

THE THORACIC DUCT

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I. INTRODUCTION:

The thoracic duct is the body's main lymphatic collector.

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It drains all the lymph from the subdiaphragmatic region and the lymph from the left half of the supradiaphragmatic region.



II.<u>DESCRIPTIVE</u> <u>ANATOMY:</u>

1. Origin:

- The thoracic duct originates from the confluence of :
 - Two lumbar lymphatic collecting trunks.

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- Intestinal trunk.
- \succ The origin might be variable:
 - A high origin, intrathoracic, located just anterior to T11 or T12.
 - A low origin, intra-abdominal, just interior to L1 or L2. In this case, its origin is often dilated forming a variably shaped enlargement, sometimes ampullary, known as the cisterna chyli.



2. Course:

> In its thoracic segment, the thoracic 同 duct ascends almost vertically in the posterior mediastinum, with a slightly oblique upward-leftward course, particularly at the level of T4-T5.

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> In its cervical segment, after passing through the superior thoracic aperture, it follows a concave curve downward, forward and to the left.

3. Termination :

> It drains into the left jugulosubclavian confluence, or into one of its the two contributing veins.



4. Positioning :

- The abdominal segment is deep, prevertebral, and retro-aortic.
- The thoracic segment is located far posteriorly in the posterior mediastinum.

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The cervical segment is located in the lower and inner part of the left omoclavicular triangle (left supraclavicular fossa).



5. External configuration:

The thoracic duct appears as a long, grayish-white duct, with a consistence roughly the consistency roughly similar to that of a vein.

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6. Internal configuration :

It contains values that prevent lymph and chyle reflux.

7. Dimensions :

- \succ Length : 30 cm
- > Caliber :
 - Variable
 - 2 to 3 mm in its middle
 - It is dilated at the level of the cisterna chyli at its origin and the thoracic duct ampulla at its termination (5 mm).



III. <u>ANATOMICAL</u> <u>RELATIONS</u>

<u>Abdominal segment :</u>

The abdominal segment is inconstant, prevertebral, and retro-aortic.

Diaphragmatic passage :

The thoracic duct is positioned behind the right border of the aorta within the aortic hiatus of the diaphragm, sharing its anatomical relations.



ANTERIOR VIEW OF THE DIAPHRAGM'S PILLARS

Thoracic segment :

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- Sub-azygos-aortic segment.
- > Inter-azygos-aortic segment.
- Supra-azygos-aortic segment.



1. The sub-azygos-aortic segment: 1

- > Posteriorly :
 - The right posterior intercostal arteries

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- The hemiazygos veins
- • The vertebral column (from T12 to T5)
- > Anteriorly :
 - The aorta
 - The esophagus
- > Laterally :
 - To the right : the azygos vein
 - To the left : The descending thoracic aorta



2. The inter-azygos aortic segment:

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- > Posteriorly :
 - T4
- > Anteriorly :
 - The esophagus,
 - The right bronchial artery.

Laterally

- The azygos vein arch
- The aortic arch



3. The supra-azygo aortic segment:

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> Posteriorly :

• T2 and T3

- > Anteriorly and to the left :
 - The left subclavian artery

- > To the right :
 - The esophagus
 - The trachea
 - The left recurrent laryngeal nerve.



The superior thoracic aperture :

- The thoracic duct crosses through the superior thoracic aperture, which is bounded by:
 - ✓ Posteriorly: T2
 - Anteriorly: the jugular notch of the sternum

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- ✓ Laterally: the first rib
- It occupies a very posterior and left paramedian position, in relation to:
- Anteriorly:
 - $\checkmark\,$ On the right: the esophagus
 - ✓ On the left: the subclavian artery [■]
 - ✓ The trachea and the pretracheal vasculonervous structures more anteriorly
- Laterally: the left pleural dome, with:
 Posteriorly: the supra-pleural and retro-pleural recess
 - ✓ Anteriorly: the lower part of the omoclavicular triangle



Cervical segment:

In the left base of the neck, the thoracic duct curves, forming an arch at the level of C7, above the left pleural dome and 3 to 4 cm above the clavicle.

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- The arch of the thoracic duct corresponds to:
 - Anteriorly:
 - ✓ Left common carotid artery
 - ✓ Left internal jugular vein
 - ✓ Left vagus nerve
 - Posteriorly:
 - Left vertebral artery and vein
 - ✓ Left sympathetic trunk
 - ✓ Left cervicothoracic ganglion



<u>Cervical segment:</u>

• Laterally :

- \checkmark The left phrenic nerve
- \checkmark The left thyrocervical trunk

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- ✓ The left anterior scalene muscle
- Medially :
 - ✓ Esophagus
 - ✓ The longus colli muscle



IV.<u>COLLATERAL BRANCHES</u> <u>AND COLLATERAL</u> <u>PATHWAYS</u>

1. Collateral branches:

- The thoracic duct receives numerous collateral lymphatic branches:
 - Phrenic lymphatics
 - Thoracic lymphatics
 - Cervical lymphatics
 - ✓ Jugular trunk,
 - ✓ Subclavian trunk,
 - ✓ Bronchiomediastinal trunk.



2. <u>Collateral pathways:</u> <u>Accessory lymphatic pathways</u>:

- > Para-esophageal pathways
- > Trans-diaphragmatic pathways
- > Para-caval pathways
- > Para-umbilical pathways.

Lymphovenous anastomoses :

They are present in 50% of cases and can occur at various levels: lumbar veins, renal veins, mesenteric veins, azygos vein, and inferior vena cava.



ACCESSORY LYMPHATIC PATHWAYS

V. VARIATIONS :

> Origin:

It could be : high (thoracic) or low (abdominal), with the cisterna chyli being variable.

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> Course:

11------It could be inverted, double, or with multiple ducts, especially in the lower or middle part of its path.

> Termination:

There could be multiple arches, particularly bilateral, with an arch on the right.



VI. CLINICAL APPLICATIONS:

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The thoracic duct rupture :

- A rupture can occur during an accident or a procedure on the lung and can allow lymph to escape into the thoracic cavity, at a rate of 75 to 200 mL per hour.
- The lymph can also enter the pleural cavity, causing chylothorax.
- The spilled fluid can be drained using a cannula or by thoracocentesis.





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The anatomical study of the thoracic duct is important due to the variety of anatomical variations and the frequency of its pathology.

