Histomorphochemical Studies on the Trachea of Dalmatian Dog

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SUMMARY

The present study was conducted on the trachea of six adult Dalmatian dogs. Samples were processed by routine paraffin technique. Histomorphological observations revealed that trachea was lined by pseudostratified columnar epithelium which consisted of basal, ciliated and mucous cells. Lamina propria was composed of lymphocytes, plasma cells and glands. Histochemical studies showed that the cartilaginous rims of trachea stained blue with PAS/AB while most glandular cells stained red with PAS.

Key words: Dog, Histomorphology, Trachea

Tracheal anatomy is pre-requisite for future biomedical investigations. Earlier studies reported mostly the histological aspects of trachea in laboratory rat (Choi et al., 2000 and Widdicombe et al., 2001), hamster (Kennedy et al., 1978) and rabbit (Plopper et al., 1984). However, information on tracheal morphology of Dalmatian dog is very scanty. The present investigation was therefore undertaken to elucidate its histomorphology and histochemistry.

The present study was conducted on six adult Dalmatian dogs. Tissue samples of trachea were collected and fixed in 10% neutral buffered formalin and were processed by routine paraffin technique. The sections of 5-7 µ were stained with haematoxylin and eosin and Masson’s trichrome (Luna, 1968) for general histomorphology, PAS and Alcian blue methods for demonstration of neutral and acid mucopolysaccharides (Sheehan and Hrapchak, 1973).

Trachea was lined with pseudostratified columnar epithelium which consisted of basal, ciliated and mucous cells (Figs.1, 2) as observed in rats by Reznik (1990). Basal cells were located at the basal portion of the epithelium and their processes occasionally passed towards the lumen. These cells were abundant and differentiated clearly. Apparently the change of basal cell into the definitive type of epithelial element occurred through an intermediate stage, represented by the intermediary cell. The latter were considerably less uniform with varied cytoplasmic density and absence of secretory granules. Tracheal epithelium showed variations in thickness and stratification depending on the area such as the cartilaginous and epithelial part from the larynx to the extra pulmonary bronchi.

Many lymphocytes, plasma cells and reticular fibres were observed in the lamina propria (Fig. 3) as reported earlier in mammals (Pack et al., 1981). Glands were present in lamina propria between and over the cartilaginous rings of trachea. The latter were more in the...
ventral part of tracheal ring as compared to dorsal part. Whereas, in ox the glands were internal to trachealis muscle (Choi et al., 2000). Trachealis muscle was attached to the external side of the cartilaginous ring. However, in most species there were more glands in cartilaginous region and they tended to lie in between rather than over the cartilaginous ring (Choi et al., 2000). Cartilaginous rings of trachea stained blue with PAS/AB. Most glandular cells stained red with PAS. According to Wilson et al. (1983) acid mucopolysaccharides stained blue with AB stain at pH 2.5 whereas, neutral mucopolysaccharides stained red with PAS. Basic proteins were more in epithelium than in tunica submucosa (Fig. 4).

REFERENCES