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Matric No: 18/MHS01/163

Department: Anatomy

Course Code: ANA 206

**Question**

Write notes on the following:

I) Development of the lungs

II) Rotation of the stomach and the formation of the Omental bursa

III) Development of the esophagus

Answers

1.) Development of the Lungs

This occurs in five phases which would be listed below

* **Embryonic Phase:**

The embryonic phase of the fetal lung development begins at around four to five weeks of the gestational age. During the embryonic stage, two tiny buds branch off, one of the forms the right lung and the other forms the left lung. The larynx or voice box and trachea or windpipe, develop from the foregut in an embryonic phase.

* **Pseudo Glandular Phase:**

The pseudo-glandular phase of fetal lung development begins at the 17th week of gestational age. Medical studies conclude that the original lung buds branch into smaller and numerous units in the pseudo-glandular phase. Over a time span, each bud develops into an independent respiratory unit consisting of a bronchiole and lots of capillary vessels that supply the blood to lungs for its oxygen requirements.

* **Canalicular Phase:**

The canalicular phase of fetal lung development begins around the 25th week of the gestational age. During the canalicular phase, a barrier develops between the air and blood, which enables oxygen to supply blood to respiratory capillaries and enable the carbon dioxide to depart from the respiratory capillaries in the lungs. Different tissue types develop in the fetus’ lungs during the canalicular phase distinguishing air-carrying tissues from the gas carrying tissues.

* **Saccular Phase:**

The fetus gets in the saccular phase of the lung development at an around 36th week of gestational age. The production of surfactant starts in the saccular phase of lung development. Surfactant is nothing but a soapy fluid that helps keep the lung tissue delicate and prevents it from sticking within, tearing away during exhalation and damage when it compresses. Surfactant is extremely crucial during the delivery since it allows the amniotic fluid in the lungs to drain away and fills the lungs with air appropriately. Premature babies are more prone to respiratory issues and health condition popular as lung collapse if they are born prior to the adequate formation of surfactant. Moreover, air sacs fill up during the saccular phase.

* **Alveolar Phase:**

The alveolar phase, or the last phase, of fetal lung development, lasts until your little one sees the world and beyond until her early childhood. Additional production of surfactant starts during the alveolar phase. There is growth in the bronchioles and air sacs, or alveoli. Moreover, gas-carrying tissues of the lungs expand and become more efficient for carrying air during the alveolar phase.

2.) Rotation of stomach and the formation of the Omental bursa

The omental bursa is a pouch found in the abdomen of mammals, including humans, that is formed by the greater and lesser omentum. The term "omental" stands for its manner of formation, while "bursa" denotes its classification as a sac-like cavity. It is also known as the lesser sac or bursa omentalis minor. In some mammals, this feature might house some significant amounts of fat.

A thin layer of tissue that lines the walls of the abdominal cavity, the peritoneum is the location of the omental bursa. It is also the side of the greater and lesser omentum. Also known as the omentum majus, the greater omentum is the double layer of peritoneum, which is the biggest of its kind. It looks as if it is floating over the surface of the intestines as it hangs down from underneath the stomach, thus the alternate term "epiloon." The lesser omentum, also referred to as the omentum minus, is a double layer of peritoneum as well, but it extends from the lesser curvature of the stomach rather than from its greater curvature like the greater omentum.

The greater and the lesser omentum are two of the demarcation of the omental bursa. Anteriorly, or at the front, it is bordered by the greater omentum as well as the stomach and a well-defined section of the liver called a caudate lobe. Posteriorly, or from behind, the omental bursa is bordered, again, by the greater omentum via its posterior layers. Also demarcating the back of the lesser sac are a fold of peritoneum called transverse mesocolon and the transverse colon it connects to the stomach, the upper sections of the kidney and the pancreas, and the adrenal gland on the left side of the kidney. At the omental bursa's right are not only the lesser omentum, but the epiploic foramen as well.

Also known as the foramen of Winslow, the epiploic foramen is significant for being the opening that provides the communication link between the omental bursa as the lesser sac with the greater sac. This is the pouch in the abdomen that is outside of the lesser sac but inside the peritoneum. The epiploic foramen, also called the omental foramen, is formed by the greater omentum folding inwardly, which is a process that also contributes in the formation of the omental bursa itself.

3.) Development of the esophagus

As early as the fourth week of development, the esophagus of the human embryo is merely a sphincter or constricted part of the primitive foregut, situated between the pharynx and stomach. During the sixth and seventh weeks of gestation, the esophagus undergoes rapid elongation as cephalic development separates the head and neck from the thorax. The elongation is facilitated by development of the lungs and pleural cavities, which push the stomach dorsally and inferiorly. The esophagus is of dual origin, with an upper retrotracheal part originating from the pharyngeal portion and an intratracheal part originating from the pregastric segment of the foregut. During the sixth week of development, the esophagus is only 2 mm long, but at birth it extends to 100 mm. Its superior limit is marked by the inferior cricopharyngeal portion of the inferior pharyngeal constrictor. The cricopharyngeal part of the inferior pharyngeal constrictor relaxes suddenly during swallowing and simultaneously lengthens the vocal folds of the larynx. The lower limit of the esophagus is marked by its entrance to the stomach, in a region that constitutes a barrier to reflux of gastric contents, but it is not marked by an anatomically recognizable sphincter. At lower thoracic levels, the esophagus is supported away from the aorta, azygos vein, and body of the vertebrae, which permits advancement of the esophagus away from the vertebral column.  As it reaches a length between 8.4 and 16 mm (at the fifth to seventh weeks), the esophagus is crescentic, with the concavity of the crescent directed toward the trachea. Its upper part is round, but as it descends, it appears transversely elliptical. Near the level of tracheal bifurcation, it becomes round again; finally, it assumes an elliptical shape in the dorsoventral direction. The esophagus remains patent during this early period save for a nonspecific reticular coagulum.