

وسهلا



أهلا

يُمنع أخذ السلايدات بدون
إذن المحرر واي اجراء
يخالف ذلك يقع تحت طائلة
المسؤولية القانونية
جميع المعلومات للاستخدام
التعليمي فقط

الأستاذ الدكتور يوسف حسين

أستاذ التشريح وعلم الأجنة - كلية الطب - جامعة الزقازيق - مصر

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دكتورة من جامعة كولونيا المانيا

جميع المعلومات المنشورة هي فقط للاستخدام التعليمي

جروب الفيس د. يوسف حسين (استاذ التشريح)

اليوتيوب د. يوسف حسين

Prof. Dr. Youssef Hussein Anatomy - YouTube

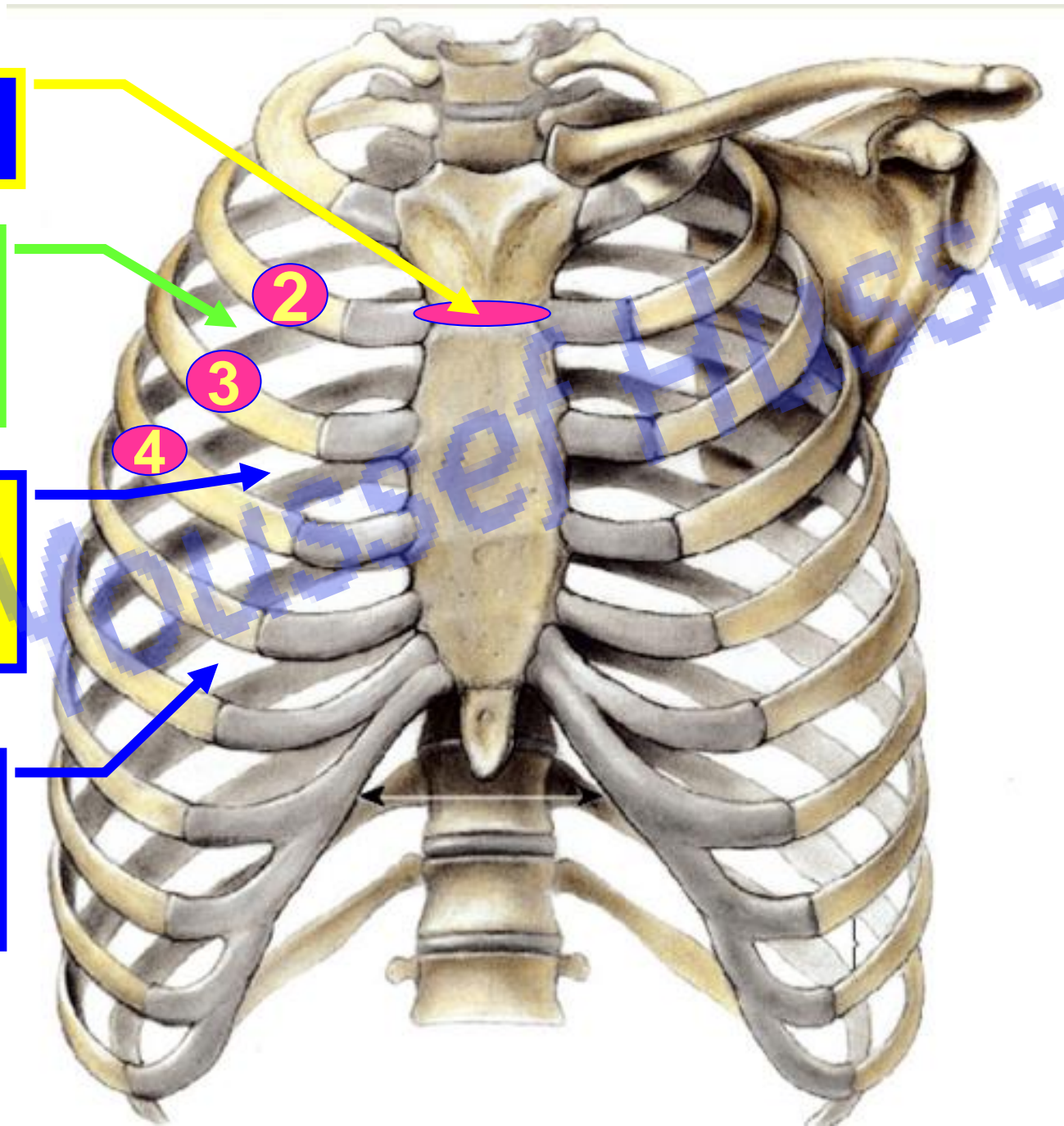
https://www.youtube.com/channel/UCVSNqbibj9UWYaJdd_cn0PQ

Sternal angle

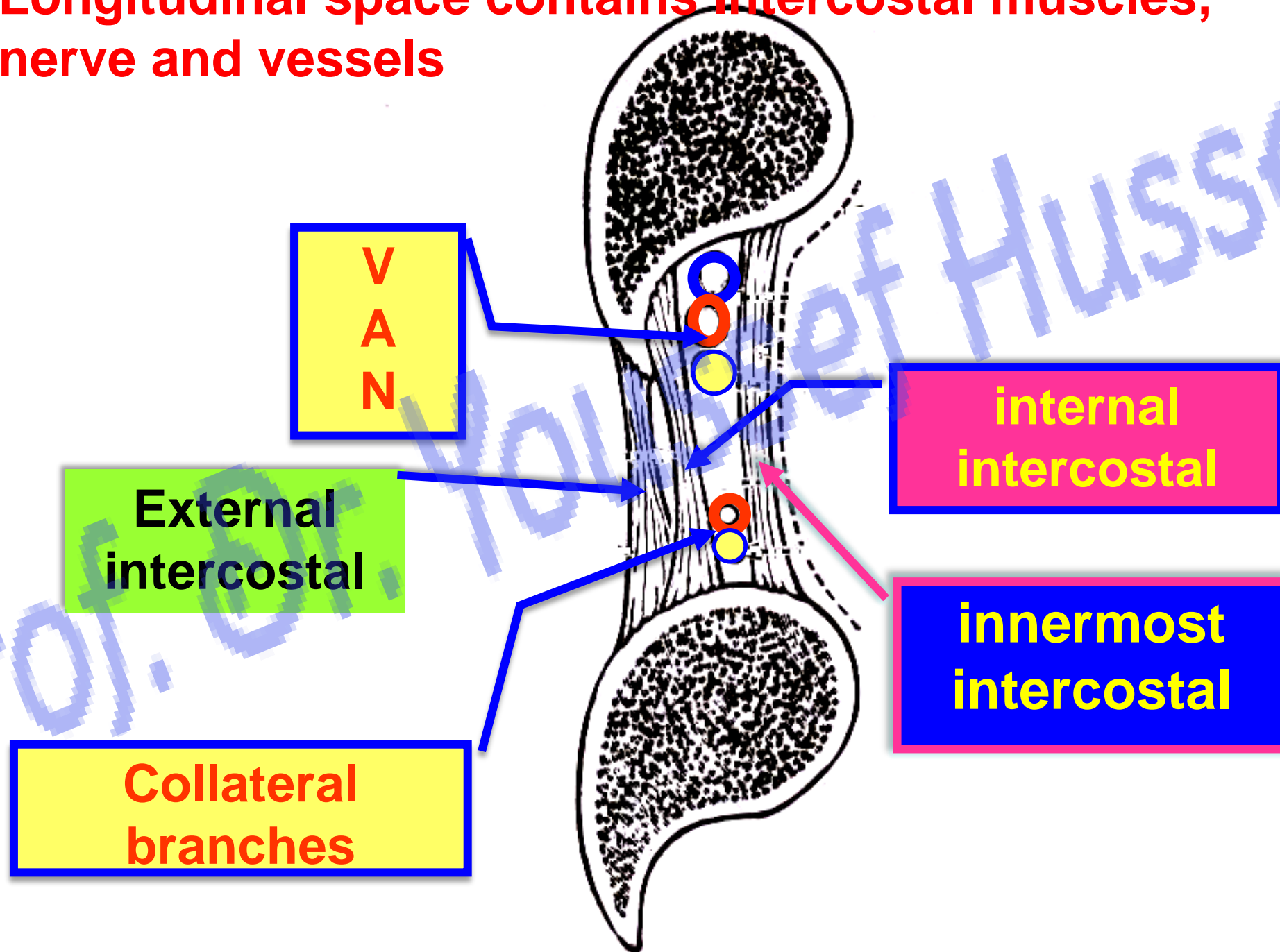
2nd Intercostal space

3rd Intercostal space

Intercostal space



Longitudinal space contains Intercostal muscles, nerve and vessels



Nerve supply of Thoracic Wall

**Intercostal
nerves**

Beginning

End

Course

Types

Branches

Thoracic spinal nerves

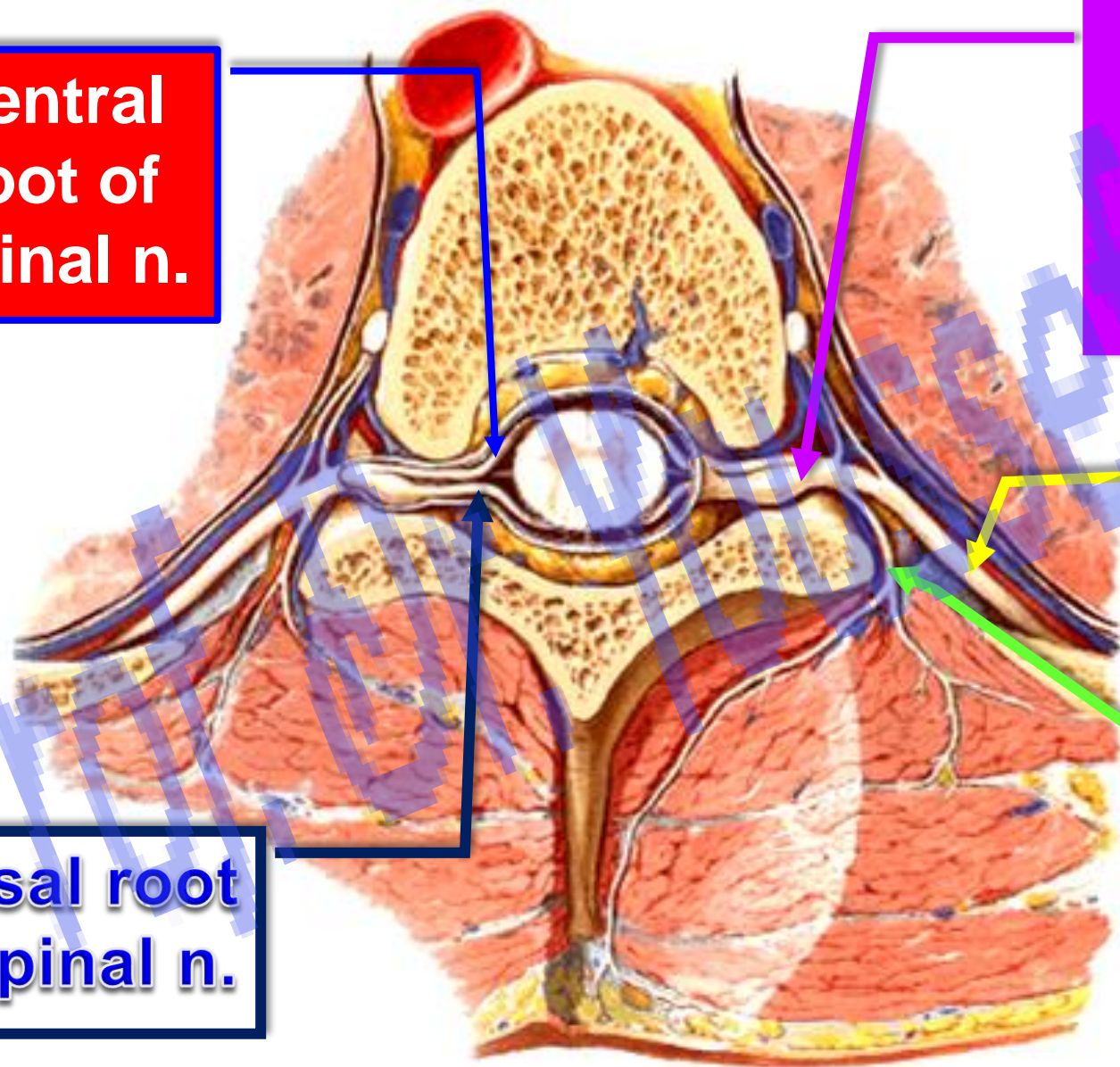
Ventral root of spinal n.

Trunk of the spinal nerve (intervertebral foramen)

Ventral ramus

Dorsal root of spinal n.

Dorsal ramus



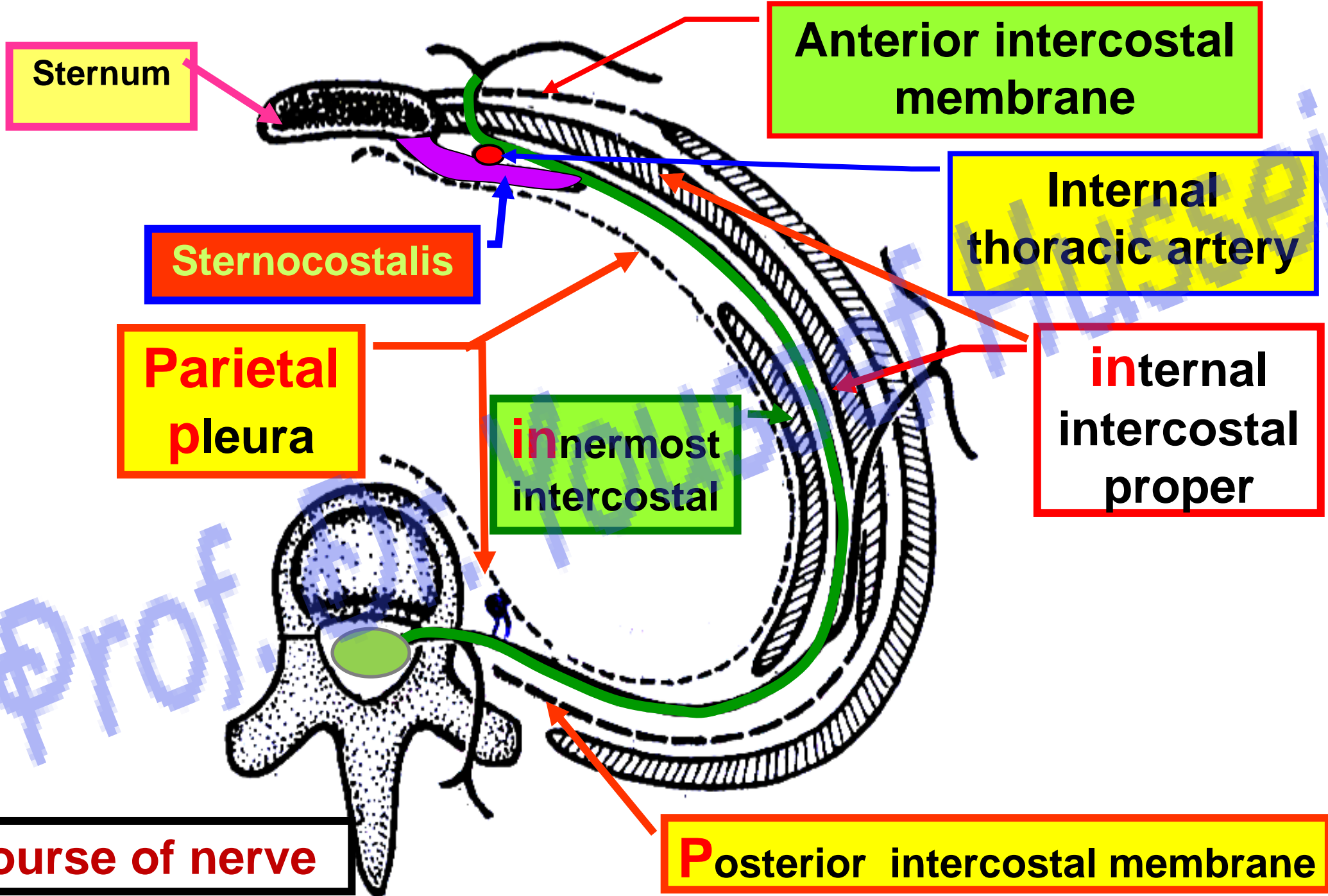
- **Intercostal Nerves**

- **Typical (3rd-6th)** : supplied thoracic wall only
- **A Typical Intercostal Nerve:** supplied thoracic wall and structures outside

1- The first Intercostal Nerve (ventral ramus): shares in the formation of the **brachial plexus**.

2- The Second Intercostal Nerve: its lateral cutaneous branch does not divide (**intercostobrachial nerve**) supply the skin of the floor of the axilla and medial side of the arm.

3- Lower five intercostal and subcostal (12th) Nerves: supply muscles and skin of anterior abdominal wall.



• Typical intercostal nerves

** **Roots**, ventral rami of the thoracic spinal nerves.

** **End**: as anterior cutaneous nerves.

** **Course and relations**;

- It runs forwards in the intercostal groove below intercostal vessels (V.A.N.) as follows:-

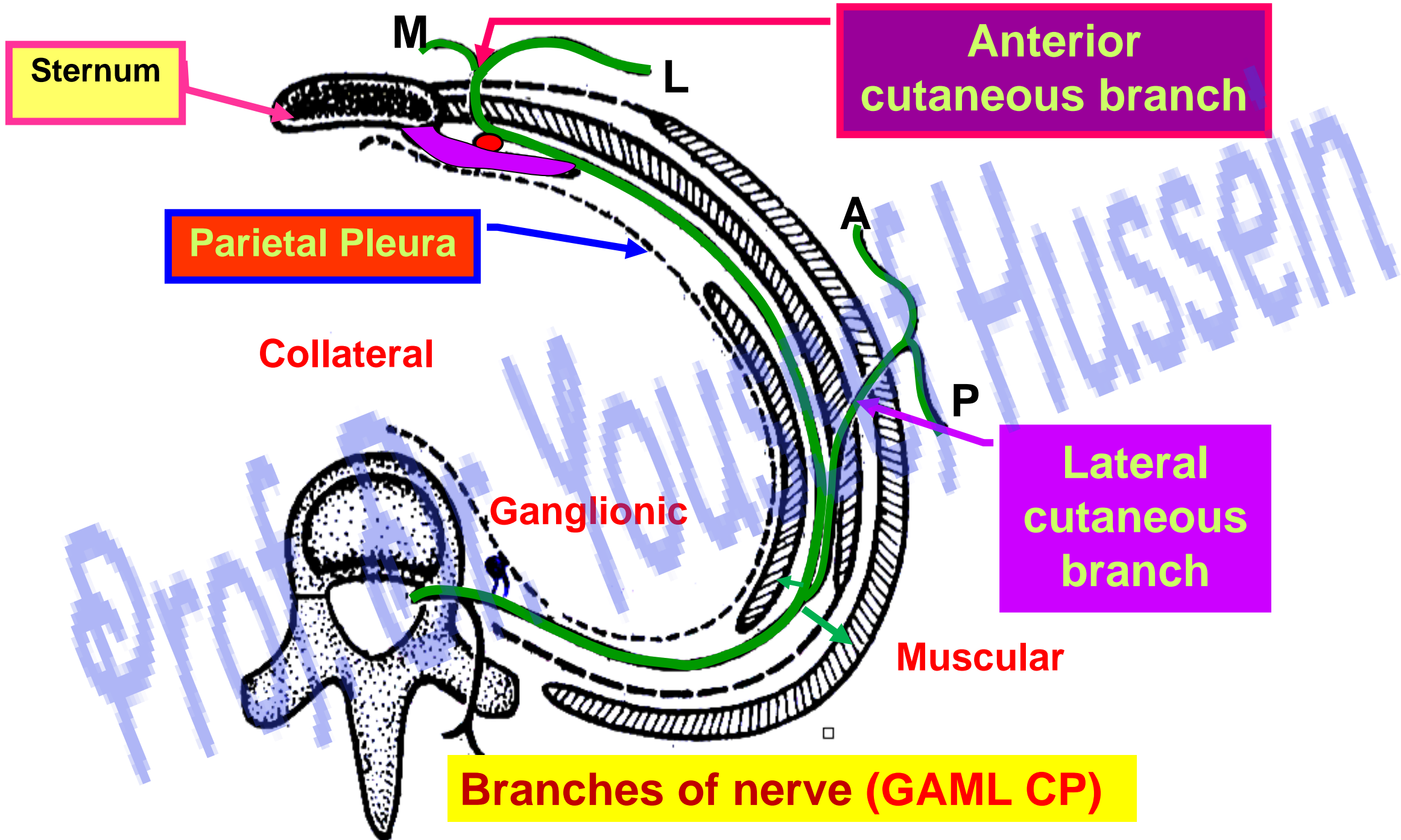
- **At first**, it runs between **Posterior** intercostal membrane and Parietal **Pleura**.

- **Then**, between **Internal** intercostal muscle (Outer) and **Innermost** intercostal (Inner).

- It passes between **Internal** intercostal muscle and **Pleura**.

- **Then**, **in front of** sternocostalis and internal mammary artery.

- **Finally**, it curves **forward and pierces** internal intercostal muscle and anterior intercostal membrane.



- **Branches of typical intercostal nerve (GAML CP):**

- 1) **Ganglionic branches:**

- They **give White** ramus communications to the corresponding sympathetic ganglion.
- They **receive Gray** ramus communications

- 2) **Anterior cutaneous branch (terminal branch)** divided into lateral and medial divisions to the skin of anterior thoracic wall.

- 3) **Muscular branches** to the intercostal muscles.

- 4) **Lateral cutaneous branch** divided into anterior and posterior divisions to the skin of lateral thoracic wall.

- 5) **Collateral branch:** runs along the upper border of the rib below.

- 6) **Pleural branches** to the costal part of the parietal pleura.

Herpes Zoster

- **Herpes Zoster**
- **Viral infection characterized by painful skin rash with vesicles along the course of intercostal nerves**
- **It appears on the single side only.**



Blood Vessels of Thoracic Wall

Internal thoracic artery

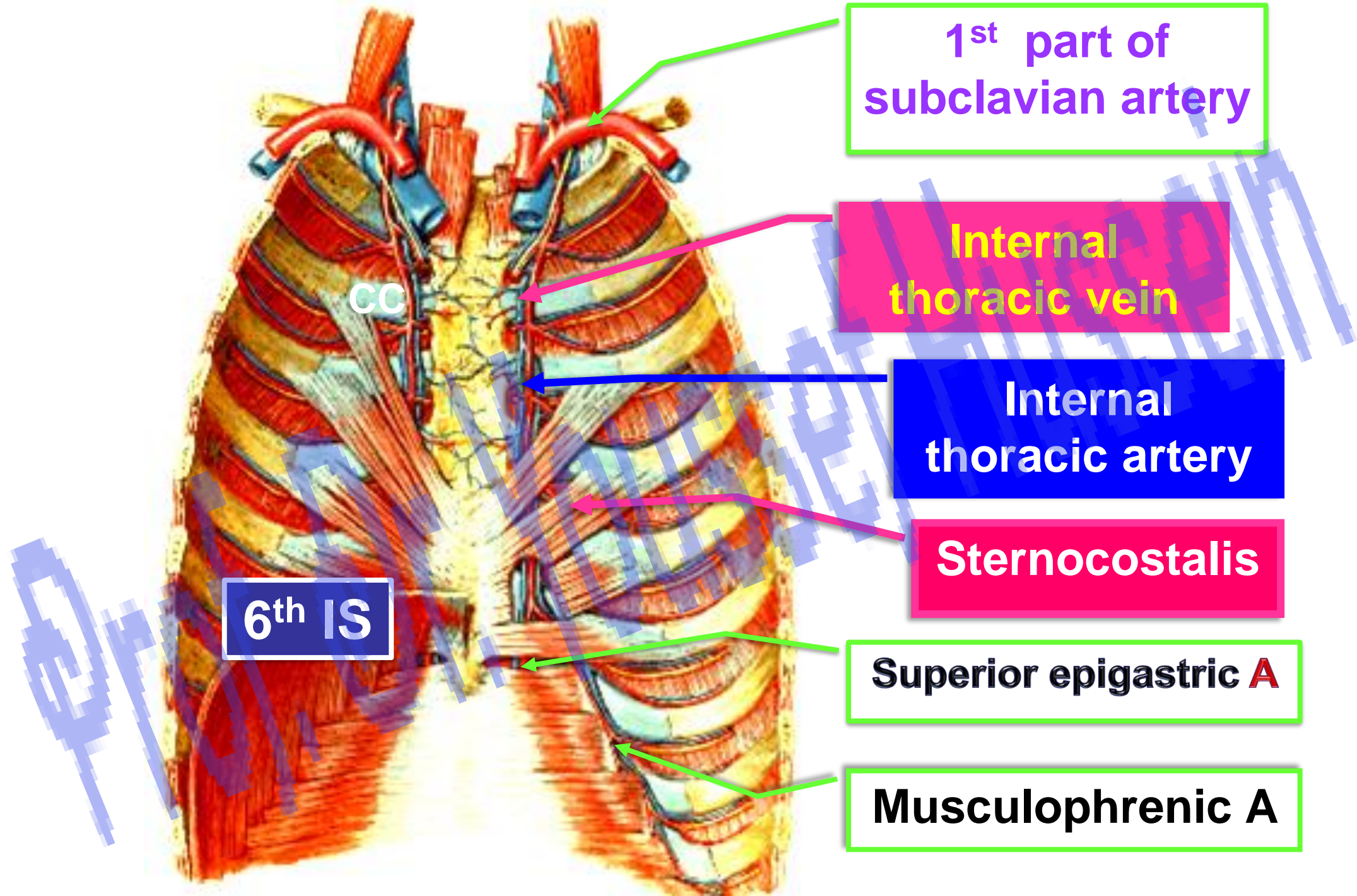
Beginning

End

Course

Relations

Branches



1st part of subclavian artery

Internal thoracic vein

Internal thoracic artery

Sternocostalis

Superior epigastric A

Musculophrenic A

6th IS

CC

• Internal Thoracic (Mammary) Artery

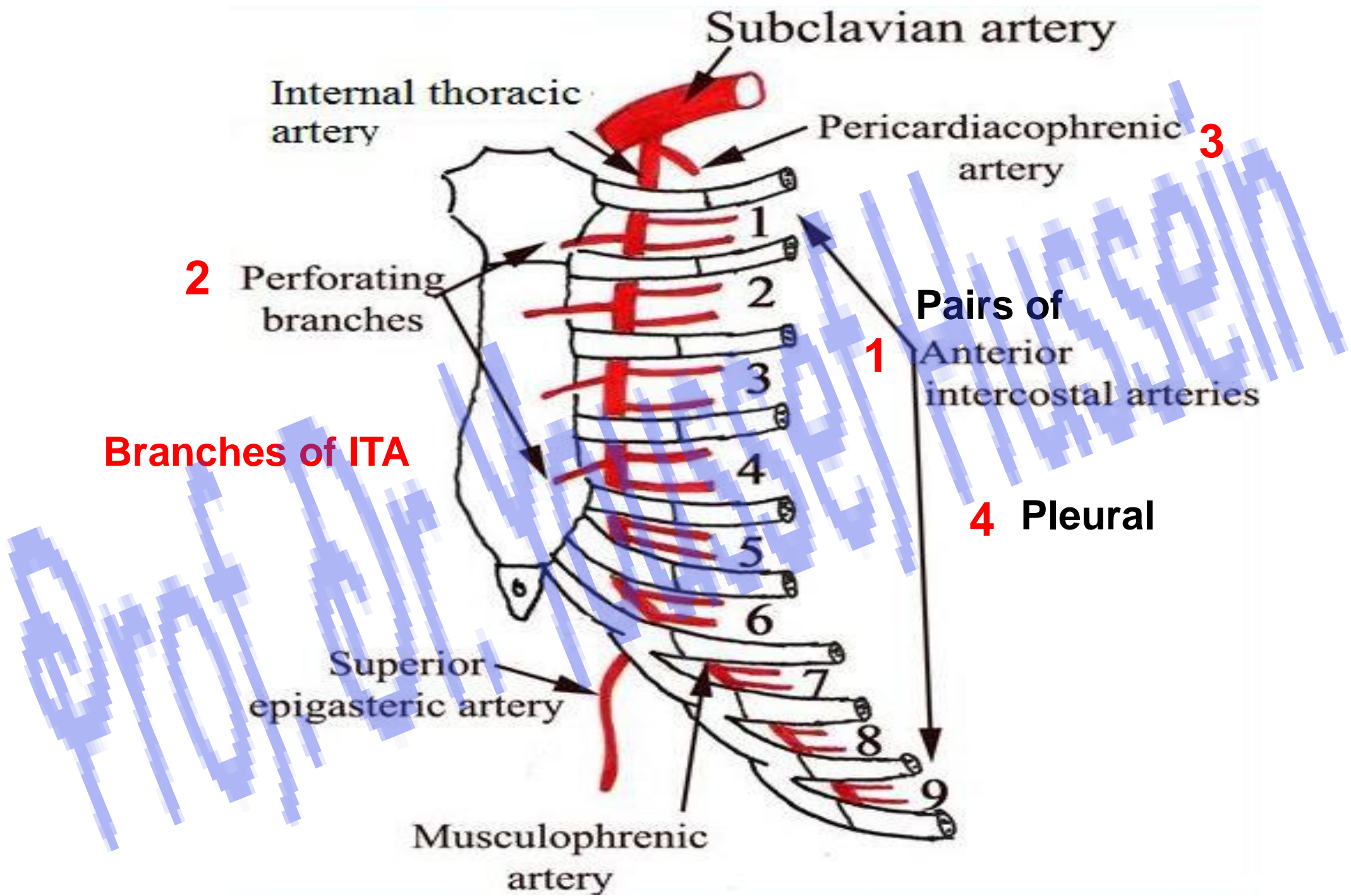
** **Begins**: From the **first part of the subclavian artery** behind the sternoclavicular joint.

** **End**, at the **6th intercostal space** by dividing into:

- a) Superior epigastric artery.
- b) Musculophrenic artery.

** **Course and Relations:-**

- It descends vertically:
- **Behind** upper 6 costal cartilages.
- **Infront** of sternocostalis muscle and pleura
- **lateral** to the internal thoracic vein.



**** Branches (4 Ps)**

1- Pairs of anterior intercostal arteries (upper and lower) to the **upper 6 intercostal spaces**.

a- Upper passes along lower border of the corresponding rib.

b- Lower passes along the upper border of the rib below.

2- Perforating branches: to the breast in female.

3- Pleural branches to the pleura.

4- Pericardiophrenic artery: to pericardium and diaphragm.

5- Two terminal branches:

A) Musculophrenic artery: along the costal margin.

- Pairs of anterior intercostal arteries to **7, 8, 9th** intercostal spaces.

B) Superior epigastric artery: enters the rectus sheath and supplies the anterior abdominal wall and diaphragm.

Posterior Intercostal Arteries

**** Number;** one artery in each 11 intercostal spaces and subcostal artery along lower border of the corresponding rib.

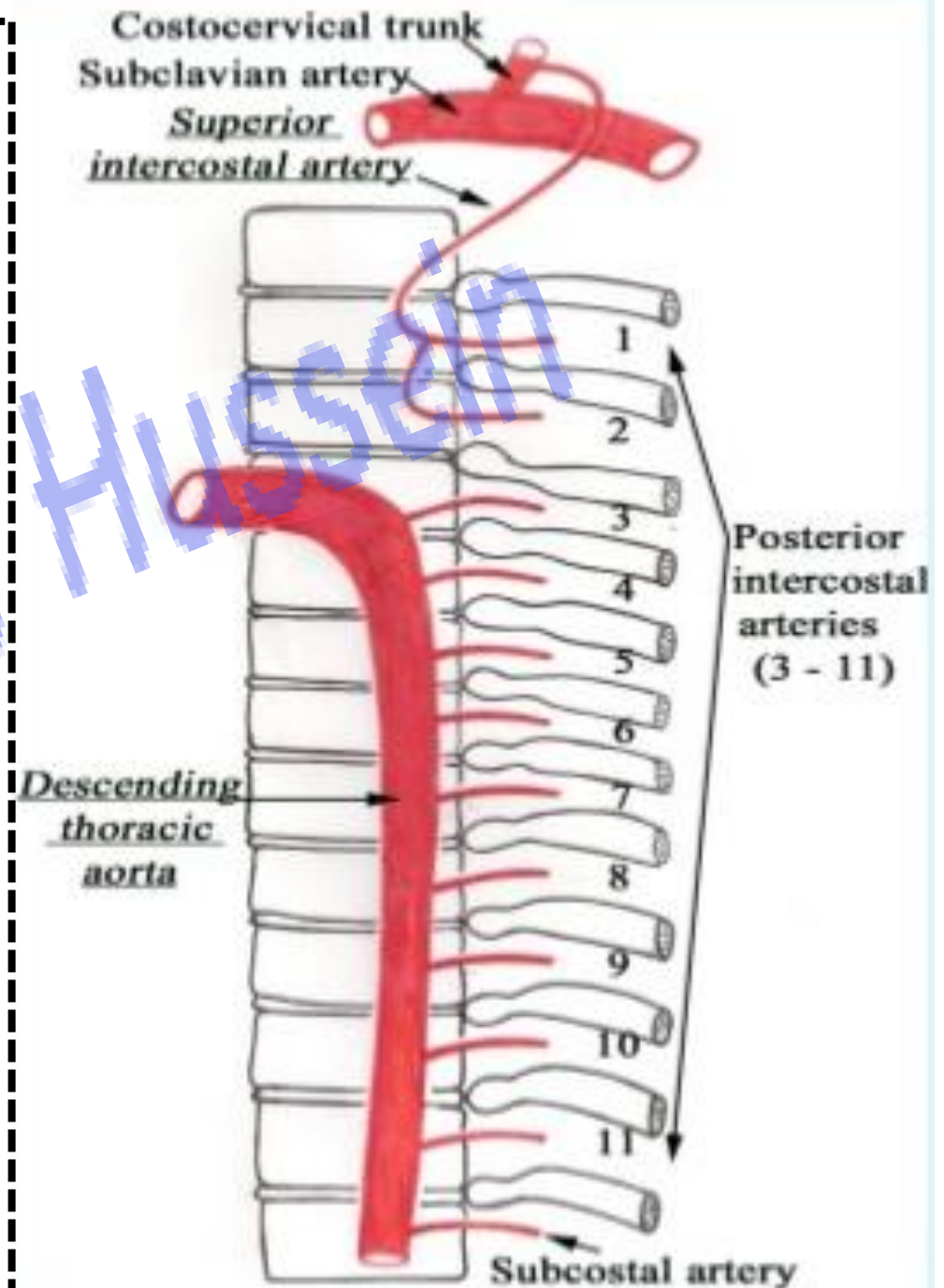
**** Origin;**

1- The 1st and 2nd arteries from superior intercostal artery. From costocervical trunk of 2nd part of subclavian artery.

2- From the 3rd to 11th arteries from descending thoracic aorta.

2- Subcostal artery from descending thoracic aorta.

- The posterior intercostal artery gives collateral branch along the upper border of the rib below.

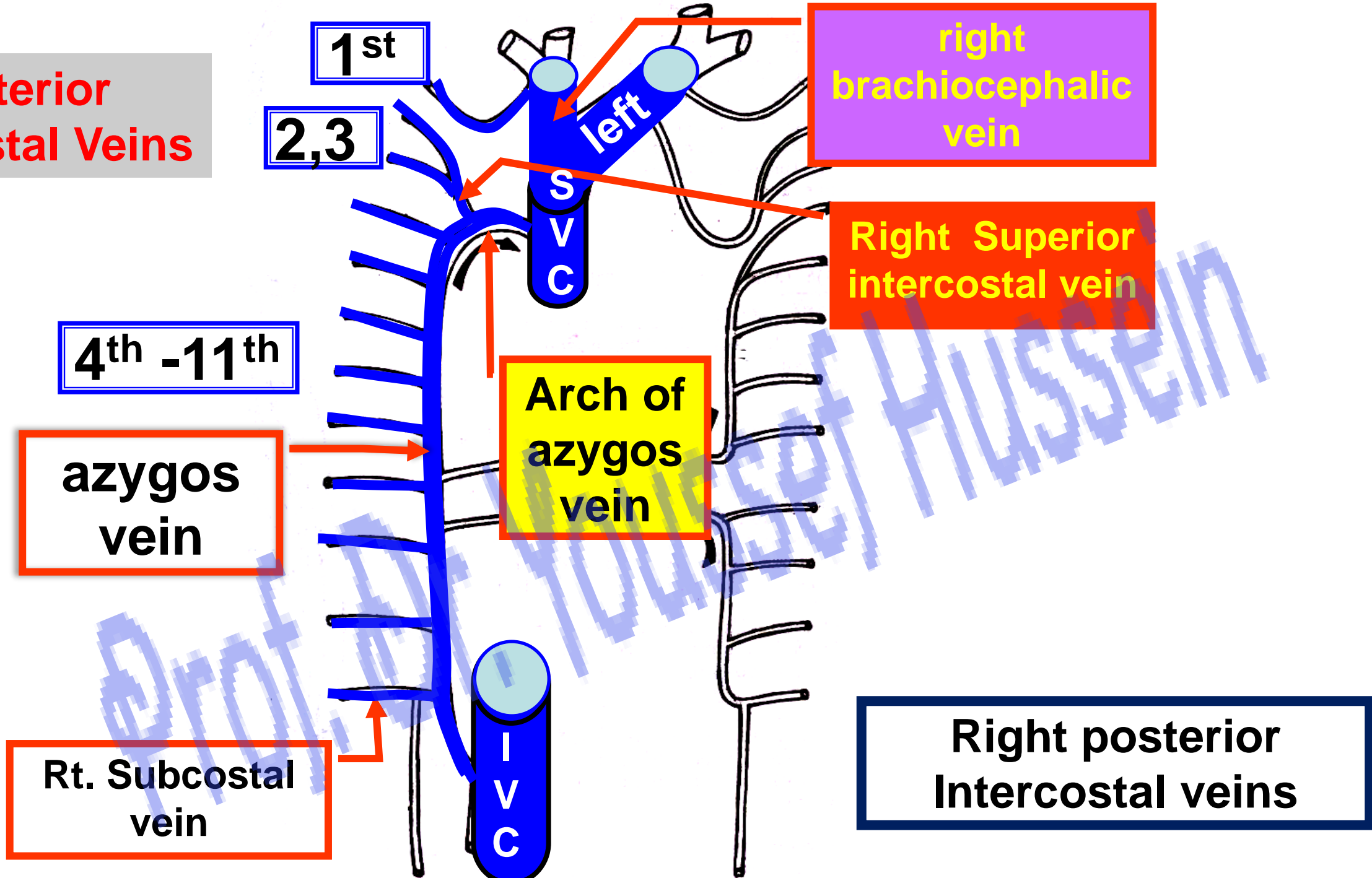


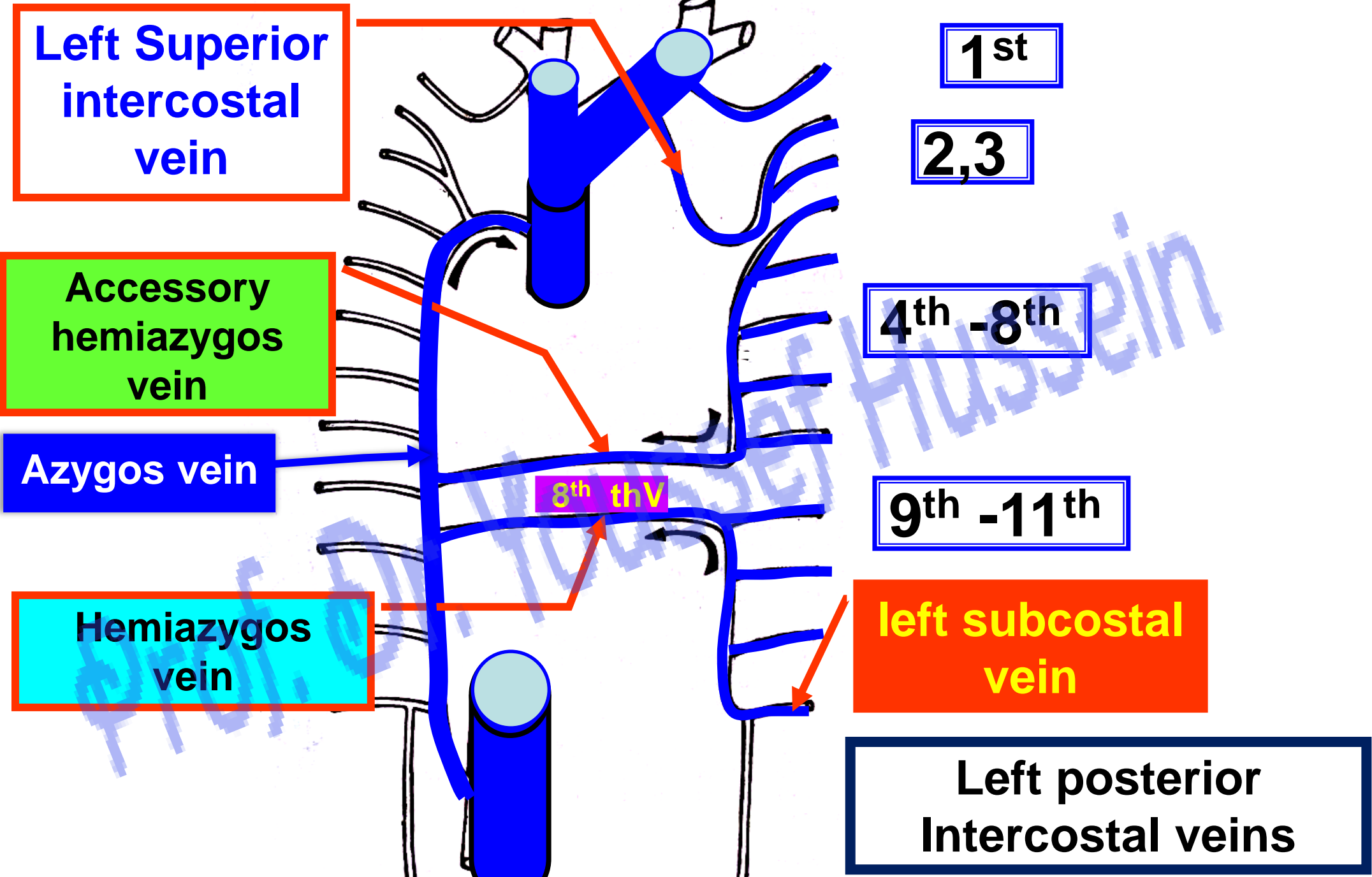
Venous drainage of the Thoracic wall

**** The Anterior Intercostal Veins:-**

- The upper 6 pairs end in the internal thoracic (mammary) vein which ends into brachiocephalic vein.
- The 7, 8, 9th pairs end in the musculophrenic vein.

Posterior Intercostal Veins





Left Superior intercostal vein

1st

2,3

Accessory hemiazygos vein

4th -8th

Azygos vein

8th thV

9th -11th

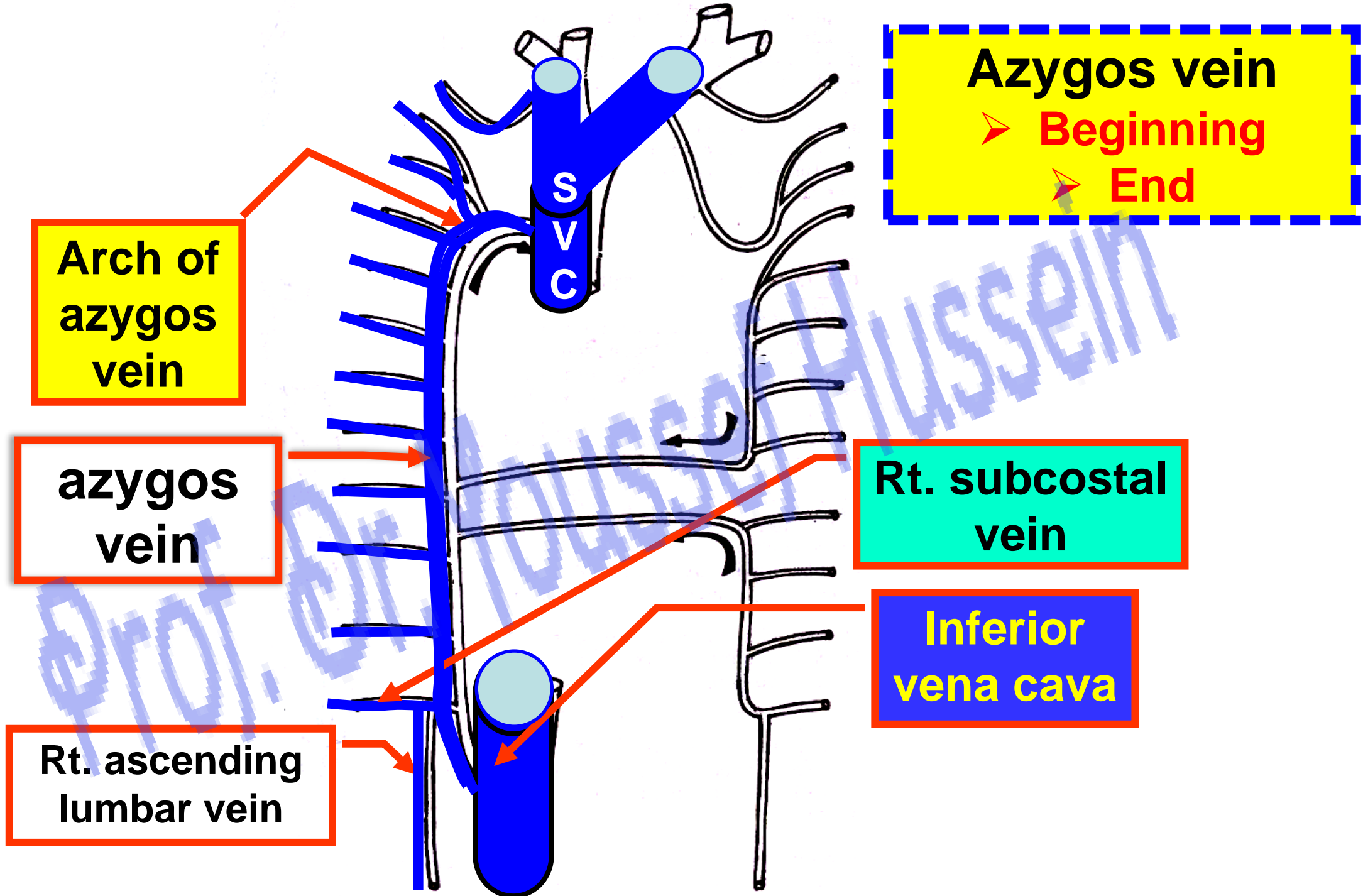
Hemiazygos vein

left subcostal vein

Left posterior Intercostal veins

Posterior Intercostal Veins

Right side	left side
<ul style="list-style-type: none">- First vein ends into right brachiocephalic vein.	<ul style="list-style-type: none">- First vein ends into left brachiocephalic vein.
<ul style="list-style-type: none">- 2nd and 3rd veins: form right superior intercostal vein which ends in arch of azygos vein	<ul style="list-style-type: none">- 2nd and 3rd veins: form the left superior intercostal vein which ends into left brachiocephalic vein
<ul style="list-style-type: none">• 4th till 11th and subcostal vein: end into azygos vein	<ul style="list-style-type: none">- Left 4th to 8th: end in accessory hemiazygos vein.
	<ul style="list-style-type: none">- 9th to 11th and subcostal vein: end in hemiazygos vein



Arch of azygos vein

azygos vein

Rt. ascending lumbar vein

Azygos vein
➤ Beginning
➤ End

Rt. subcostal vein

Inferior vena cava

Esophagus

Trachea
Rt. vagus

arch of
azygos vein

azygos
vein

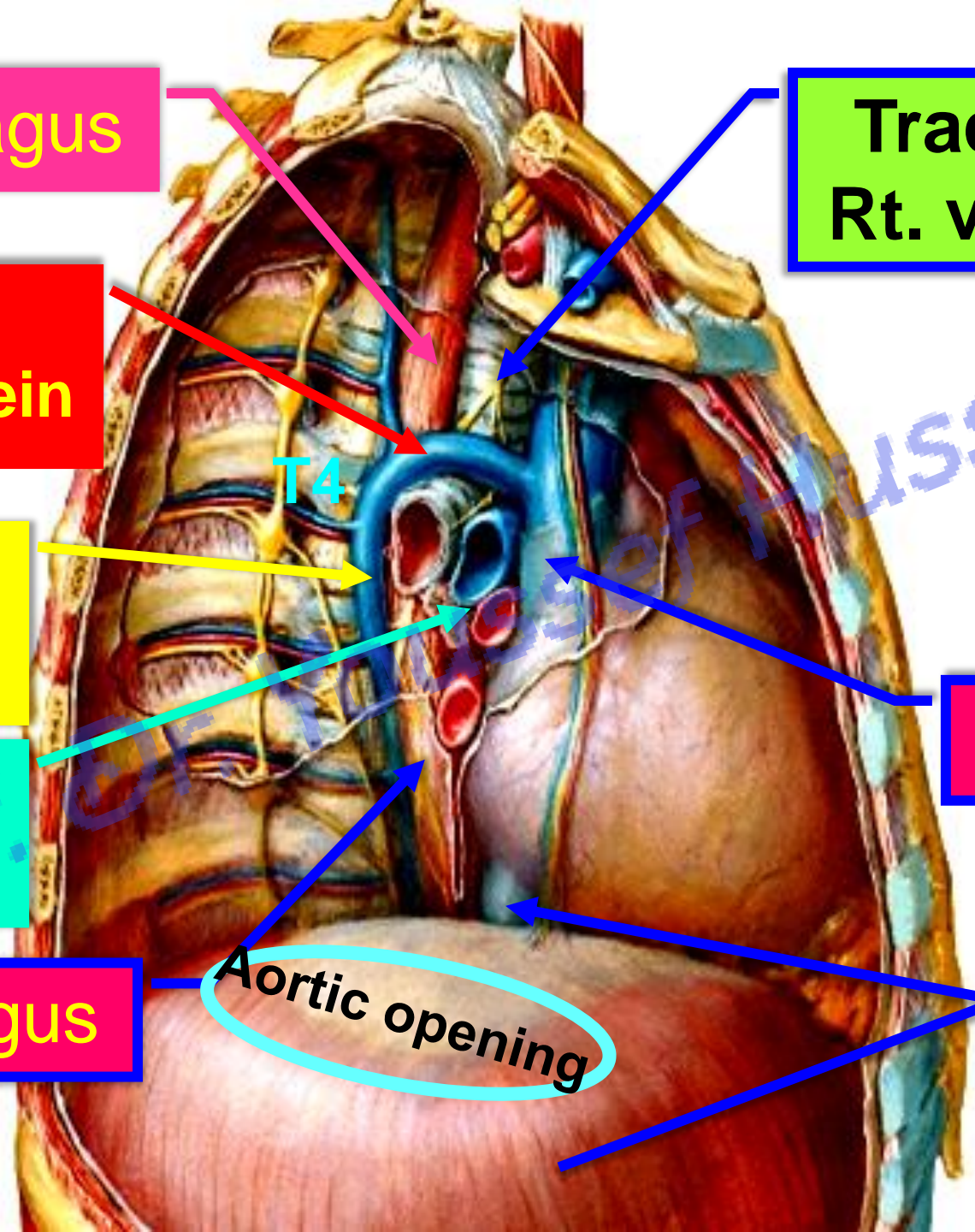
Root of
right lung

Esophagus

Aortic opening

SVC

IVC



T4

**** Course and Relations**

1- In the abdomen;

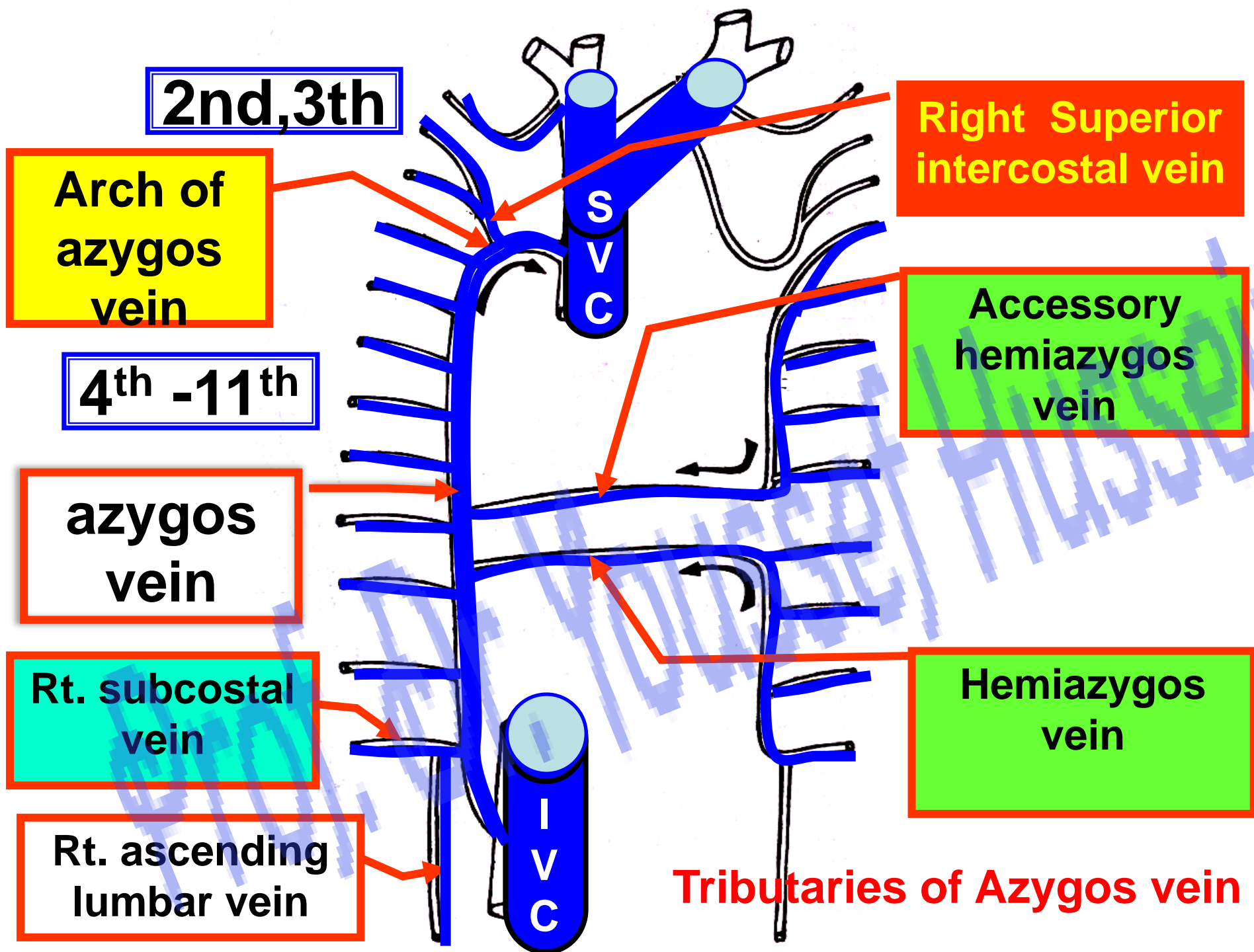
- * It **begins from the back of IVC** and ascends **in front of** the upper 2 lumbar.
- * **It enters thoracic cavity** through **aortic opening of the diaphragm** with aorta and thoracic duct at **T 12**.

2- In the posterior mediastinum, it ascends

- **In front of** lower 8 thoracic vertebrae.
- **Behind** 1) Oesophagus. 2) Root of the right lung.

3- At the level of T4, it makes an **arch** above the root of the right lung **crossing** the oesophagus, and trachea.

4- It ends into the back of the superior vena cava (S.V.C).



**** Tributaries of the vein:**

- 1- Right ascending lumbar vein.
- 2- Right subcostal vein.
- 3- Right posterior intercostal veins from 4th to 11th.
- 4- Right superior intercostal vein (2nd + 3rd)
- 5- Hemiazygos vein.
- 6- Accessory hemiazygos vein.
- 7- Right bronchial vein.
- 8- Oesophageal veins

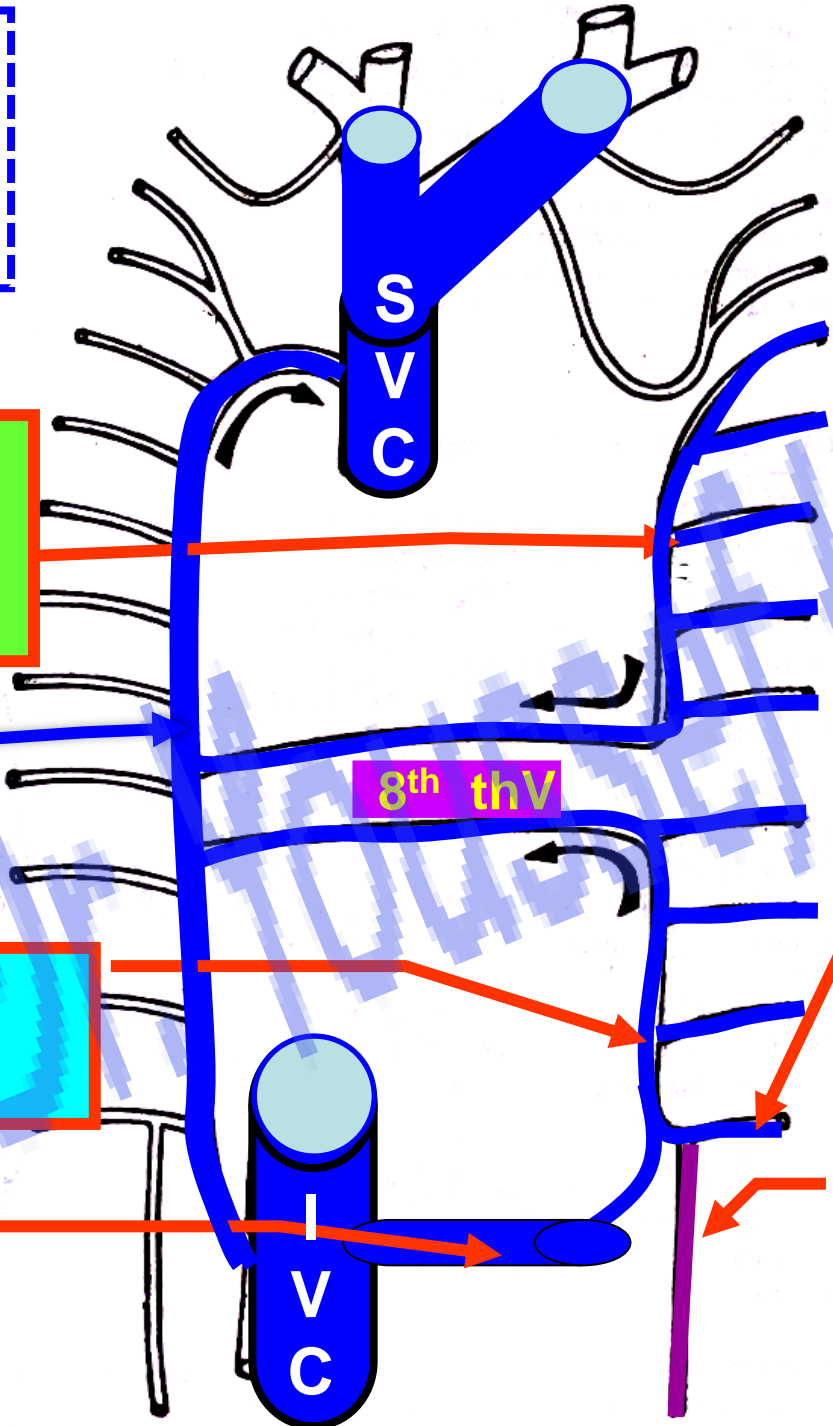
- Hemiazygos vein
- Beginning
- End

Accessory hemiazygos vein

Azygos vein

Hemiazygos vein

Left renal vein



4th -8th

9th -11th

left subcostal vein

Lt. ascending lumbar vein

- **Hemiazygos (inferior) Vein**

**** Beginning;** it arises in the abdomen as follows (theories):

- 1- From the back of the left renal vein.
- 2- Union of the left subcostal and left ascending lumbar veins.
- 3- As a continuation of the left subcostal vein.
- 4- As a continuation of the left ascending lumbar vein.

**** Course;**

- It crosses the middle line **Infront of T8 behind thoracic aorta, and thoracic duct to end into the azygos vein.**

**** Tributaries;**

1. Left ascending lumbar vein.
2. Left subcostal vein.
3. Left posterior intercostal veins from the 9th to the 11th.

- **Accessory (Superior) hemiazygos Vein**

* It crosses middle line Infront of **T 8 to end into** the azygos vein.

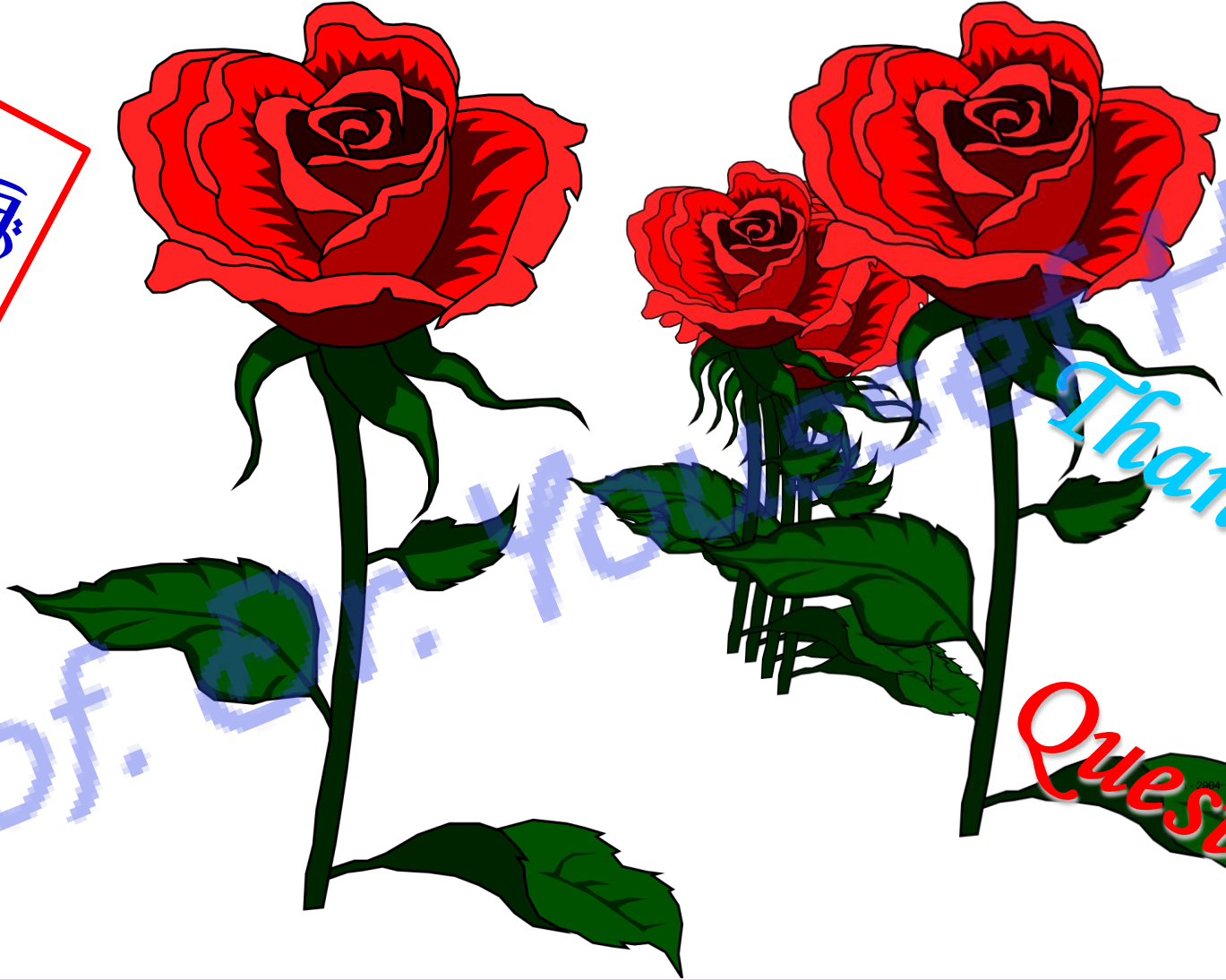
**** Tributaries;** Left posterior intercostal veins from the 4th to 8th

- Left bronchial vein.

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