أهلا وسهلا

الأستاذ الدكتور يوسف حسين

أستاذ التشريح وعلم الأجنة ـ كلية الطب ــ جامعة الزقازيق ــ مصر

رئيس قسم التشريح و الأنسجة و الأجنة ـ كلية الطب ـ جامعة مؤتة ـ الأردن

دكتوراة من جامعة كولونيا المانيا

جروب الفيس د. يوسف حسين (استاذ التشريح)

Prof. Dr. Youssef Hussein Anatomy - YouTube

اليوتيوب د. يوسف حسين

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dr_youssefhussein@yahoo.com

Development of Tongue

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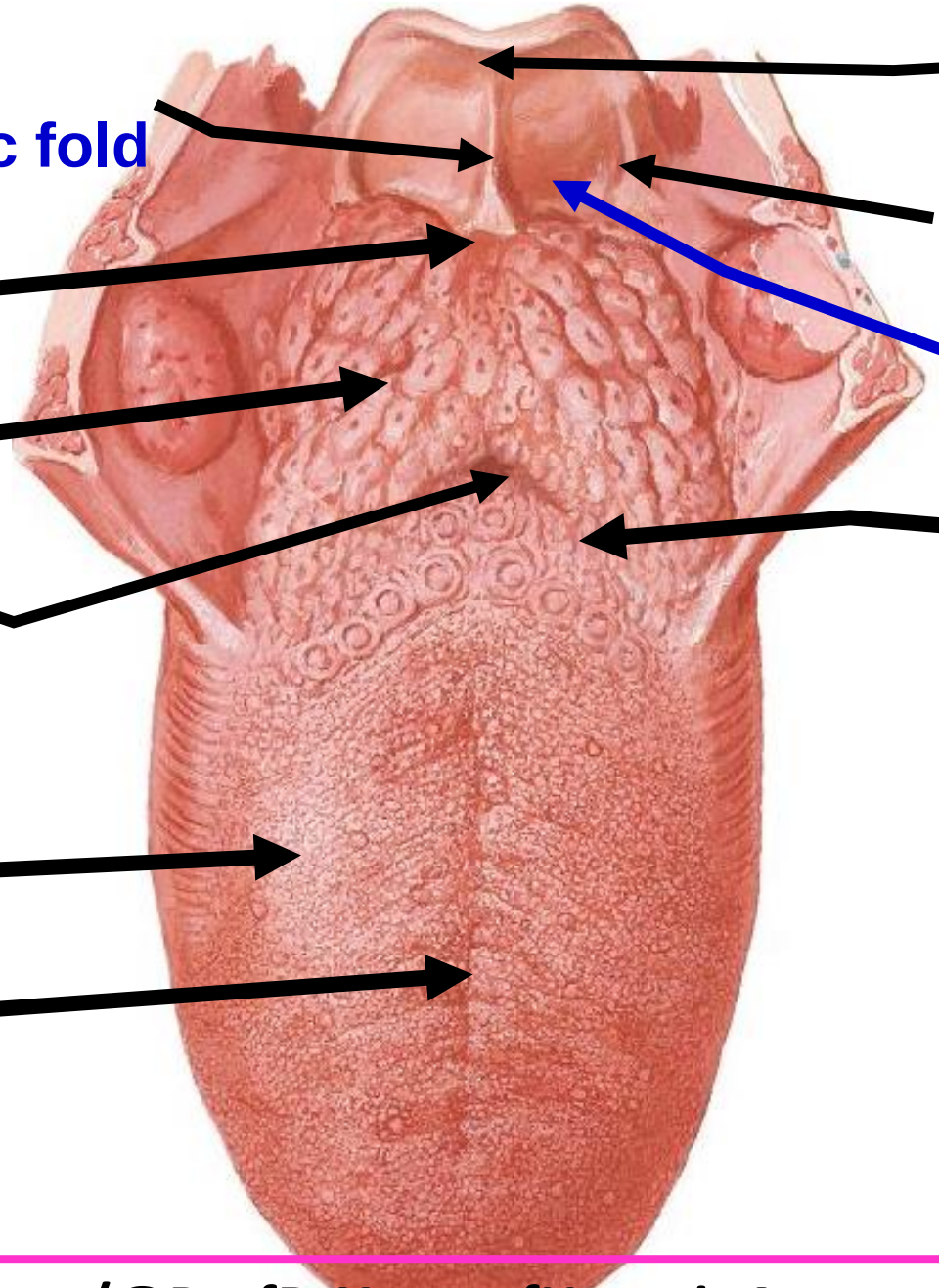

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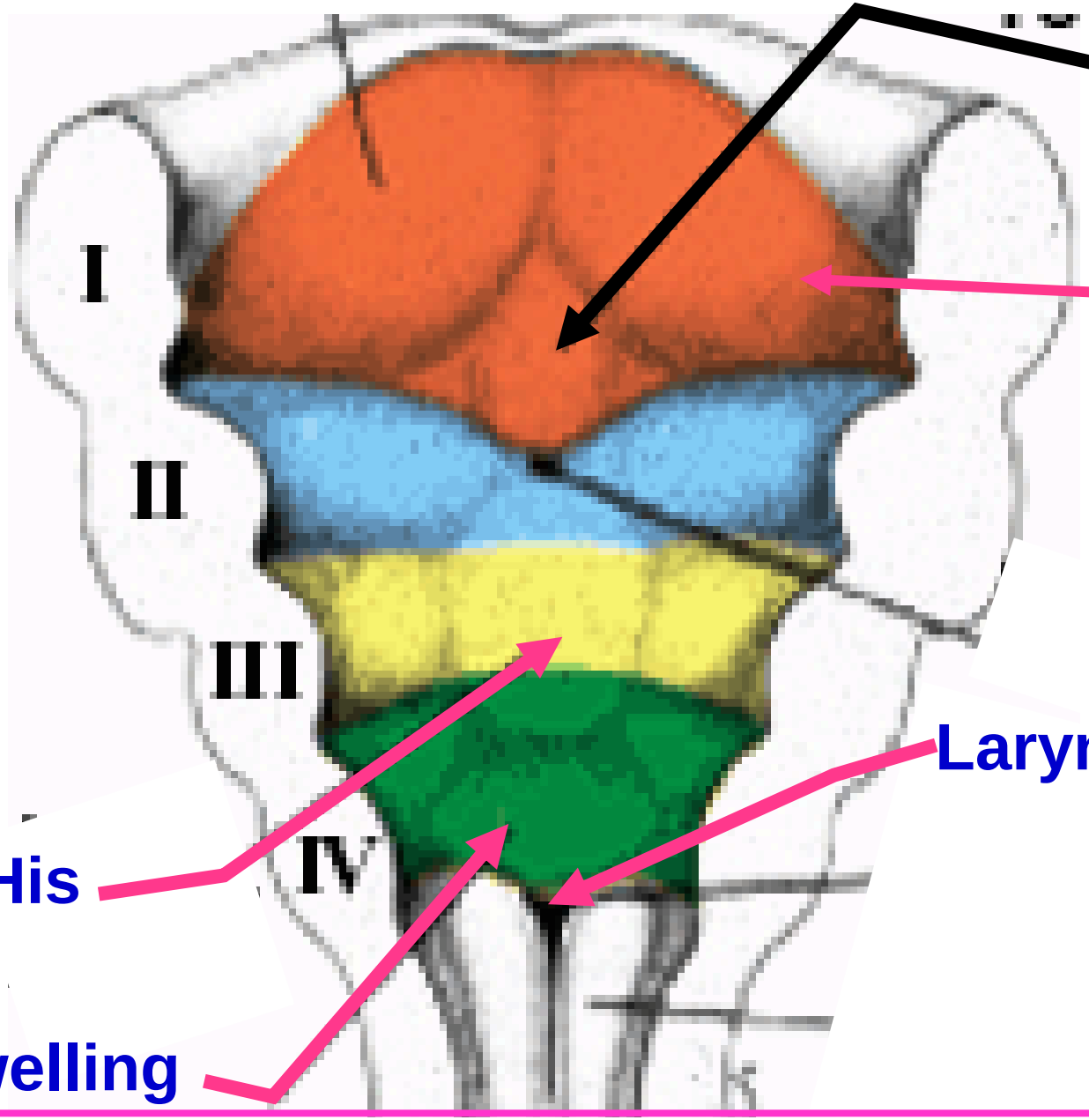


Tuberculum impar

Lateral lingual swelling

Laryngeal orifice

Copula of His

Epiglottic swelling

- **Development of the mucous membrane of the anterior 2/3 of the tongue:**

- **At 4th week 3 endodermal swellings appears from 1st pharyngeal arches**
- **1- A median swelling** called the **tuberculum impar**
- **2- Two lateral lingual swellings** proliferate and grow medially.
- In the midline, they fused together at **median sulcus** and completely covered tuberculum impar forming mucous membrane of anterior 2/3 of the tongue.
- **So the anterior 2/3 is supplied by Lingual nerve from posterior division of mandibular nerve.**

- **Development of the mucous membrane of the posterior 1/3 of the tongue:**

- It develops as a large midline mass (**copula of His**) derived from **endoderm** of **2nd, 3rd and 4th** pharyngeal arches.

- The part of the **3rd arch** proliferates and migrates forward overlying the 2nd arch and forms **posterior 1/3 of the tongue that fused with anterior 2/3 by sulcus terminalis**.

- **So the posterior 1/3 is supplied by the glossopharyngeal nerve.**

- **Development of the mucous membrane of the Root of the tongue**;

- **From** the part of the copula derived from the **4th pharyngeal arch**

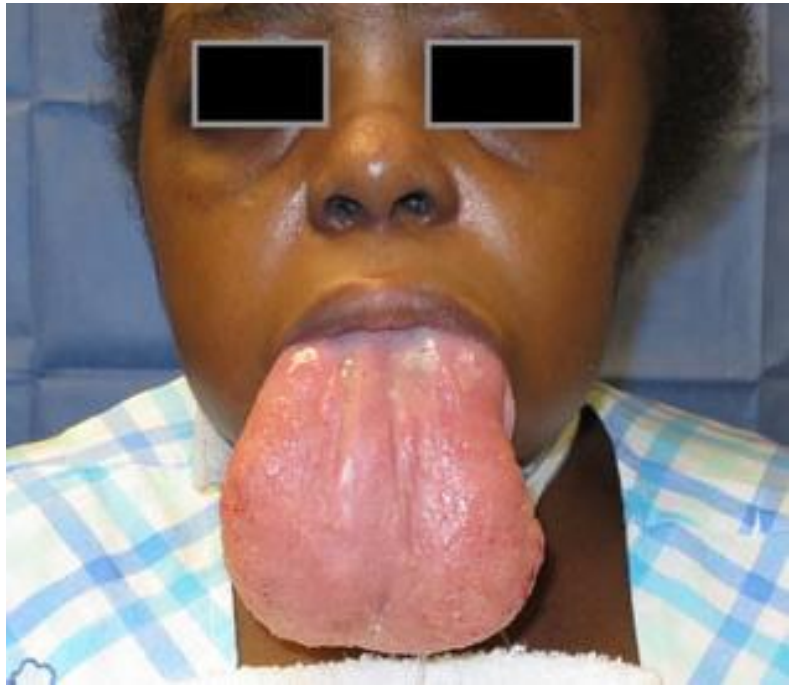
- **So** it is supplied by the vagus nerve (internal laryngeal nerve).

• Development of the muscles of the tongue:

- **The muscles of the tongue** are derived from the **occipital myotomes** except **palatoglossus** muscle that develop from the **mesoderm in situ**.
- **So** the muscles are supplied by the **hypoglossal nerve** except palatoglossal muscle supplied by **pharyngeal nerve plexus**

Separation of the tongue

- At first the tongue is adherent to the floor of the mouth, then a horse-shoe (C-shaped) groove called **alveololingual groove** separates the anterior 2/3 of tongue from the floor of the mouth except in the midline where the tongue is connected to the floor by the **frenulum of the tongue**.

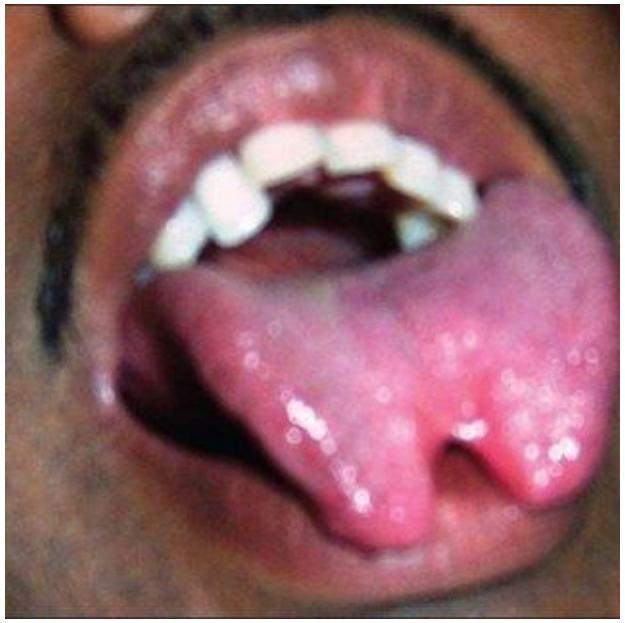


** Congenital anomalies of the tongue

- **A glossa:** failure of development of the tongue,

- **Macroglossia:** large sized tongue which protrudes from the mouth (as in mongolism and cretinism).

- **Microglossia:** small sized tongue



- **Bifid tongue:** due to failure of fusion of the 2 lingual swellings.

- **Tongue-tie (Ankyloglossia):** the tongue is adherent to the floor of the mouth.

- **Short frenulum:** due to incomplete separation of tongue (common).
- **Long frenulum:** due to excess separation of the tongue. It causes the tongue to fall back and close the pharynx and larynx (suffocation).

dr_youssefhussein@yahoo.com

Development of liver & Biliary system

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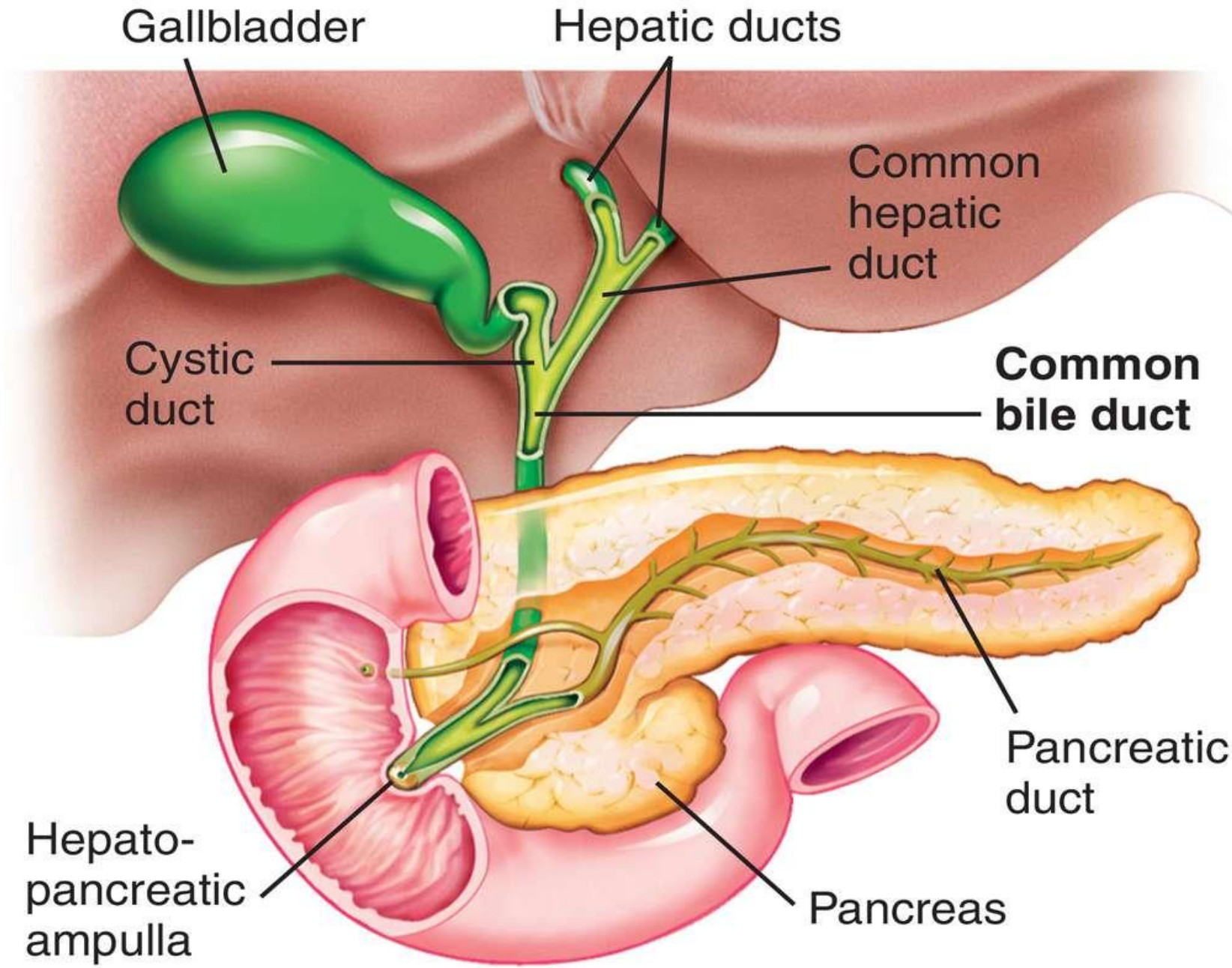
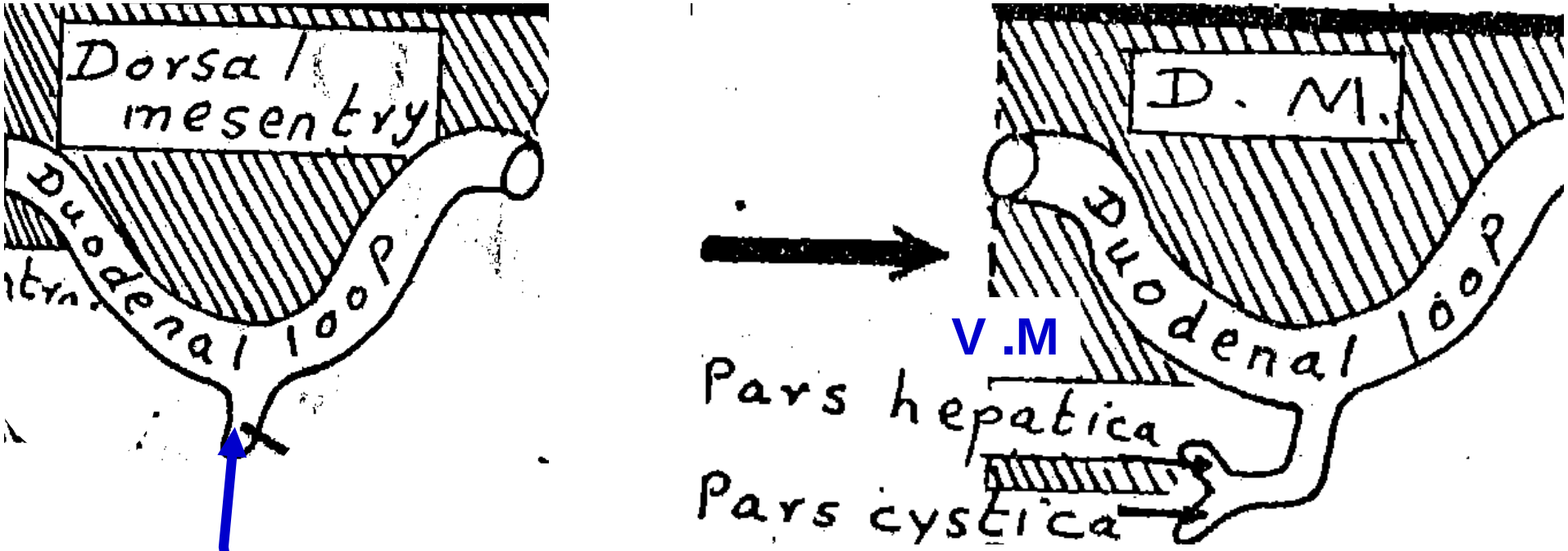
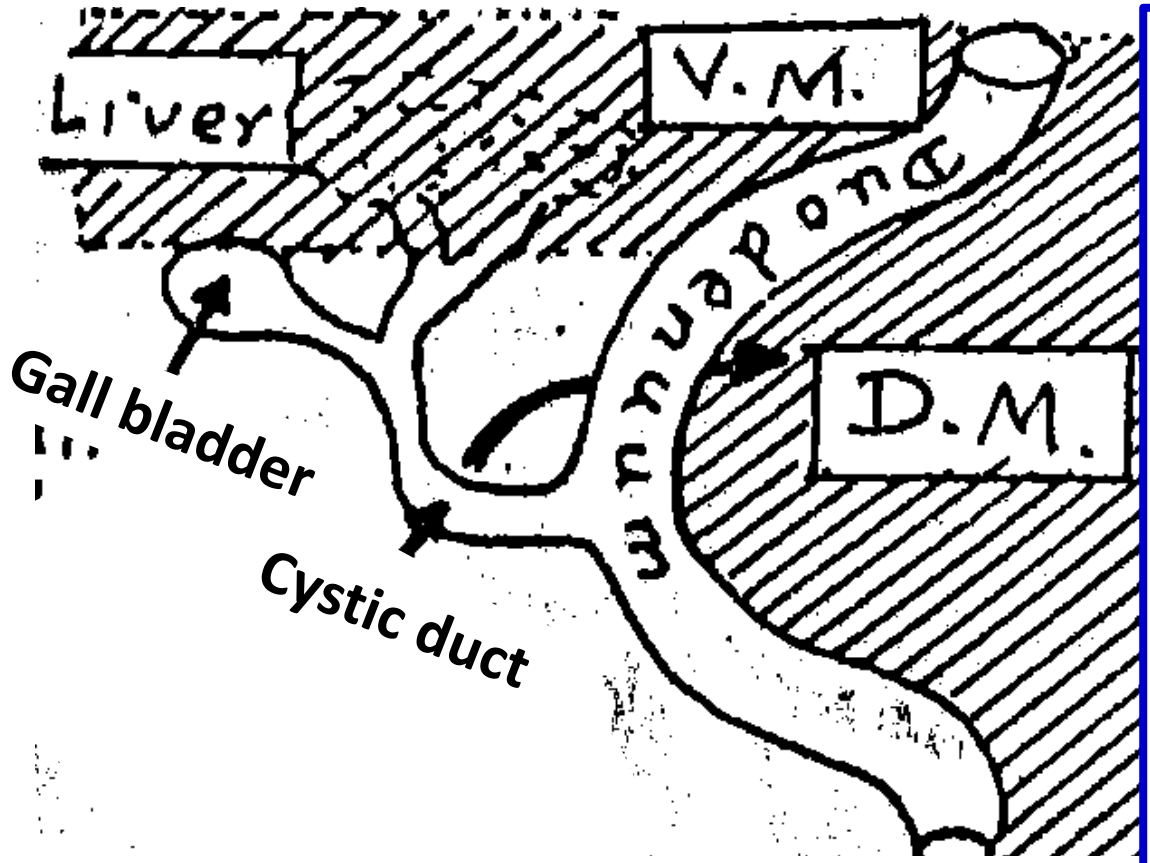




Hepatic diverticulum from the **ventral** wall of the duodenal loop by the 4th week of development

- **The diverticulum** grows ventrally and cranially into ventral mesentery.
- The diverticulum divides into 2 parts:
- **Cranial** part called **pars hepatica**
- **Caudal** part called **pars cystica.**



I- Development of the liver (Pars Hepatica)

* The cranial end of the pars hepatica divides into 2 branches that form **right and left hepatic ducts.**
* The cranial ends of ducts divide to form hepatic cells and intrahepatic biliary tree.
* The hepatic cells are separated by **blood sinusoids** developed from absorbed umbilical and vitelline veins.
* The blood sinusoids are lined by mesenchymal cells and large phagocytic cells (Kupffer cells).
* The connective tissue stroma and fibrous capsule derived from the surrounding mesoderm

II- Development of the gall bladder (Pars cystica)

a- Distal part is dilated and forms **gall bladder**.

b- Proximal part remains narrow and forms **cystic duct**.

III- Development of the common bile duct:

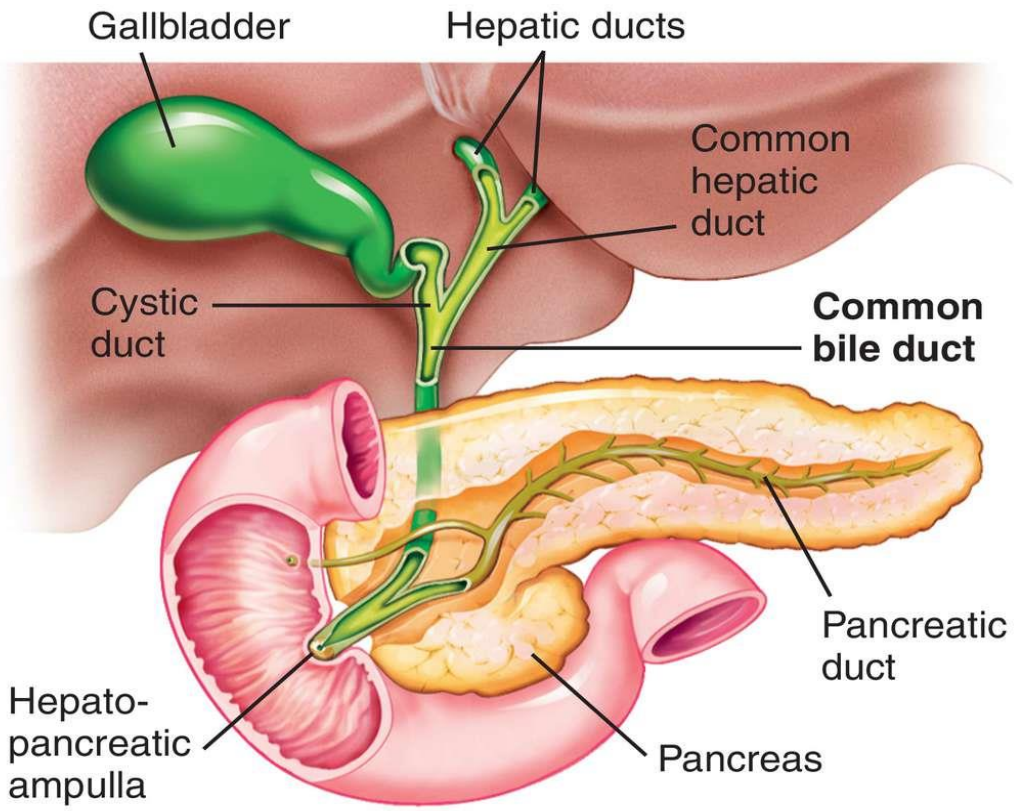
- The proximal part of the hepatic diverticulum forms the common bile duct.

** **At first,** the common bile duct opens in the ventral wall of the duodenum.

- After **rotation of the duodenal loop 90° (clockwise) and unequal growth of its walls,**

a) The opening shifts to the dorsomedial wall of the 2nd part of the duodenum.

b) The common bile duct passes behind the first part of the duodenum



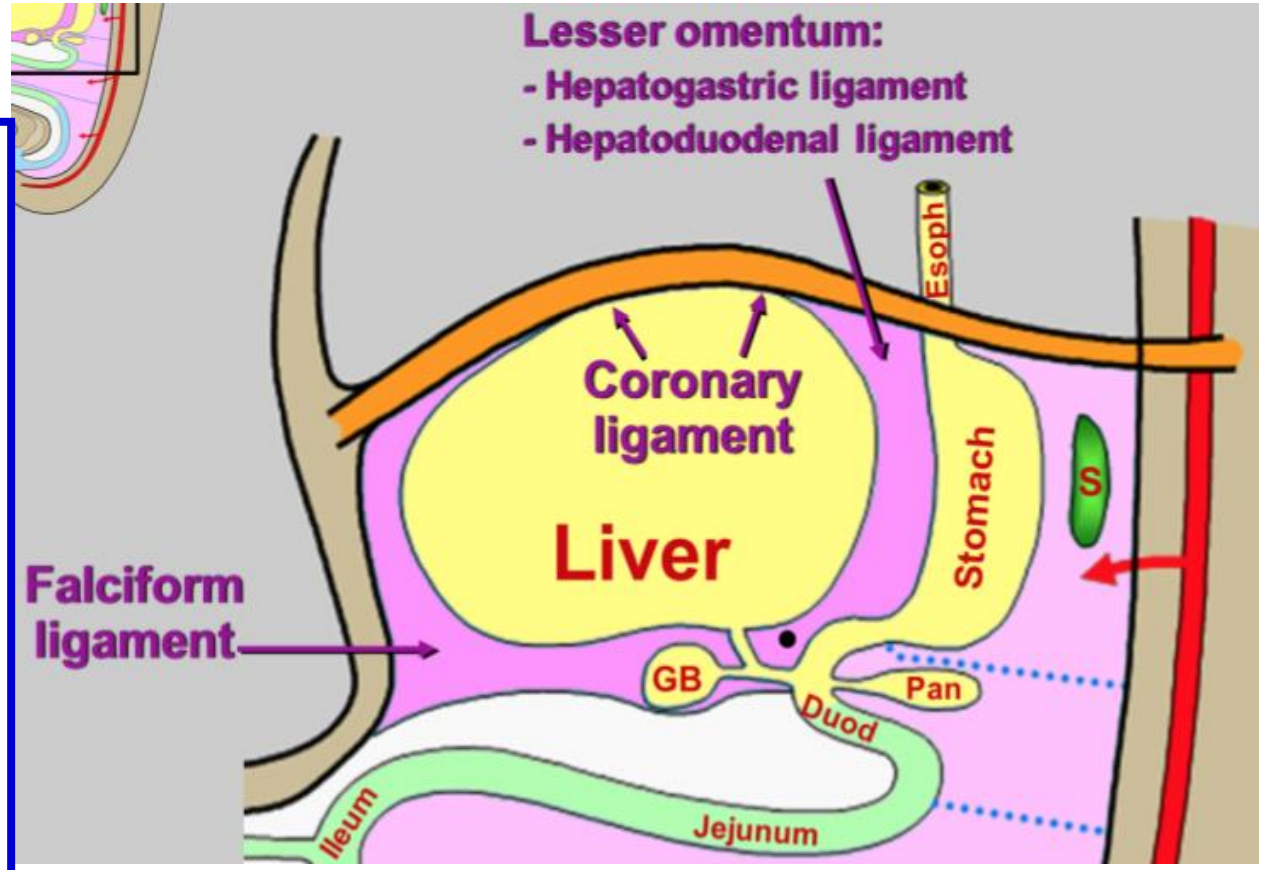
** **Development of ligaments of liver:**

- Development of the liver between the layers of the **ventral mesentery** divides it into:

a- Ventral part connects liver to anterior abdominal wall **(falciform ligament).**

b- Dorsal part connects liver to stomach (lesser omentum)

c- Cranial part forming triangular and coronary ligaments



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** Congenital Anomalies of the liver and biliary system:

I. **Agenesis or hypo-genesis of the liver:** due to failure of formation of the hepatic diverticulum or due to incomplete development of the hepatic bud.

II. **Abnormal number of the liver lobes:** due to abnormal division of the pars hepatica.

III. **Agenesis of the gall bladder:** failure of development of the cystic bud

IV. **Double gall bladder:** abnormal division of the cystic bud into 2 parts.

V. **Mobile gall bladder:** the gall bladder is completely separated from the liver and completely covered with peritoneum.

VI. **Atresia (narrowing) of the biliary ducts:** due to failure of their canalization. It is associated later with congenital jaundice

dr_youssefhussein@yahoo.com

Development of Esophagus

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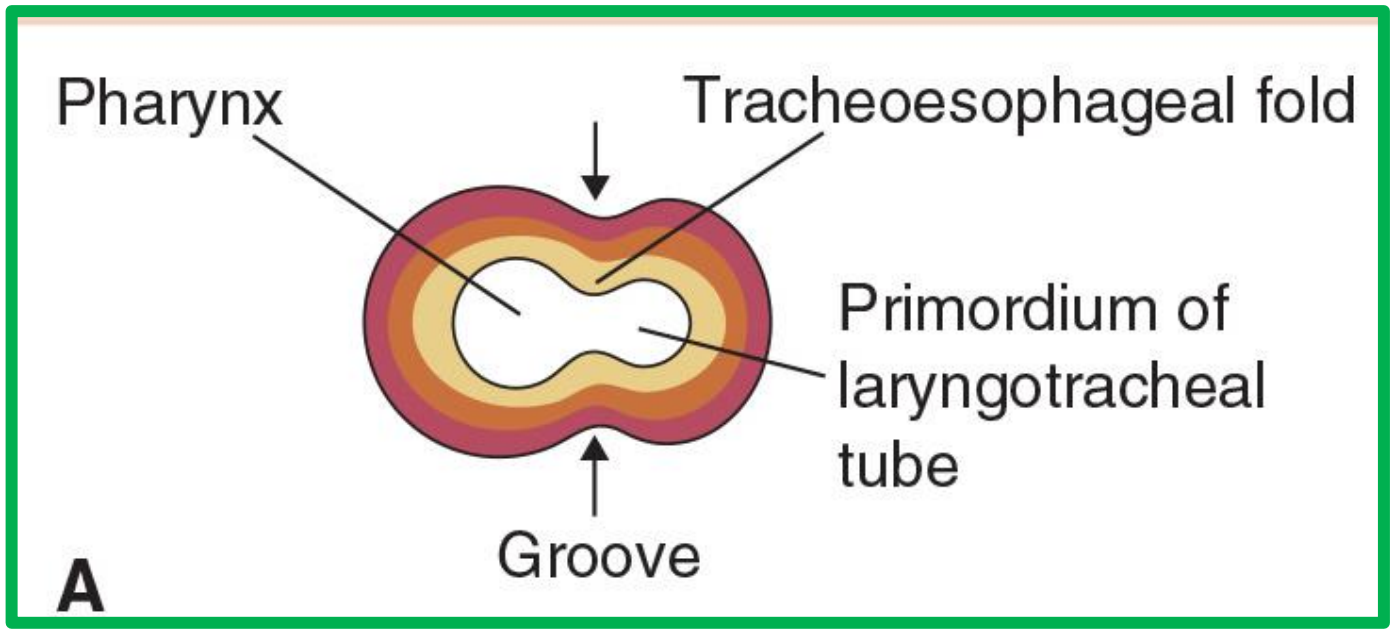
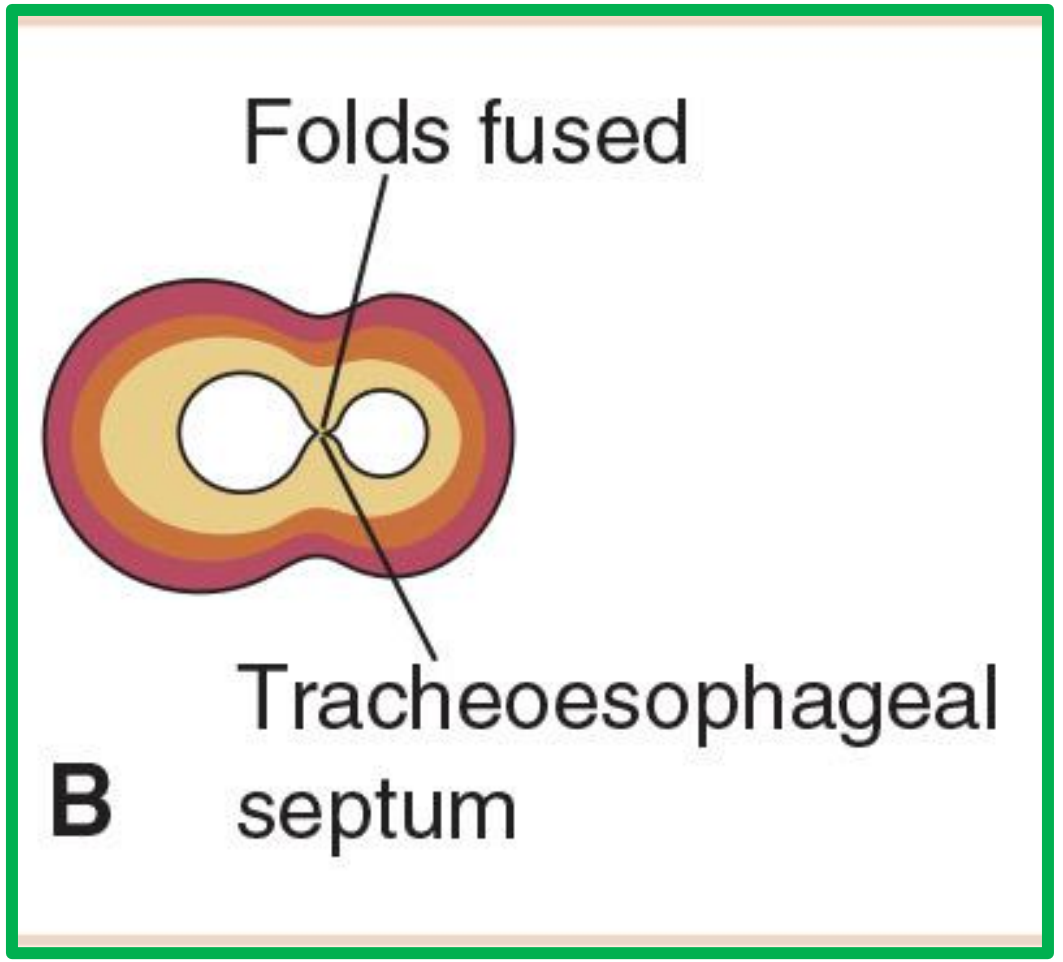
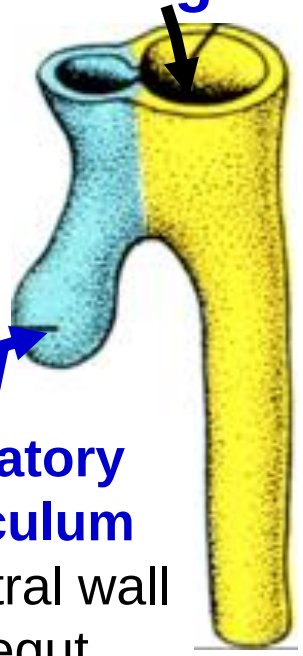
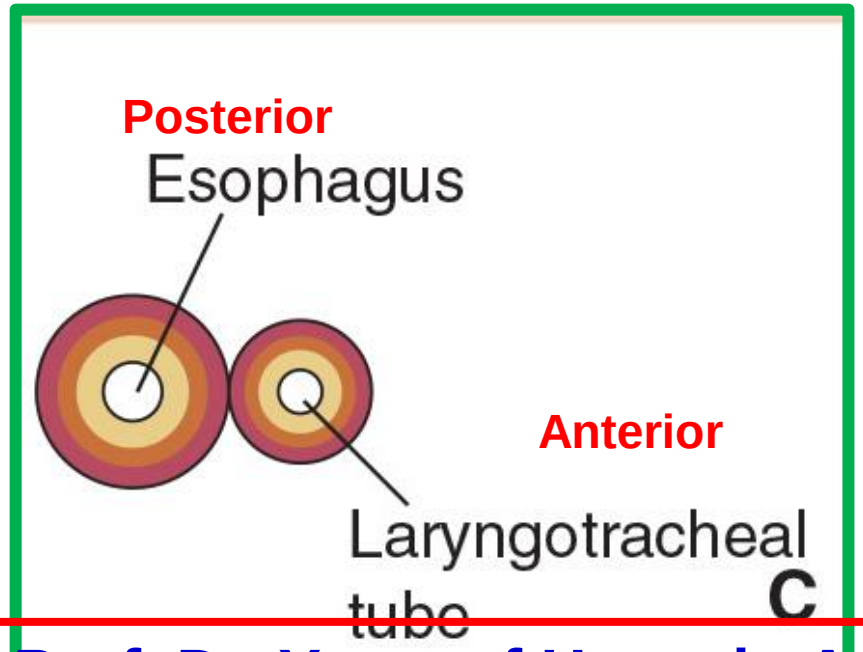




Foregut



Respiratory diverticulum from ventral wall of foregut



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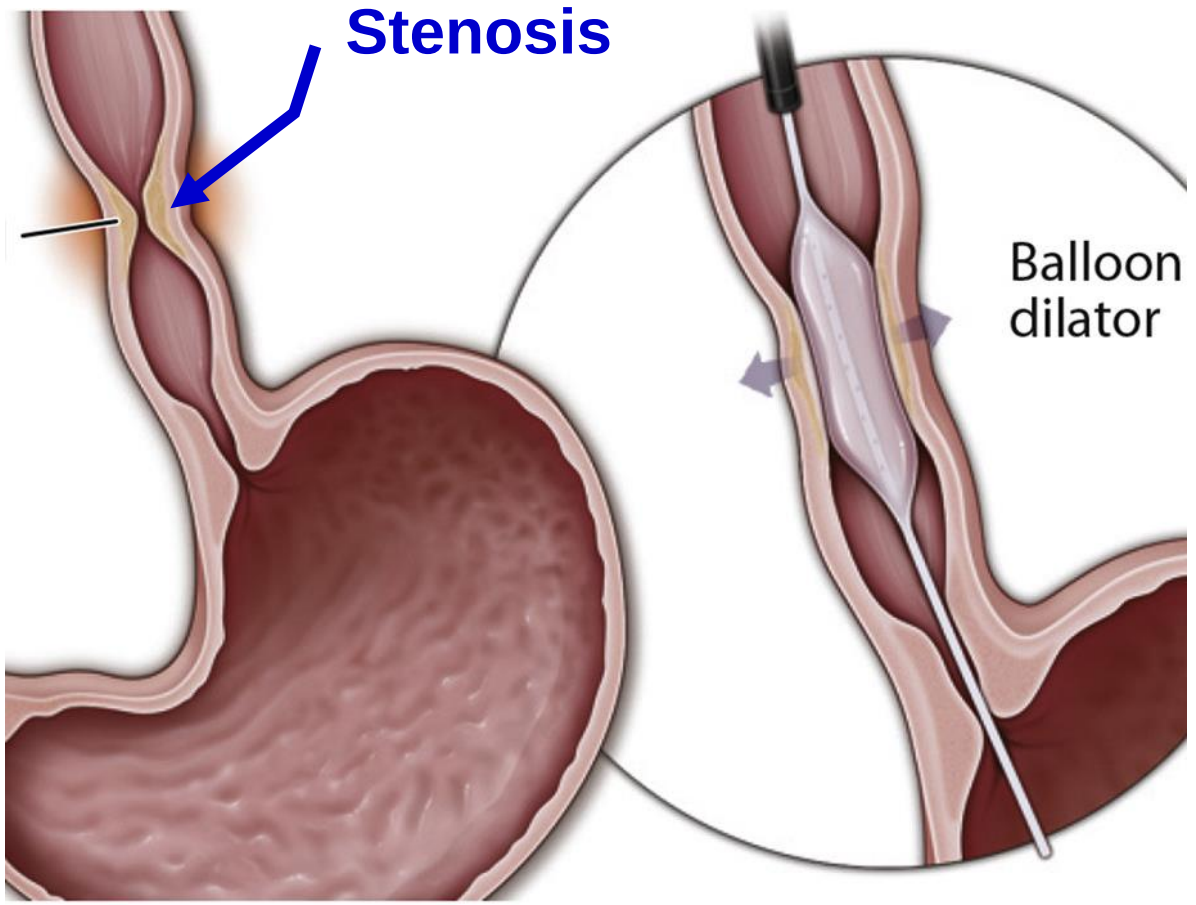
** Congenital abnormalities of the esophagus

- Esophageal atresia (obstruction): associated with polyhydramnios due to failure of swallowing of the amniotic fluid

- Esophageal stenosis (narrow): due to

a- Posterior displacement of tracheoesophageal septum.

b- Mechanical factors push posterior wall of the tube forward.



- **Tracheoesophageal fistula:**

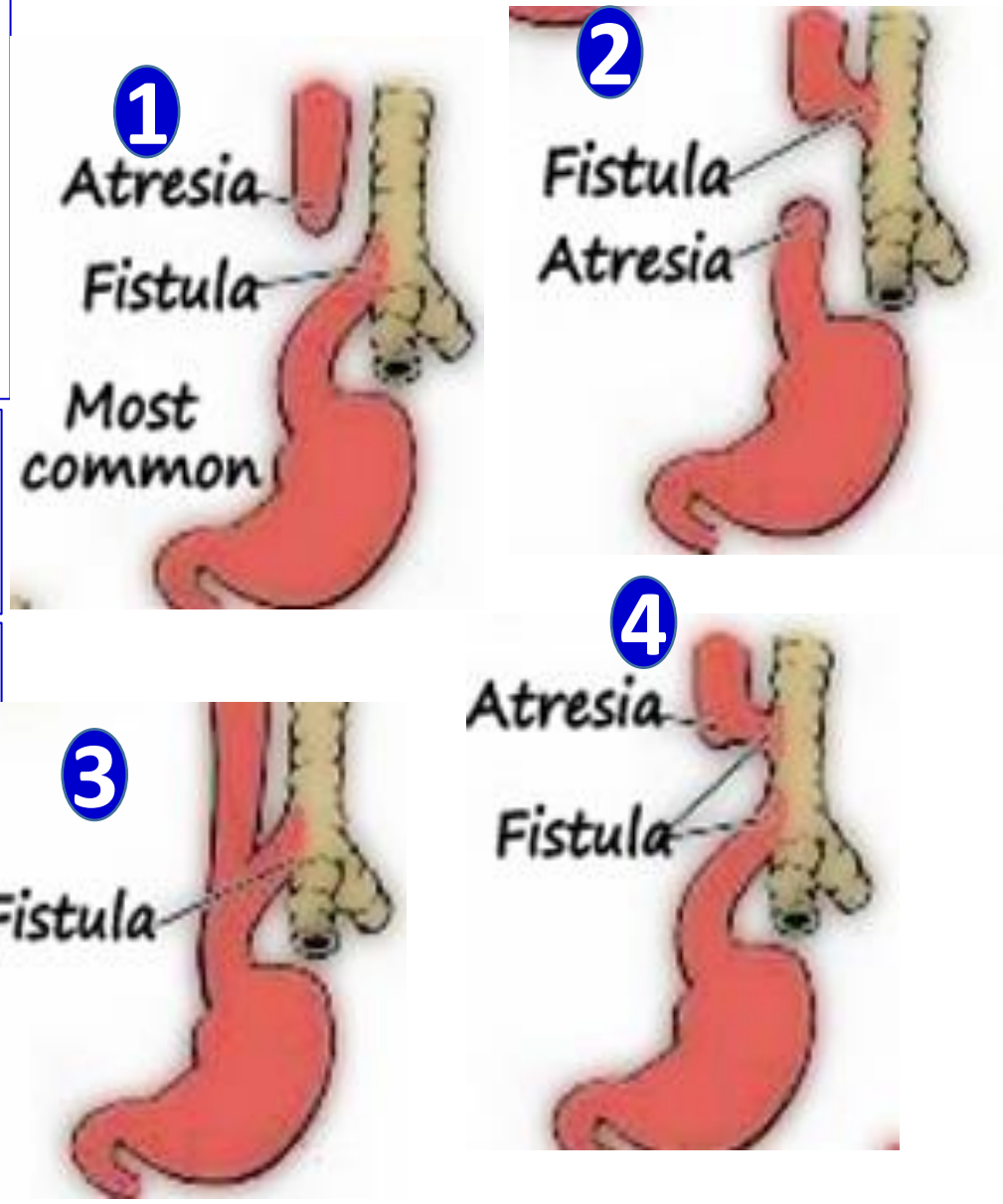
- An abnormal opening between esophagus and trachea caused by failure of complete closure of the tracheoesophageal septum.

1. P**roximal part** of esophagus ends as a **blind sac** and distal part continues with the trachea.

2- Proximal part of esophagus **continues** with trachea and distal part ends as blind sac.

3- Proximal and distal parts of **continue** with trachea by **single tube** .

4- Proximal and distal parts of esophagus **continue** with trachea separately by **double tubes**.



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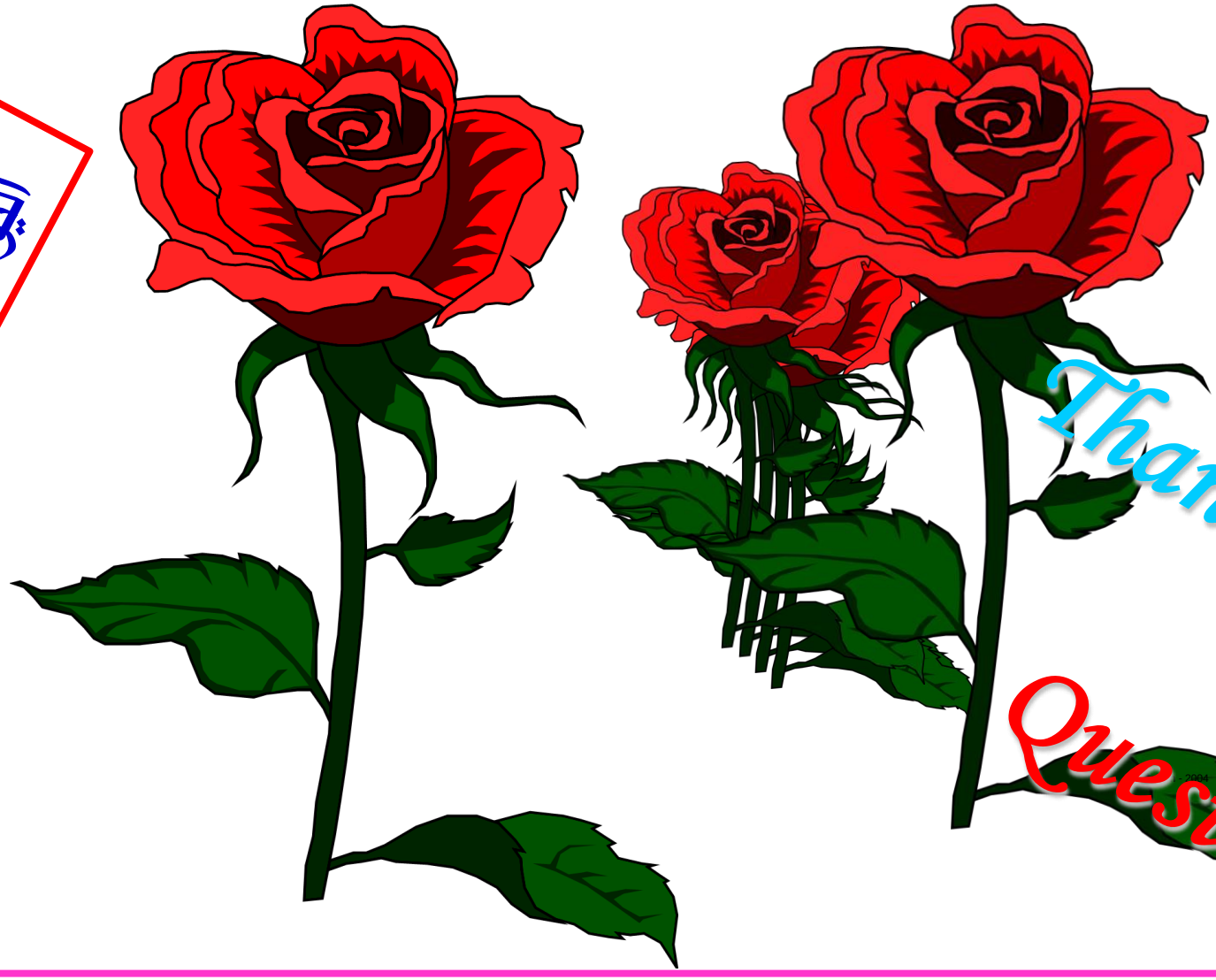

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