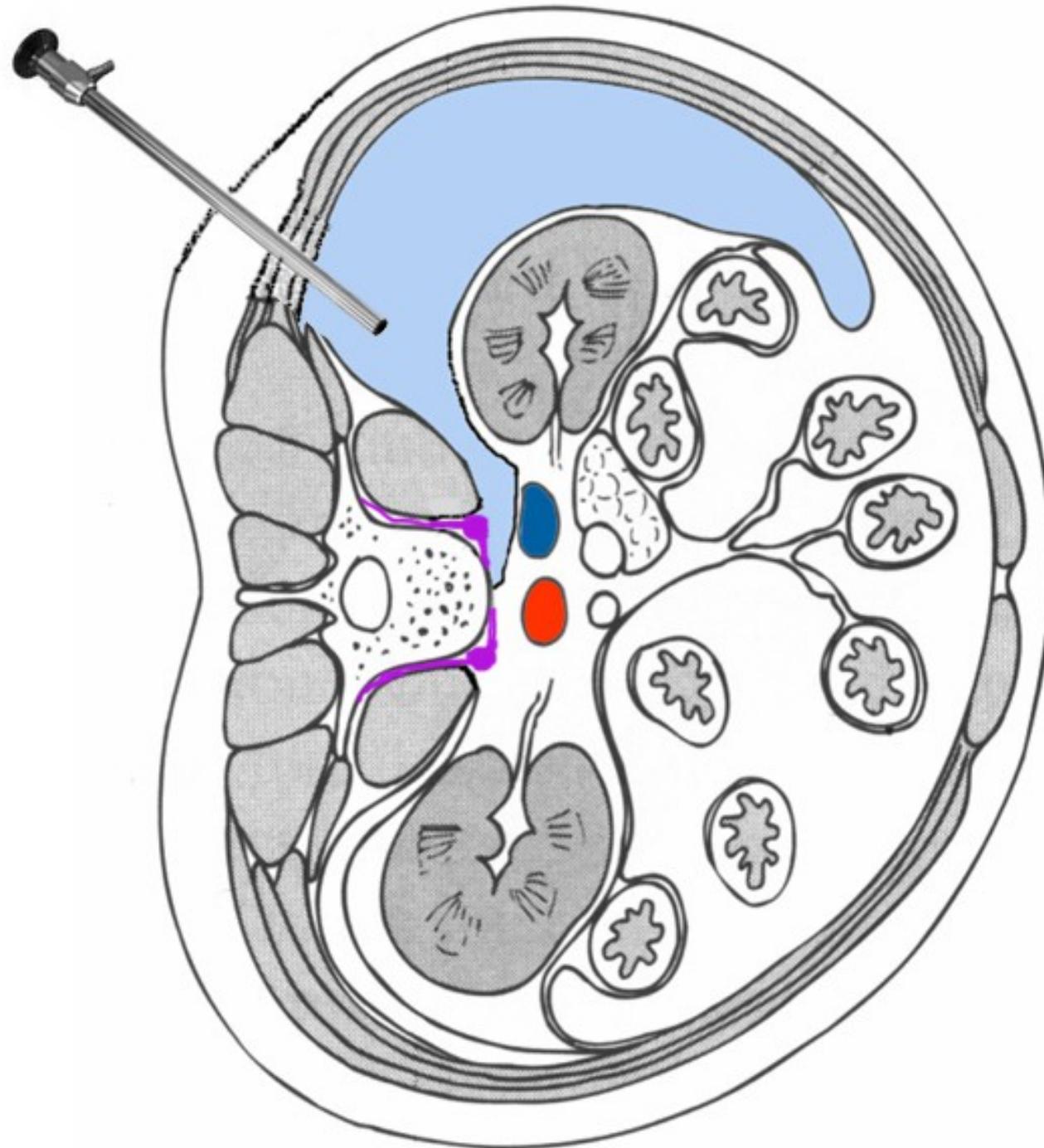
- Chronic lumbalgias are vegetative pain
- Sympathetic tracts guide the pain
- L2 somatic root collects the pain
- Treatment must protect somatic and vegetative systems
- Blocs at the lateral part of L2 reaches the rami communicantes
- Easy technic, reproducible.

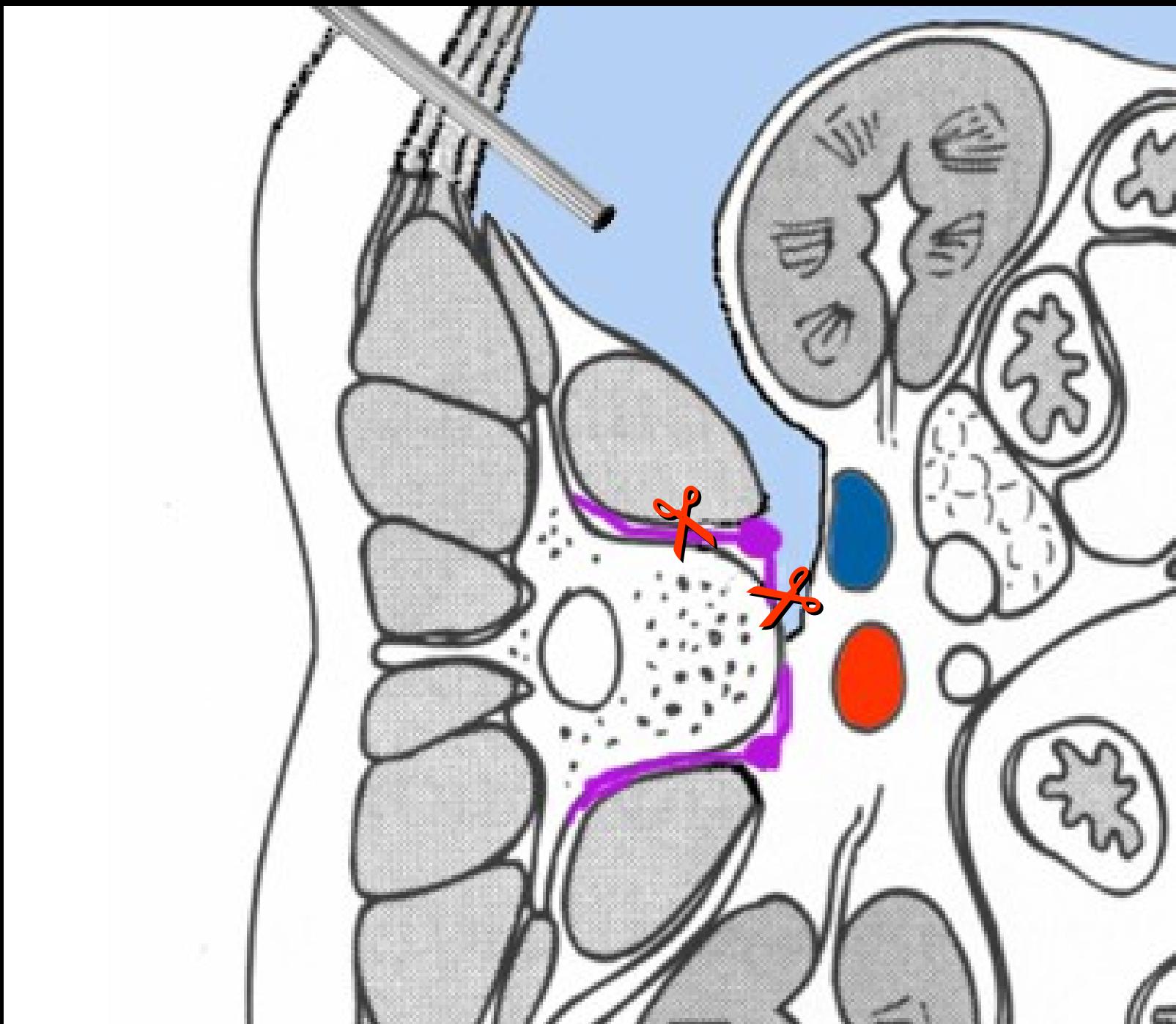
# **Sections des Rameaux communicants**

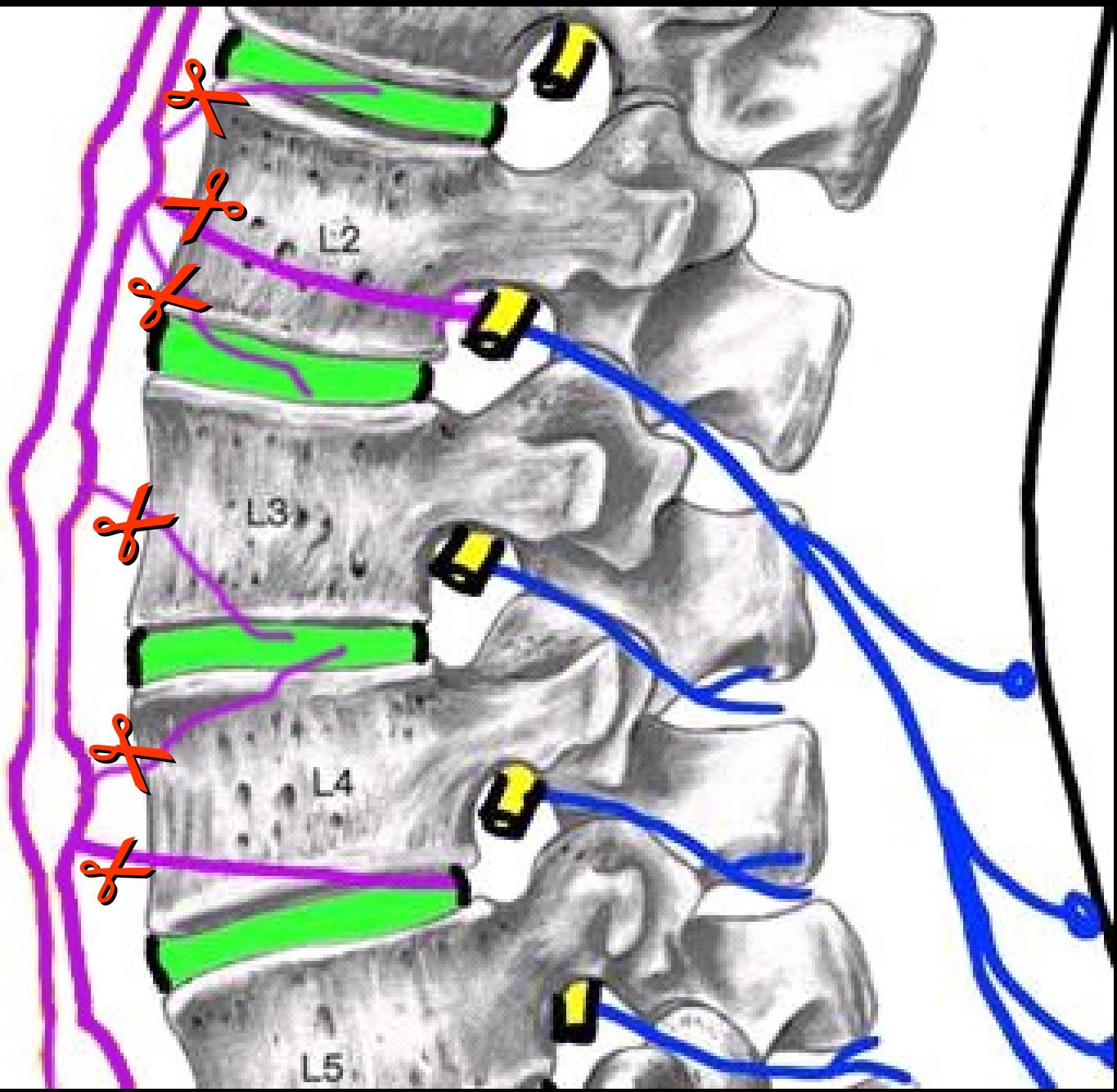
**Dr Jérôme RIGAUD – Pr Roger  
ROBERT  
CHU de Nantes**

# Geste Chirurgical

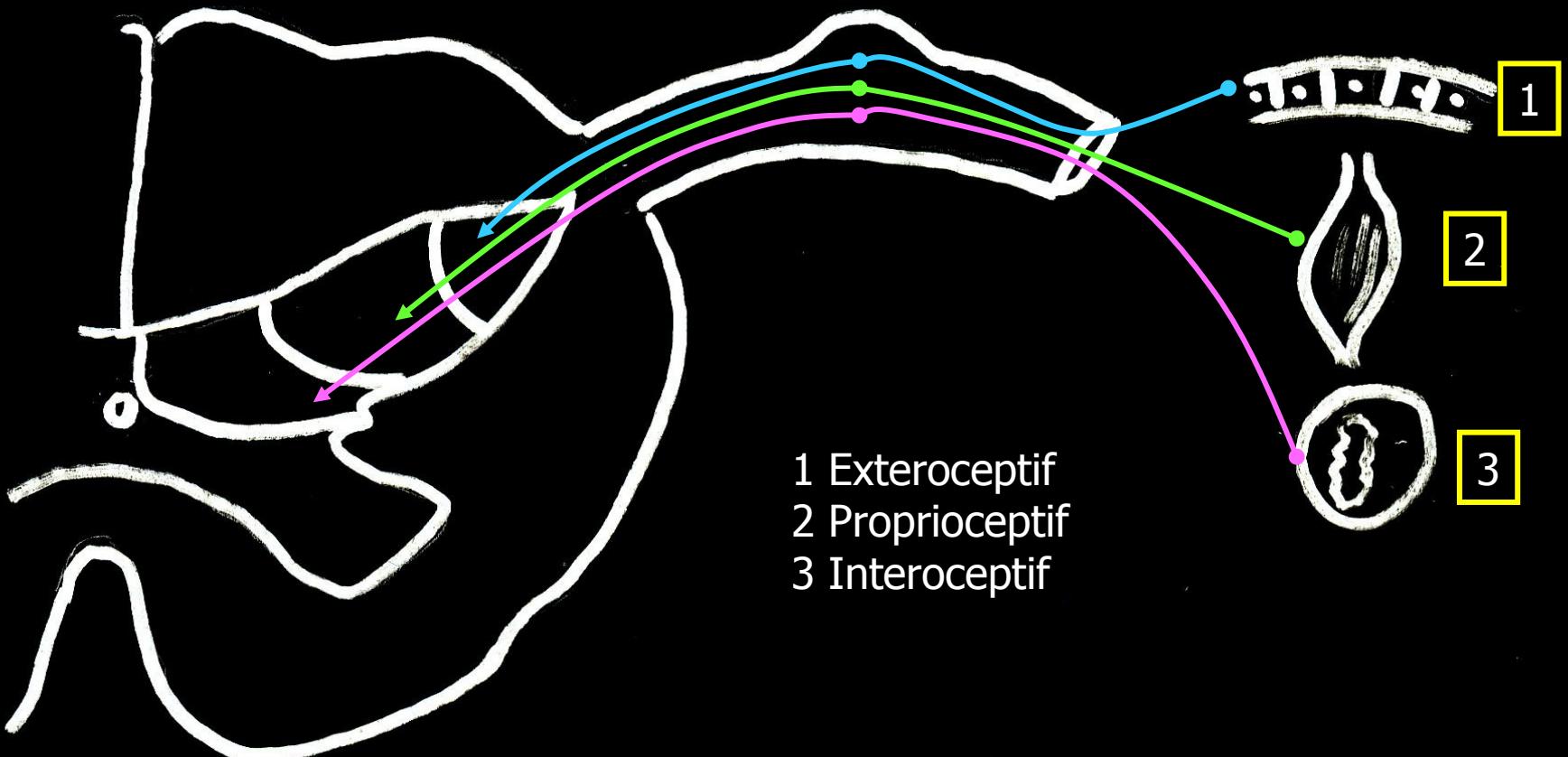
- Abord **Laparoscopique** par voie rétro-péritonéale bilatérale
- Sections sélectives des rameaux communicants allant de L1 à L4
- Conservation de la chaîne sympathique







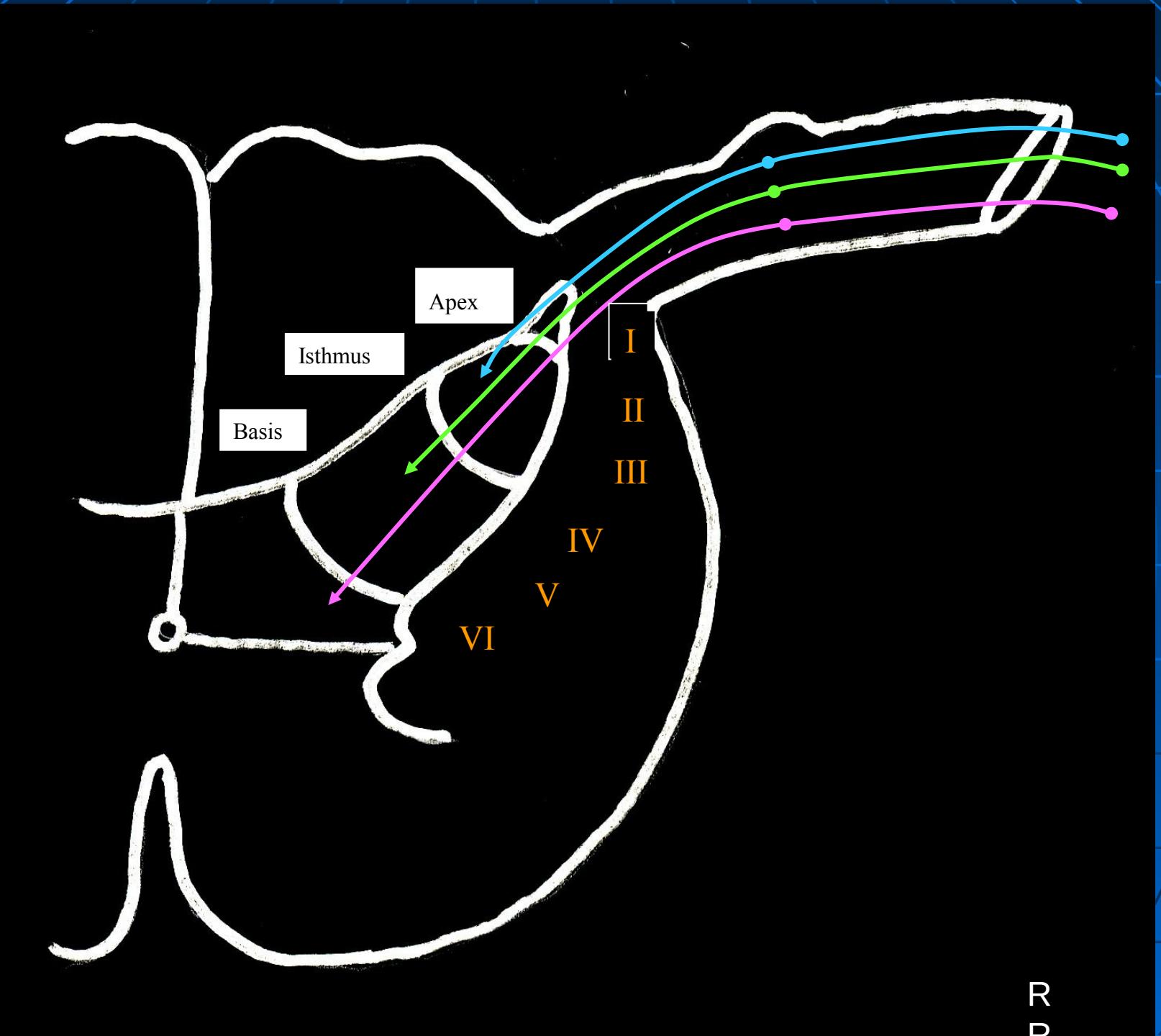
# Pain tracts in the spinal cord



1 Exteroceptif  
2 Proprioceptif  
3 Interoceptif

3 Sheats, 3 Sensibilities , 3 Pains

RR

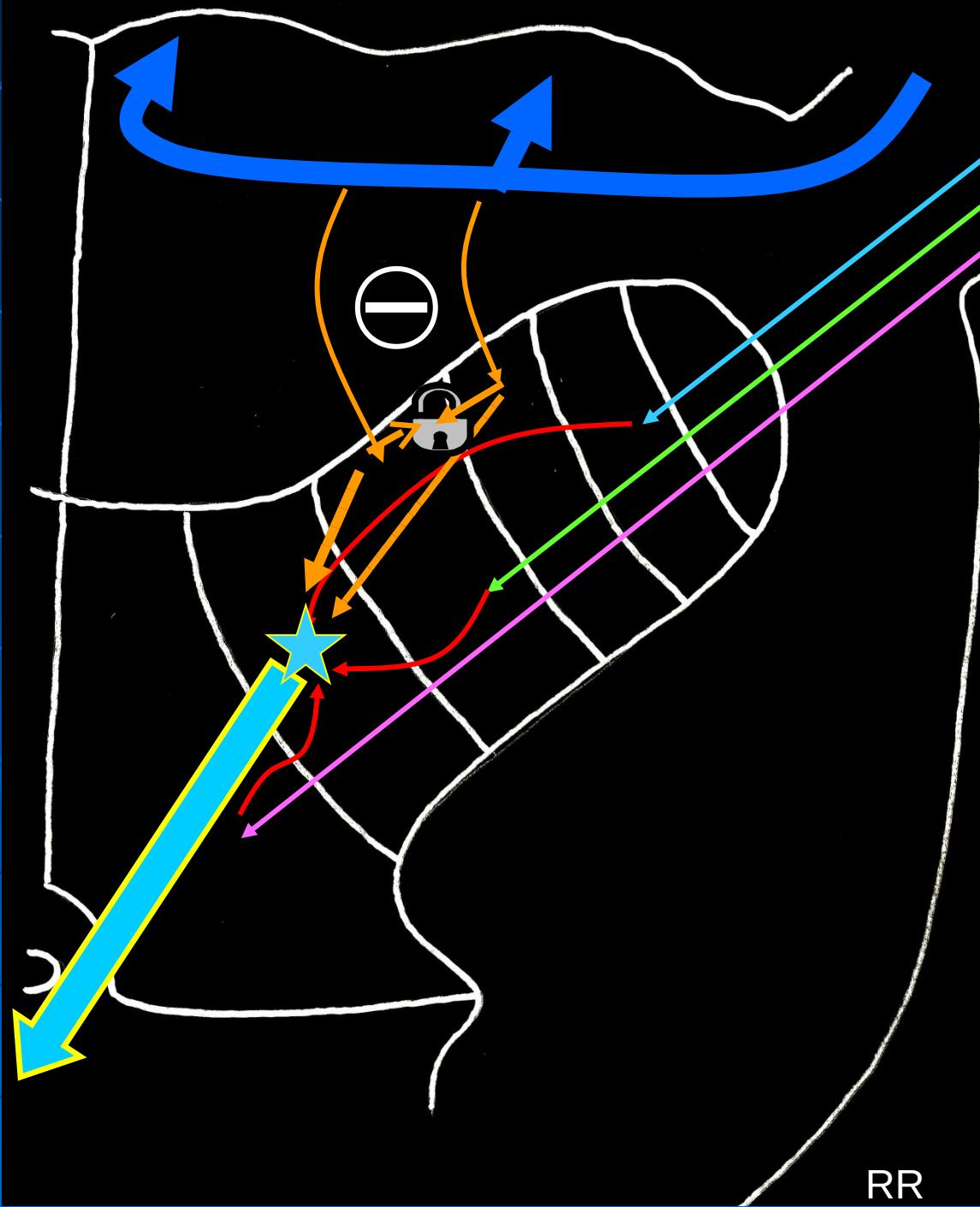


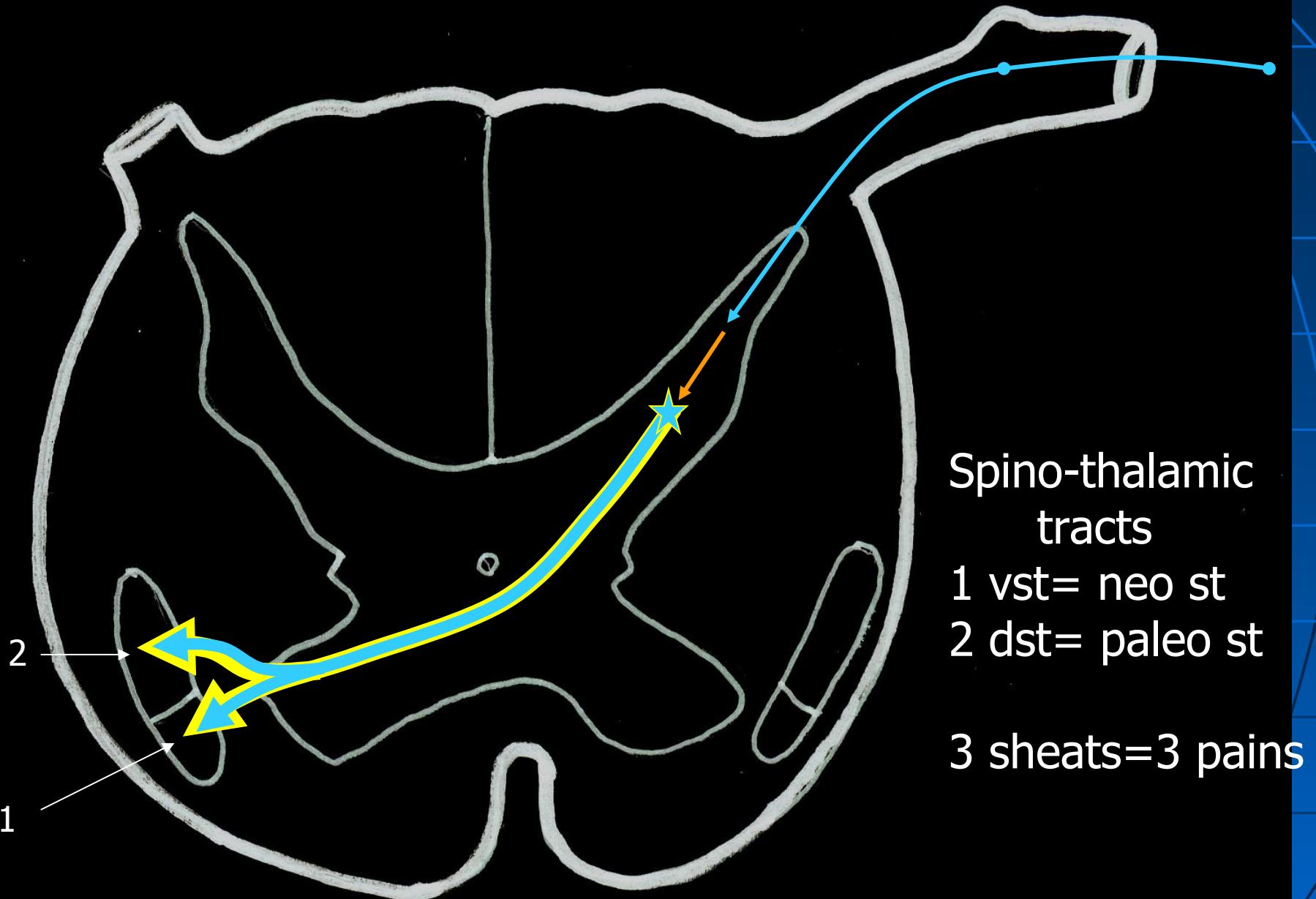
R

P

G  
A  
T  
E

RR





Spino-thalamic  
tracts

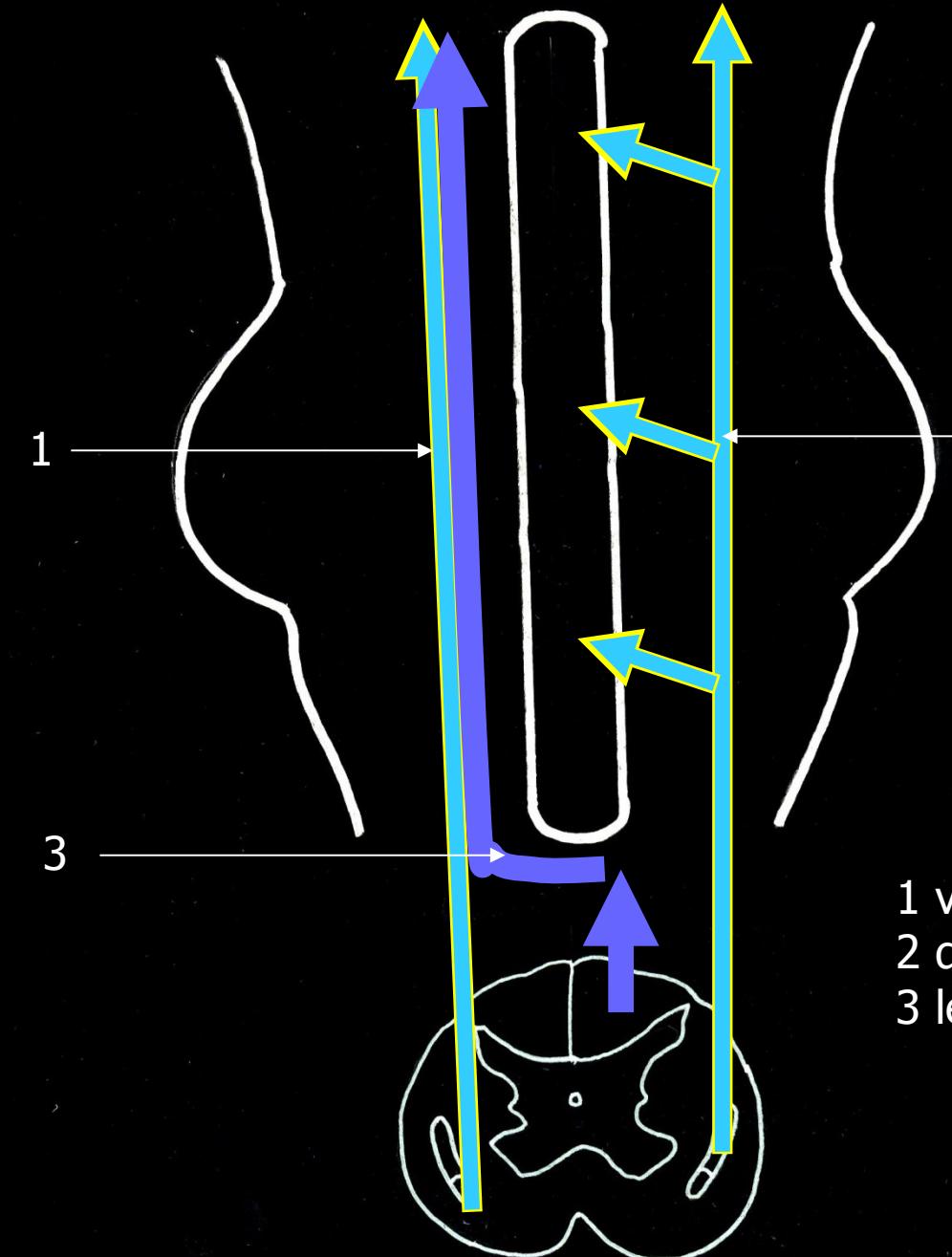
1 vst= neo st

2 dst= paleo st

3 sheets=3 pains

R

B



2

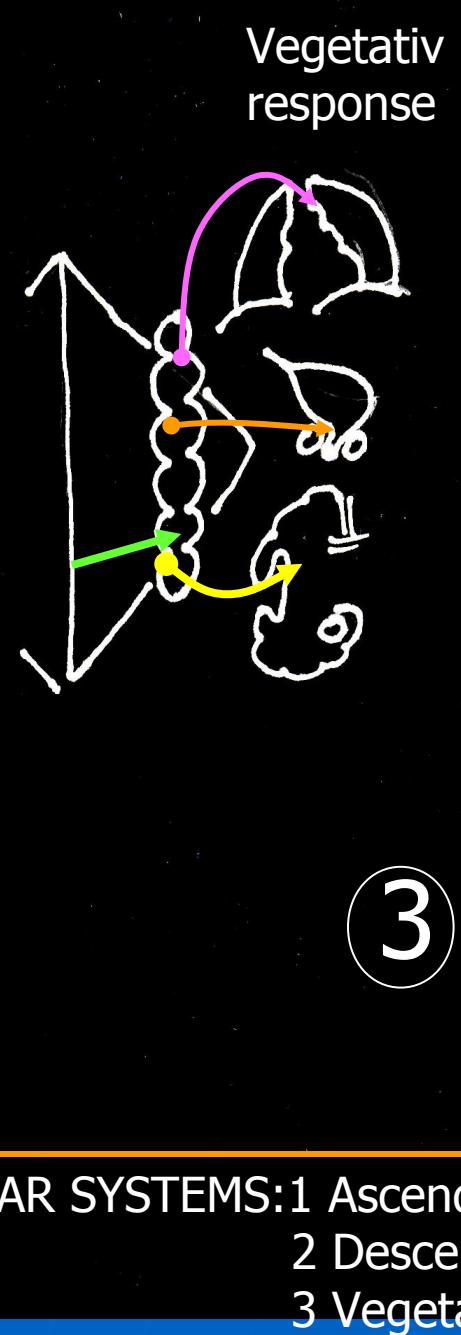
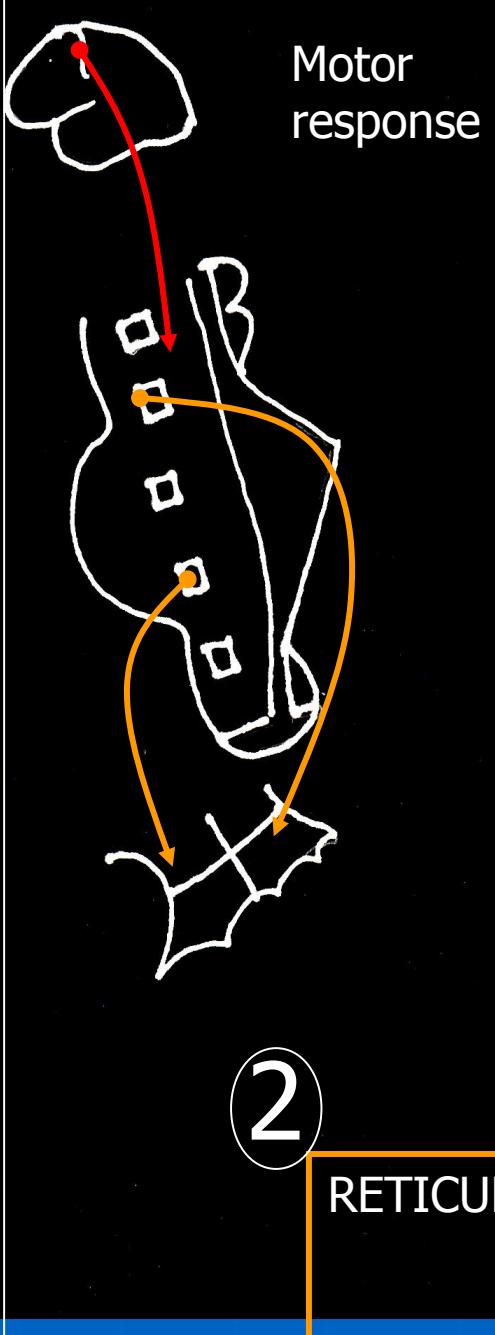
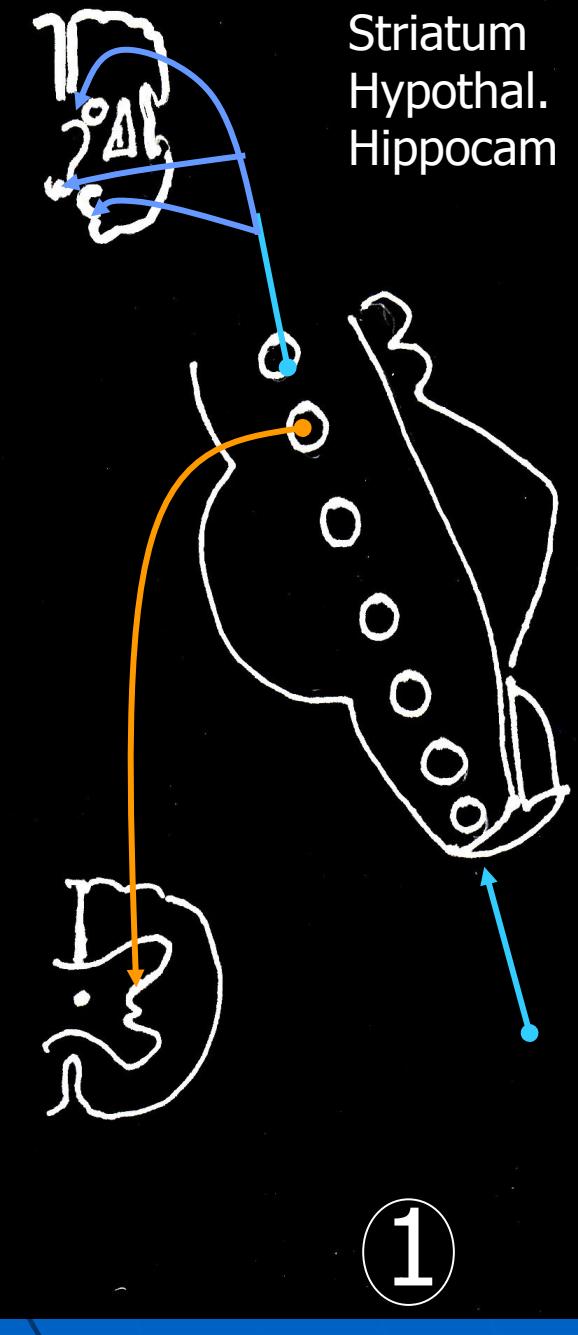
1

3

1 vst  
2 dst  
3 lem med

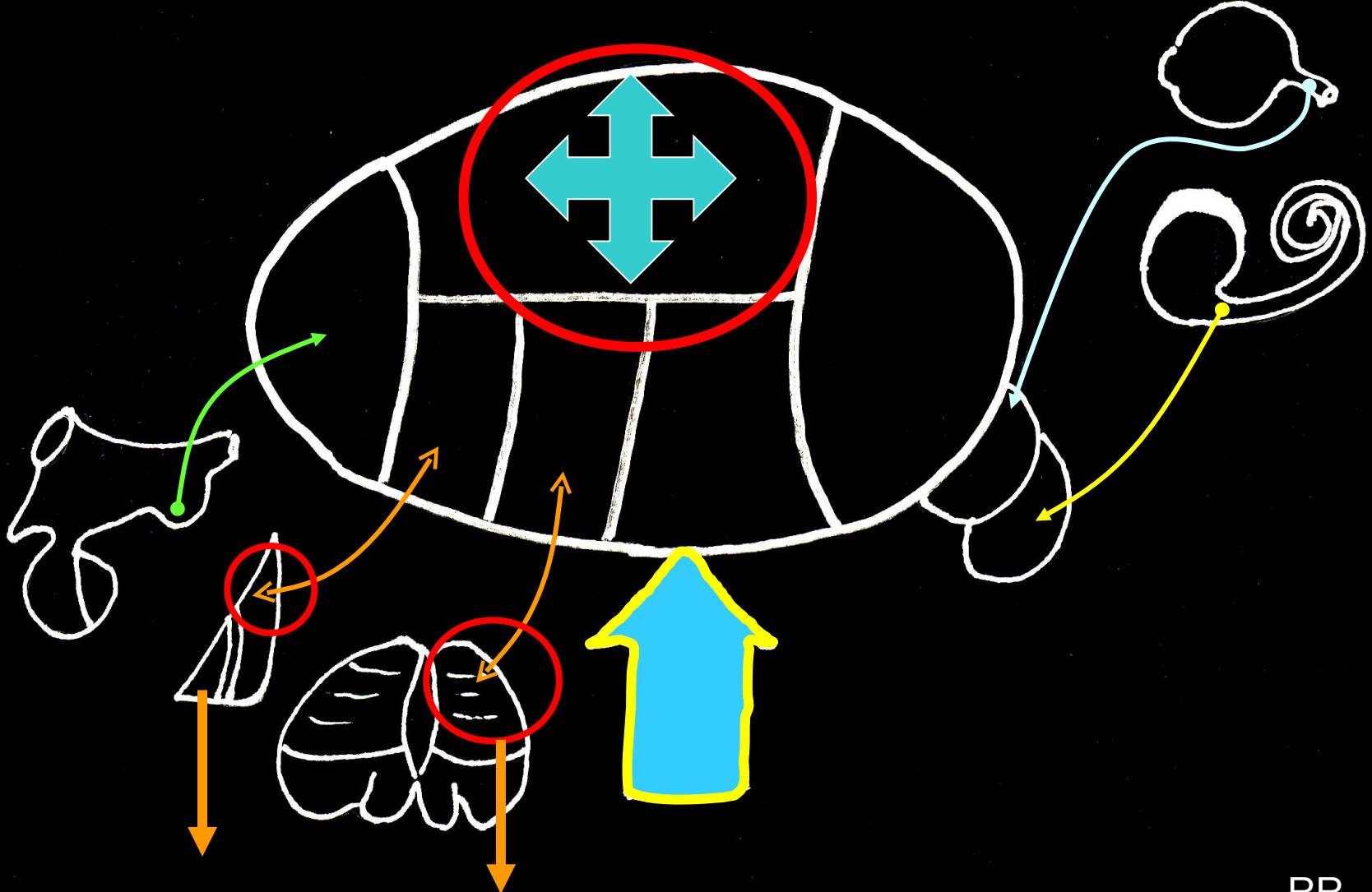
RR

Cerebral  
Stem

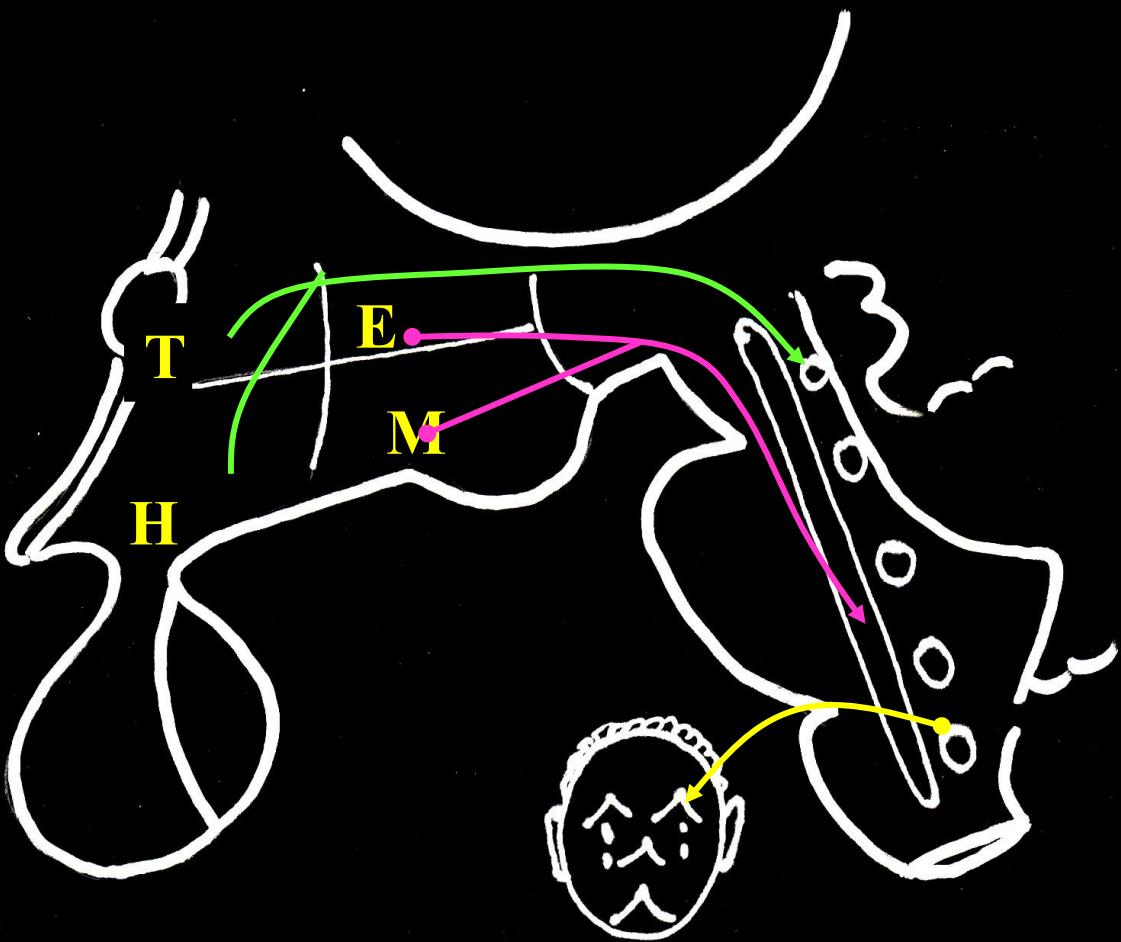


RETICULAR SYSTEMS:  
1 Ascending  
2 Descending  
3 Vegetative

# THALAMUS



RR



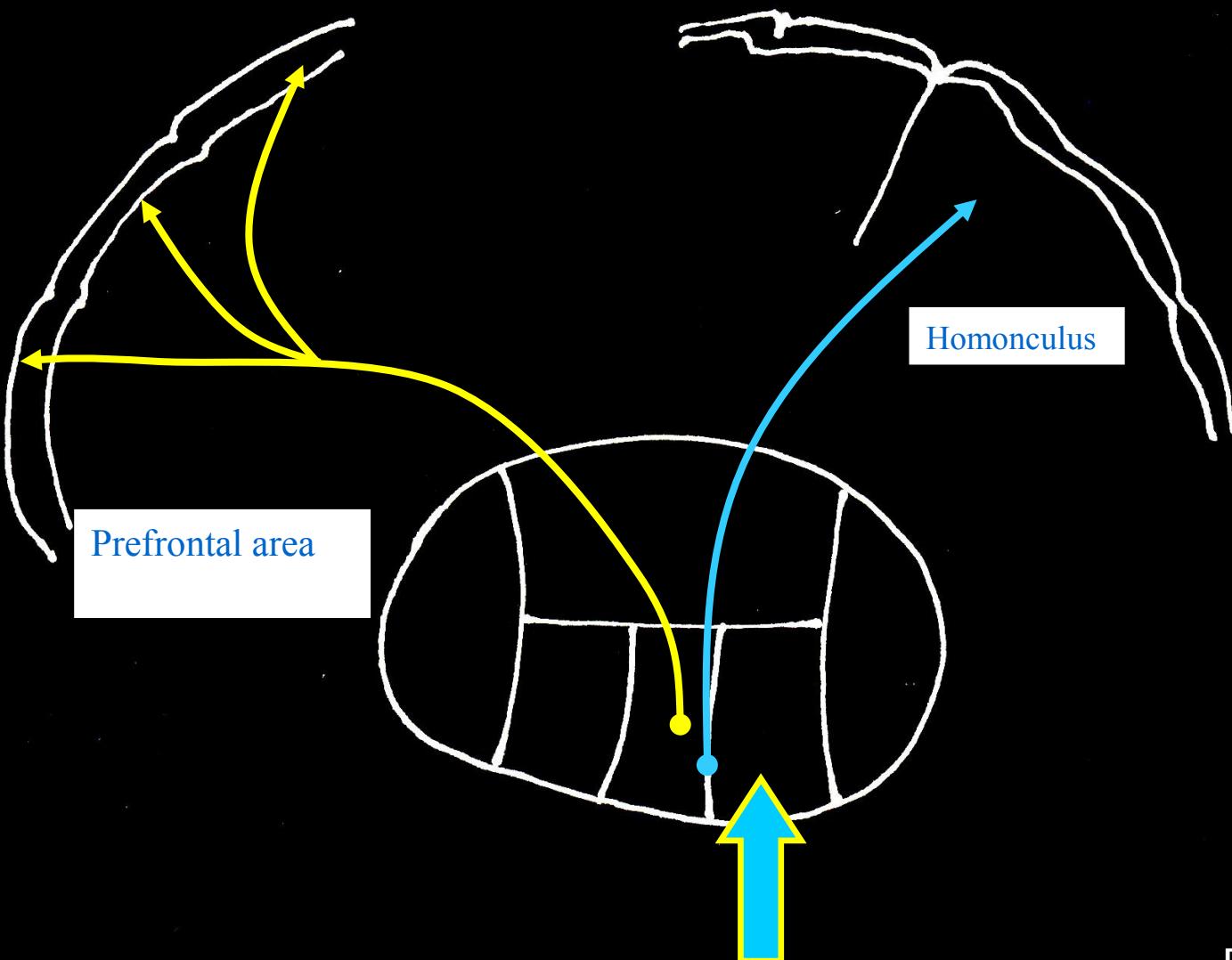
RR

# HYPOTHALAMUS



HMTC Circuit of PAPEZ : Memory and Emotion

# Thalamo-cortical circuits



# **Les traitements neurochirurgicaux**

**Stimulation cordonnale**

**Stimulation trans cranienne**

**Stimulation végétative?**