Topographic anatomy of the dog
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Introduction

This topographic anatomy textbook of the dog is intended for the students of natural sciences and students of the Faculty of Veterinary Medicine and the Faculty of Veterinary Hygiene and Ecology of the VFU Brno. In addition, to the systematic study of anatomy it also deals with the detailed description of the various organ systems. It is also recommended for the use by veterinary practitioners because it provides a synopsis of all areas concerned. Topographic anatomy studies the interrelationships of organs and other anatomical structures, their spatial organization within body cavities and in the regions of the body.

The textbook is divided into seven chapters according to individual body parts. The introduction to each chapter contains a list of the regions followed by a specific description of the area and concluded with a detailed synopsis of the blood vessels, nerves and lymph nodes which can be found in the particular part of the body. Each regio is first defined in relation to their surroundings followed by a description of all the structures from the bone base through to the muscle layer and particular organs up to the skin, including their blood supply, innervations and lymphatic drainage. The chapters are complemented with diagrams and pictures. Each chapter is followed the section for taking necessary notes.

The information presented on a dogs’ body is far from exhaustive. There are many differences between breeds of dogs that are not included here. This is a general synopsis and provides a basic anatomical topography of the dog which should follow and supplement the systematic study of the anatomy of the dog in the first year of veterinary anatomy study. For senior students, the textbook provides a synopsis of, and is a tool for the rapid revision of, anatomical knowledge.

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Team of authors
1. Head, Caput

The boundary between the neck and head goes through the atlantooccipital joint and touches the caudal edge of *ramus mandibulae*. From the topographical point of view, the head can be divided into the brain and facial parts. The boundaries between them connects the supraorbital margins, continues along the upper edge of the zygomatic arch to the bottom of the ear lobe up to the *protuberantia occipitalis externa* of the occipital bone.

The underlying bone of the head is the skull. The part of the skull that houses the brain is often referred to as the *cranium*, and the facial part as the *facies*. This corresponds to the breakdown of the areas into the *regiones cranii* covering the brain and *regiones faciei*, the facial areas.

**REGIONES CRANII**
- Regio frontalis
- Regio parietalis
- Regio occipitalis
- Regio temporalis
- Regio auricularis

**REGIONES FACIEI**
- Regio nasalis
  - Regio dorsalis nasi
  - Regio lateralis nasi
  - Regio naris
- Regio oralis
  - Regio labialis superior
  - Regio labialis inferior
- Regio mentalis
- Regio orbitalis
- Regio zygomatica
- Regio infraorbitalis
- Regio articulationis temporomandibularis
- Regio masseterica
- Regio buccalis
- Regio maxillaris
- Regio mandibularis
- Regio intermandibularis
1.7 REGIO MENTALIS

The underlying bone of the chin area is a combination of both mandibles in *symphysis mandibulae* and the rostral part of the mandible body, which contains the *foramina mentalia*. Only the mimic muscle *m. mentalis* is located in this area which is innervated by the *r. buccalis n. facialis*. Blood vessels and sensitive nerves emerge here from the *foramina mentalia, a.et v. mentalis (a. alveolaris inf)* and *n. mentalis of n. alveolaris inf. (n. mandibularis)*.

1.8 REGIO ORBITALIS

The surface of the orbital region is overlaid by the upper and lower lids, *palpebra superior et inferior*. The muscles forming the basis of the eyelids in a dog are the *m. orbicularis oculi* which is attached to the lacrimal bone by the so-called Horner muscle, then the *m. levator anguli oculi medialis, m. levator palpebrae superior, m. frontalis* and *m. retractor anguli oculi*. With exception to the *m. levator palpebrae superior* which is innervated by the *n. oculomotorius*, all other muscles are innervated by the *n. facialis*. The eyelids are reinforced by tarsal discs, *tarsus superior et inferior*. In the medial corner of the eye there is the third eyelid, *palpebra tertia*, its medial surface being crowded by the lymphoreticular tissue, the part of which is *glandula lacrimalis palpebrae tertiae*. The surface of the eyelids is covered with skin, the innermost layer of the eyelid is conjunctiva, *tunica conjunctiva*.

Eyelids get blood laterally from the *a. palpebralis inferior et superior lateralis* (originating from the *a. temporalis superf.*), and medially from *a. palpebralis inferior et superior medialis* (from *a. malaris*). The third eyelid is supplied by the *a. palpebrae tertiae* (a. *malaris*). Venous blood goes from the cap through the *v. angularis oculi* into the *v. facialis*. The sensitive innervations of the eyelids are provided by the *n. ophthalmicus* and its branches *n. lacrimalis, n. frontalis (n. supratrochlearis)* and *n. zygomaticus (n. zygomaticofacialis)*.

The entrance into orbita, *aditus orbitae*, is posteriorly and medially bordered by the *os frontale*, medially by the *os lacrimale*, ventrally and laterally by the *os zygomaticum* and laterally by the *lig. orbitale* which connects *processus zygomaticus ossis frontalis* to *processus frontalis ossis zygomatici*. The medial wall of the orbita is formed by the *os lacrimale*, *laminate orbitalis ossis frontalis*, and *ala ossis prefrontalis*. On this wall there are the *fossa sacci lacrimalis, foramina ethmoidalia, fissure orbitalis* and *canalis opticus*. The ceiling of the orbita is formed by the *processus zygomaticus ossis frontalis*, where the *fossa glandulae lacrimalis* occur. The orbita is dorsolaterally attached by the medial surface of the *m. temporalis* and *lig. orbitale*. The bottom of the orbita consists of only soft tissues, two thirds by *glandula zygomatica*.

The contents of the orbita are the eyeball, nerves and blood vessels and accessory organs of the eye. *Glandula lacrimalis* is located at the dorsolateral corner of the eye. The fibroelastic fascia lining of the eye socket, *periorbita*, divides the functional orbital fat into intraperiorbital and extraperiorbital bodies. Around the perimeter of the *canalis opticus* run four straight muscles, namely the *m. rectus dorsalis, medialis, lateralis*, and *ventralis*. All the direct eye moving muscles, with exception to the lateral one, are innervated by the *n. oculomotorius* while the *n. abducens* innervates the *m. rectus lateralis* and *m. retractor bulbi*. The *m. obliquus dorsalis* passes close to the *foramen ethmoidale*, which is innervated by the *n. trochlearis*. The second oblique muscle, *m. obliquus ventralis*, leaves the medial wall of the orbita and is also innervated by *n. oculomotorius*. On the ceiling of the orbit, between the *periorbita* and the *m. rectus dorsalis*, runs the *m. levator palpebrae superioris*. It is also innervated by the *n. oculomotorius*. The eyeball is surrounded by *vagina bulbi* (Tenon’s fascia) separating it from the orbital fat. Between the sclera and fascia is the episcleral space which is filled with rare connective tissue.

The orbital nerves enter the orbita through the fissure, *fissura orbitalis*. They are namely the *n. oculomotorius, n. trochlearis, n. abducens* and *n. ophthalmicus* from *n. trigeminus*. The
Lymphocenters of the neck

LYMPHOCENTRUM CERVICALE SUPERFICIALE

Two palpable lymph nodes (ie. prescapular lymph nodes) which lie in the regio prescapularis are covered by the m. cleidocervicalis and m. omotransversarius. They collect the lymph from the pharynx, from the lateral side of the neck and the proximal part of the thoracic limb.

LYMPHOCENTRUM CERVICALE PROFUNDUM

Lymph nodes scattered along the dorsolateral side of the trachea collect the lymph from the ventral side of the neck, of the neck muscles, larynx, thyroid gland, parathyroid glands, oesophagus, trachea, and thymus. The inn. cervicales profundi craniales are standardly found in a dog, whereas inn. cervicales profundi mediales et caudales inconsistently.

SUPERFICIAL NERVES OF THE NECK - LATERAL VIEW

N. accessorius

N. auricularis caudalis

Platysma

M. cleidocervicalis

M. trapezius

Ramus ventralis C4

V. jugularis externa

Gl. mandibularis

N. auricularis magnus

N. transversus colli

Ramus ventralis C2

Ramus ventralis C3

Ramus colli n. facialis

Gl. parotis

R. buccalis ventralis
Innervation of the thoracic limb

**Plexus brachialis** originates from *rami ventrales* of spinal nerves C6–Th2, whose nerve fibers are interconnected. Large nerves for the thoracic limb originate from *plexus brachialis*.

**N. AXILLARIS** (C7–8) – for *m. teres major*, caudal part of *m. subscapularis* and shoulder joint, following a descend deep below the *caput longum m. tricipitis brachii* ending laterally on the shoulder joint where it innervates *m. teres minor* and *m. deltoideus* and forms cutaneous branch which on the caudal edge of the *m. deltoideus* follows *v. axillobrachialis*

——— **Rr. musculares**
——— **N. cutaneus brachii lateralis cranialis**
——— **N. cutaneus antebrachii medialis**

**N. AXILLARIS ACCESSORIUS (N. BRACHIOCEPHALICUS, C6)** – is the most cranial nerve of *plexus brachialis*; innervates *m. cleidobrachialis* and then continues as a cutaneous nerve

**N. SUBSCAPULARIS** (C6–7) – for *m. subscapularis*

**N. SUPRASCAPULARIS** (C6–7) – courses laterally, deep between *m. subscapularis* and *m. supraspinatus*, cranially it courses over the *collum scapulae* and follows lateral surface of the scapula and innervates *m. supraspinatus* and *m. infraspinatus*

**N. MUSCULOCUTANEOUS** (C6–Th1) – follows *a. brachialis* along its cranial edge and about a finger width proximally above the elbow joint creates a communicating branch with *n. medianus*

——— **R. muscularis proximalis** – for *m. coracobrachialis* and *m. biceps brachii*

——— **R. communicans cum n. mediano**

——— **R. muscularis distalis** – for *m. brachialis* and for distal craniomedical part of the *m. biceps brachii*

——— **N. cutaneus antebrachii medialis** – courses craniodistally between *m. biceps brachii* and *m. brachialis* to the subcutaneous layer and innervates craniomedical aspect of the antebrachium

**N. RADIALIS** (C7–Th2) – courses distally deep below *m. teres major*, branches off a small branch for *m. tensor fasciae antebrachii* and enters triceps muscle between its *caput mediale et caput longum m. tricipitis brachii* which it innervates

– innervates all the extensor muscles of the elbow, carpus and digits

——— **Rr. musculares** – for *m. triceps brachii*, *m. anconeus*, *m. tensor fasciae antebrachii*

——— **N. cutaneus brachii lateralis caudalis**

——— **R. profundus** – for *m. extensor carpi radialis et ulnaris*, *m. extensor digitorum communis et lateralis*, *m. abductor digiti I longus*, *m. supinator* and *m. brachioradialis*

——— **Rr. musculares**