HISTOLOGICAL STUDIES ON LUNGS OF LOCAL INDIAN PIGEON

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ABSTRACT

Two male pigeons that are died due to accidental injury in the college premises after death tissue sample of lung were collected for histoarchitectural observations. The secondary bronchi, parabronchi, atria, infundibula and air capillaries were together with connective tissues constituted lobules of lungs. The epithelium of air capillaries and the endothelium of blood capillaries were separated by basement membrane only. Air and blood capillaries were intermingled with each other to form the blood-gas barrier. Histoarchitectural observations of lungs were made from the section stained with haematoxylin and eosin (H&E). The histological study involves the histological description of external and internal bronchi of the left and right lungs.

Key words: Microscopy, lung, local Indian pigeon

Introduction

The respiratory organs of birds differ from mammals due to specific structures includes nasal cavity, larynx, trachea, syrinx, bronchi, lungs and sacs, while in mammals the respiratory system includes nostrils, nasal cavity, larynx, trachea, bronchi, lungs and absence of syrinx and sacs. The respiratory system plays a vital role in thermo-regulation, the sense of smell, and voice are associated with it. The primary bronchi consist of cartilaginous rings held together by connective tissues. They extend from the tracheal bifurcation to the hilus of the lungs. The basic structure of primary bronchi was consist of series-C-shape of cartilage rings connect together by annular ligaments and the distance between the rings cartilage differ according to bird species. The secondary bronchi originate from primary bronchi at dissimilar position with variable number, and named according to the parts of the lung which they supplies.

Materials and Methods

Two male pigeons that died due to accidental injury in the college premises, tissue sample of lungs from these dead pigeons were collected for histoarchitectural observations. Histoarchitectural observations of lung were made from the section stained with haematoxylin and eosin (H&E) technique (Singh and Sulochana, 1997).
Results and Discussion

The current study showed that the walls of the primary bronchi were lined by pseudostratified columnar ciliated epithelium. The lamina propria and submucosa was made up of loose connective tissues which were continued with the perichondrium which confined the hyaline bronchial cartilage. The perichondrium connective tissue externally was surrounded by adventitial connective tissue; primary bronchi were branched inside of lung into secondary bronchi that was embedded in the lung parenchyma and were lined by pseudostratified columnar ciliated epithelium. In this part the lamina propria and submucosa were also made up of loose connective tissue but hyaline cartilage was absent and it was replaced by small layer of the smooth muscle bundles. The bronchial walls inside the lung were openings leading to small anastomosing (Fig. 1 and 2) parabronchi. Similar finding were reported by Eurell and Froppier (2005) and Alumeri et al. (2013).

The parabronchi were opened into the several dilated chambers called atria that led to the smaller dilated ducts called infundibula, which led to very small and complicated network of the air capillaries includes veins and arteries. The histological structure of parabronchi was consisted of three layers, the simple squamous epithelium, loose connective tissue layer, and thick smooth muscle fibres, while the atria, infundibula, and air capillaries were lined by similar that the parabronchial epithelium and connective tissue but smooth muscle fibres were absent except on the atrial openings. The secondary bronchi, parabronchi, atria, infundibula and air capillaries were together with connective tissues and constituted the lobules of lungs. The epithelium of air capillaries and the endothelium of blood capillaries were separated by basement membrane only. Air and blood capillaries intermingled with each other to form the blood-gas barrier (Fig. 3). This statement was in agreement with Eurell and Froppier (2005) and Alumeri et al. (2013).

References


