

FETAL PIG DISSECTION. THE VISCERA This should be a review of fetal pig freshman studies, and will help you to see embryo organ placement in younger stages.

We are going to examine the contents of the body cavity, called the viscera. The diaphragm separates the thoracic from the abdominal cavity, and the two pleural cavities and pericardial cavity are found in the thorax. To see the organs in these cavities, a careful dissection is required since the fetal pig tissues are thin and easily cut. You should work in groups of two with one of you doing a small pig, the other a large one, then you each can compare the structures in the two sizes of pigs. The first thing to do is to open up the cavities using the diagram to show you where the cuts should be made and in which order, from 1 to 6. Use a scalpel and make a shallow cut or you will mangle the organs inside the cavity. However, make only 1-4 at first until you finish looking at the viscera in the abdominal cavity, then continue with 5-6 to examine the thoracic cavity contents (heart and lungs.) The wall of the cavity is about 1/4 inch thick, so don't use the full length of the blade as you cut. Cut 1 is to be just below the ribs, which you can feel with your fingers. You will first cut skin, then muscle, then the lining of the peritoneal cavity, the peritoneum. Note that you cut around the umbilical cord. You can use scissors if you prefer. The umbilical cord is firmly anchored by the umbilical vein which passes into the liver to its union with the vena cava, so you will have to cut this connection before you can really see the contents of the peritoneal cavity. Cut it a little away from the skin and liver so you can see the cut ends. There may be some coagulated blood or extra preserving fluid in the cavity. Wash it out with tap water, if found. Look for the following structures in the cavity:

diaphragm- just under the ribs it is a dome shaped thin muscular membrane

liver- the large multi-lobed brown organ just below the diaphragm

gall bladder- found in the right lobe by lifting it up and looking underneath, it looks like a sac. It is formed by the unbranched part of the liver diverticulum

stomach, on the left side of the pig, (your right side) under the liver, it is joined by the duodenum to the small intestine which is highly coiled, and ends in the colon of the large intestine which is larger than the rest, and clearly visible. The colon opens into the rectum which is along the back side under the rest of the

intestine, and descends to the anus.

pancreas- found between the duodenum, or upper part of the small intestine and the stomach in the mesentery, a thin membrane which holds the intestine up when animals walk, since it is connected to the dorsal body wall (at the back of the cavity). The pancreas empties digestive juices into the duodenum through its duct. It also makes hormones (insulin, glucagon) to control the blood sugar level.

spleen-red colored organ on the left side of the stomach. It stores blood and immune system cells.

kidneys- found just outside the peritoneum in the dorsal body wall, two bean shaped structures. The adrenal glands are a cap on the kidneys.

bladder-attached to the umbilical cord part of the skin on the under side.

the reproductive organs will be a separate lab.

Now make your cuts for the thoracic cavity with scissors starting in the midline below the ribs, cut all the ribs (cut 5), then make the cuts 6.

Make another cut through the musculature of the neck down to depth of the trachea (windpipe).

Find the following:

Thymus-the immune system gland which covers the heart and must be partly removed to see the heart. This is largest in fetal animals as the immune system is forming, and gets smaller through puberty.

Pericardium, the covering of the heart, lining the pericardial cavity which is the sac containing the heart, bathing it in fluid and keeping it separate from the expanding lungs during breathing. Make a cut in it to expose the heart.

Heart-find the two auricles and look for the coronary arteries along the ventricles. There are two arteries leaving the heart, coiled around each other: the pulmonary artery and the aorta. These are connected in the fetus through the very short ductus arteriosus which carries blood which cannot go into the unexpanded lungs to the rest of the lower body and can be seen coming off the pulmonary aorta on the left side (your right) into the arch of the aorta. It closes at birth. Two large veins can be seen coming to the right auricle or atrium the posterior (or superior) and inferior vena cavae. The pulmonary veins come from the lungs to the left atrium.

Lungs- found on each side of the heart in the two pleural cavities.

esophagus- located under the trachea, it is the connection leading from the mouth to the stomach. It is separated from the trachea at the larynx which, if cut open, reveals the vocal folds.

thyroid- dark gland above the trachea, just above the ribcage. replace the pig in the preservative until next time.

If you complete this before the end of the lab, take a series of fetal pigs of different sizes and make sagittal sections of them with razor blades, and examine the viscera to see the relationship of body cavity size, coiling of intestine, size of liver, etc with age. Keep the halves of the embryos and place back into the preservative for others to look at.

The kidneys will be covered in a separate exercise.

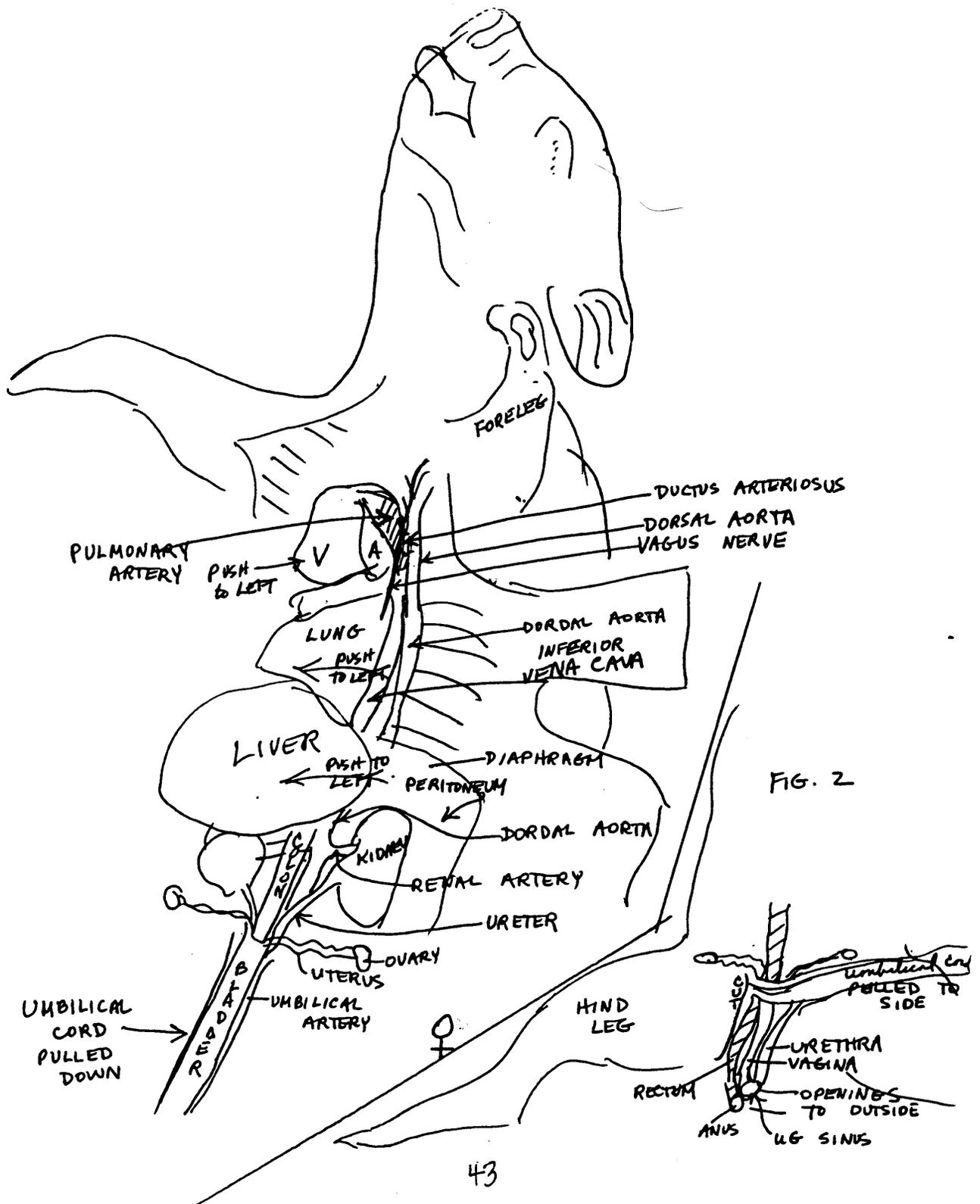
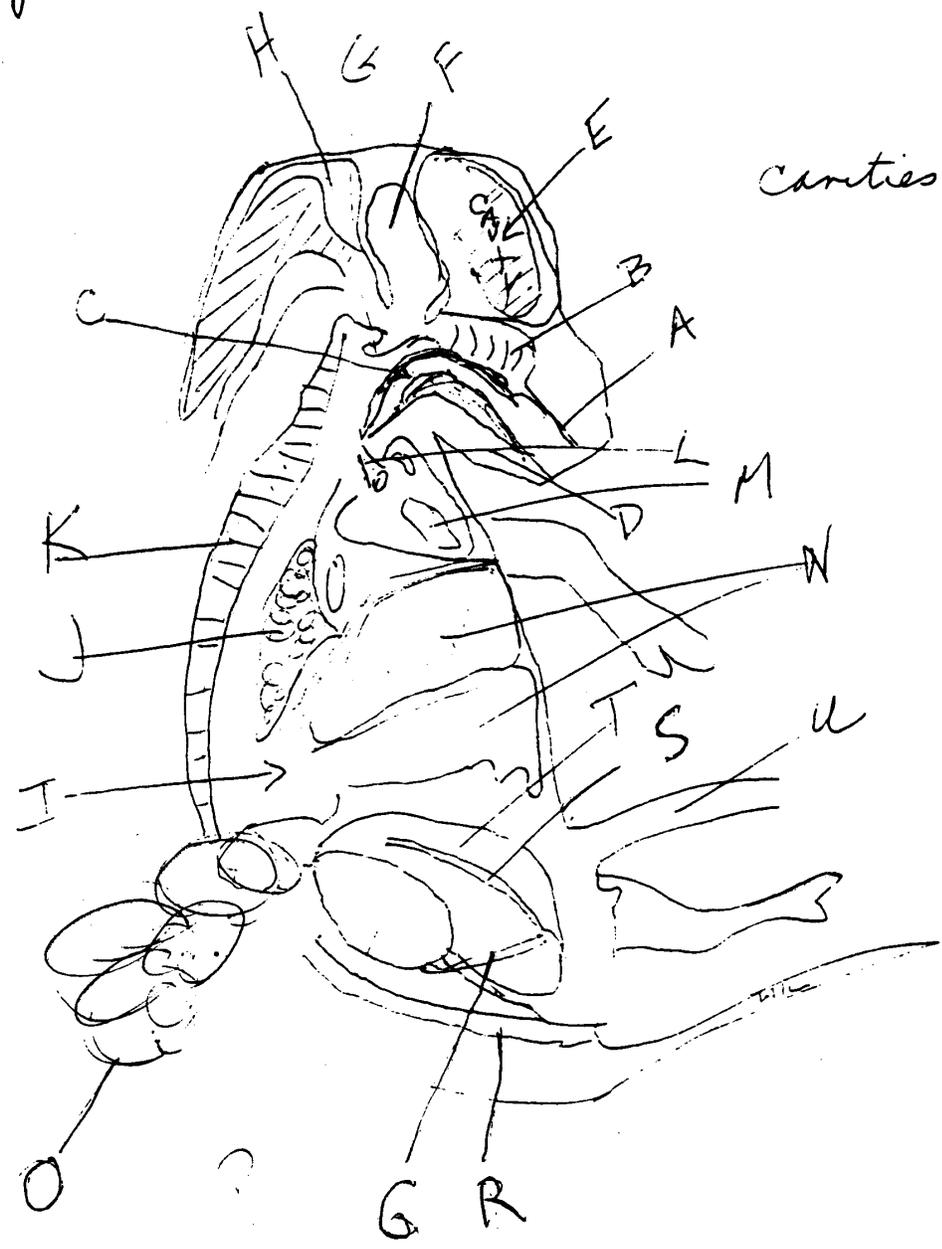


FIG. 2

40 mm pig B



Cavities are dark

A

17 mm -

