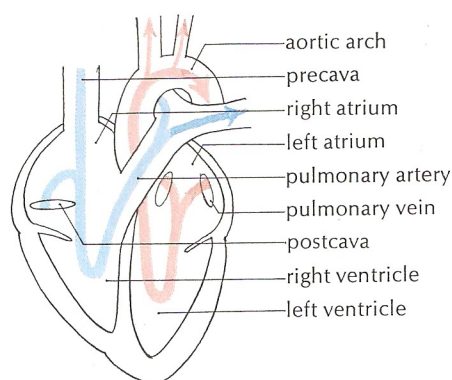


THE CIRCULATORY SYSTEM



PULMONARY VEINS

PULMONARY ARTERY

EXPOSURE OF BRACHIAL VESSELS

Remove the pericardium and the thymus gland to expose the heart. Identify the vagus and phrenic nerves by referring to Figure 48, page 69, and Figure 69, page 95; be careful to preserve them.

The heart consists of two thin-walled atria and two muscular ventricles. Unoxygenated blood returns to the right atrium from the precava and postcava. From the right atrium it passes into the right ventricle, and from the right ventricle it is pumped through the pulmonary artery to the lungs. Oxygenated blood returns from the lungs via the pulmonary veins to the left atrium. From the left atrium it passes to the left ventricle, and from the left ventricle it is pumped to the body via the aorta. The ventricle and the atria are completely separated so that there is no mixture of oxygenated and unoxygenated blood within the heart.

To identify the pulmonary veins pull the heart away from the lung on one side and examine the root of the lung. From each lobe a vein (usually uninjected) will be seen passing toward the dorsal side of the heart. There are three groups of pulmonary veins: the left pulmonary veins, from the anterior and middle lobes of the left lung; the right pulmonary veins, from the anterior and middle lobes of the right lung; and the dorsal pulmonary veins, from the terminal lobes of both lungs. Each group is composed of two or three veins (see Fig. 51, p. 72).

The pulmonary artery divides into right and left branches shortly after leaving the right ventricle. Near the point of division it is connected to the aorta by the ligamentum arteriosum, a strand of connective tissue representing the obliterated ductus arteriosus. (In the fetus the ductus arteriosus forms an open channel between the pulmonary artery and the aorta.) The left branch of the pulmonary artery passes ventral to the aorta to reach the left lung; the right branch passes between the aortic arch and the heart to reach the right lung.

Review the muscles of the upper forelimb and identify the muscles encountered in the dissection of the circulatory system as you come to them.

Cut and remove the pectoral muscles, making a dissection similar to Figure 45. Particular care should be taken not to damage the components of the brachial plexus, which are somewhat difficult to

distinguish because they are surrounded by connective tissue and fat. In Figure 45 the musculocutaneous nerve has been omitted to expose the vessels lying below it. Identify the musculocutaneous nerve by referring to Figure 69 on page 95, and be careful to preserve it.

Individual variations in the nerves, arteries, and veins will be encountered in different specimens, and you should therefore examine several specimens other than your own in the course of this dissection.

Because the veins anterior to the heart lie for the most part ventral to the arteries, they will be described first. In your dissection, however, you should expose and identify the veins and arteries together. In most cases the veins follow correspondingly named arteries, and the veins will therefore not be described in detail.

The precava returns unoxygenated blood from the head and forelimbs to the right atrium. Refer to Figure 45 and identify its principal branches: the internal jugular, from the brain and spinal cord; the external jugular, from the head and neck; the subscapular, from the shoulder, and the axillary, from the forelimb.

Press the heart to the left and find the azygos vein, which arches over the root of the right lung and joins the precava near the right atrium. The azygos vein lies along the right side of the vertebral column in the thorax and receives the intercostal veins, as well as tributaries from the muscles of the dorsal abdominal wall, the esophagus, and the bronchi.

Toward the anterior end of the precava on the ventral side find the common stem by which the paired internal mammary veins enter the precava. The internal mammary veins lie on either side of the midline on the inner surface of the ventral chest wall, and anastomose with the superior epigastric veins.

The precava is formed by the union of the two short innominate veins. Dorsally each innominate vein receives the common stem of the vertebral and costocervical veins, corresponding in distribution to the arteries of the same name.

Near the first rib, the innominate vein is formed by the union of the external jugular and the subclavian veins. The subclavian vein is continuous with the axillary and brachial veins. The very short portion of this vein which lies within the thorax is the subclavian vein; the portion which lies within the axilla is the axillary vein; and the portion within the upper forelimb is the brachial vein. The largest tributary of the axillary vein is the subscapular, which joins it just lateral to the first rib. Near this point find the ventral thoracic vein, a small vessel joining the ventral surface of the axillary. Identify the long thoracic, thoracodorsal, and deep brachial veins as illustrated.

Near the elbow the median cubital vein forms a union between the cephalic vein and the brachial vein. Trace the course of the cephalic vein. It originates by superficial branches which unite near the wrist, and passes along the extensor side of the forelimb, dividing at the shoulder into two branches which anastomose with the posterior humeral circumflex and transverse scapular vein.

Near its union with the innominate vein the external jugular receives the internal jugular vein, which originates from the venous sinuses of the brain and from the vertebral column and the back

BRANCHES OF PRECAVA

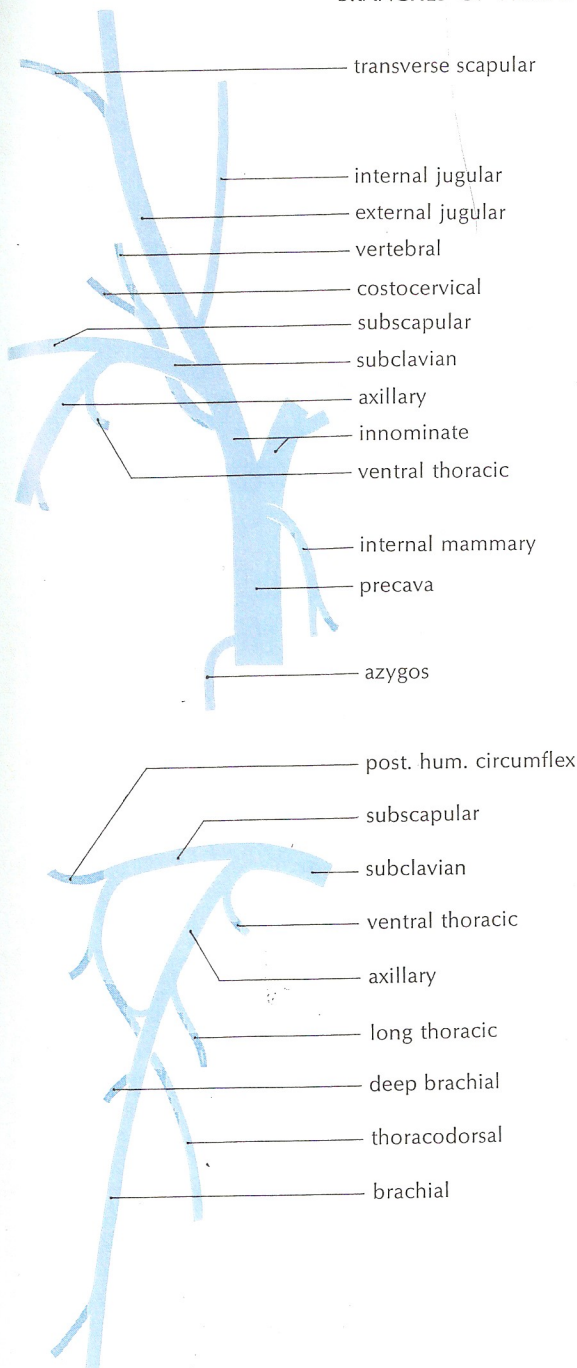


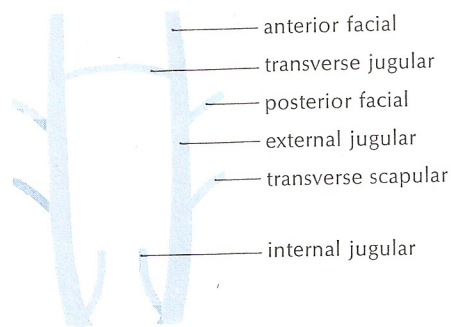


FIG. 45.

THE BRACHIAL VESSELS AND NERVES, VENTRAL VIEW

The musculocutaneous nerve is removed to expose underlying structures.
For details of the brachial plexus, see Figure 69, page 95.

- | | | | | | |
|----|-------------------------------------|----|--|----|---|
| 1 | anterior humeral circumflex artery | 22 | latissimus dorsi | 45 | subscapular artery and vein |
| 2 | aortic arch | 23 | left atrium | 46 | subscapular nerve |
| 3 | axillary artery | 24 | left lung, anterior lobe | 47 | superior radial collateral artery |
| 4 | axillary nerve | 25 | left lung, middle lobe | 48 | supracondyloid foramen |
| 5 | axillary vein | 26 | left ventricle | 49 | suprascapular nerve |
| 6 | biceps | 27 | long thoracic artery and vein | 50 | teres major |
| 7 | brachial artery | 28 | longus capitis | 51 | thoracodorsal artery and vein |
| 8 | brachial vein | 29 | median cubital vein | 52 | thyrocervical artery |
| 9 | cephalic vein | 30 | median nerve | 53 | trachea |
| 10 | common carotid artery | 31 | origin of phrenic nerve | 54 | transverse scapular artery and vein |
| 11 | costocervical artery and vein | 32 | pectoral muscles, cut | 55 | triceps |
| 12 | deep brachial artery and vein | 33 | phrenic nerve | 56 | ulnar collateral artery |
| 13 | esophagus | 34 | posterior humeral circumflex artery and vein | 57 | ulnar nerve |
| 14 | external jugular vein | 35 | postcava | 58 | vagus nerve |
| 15 | fifth cervical nerve | 36 | precava | 59 | ventral branches of left coronary artery and vein |
| 16 | innominate artery | 37 | pulmonary artery | 60 | ventral thoracic artery and vein |
| 17 | innominate vein | 38 | radial nerve | 61 | vertebral artery |
| 18 | intercostal vein, artery, and nerve | 39 | right atrium | 62 | vertebral vein |
| 19 | internal jugular vein | 40 | right lung, anterior lobe | | |
| 20 | internal mammary artery | 41 | right lung, middle lobe | | |
| 21 | internal mammary vein | 42 | right ventricle | | |
| | | 43 | sixth cervical nerve | | |
| | | 44 | subclavian vein | | |



AORTA

CORONARY ARTERIES

of the head.

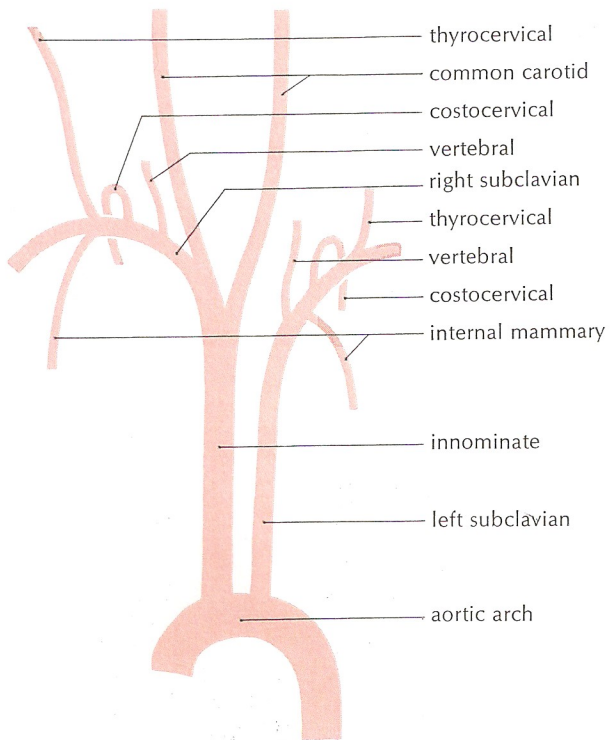
The external jugular vein, larger and more superficial than the internal jugular vein, is formed by the union of the anterior and posterior facial veins (see Figs. 15 and 16 on pp. 20 and 21). Near the jaw the external jugular veins are connected by the transverse jugular vein. At the shoulder the external jugular vein receives the large transverse scapular vein and one or more small tributaries from nearby muscles.

Remove the precava and its branches to make a dissection similar to Figure 46.

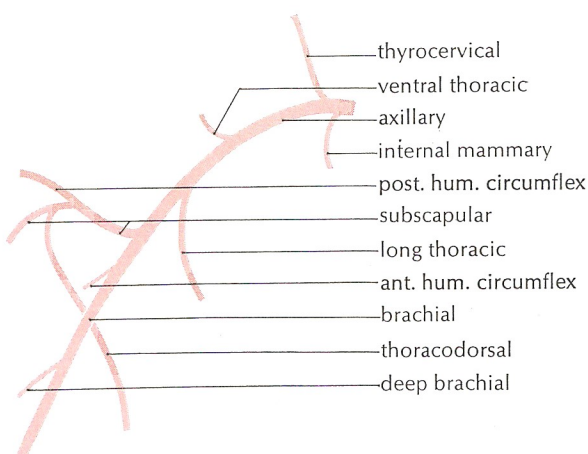
The aorta is the large arterial trunk which conveys oxygenated blood from the left ventricle to the body. At its origin it makes an abrupt curve to the left, passing dorsal to the pulmonary artery and continuing down the left side of the vertebral column to the pelvis, where it divides into branches that supply the legs. The portion of the aorta anterior to the diaphragm is termed the thoracic aorta, and the proximal curved portion of the thoracic aorta is termed the aortic arch.

The coronary arteries arise near the origin of the aorta, just cranial to the aortic valves (see Fig. 53, p. 74). The left coronary artery passes dorsal to the pulmonary artery and divides into two branches: one to the dorsal and one to the left and ventral sides of the heart. The right coronary artery passes to the right, lying between the right auricle and the right ventricle, giving branches to

BRANCHES OF INNOMINATE AND SUBCLAVIAN ARTERIES



BRANCHES OF AXILLARY ARTERY



the right side of the heart.

The aortic arch gives rise to the innominate and the left subclavian arteries, which supply the head and forelimbs. About the level of the second rib the innominate divides into right subclavian and right and left common carotids. Near the first rib the subclavian gives off four branches: the internal mammary, vertebral, costocervical, and thyrocervical.

The internal mammary arises from the ventral surface of the subclavian and passes caudally in the ventral thoracic wall, giving off branches to the adjacent muscles, the pericardium, the mediastinum, and the diaphragm. It passes out of the thorax and anastomoses with the inferior epigastric artery.

The vertebral artery arises from the dorsal surface of the subclavian and passes cranially through the vertebral canal of the cervical vertebrae, giving off branches to the deep neck muscles and to the spinal cord. Near the foramen magnum the right and left vertebral arteries enter the vertebral canal and unite to form the basilar artery, which lies along the ventral aspect of the medulla oblongata.

The costocervical artery arises from the dorsal surface of the subclavian. It sends branches to the deep muscles of the neck and shoulder and to the first two costal interspaces.

The thyrocervical artery arises from the cranial aspect of the subclavian and passes cranially and laterally, supplying the muscles of the neck and chest. At the cranial border of the scapula it is termed the transverse scapular artery, and divides into several branches which supply the shoulder muscles. The branches of the transverse scapular artery accompany the fifth cervical and the suprascapular nerves.

Lateral to the first rib the subclavian artery continues into the axilla as the axillary artery.

The ventral thoracic artery arises from the ventral surface of the axillary just lateral to the first rib, passing caudally to supply the medial ends of the pectoral muscles. It accompanies the anterior ventral thoracic nerve.

The long thoracic artery arises lateral to the ventral thoracic, passing caudally to the pectoral muscles and the latissimus dorsi. It accompanies the posterior ventral thoracic nerve.

The subscapular artery is the largest branch of the axillary. It passes laterally and dorsally between the long head of the triceps and the latissimus dorsi to supply the dorsal shoulder muscles. A short distance from its origin the subscapular gives off two branches, the thoracodorsal and the posterior humeral circumflex. The thoracodorsal artery passes dorsal to the brachial plexus, giving branches to the teres major and the latissimus dorsi. The posterior humeral circumflex passes dorsally with the axillary nerve between the long and lateral heads of the triceps. To trace the branches of the posterior humeral circumflex and the subscapular arteries, turn the specimen over and remove the spinodeltoid muscle. Branches of these arteries will then be seen near the origin of the triceps.

Distal to the origin of the subscapular artery, the axillary continues as the brachial artery. The anterior humeral circumflex arises just distal to the origin of the subscapular and supplies the biceps. The deep brachial accompanies the radial nerve to the dorsal side of the

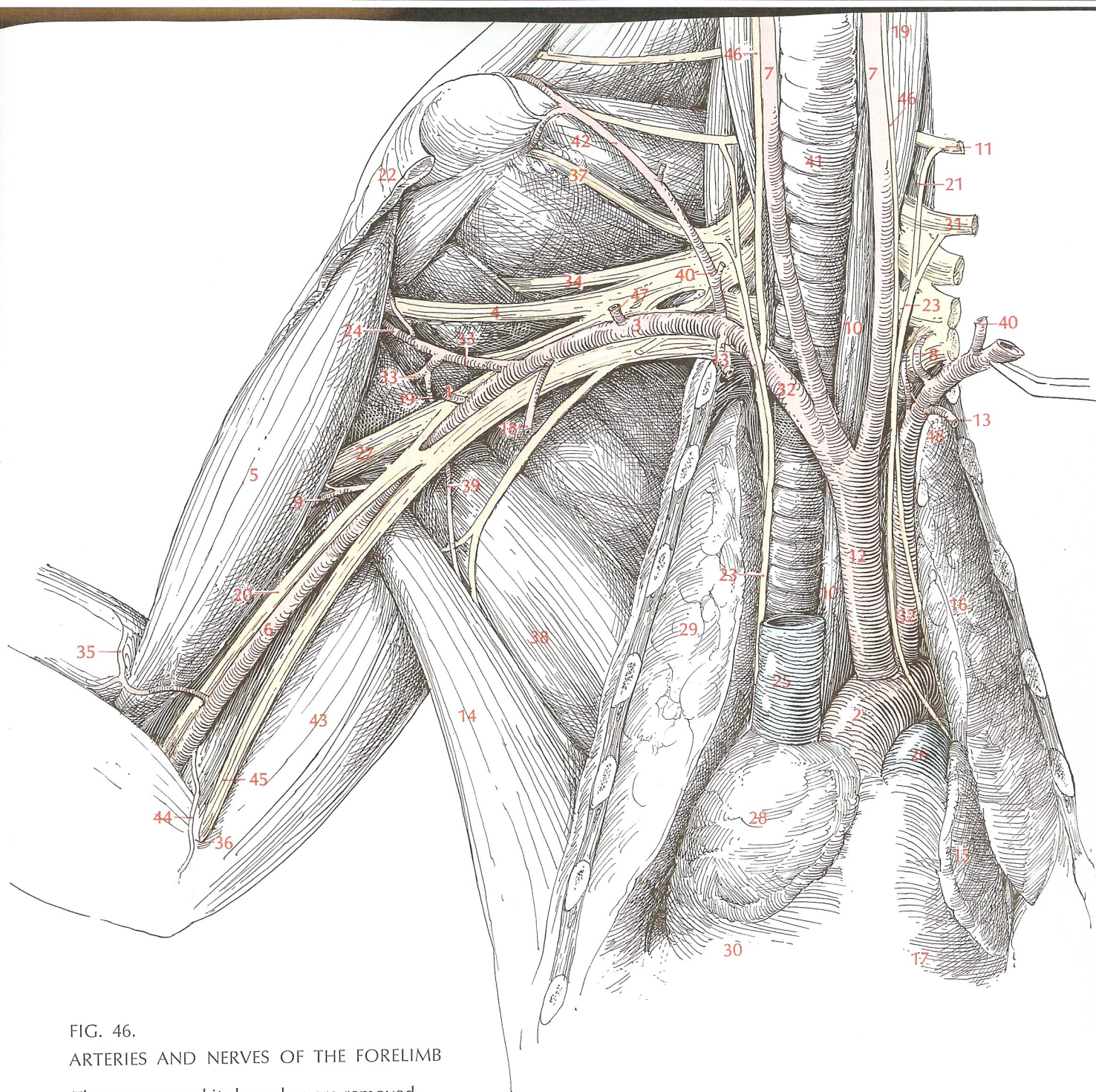
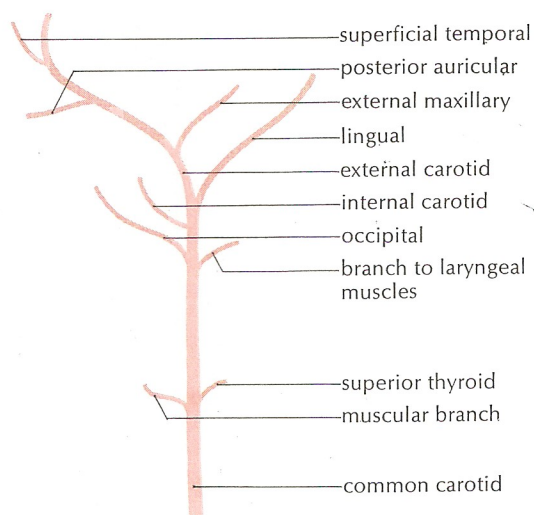


FIG. 46.
ARTERIES AND NERVES OF THE FORELIMB

The precava and its branches are removed.

- | | | |
|--------------------------------------|--|--------------------------------------|
| 1 anterior humeral circumflex artery | 17 left ventricle | 33 subscapular artery |
| 2 aortic arch | 18 long thoracic artery | 34 subscapular nerve |
| 3 axillary artery | 19 longus capitis | 35 superior radial collateral artery |
| 4 axillary nerve | 20 median nerve | 36 supracondyloid foramen |
| 5 biceps | 21 origin of phrenic nerve | 37 suprascapular nerve |
| 6 brachial artery | 22 pectoral muscles, cut | 38 teres major |
| 7 common carotid artery | 23 phrenic nerve | 39 thoracodorsal artery |
| 8 costocervical artery | 24 posterior humeral circumflex artery | 40 thyrocervical artery |
| 9 deep brachial artery | 25 precava | 41 trachea |
| 10 esophagus | 26 pulmonary artery | 42 transverse scapular artery |
| 11 fifth cervical nerve | 27 radial nerve | 43 triceps |
| 12 innominate artery | 28 right atrium | 44 ulnar collateral artery |
| 13 internal mammary artery | 29 right lung, anterior lobe | 45 ulnar nerve |
| 14 latissimus dorsi | 30 right ventricle | 46 vagus nerve |
| 15 left atrium | 31 sixth cervical nerve | 47 ventral thoracic artery |
| 16 left lung, anterior lobe | 32 subclavian artery | 48 vertebral artery |

EXPOSURE OF COMMON CAROTID ARTERY



DISSECTION OF THORAX

forelimb. Distal to the deep brachial the brachial artery gives off several muscular branches, and just proximal to the elbow it gives off two collateral branches. It then passes through the supracondyloid foramen of the humerus in company with the median nerve. Distal to the elbow the brachial artery is continuous with the radial, and gives rise to the ulnar artery.

To identify the branches of the right common carotid artery remove the digastric, and cut and pull back the sternomastoid and cleidomastoid muscles to make a dissection similar to Figure 47. In tracing these arteries be careful to avoid injury to the cervical nerves.

The superior thyroid artery branches from the common carotid at the cranial end of the thyroid gland. It supplies the thyroid gland, superficial laryngeal muscles, and ventral neck muscles. At the same level the common carotid gives off one or more dorsal muscular branches to the deep muscles of the neck.

Near the point where it is crossed by the hypoglossal nerve the common carotid gives off the occipital and the internal carotid arteries, which sometimes arise by a common stem. The occipital supplies the deep muscles of the neck and extends toward the dorsal side of the tympanic bulla, continuing to the back of the skull where it runs along the superior nuchal line. The internal carotid artery passes toward the ventral side of the tympanic bulla and enters the bulla with the Eustachian tube; it then enters the skull via the foramen lacerum and joins the posterior cerebral artery.

After giving off the internal carotid artery, the common carotid continues as the external carotid artery. It passes deep to the digastric and gives off the lingual artery, which accompanies the hypoglossal nerve, giving off branches to the hyoid and pharyngeal muscles. It then enters the tongue, to which it gives numerous branches.

The external maxillary artery branches from the external carotid near the angle of the jaw. It passes along the ventral border of the masseter muscle, extending toward the nose and giving off branches to the lips and mouth. Distal to the external maxillary, the external carotid gives off the posterior auricular and superficial temporal branches, which run dorsally and laterally, supplying the superficial muscles of the side and back of the head.

After giving off the superficial temporal, the external carotid turns medially near the posterior margin of the masseter and continues as the internal maxillary. After giving off inferior alveolar and middle meningeal branches, it ramifies to form the carotid plexus, a network of arteries which surrounds the maxillary branch of the fifth cranial nerve near the foramen rotundum. The internal maxillary and the carotid plexus give various branches to the brain, eye, and other deep structures of the head. See the carotid plexus as illustrated in Figure 73, page 103.

Remove the left lung and cut away the left lateral portion of the thorax. Remove connective tissue and pleura as necessary to make a dissection similar to Figure 48. Near the aorta on the left side you will find the thoracic duct, which appears as a thin tube of irregular diameter. It may be removed to expose the underlying structures. (The lymphatics will be seen best in a demonstration dissection of an animal in which they have been injected).

The thoracic aorta gives off paired intercostal arteries corresponding to the interspaces between the last eleven ribs. The intercostal

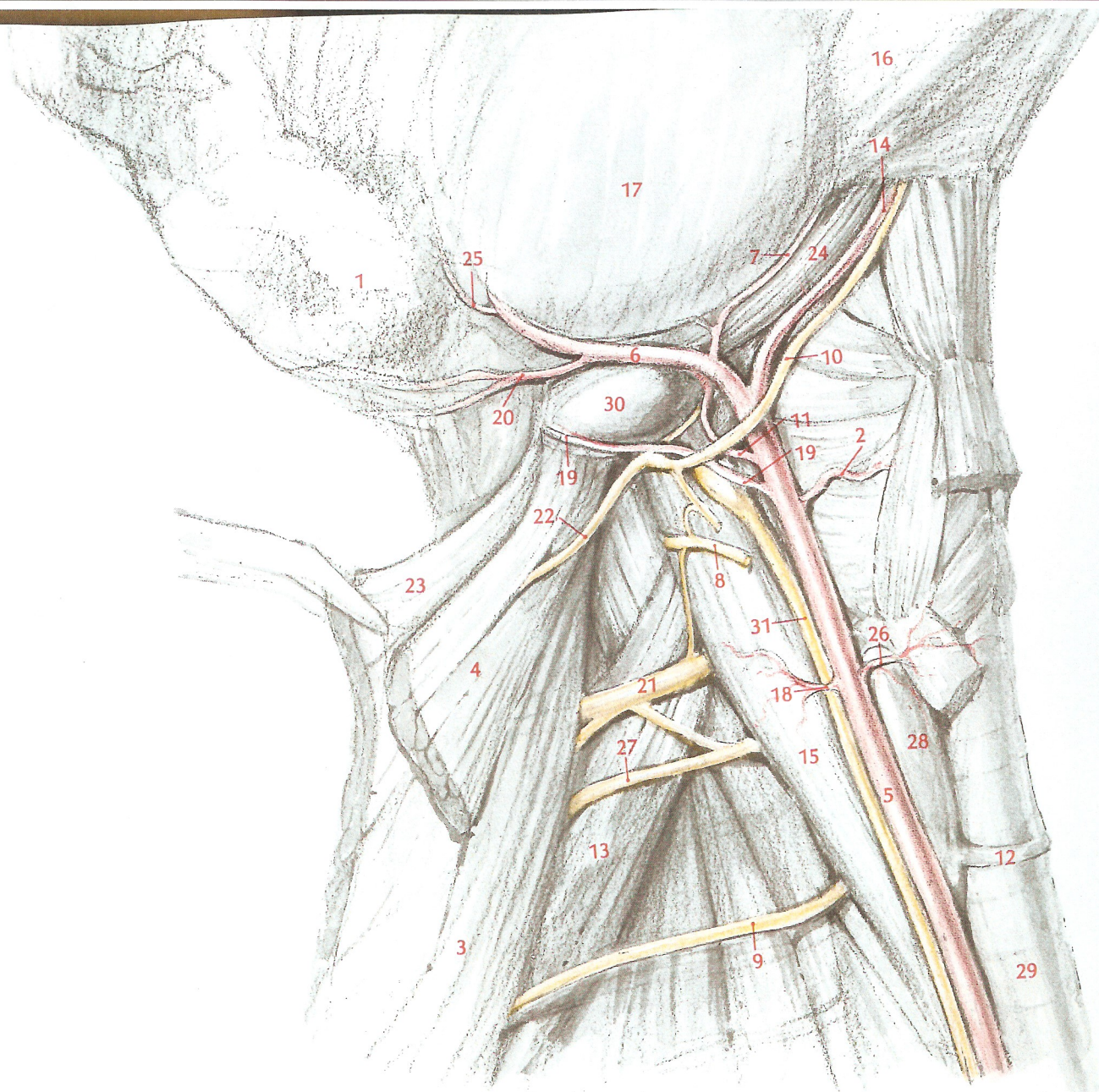
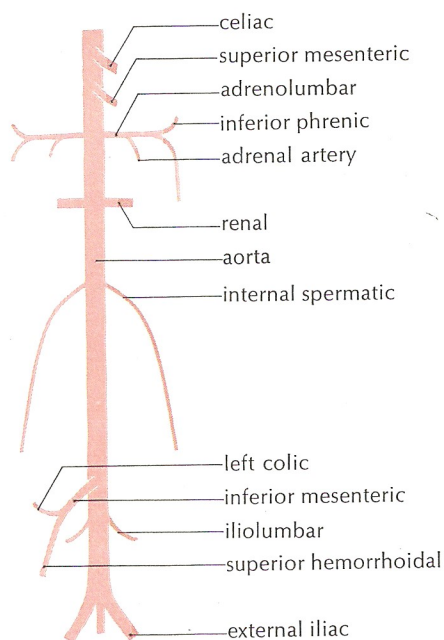


FIG. 47.

THE RIGHT COMMON CAROTID ARTERY

- | | |
|-------------------------------|---|
| 1 auricular cartilage | 18 muscular branch |
| 2 branch to laryngeal muscles | 19 occipital artery |
| 3 clavotrapezius | 20 posterior auricular artery |
| 4 cleidomastoid | 21 second cervical nerve |
| 5 common carotid artery | 22 spinal accessory nerve (11) |
| 6 external carotid artery | 23 sternomastoid |
| 7 external maxillary artery | 24 styloglossus |
| 8 first cervical nerve | 25 superficial temporal artery |
| 9 fourth cervical nerve | 26 superior thyroid artery |
| 10 hypoglossal nerve (12) | 27 third cervical nerve |
| 11 internal carotid artery | 28 thyroid gland |
| 12 isthmus of thyroid gland | 29 trachea |
| 13 levator scapulae ventralis | 30 tympanic bulla |
| 14 lingual artery | 31 vagus nerve (10) and sympathetic trunk |
| 15 longus capitis | |
| 16 mandible | |
| 17 masseter | |



arteries corresponding to the first and second costal interspaces arise as branches of the costocervical artery.

The thoracic aorta also gives off paired bronchial arteries to the bronchi and several esophageal arteries of varying origin.

The aorta passes through the diaphragm at the level of the second lumbar vertebra. The portion of the aorta between the diaphragm and the pelvis is termed the abdominal aorta.

The first two branches given off by the abdominal aorta are the celiac and the superior mesenteric. The branches of these arteries were identified during the dissection of the alimentary canal (pp. 47-48). Other branches of the abdominal aorta are illustrated in Figures 39 and 42, pages 53 and 55.

Just below the superior mesenteric artery, the abdominal aorta gives off the paired adrenolumbar arteries, which pass laterally along the dorsal body wall. Each adrenolumbar artery gives off an inferior phrenic artery to the diaphragm and an adrenal artery to the adrenal gland. It then continues laterally to supply the muscles of the dorsal body wall.

The paired renal arteries supply the kidneys and, in some specimens, give rise to the adrenal artery (Figure 39, page 53).

Before entering the substance of the kidney each renal artery usually divides into two or more branches.

The paired internal spermatic arteries (in the male) arise from the aorta near the caudal ends of the kidneys. They lie on the surface of the psoas minor and iliopsoas muscles, passing caudally to the internal inguinal ring, and through the inguinal canal to accompany the ductus deferens to the testes.

The paired ovarian arteries (in the female) arise from the aorta near the caudal ends of the kidneys, passing laterally in the broad ligament to supply the ovaries. Each ovarian artery gives a branch to the cranial end of the corresponding uterine horn. This branch anastomoses with the uterine artery, a branch of the middle hemorrhoidal.

Seven pairs of lumbar arteries arise from the dorsal surface of the aorta, supplying the muscles of the dorsal abdominal wall.

At the level of the last lumbar vertebra the inferior mesenteric artery arises from the aorta. Near its origin it divides into the left colic artery, which passes anteriorly to supply the descending colon, and the superior hemorrhoidal, which passes posteriorly to supply the rectum.

The paired iliolumbar arteries arise near the inferior mesenteric and pass laterally across the psoas minor and the iliopsoas muscles to supply the muscles of the dorsal abdominal wall.

POSTCAVA

The postcava returns venous blood from the hindlimbs and abdomen to the right atrium. It receives iliolumbar veins, lumbar veins, ovarian or internal spermatic veins, renal veins, and adrenolumbar veins corresponding to the arteries of the same name. (The left internal spermatic or ovarian vein is usually a tributary of the left renal vein.) The postcava does not, however, receive tributaries corresponding to the celiac, superior mesenteric, or inferior mesenteric arteries. Blood from these arteries returns via the portal vein, passes through the sinusoids of the liver, and enters the postcava via the hepatic veins. The postcava passes through the liver, within which it receives the hepatic veins, and pierces the diaphragm near

FIG. 48.

THE HEART AND THORACIC AORTA, LATERAL VIEW

- 1 adrenal gland
- 2 aortic arch
- 3 branches of left bronchus
- 4 common carotid artery
- 5 celiac artery
- 6 celiac ganglion
- 7 coronary artery and vein
- 8 diaphragm
- 9 dorsal branch of left vagus nerve
- 10 dorsal division of vagus nerve
- 11 esophagus
- 12 eighth cervical nerve
- 13 first thoracic nerve
- 14 greater splanchnic nerve
- 15 inferior cervical ganglion
- 16 innominate artery
- 17 intercostal artery
- 18 intercostal vein, artery, and nerve
- 19 internal mammary artery
- 20 kidney
- 21 left atrium
- 22 left branch of pulmonary artery
- 23 left subclavian artery
- 24 left ventricle
- 25 lesser splanchnic nerve
- 26 phrenic nerve
- 27 precava
- 28 pulmonary artery
- 29 pulmonary vein
- 30 recurrent laryngeal nerve
- 31 right auricle
- 32 right lung, anterior lobe
- 33 right ventricle
- 34 sixth cervical nerve
- 35 seventh cervical nerve
- 36 subclavian artery
- 37 superior mesenteric artery
- 38 superior mesenteric ganglion
- 39 sympathetic trunk
- 40 thoracic aorta
- 41 trachea
- 42 vagus nerve
- 43 ventral branch of right vagus nerve
- 44 ventral division of vagus nerve

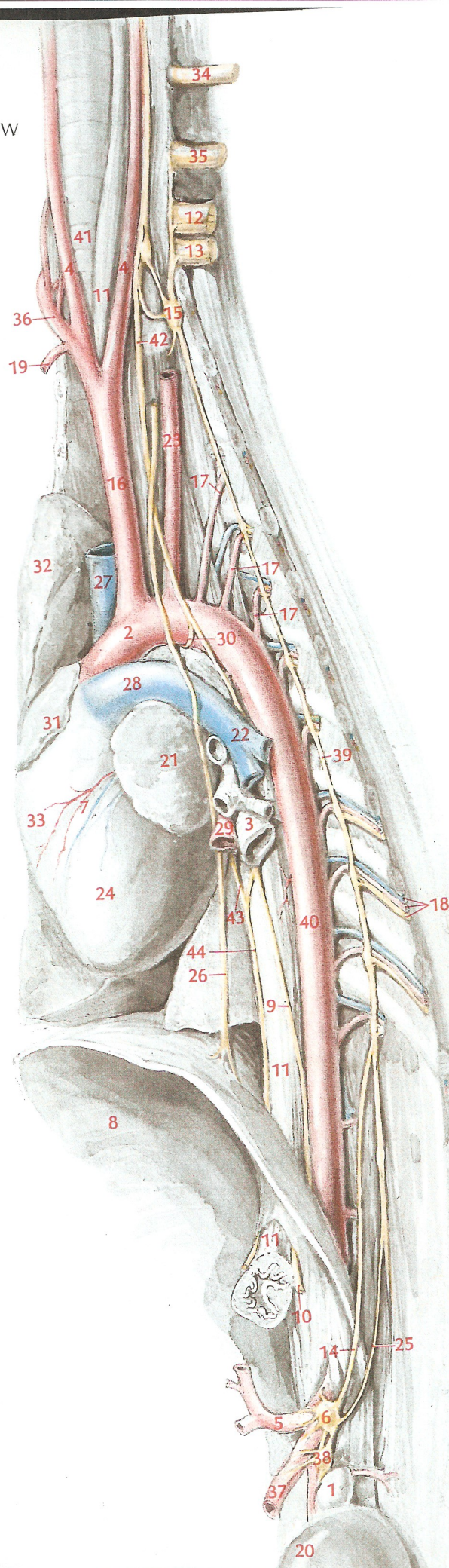
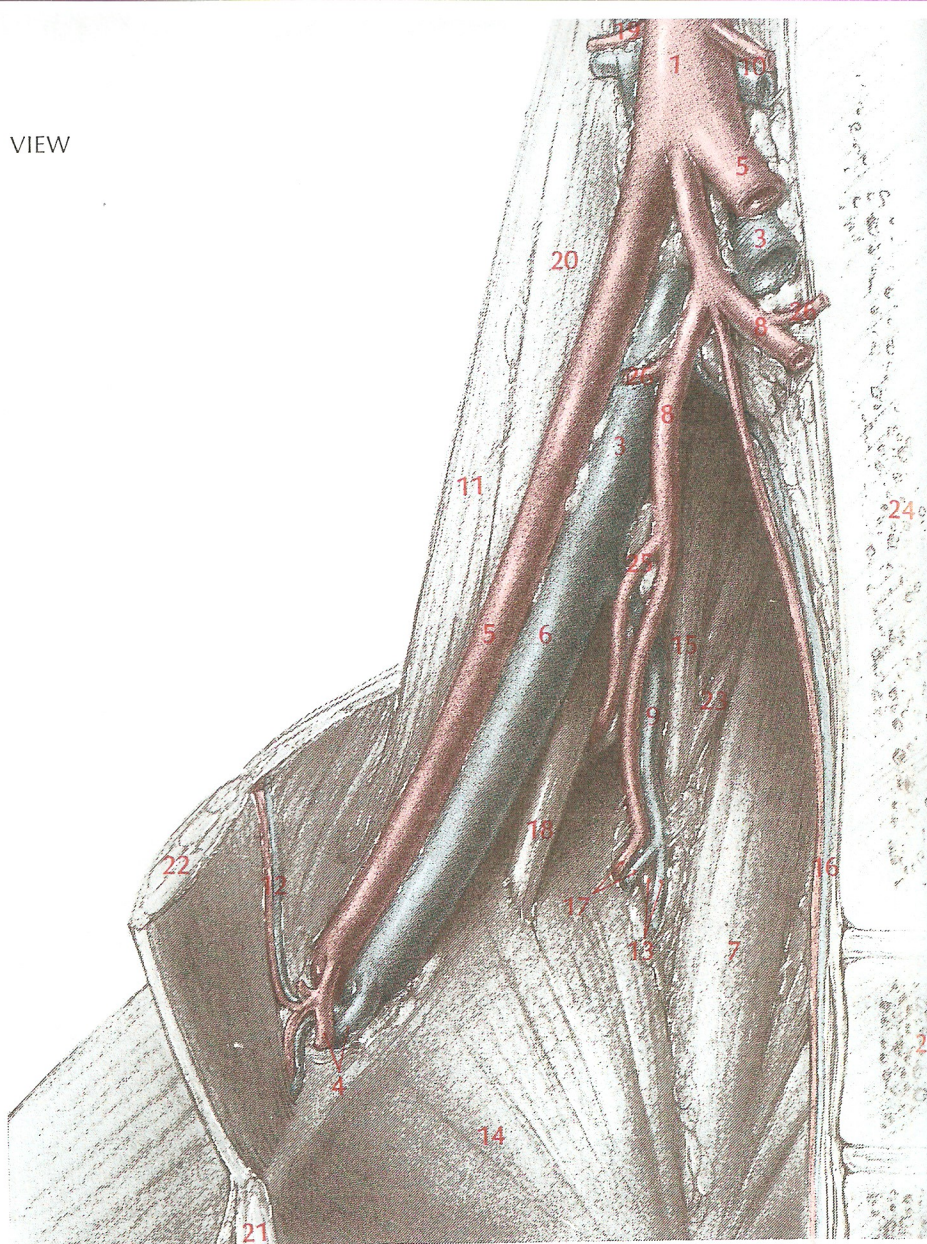


FIG. 49.
PELVIC VESSELS AND NERVES, LATERAL VIEW

- 1 aorta
- 2 caudal vertebra
- 3 common iliac v.
- 4 deep femoral a. & v.
- 5 external iliac a.
- 6 external iliac v.
- 7 flexor of tail
- 8 hypogastric a.
- 9 hypogastric v.
- 10 iliolumbar a. & v.
- 11 iliopsoas m.
- 12 inferior epigastric a. & v.
- 13 inferior gluteal a. & v.
- 14 levator ani m.
- 15 lumbar n. #8
- 16 median sacral a. & v.
- 17 middle hemorrhoidal a. & v.
- 18 obturator nerve
- 19 postcava
- 20 psoas minor m.
- 21 pubic symphysis
- 22 rectus abdominis m.
- 23 sacral nerve #1
- 24 sacrum
- 25 superior gluteal a.
- 26 umbilical a.



the central tendon. At this point it receives the inferior phrenic veins from the diaphragm. It then passes between the heart and the caudal lobe of the right lung to enter the right atrium.

EXPOSURE OF PELVIC VESSELS

Remove the pelvic viscera and identify the vessels illustrated in Figure 49. Also see the blood supply of the pelvic viscera as illustrated in Figure 44 on page 58.

Near the sacrum the aorta divides into right and left external iliac arteries. From this point of division a short common stem extends caudally, giving rise to the paired hypogastric arteries and the unpaired median sacral artery, which passes along the ventral aspect of the tail.

The umbilical artery is the first branch of the hypogastric. It arises near the origin of the hypogastric and passes ventrolaterally within the fat surrounding the lateral ligament of the bladder, dividing into numerous branches on the surface of the bladder.

The superior gluteal artery is a large branch of the hypogastric which passes dorsolaterally, supplying the gluteal muscles and other muscles of the thigh. The middle hemorrhoidal passes first ventrally and then caudally along the lateral surface of the rectum, extending as far as the anus and supplying adjacent structures. Near its origin it gives off a branch which passes ventrally to the urethra.

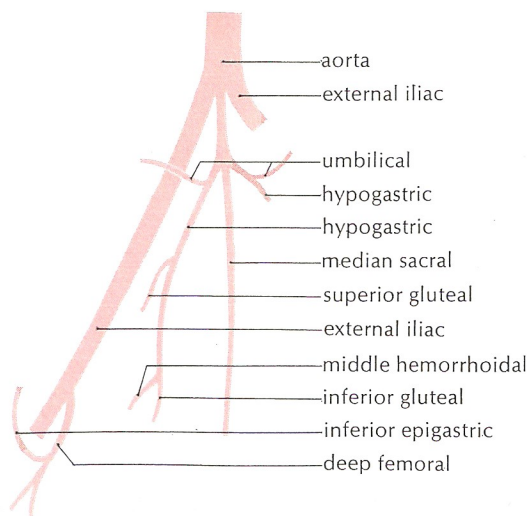
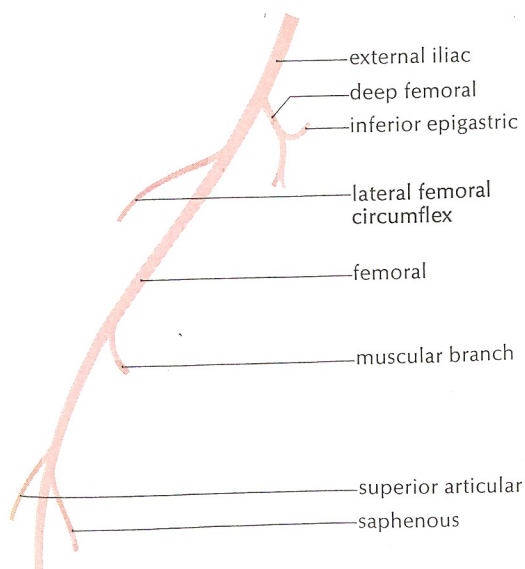
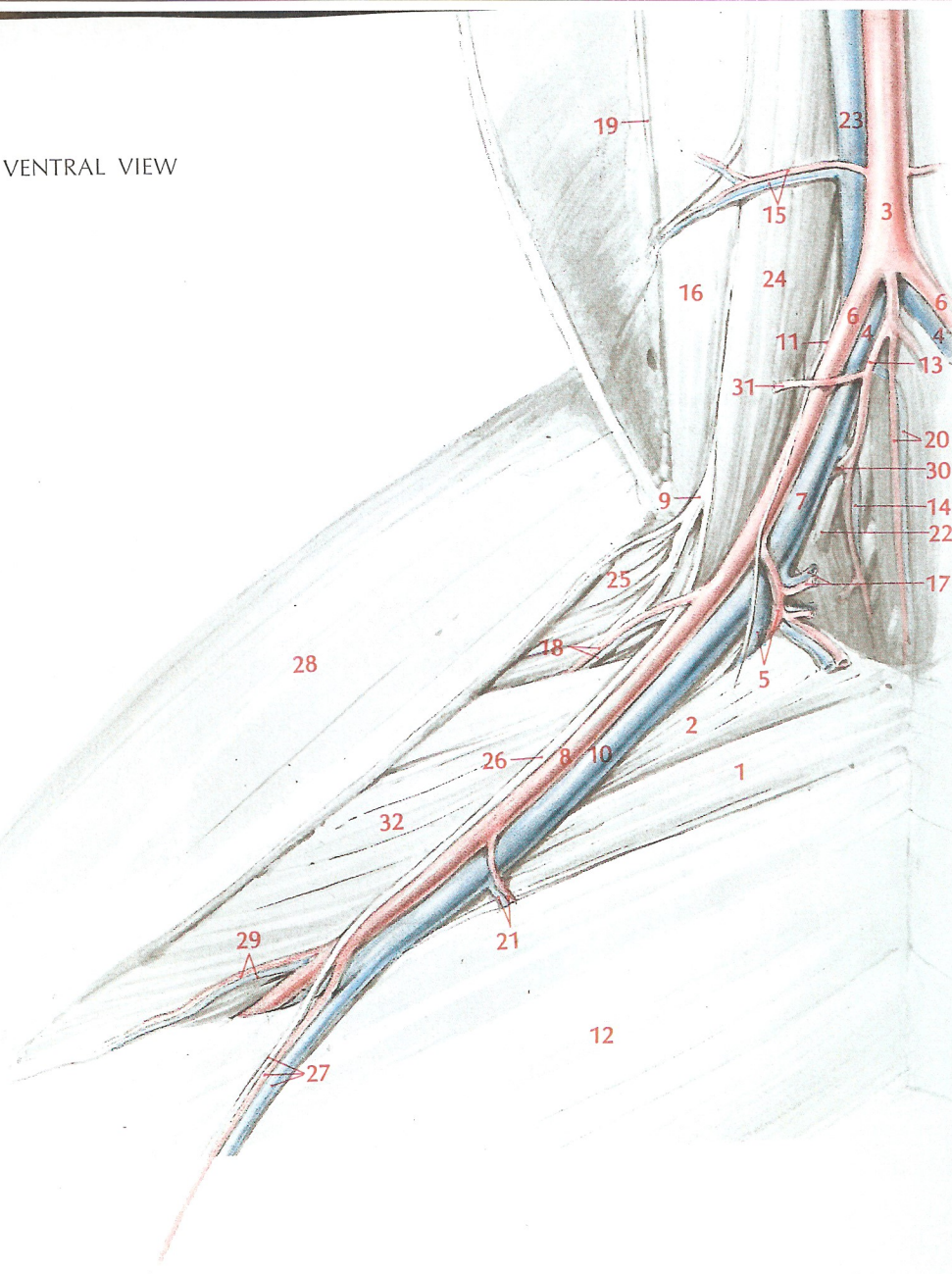


FIG. 50.

VESSELS OF THE PELVIS AND THIGH, VENTRAL VIEW

- 1 adductor femoris
- 2 adductor longus
- 3 aorta
- 4 common iliac vein
- 5 deep femoral artery and vein
- 6 external iliac artery
- 7 external iliac vein
- 8 femoral artery
- 9 femoral nerve
- 10 femoral vein
- 11 genitofemoral nerve
- 12 gracilis
- 13 hypogastric artery
- 14 hypogastric vein
- 15 iliolumbar artery and vein
- 16 iliopsoas
- 17 inferior epigastric artery and vein
- 18 lateral femoral circumflex artery and vein
- 19 medial branch of third lumbar nerve
- 20 median sacral artery and vein
- 21 muscular branches of femoral artery and vein
- 22 obturator nerve
- 23 postcava
- 24 psoas minor
- 25 rectus femoris
- 26 saphenous nerve
- 27 saphenous nerve, artery, and vein
- 28 sartorius
- 29 superior articular artery and vein
- 30 superior gluteal artery
- 31 umbilical artery
- 32 vastus medialis

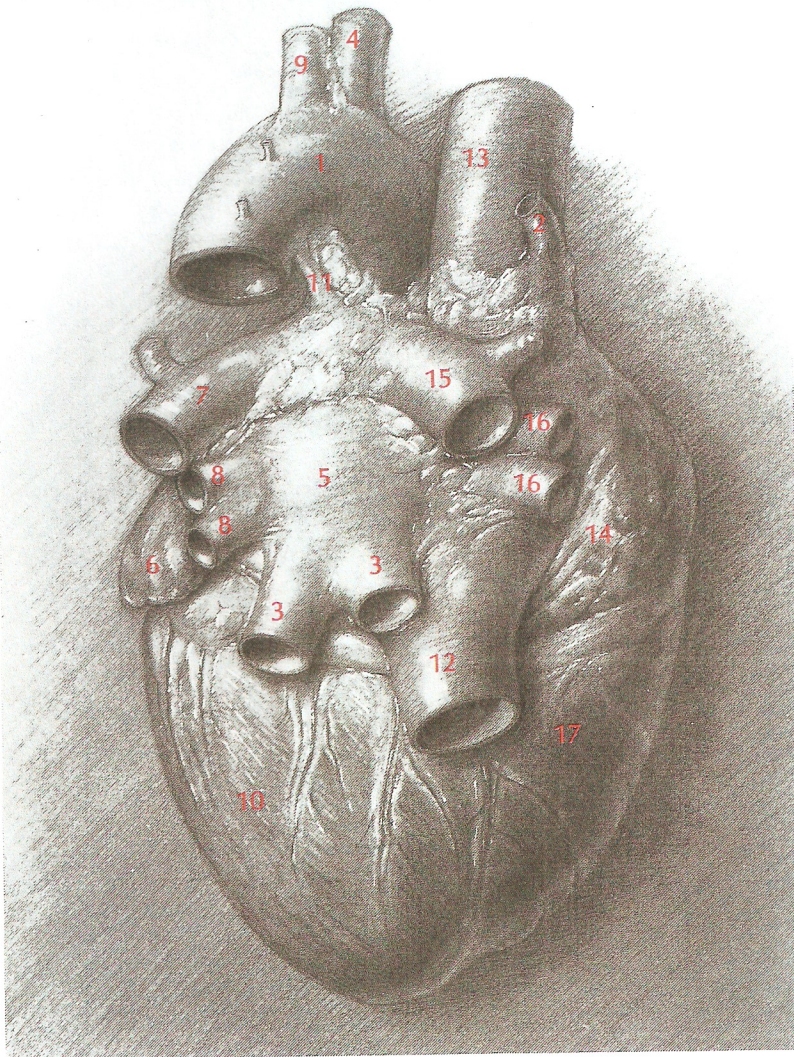


This branch is small in the male; in the female it is the prominent uterine artery, which passes anteriorly along the body of the uterus and the uterine horn, extending to the anterior end of the horn and anastomosing with a branch of the ovarian artery. The terminal branch of the hypogastric is the inferior gluteal artery. It follows the sciatic nerve, dividing into several branches.

Trim away the medial border of the sartorius muscle and clear away fat and connective tissue as necessary to identify the structures illustrated in Figure 50.

Just before leaving the abdominal cavity the external iliac artery gives off the deep femoral artery, which passes between the iliopsoas and the pectineus to supply the muscles of the thigh. Near its origin it gives off several branches. One of these is the inferior epigastric artery, which passes anteriorly on the inner surface of the rectus abdominis muscle, and anastomoses with the terminal branches of the internal mammary artery. One branch of the deep femoral passes to the bladder, and another pierces the abdominal wall to ramify on the medial aspect of the thigh, contributing a small vessel (the external spermatic artery) to the spermatic cord.

FIG. 51.
DORSAL VIEW OF THE
HEART OF THE CAT



- 1 aorta
- 2 azygos vein
- 3 dorsal pulmonary vein
- 4 innominate artery
- 5 left atrium
- 6 left auricle
- 7 left pulmonary artery
- 8 left pulmonary veins
- 9 left subclavian artery
- 10 left ventricle
- 11 ligamentum arteriosum
- 12 postcava
- 13 precava
- 14 right atrium
- 15 right pulmonary artery
- 16 right pulmonary veins
- 17 right ventricle

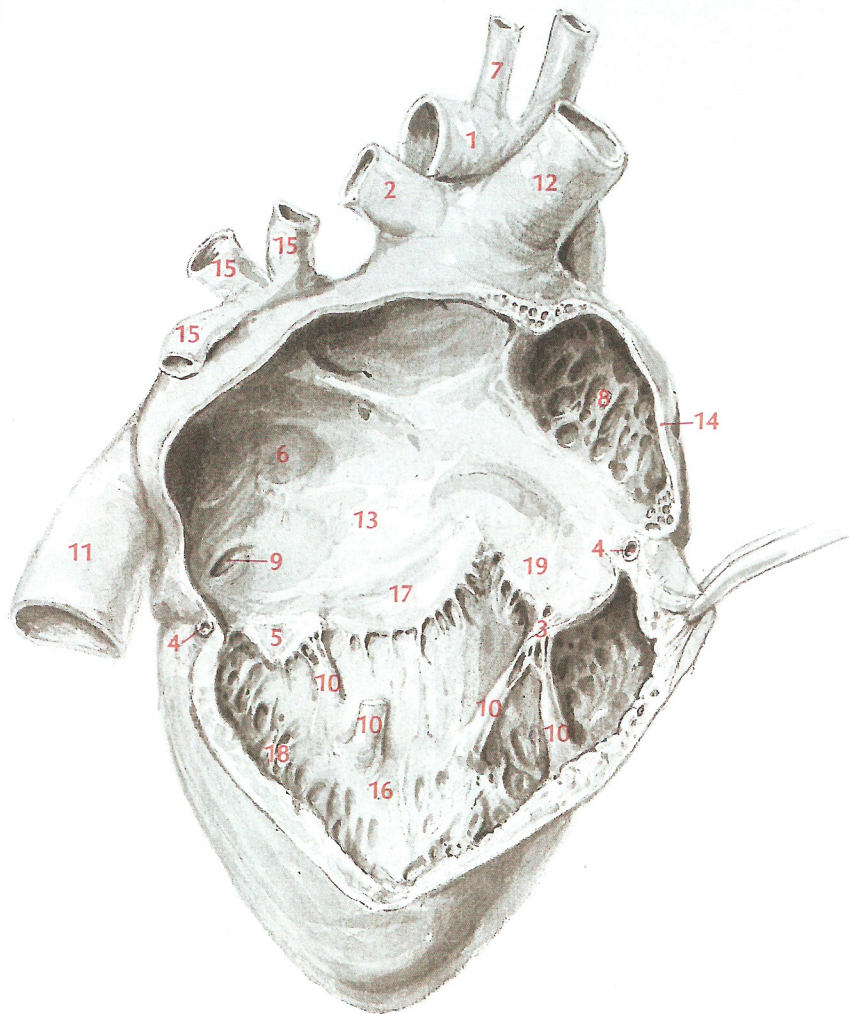
The external iliac artery continues outside the abdominal cavity as the femoral artery, lying on the medial surface of the thigh. Its first branch is the lateral femoral circumflex artery, which passes laterally between the rectus femoris and the vastus medialis. About the middle of the thigh a large muscular branch is given off medially. Near the knee the superior articular artery is given off laterally; it passes toward the knee. At about the same point the saphenous artery is given off medially. It follows a superficial course along the medial surface of the lower limb as far as the foot. The femoral artery then passes between the vastus medialis and the semimembranosus. It continues as the popliteal artery (in the region of the knee) and then branches into anterior and posterior tibial arteries to supply the lower limb and foot. The veins of the pelvis and thigh correspond to the arteries, except that the hypogastric vein joins the external iliac vein directly to form the common iliac vein; notice that there is no common iliac artery in the cat.

Remove the heart, leaving as much as possible of the pulmonary vessels attached to the heart. Remove connective tissue and fat as necessary to identify the vessels illustrated in Figure 51.

Trim away the lateral wall of the right atrium and remove any coagulated blood and latex found within. Probe the precava

FIG. 52.

THE RIGHT ATRIUM AND RIGHT VENTRICLE



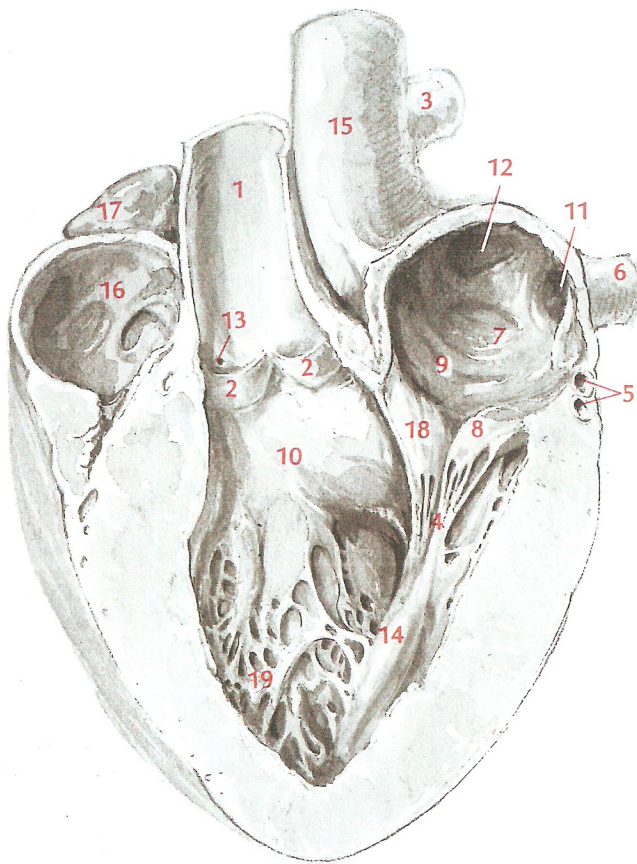
- 1 aorta
- 2 azygos vein
- 3 chordae tendineae
- 4 coronary artery
- 5 dorsal cusp of tricuspid valve
- 6 fossa ovalis
- 7 left subclavian artery
- 8 muscoli pectinati
- 9 opening of coronary sinus
- 10 papillary muscles
- 11 postcava
- 12 precava
- 13 right atrium
- 14 right auricle
- 15 right pulmonary veins
- 16 right ventricle
- 17 septal cusp of tricuspid valve
- 18 trabeculae carneae
- 19 ventral cusp of tricuspid valve

and postcava, observing that they both empty into the right atrium. In the dorsal atrial wall, just caudal to the opening of the postcava, find a small oblong opening guarded by a valve. This is the opening of the coronary sinus, via which blood returns from the coronary veins to the right atrium. Probe the opening, observing that it leads to a venous channel on the dorsal side of the heart. This channel is the coronary sinus; most of the veins of the heart empty into it.

The term *auricle* is applied to the portion of the atrial wall that forms a flap-like extension projecting ventrally over the coronary vessels. Observe the delicate strands which form a network on its inner surface; they are termed the muscoli pectinati. Near the opening of the postcava find the fossa ovalis, a shallow oval depression in the medial wall of the atrium. This is the site of the foramen ovale in fetal life. Soon after birth the foramen ovale is closed by a membrane, which completely separates the right and left atria. The right atrioventricular opening is guarded by the tricuspid valve. Observe its cranial surface; then cut open the right ventricle and trim away portions of the ventricular wall to make a dissection similar to Figure 52. The tricuspid valve consists of three cusps named according to their positions: dorsal, ventral, and septal. Slender strands termed chordae tendineae are connected to the

DISSECTION OF RIGHT VENTRICLE

FIG. 53.
THE LEFT ATRIUM AND LEFT VENTRICLE



- 1 aorta
- 2 aortic semilunar valves
- 3 azygos vein
- 4 chordae tendineae
- 5 coronary artery and vein
- 6 dorsal pulmonary vein
- 7 fossa ovalis
- 8 lateral cusp of bicuspid valve
- 9 left atrium
- 10 left ventricle
- 11 opening of dorsal pulmonary vein
- 12 opening of right pulmonary vein
- 13 origin of right coronary artery
- 14 papillary muscle
- 15 precava
- 16 right atrium
- 17 right auricle
- 18 septal cusp of bicuspid valve
- 19 trabeculae carneae

DISSECTION OF LEFT ATRIUM AND VENTRICLE

free margins of the cusps. These strands connect the septal cusp directly to the ventricular septum, and attach the dorsal and ventral cusps to muscular projections termed papillary muscles. The irregular muscular strands on the inner wall of the ventricle are termed trabeculae carneae.

Make a slit in the ventral wall of the right ventricle and the pulmonary artery. Observe the three pulmonary semilunar valves at the base of the pulmonary artery.

Referring to Figure 53, remove the pulmonary artery and trim away the lateral walls of the left atrium and ventricle. Cut the medial wall of the left atrium and make a slit in the left lateral wall of the aorta, observing the three aortic semilunar valves at the base of the aorta. Near two of the semilunar valves find the openings of the coronary arteries. The right and left atria are completely separated by the interatrial septum. Similarly, the right and left ventricles are completely separated by the interventricular septum. If the interatrial septum is observed by transmitted light, it will be seen that the fossa ovalis is the thinnest part of the septum.

Trace the pulmonary veins to their openings into the left atrium. The left atrioventricular opening is guarded by the bicuspid valve, consisting of two cusps, septal and lateral. Both cusps are attached to the ventricular wall by chordae tendineae and papillary muscles. Note that the wall of the left ventricle is considerably thicker than the wall of the right ventricle.