

Fig. 19-42. Schematic illustration of the regions on the front leg in the dog (lateral view).

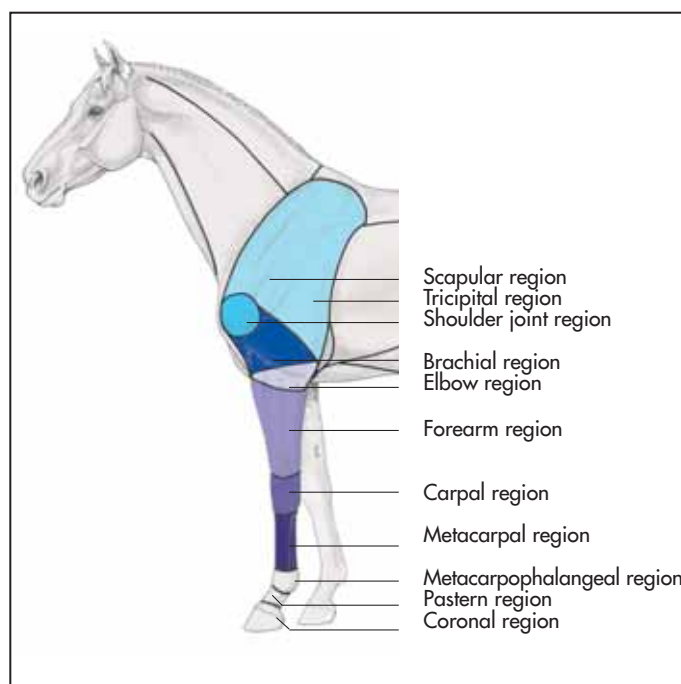


Fig. 19-43. Schematic illustration of the regions on the front leg in the horse (lateral view).

Surgery of the copulatory organ

Surgical procedures on the copulatory organ require not only **anaesthesia of the penis**, but also of the **prepuce**. To accomplish this, a nerve block is performed on the pudendal nerve and the first four ventral branches of the lumbar nerves. A nerve block of the left and right pudendal nerves allows the penis to be extruded. In the ox, this nerve block is carried out in the perineal region, approximately a hand's width ventral to the anus and left and right in the middle between the ischial tuberosity and the perineum.

In male cats, the penis is directed caudally. In the case of urolithiasis, a perineal urethrostomy is performed. The urethra is exposed and incised, and the distal part of the penis transected.

Examination of the udder

The **udder** is clinically important in large female animals, especially in the cow, for economic reasons. In examining the udder, it is important to determine the location and size of the superficial inguinal (mammary) lymph nodes. In carnivores and pigs, the lymph nodes of the cranial mammary complexes belong to the axillary lymphocentre, and those of the caudal mammary complexes belong to the superficial inguinal lymphocentre. In cows, the superficial inguinal lymphocentre includes the superficial and the deep inguinal lymph nodes. The **superficial inguinal lymph node** is approximately 7 cm long, 5 cm wide and 2 cm thick, and is easily palpated. Palpation of this lymph node is possible by standing behind the cow and palpating with both hands between the base of the udder and the inside of the thigh dorsal as far as possible.

The **vascularisation** of the udder is very important for the **milk production**. The main artery, the external pudendal artery, reaches the udder basis through the inguinal canal. Before it reaches the udder basis, it builds a siphon-like, S-shaped flexure. The voluminous external pudendal vein accompanies the artery. Cranial to the udder basis is the abdominal subcutaneous vein. A branch of the internal pudendal vein, the caudal labial or mammary vein, caudally approaches the udder basis. Because of the direction of the vein valves, this vessel apparently does not carry venous blood away from the udder, but towards it. In the sow, the bitch and the queen, the mammary complexes extend from the thoracic to the inguinal regions. Two symmetrical, bilateral rows are separated in the midline by the intermammary zone. During the suckling period, the mammary glands have increased so much in size so that they touch across the intermammary zone. In female dogs, often the entire mammary chain must be removed due to mammary neoplasia.

Forelimb or thoracic limb (membra thoracica)

Regions

The regions of the forelimbs are (Fig. 19-42 to 45):

- the scapular region,
- the shoulder joint region and the axillary region,
- the lateral brachial region,
- the medial brachial region,

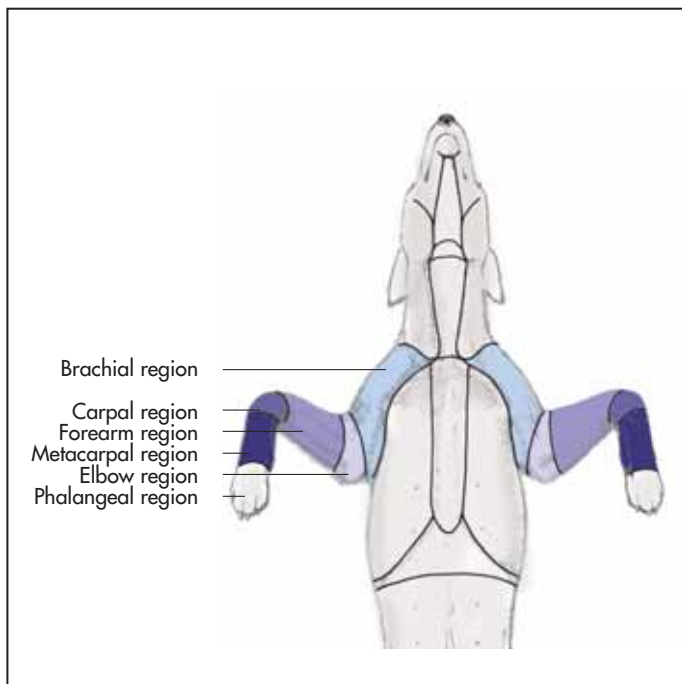


Fig. 19-44. Schematic illustration of the regions on the front legs in the dog (ventral view).

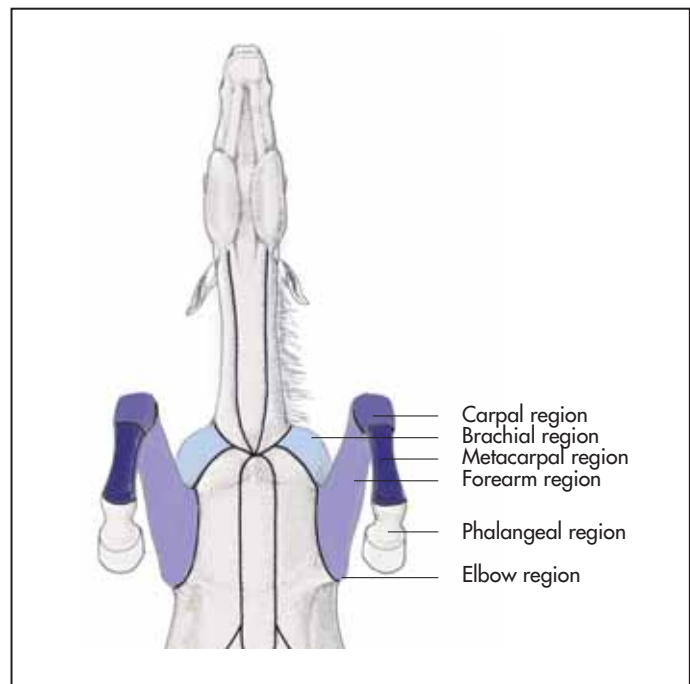


Fig. 19-45. Schematic illustration of the regions on the front legs in the horse (ventral view).

- the elbow region,
- the forearm region with:
 - the cranial forearm region,
 - the medial forearm region,
 - the caudal forearm region,
- the carpal region, and
- the metacarpal region and the digital regions.

Scapular region

The scapular region covers the shoulder blade and the scapular cartilage. The dorsal half of the skin is innervated by the dorsal branches of the cervical nerves. These nerves curve around the scapular cartilage or the dorsal margin of the scapula. The cranioventral section of the skin is innervated by the supraclavicular nerves, and the caudoventral section is innervated by the intercostobrachial nerve. Beneath the skin are the trapezius muscle, the omotransverse muscle (not in the horse), and the deltoid muscle. The second muscle layer contains the supraspinous muscle, the infraspinous muscle, and the teres minor muscle, the last of which is situated beneath the deltoid muscle. The subscapular artery and vein (arising from the axillary artery and vein) runs, along the caudal margin of the scapula.

The circumflex artery of the scapula arises from the subscapular artery and divides into a medial and lateral branch. The thick suprascapular nerve (a branch of the brachial plexus) runs laterally over the scapula and innervates the supraspinous and infraspinous muscles. This nerve is much more susceptible to injury due to blunt trauma in animals without an acromion than in animals with an acromion. This

nerve is accompanied by a small branch of the axillary artery – the suprascapular artery. The medial surface of the scapula is covered by the subscapular muscle, which is innervated by the numerous subscapular nerves (branches of the brachial plexus). The ventral serrate muscle and the rhomboid muscle are found on the dorsal and medial margins of the scapula and the scapula cartilage. The teres major muscle and the long head of the triceps muscle attach to the caudal margin of the scapula.

Shoulder joint and axillary regions

The region of the shoulder joint is laterally visible and palpable. The brachial plexus is located on the medial surface of the shoulder joint region, in the distal third of the scapula. The plexus is located in the deeper layers of this region and can be accessed medially (Fig. 19-46).

Musculature

The shoulder joint does not contain ligaments. They are replaced laterally by the infraspinous muscle tendon and medially by the subscapular muscle tendon, both of which function as contractile ligaments. An extensive synovial bursa underlies the tendon of the infraspinous muscle. The biceps muscle of the arm is situated cranial to the shoulder joint and glides through the intertubercular groove with the help of either a tendon sheath (in dogs and cats) or the intertubercular bursa (in horses and cows). In small animals, the tendon is held in place by the transverse ligament of the humerus. Other muscles found in this region: the deltoid and teres minor muscles laterally, the teres major and coracobrachial muscles medially, and the cleidobrachial muscle cranially.

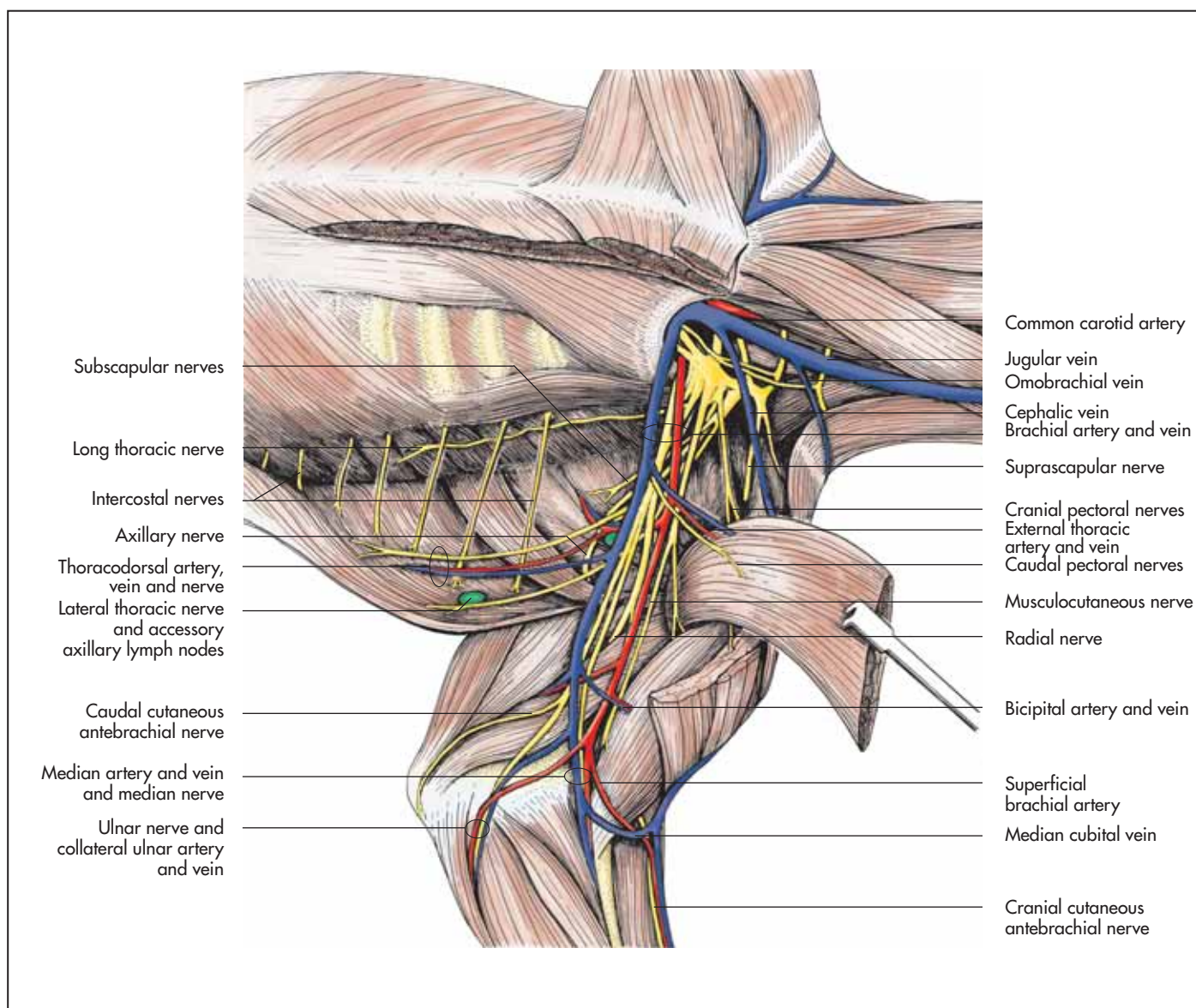


Fig. 19-46. Schematic illustration of the brachial plexus in the dog (ventrolateral view).

The axillary region can be accessed medially to the shoulder joint. This region is covered by the pectoral muscles. Both muscles of the superficial pectoral muscles are subcutaneously found here (cranially, the descending pectoral muscle and caudally, the transverse pectoral muscle). The superficial pectoral muscles cover the underlying deep pectoral muscle.

Blood vessels

The following blood vessels are present in this region: the axillary artery, the cranial and caudal circumflex arteries of the humerus and the suprascapular artery.

Nerves

The following nerves are also found in this region: suprascapular nerve, cranial pectoral nerves, subscapular nerves, the caudal pectoral nerves, the thoracodorsal nerve, the long thoracic nerve, the lateral thoracic nerve and the axillary nerve.

Brachial plexus

The nerves forming the brachial plexus innervate the forelimbs and part of the wall of the trunk. These nerves originate from the ventral branches of both the last three cervical spinal nerves and the first two thoracic spinal nerves. Fibres from the sympathetic trunk and the stellate ganglion also contribute to the plexus. The roots of the plexus reach the medial surface of the scapula cranially to the first rib through the middle and ventral portions of the scalenus muscle. The axillary artery and vein leave the thoracic cavity cranially to the first rib as well. The axillary lymph nodes are found at the point where the axillary artery divides into the brachial and subscapular arteries.

Lateral brachial region

The region of the upper arm is equivalent to the humerus; i.e., it reaches from the greater tuberosity to the lateral epicondyle

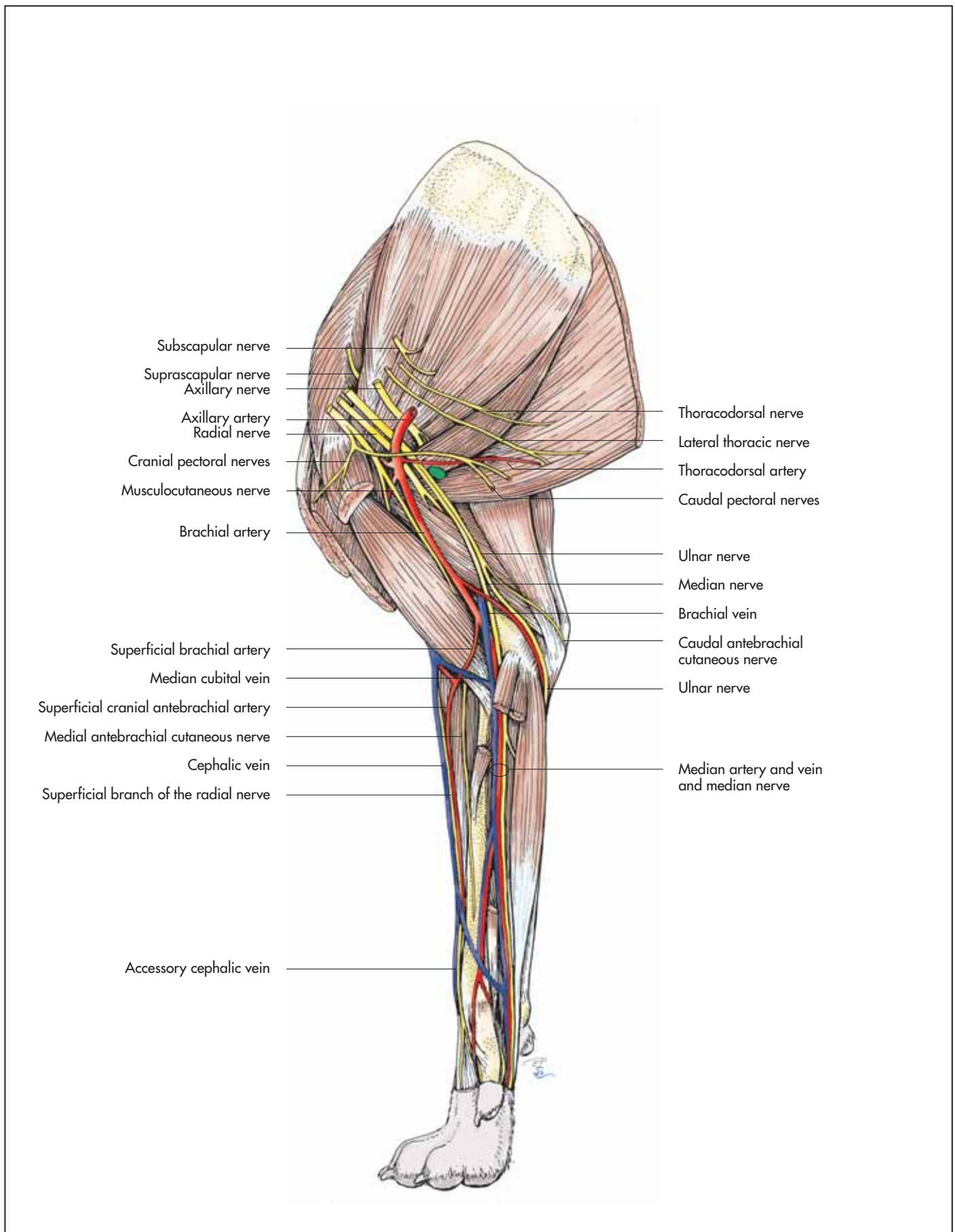


Fig. 19-47. Topography of the blood vessels and nerve tracts of the thoracic limb in the dog (medial view, schematic).

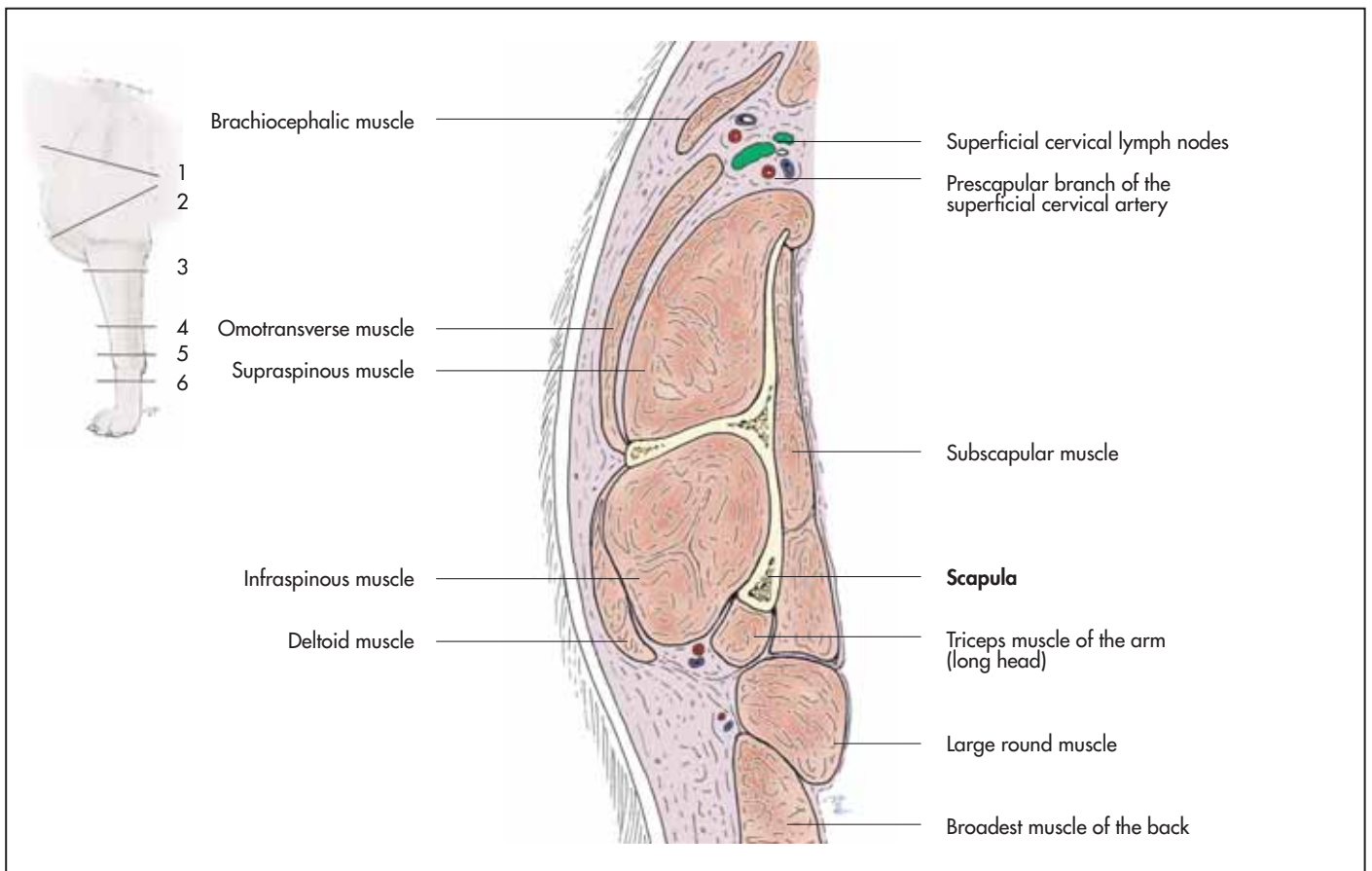


Fig. 19-48. Sectional anatomy of the left front leg in a dog (level of cross section 1 of the scapular region, see insert, schematic).

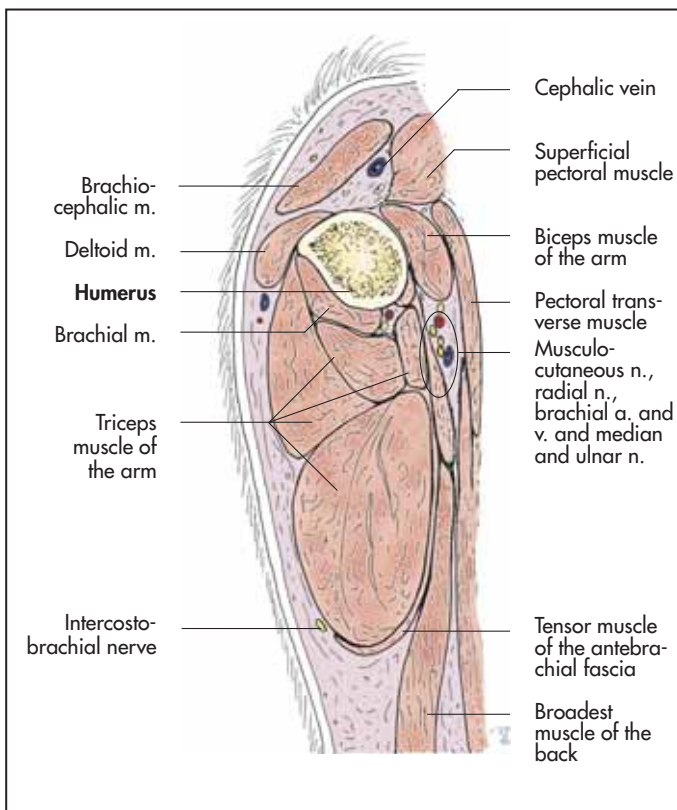


Fig. 19-49. Sectional anatomy of the left front leg in a dog (level of cross section 2 of the brachial region, see insert in Fig. 19-48, schematic).

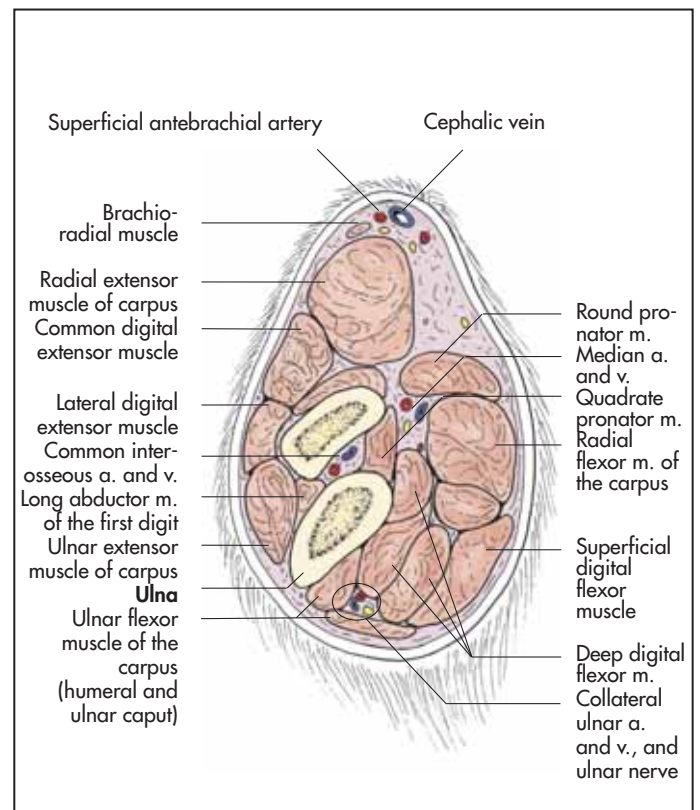


Fig. 19-50. Sectional anatomy of the left front leg in a dog (level of cross section 3 of the proximal region of the forearm, see insert in Fig. 19-48, schematic).