



Cells Adjacent to Respiratory Epithelium

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Introduction

At light microscope level, the mucous membrane was composed of a pseudo-stratified ciliated columnar epithelium containing numerous goblet cells resting on a thick basement membrane. Characteristically, the epithelium was thrown into regular folds [1]. The lamina propria contained many smooth muscle cells and elastic fibres. There were no mucous glands in the underlying thin sub-mucosa although intraepithelial mucous glands were observed in the mucous membrane at this level. The muscularis mucosae was thick and, together with the presence of elastic fibres, gave the mucous membrane a folded appearance. The patency of the primary bronchus was maintained by a series of cartilage rings. The mucous secreting cells when filled with secretion granules tended to squeeze the interposed ciliated cells [2]. In the mucous cell, the nucleus was basally located and the secretion granules, which were of variable electron density, appeared to displace the remaining intracellular organelles peripherally [3]. The apical surface was provided with short microvilli. The paler ciliated cells contained variable numbers of randomly distributed mitochondria and their nuclei were centrally located. Between the two principal cell types and the basement membrane lay numerous undifferentiated cells which probably represented a reserve population [4]. These are the subject of a separate communication. The term 'secondary bronchus' in this instance is used simply to indicate those branches of widely varying calibre arising directly from the primary bronchus at all levels. They were histologically similar to the primary bronchus with reference to the types of cell in the respiratory epithelium but, although the latter was thrown into regular folds, it was beginning to flatten out in certain areas. As observed with the scanning electron microscope, the epithelial sheet covering the primary and secondary bronchi was often interrupted by areas composed of cells exhibiting short, clumped, cilia at their luminal surface [5]. These areas were considered to be regenerating epithelium. Respiratory bronchi were distinguished on the basis of the presence in the wall of incomplete cartilage rings or plaques, and the appearance at the luminal surface of a gaseous exchange area characterised by capillary loops lying beneath a simple squamous epithelium. These exchange areas were found between the normal columnar epithelial cells which constituted the respiratory epithelium at this level. Although both ciliated and mucous cells persisted, the latter were less plentiful and more widely scattered. Respiratory bronchioles were histologically similar to respiratory bronchi but they lacked cartilaginous support. Both bronchi and bronchioles were invested with a thick band of smooth muscle external to the submucosa [6]. Alveolar ducts arose from both the respiratory bronchi and bronchioles and opened directly into clusters of alveoli. The most obvious feature of the duct wall was the broad band of smooth muscle and associated elastic fibres. At the point of origin of the alveolar duct, and where the duct opened into the alveoli, the smooth muscle appeared to form a sphincter [7]. Since the histological material examined in this study was derived from collapsed lung, the shape of the alveoli and their precise relationship to the alveolar ducts had to be treated with some caution. It did appear, however, that the alveoli formed grape-like clusters around each alveolar duct [8]. Numerous elastic fibres and prominent smooth muscle bundles were scattered amongst the dense connective tissue core of each septum [9]. Small isolated clumps of ciliated and mucous

cells were distributed very sparsely along the alveolar septa. Septal perforations or apertures were not observed.

Acknowledgement

None

Conflict of Interest

None

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