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CARTILAGINOUS AIRWAY INFLAMMATION IN SMOKERS. J.B. Mullen, B.R. Wiggs, J.L. Wright, P.D. Pare and J.C. Hogg. UBC Pulm. Res. Lab., St. Paul's Hospital, Vancouver, B.C., Canada.

To assess the role of cartilaginous airway inflammation in the pathogenesis of COPD, we studied 40 subjects  $59.3 \pm 9.4$  (SD) years old with a smoking history of  $1081.9 \pm 733.4$  (SD) cigarette years prior to lobectomy for coin lesions. FEV<sub>1</sub>, FVC, MMFR, TLC, RV and FRC were measured pre-operatively and the surgical specimens were processed for quantitative morphology. Cartilaginous airways were graded for inflammation involving the mucosa, glands, gland ducts, interstitium, smooth muscle and nerves and the epithelium was graded for goblet and squamous cell metaplasia (1). Airway structural components were measured using a digitizing board. The severity of the small airway pathology was established (2) and the emphysema estimated (3). Mucosal inflammation accounted for 39%, gland 23%, gland duct 16%, interstitial 15%, smooth muscle <3%, and nerve <3% of the total inflammatory score obtained by summing all six values. The bronchial wall consisted of (mean  $\pm$  SD) 74.7  $\pm$  6.9% connective tissue, 19  $\pm$  6% cartilage, 3.9  $\pm$  2.3% glands, and 2.1  $\pm$  1% muscle. The total inflammatory score correlated positively with the proportion of glands ( $p < .01$ ) but not with the other structures. Airway inflammation also correlated positively with both goblet cell ( $p < .01$ ) and squamous cell ( $p < .001$ ) metaplasia. The severity of the inflammatory reaction in the cartilaginous airways increased in relation to the amount smoked ( $p < .05$ ). There was no relationship between the severity of central airways inflammation and peripheral airways disease, severity of emphysema or tests of pulmonary function. We conclude that cigarette smoking produces an inflammatory reaction in the cartilaginous airways which is most active in the airway mucosa where it correlates with increasing goblet cell and squamous cell metaplasia as well as mucous gland size.

1. N Engl J Med 1978; 298: 1277-81.
2. Am Rev Respir Dis 1983; 127: 474-77.
3. Hum Pathol 1970; 1: 215-26.

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APPENDIX-2