

Fig 7-42. Paramedian section of the neck and head of a cat (König, 1992).

The **soft palate** (palatinum molle, velum palatinum) separates the rostral part of the pharynx into a dorsal and ventral portion. The part above the soft palate is referred to as the nasopharynx, the ventral compartment as the oropharynx. The two portions meet in the **intraparyngeal opening** (ostium intrapharyngeum), which is formed by the free border of the **soft palate** (arcus veli palatini) and the **palatopharyngeal arches**, which connect the soft palate to adjacent structures caudally. The caudal continuation, common to both, the nasopharynx and the oropharynx, is known as the **laryngopharynx**. The **nasopharynx** extends dorsal to the soft palate from the choanae to the intrapharyngeal opening. It is lined by respiratory mucosa and does not take part in the swallowing process, but forms the passive pathway for airflow (Fig.7-47). In ungulates the nasopharynx extends caudodorsally to form the pharyngeal recess. In the pig a blind-ending, mucosal pouch, the pharyngeal diverticulum, arises from the pharyngeal wall dorsal to the entrance of the esophagus.

The **isthmus of the faucium** extends ventral to the soft palate from the oral cavity to the intrapharyngeal opening. It is bordered dorsally by the soft palate, ventrally by the root of the tongue and laterally by the palatoglossal arches, a pair of folds from the soft palate to the adjacent tissue. It is lined by the stratified squamous epithelium of the oral mucosa.

The **laryngopharynx** extends from the intrapharyngeal opening to the entrance of the esophagus and the larynx. The epiglottis protrudes into the laryngopharynx and is flanked by the piriform recesses on either side, which serve as gutters for fluids. The caudal part of the laryngopharynx, which ends with the entrance into the esophagus, is referred to as the esophageal part of the pharynx. In the dog the pharyngo-esophageal junction is marked by an **annular mucosal bound-**

**ary** (limen pharyngo-esophageum). Several openings form into the pharyngeal cavity:

- ♦ Paired choanae between the nasal cavity and the nasopharynx,
- ♦ Isthmus of the fauces (isthmus faucium) between the oral cavity and the oropharynx,
- ♦ Entrance into the auditory (Eustachia) tubes, connecting the nasopharynx and the middle ear,
- ♦ Entrance into the larynx (aditus laryngis) and
- ♦ Entrance into the esophagus (aditus oesophageus).

The wall of the pharynx is formed by striated muscles (muscles of the pharynx), which can be grouped into three categories based on their action: constriction, dilatation and those which shorten the pharynx. The constrictor muscles arise from certain fixed points to each side of the pharynx, run onto the roof of the pharynx and form a series of arches that enclose the lumen dorsally and laterally.

The constrictor muscles can be subdivided into:

- ♦ **Rostral constrictor muscles:**
  - Pterygopharyngeal muscles (mm. pterygopharyngei) originating from the pterygoid,
  - Palatopharyngeal muscle (m. palatopharyngeus) originating from the aponeurosis of the soft palate.

The rostral constrictor muscles have many fibres, which are orientated in a longitudinal direction, thus assist in shortening the pharynx.

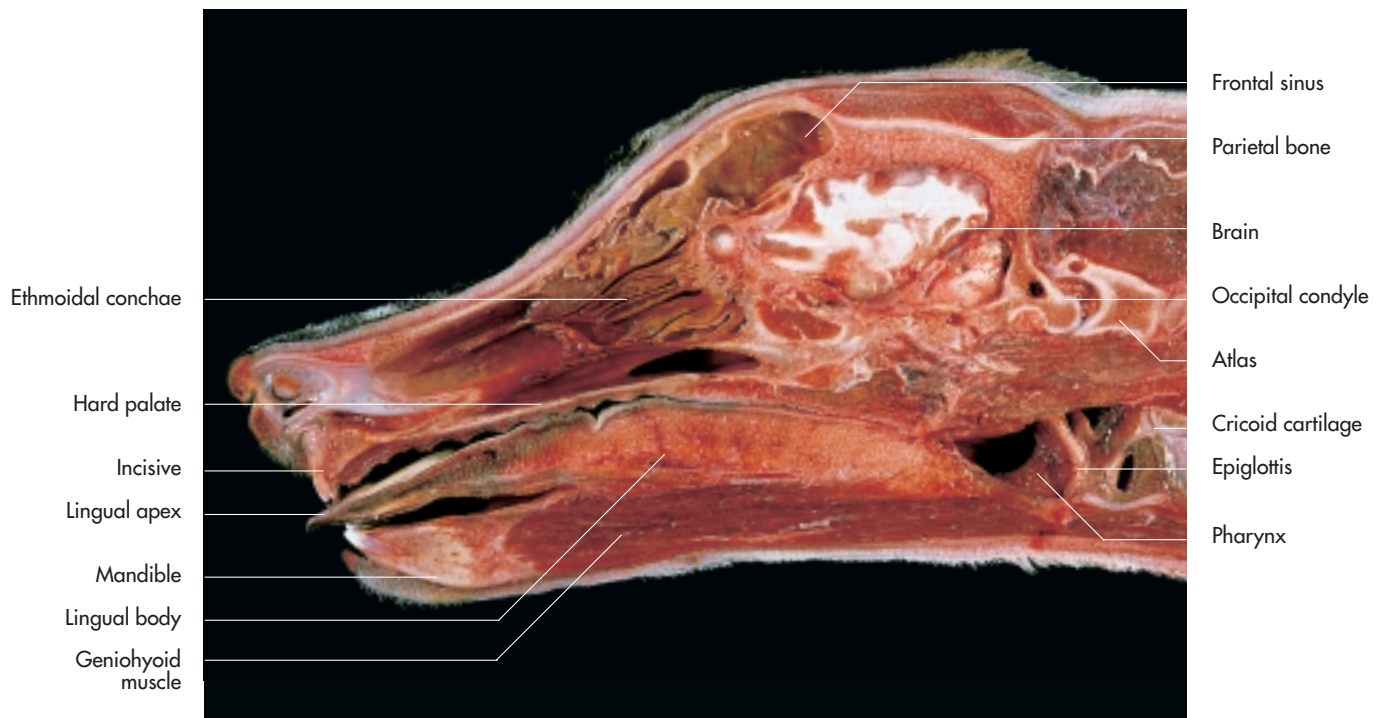


Fig 7-43. Paramedian section of the neck and head of a dog.

- ♦ **Middle constrictor muscle:**
  - Hyopharyngeal muscle (m. hyopharyngeus), originating from the hyoid bone.
- ♦ **Caudal constrictor muscles:**
  - Thyropharyngeal muscle (m. thyropharyngeus), originating from the thyroid cartilage,
  - Cricopharyngeal muscle (m. cricopharyngeus), originating from the cricoid cartilage.

In contrast to the group of constrictor muscles, there is only a single muscle responsible for dilating the pharynx: the caudal stylopharyngeal muscle, which arises from the hyoid bone to fan out in the pharyngeal wall.

### Deglutition (swallowing)

Deglutition describes the process by which a bolus of food is transferred from the oral cavity through the pharynx into the esophagus and finally into the stomach. It can be divided into two stages. The first stage is the voluntary act of mastication and the passage of the bolus of food into the oropharynx. This action involves a wave-like motion of the tongue against the palate, caused by the contraction of the mylohyoid, hyoglossal and styloglossal muscles while the jaws are closed. The second stage is initiated when the food bolus touches the pharyngeal mucosa, initiating reflexes of swallowing. The soft palate is elevated against the roof of the nasopharynx and the muscle bundles inside the palatopharyngeal arches contract, thus closing the intrapharyngeal opening. The tongue is raised, pressing against the soft palate to prevent food from re-entering the oral cavity. At the same time the hyoid apparatus and

the larynx are simultaneously drawn forward and the epiglottis is drawn back, protecting the laryngeal entrance. At this stage breathing is inhibited and the food passes over the epiglottis or in the case of fluids to each side of it. The ingested material is propelled into the esophagus by the successive contractions of the three contractors of the pharynx.

### Lymphatic structures of the pharynx (tonsils)

The pharyngeal walls contain a large amount of lymphoreticular tissue, which aggregates to form **lymph nodules** or **tonsils**. Tonsils consist of a multitude of subepithelial lymph nodules surrounded by a common soft-tissue capsule and have efferent lymphatics only. They form a ring of lymphatic tissue around the pharynx which provides an immunological barrier to protect the respiratory and alimentary systems. The pharyngeal tonsils can be grouped into palatine, pharyngeal, lingual, choanal and tubal tonsils based upon their location (Fig. 7-45 and 46).

The **lingual tonsil** (tonsilla lingualis) is located on either side of the root of the tongue and is especially well developed in the horse and the ox.

The **palatine tonsil** (tonsilla palatina) is situated in the lateral wall of the oropharynx. In carnivores it is located within a tonsillar fossa, the medial wall of which is formed by a fal-ciform fold from the soft palate, the tonsillar fold. Surgical removal of the palatine tonsil is indicated in some animals (**tonsillectomy**). It is not present in the pig. Another tonsil lies within the mucosa on the ventral surface of the soft palate and is especially well-developed in the horse and the pig. The pharyngeal tonsil is located on the roof of the nasopharynx. The