PostScript

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Airway obstruction and autoimmunity

Birring and colleagues have shown an interesting link between respiratory symptoms and autoimmunity in the form of both hypothyroidism and Crohn's disease.[1] In addition, they have previously demonstrated a link between autoimmune disease and airway obstruction in non-smokers.[2] We have reported a similar association between airway obstruction and rheumatoid arthritis with a 2–3-fold increased prevalence of wheeze and physiological abnormalities in patients with rheumatoid arthritis compared with controls with osteoarthritis.[3]

Our group has also found correlations between the severity of airway obstruction and the extent of rheumatoid disease at both the systemic[4] and articular[5] levels. Our data would favour Birring's first theory—namely, homing of activated inflammatory cells into the pulmonary compartment. We have also previously demonstrated the presence of excess lymphocytes in bronchial biopsy specimens in patients with rheumatoid arthritis, together with an increase in neutrophils in the bronchoalveolar lavage fluid (personal communication, W U Hassan). The neutrophil numbers correlated with physiological evidence of increased bronchial reactivity to methacholine and airflow obstruction, suggesting recruitment of neutrophils as the effector cell by the controlling lymphocytes. At the cytokine level, tumour necrosis factor (TNFα)—a key driver of inflammation in rheumatoid arthritis, Crohn's disease, and hypothyroidism—has a significant role in the pathophysiology of asthma and chronic obstructive pulmonary disease (COPD).[6 7]

Their second hypothesis—that airway obstruction might just be a hitherto unrecognised autoimmune bronchitis—merits further investigation. COPD due to smoking itself has been suggested to be an autoimmune disease.[8] A key investigation would be to study the origin of proinflammatory cells and cytokines when airway obstruction occurs in the presence of organ specific autoimmune diseases to determine whether these are produced elsewhere before ''homing'' into the lung or are activated and produced de novo in the lung.

We would also like to explore a third possibility—namely, the role of the lung in the aetiopathogenesis of autoimmunity. The lung is an ideal interface between the environment and the immune system. Smoking is linked to both Crohn's disease and rheumatoid arthritis. The increased prevalence of rheumatoid factor in smokers with airway obstruction compared with smokers with normal airways[9] and the presence of bronchus associated lymphoid tissue in the lung mainly in smokers[10] may not be mere coincidence. Is the lung (that is, the airway) a ''culprit'' rather than a ''target'' organ in autoimmune diseases?

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New technique for treating spontaneous pneumothorax

The BTS guidelines advocate aspiration as a first line procedure in patients with dyspnoea or complete collapse.[1] Despite being common practice, there is no specifically designed equipment widely used for this procedure. The BTS guidelines suggest assembling equipment from a cannula, three way tap, and 50 ml syringe. The assimilation and use of equipment not designed for chest aspiration often leads to a prolonged and cumbersome procedure with the following inherent problems:

- blind insertion of a sharp needle into the chest cavity risks damage to thoracic and upper abdominal viscera;
- intravenous cannulae are designed to facilitate the flow of fluid and are therefore relatively short; as a result, some fail to traverse the chest walls of larger patients;
- the thin plastic sheath is prone to damage as it passes through the chest wall;
- kinking of the plastic sheath outside of the patient during use;
- the equipment is cumbersome and time consuming to use;
- the BTS guidelines suggest the removal of a maximum of 2.5 l (that is, 50 × 50 ml syringes).

We have used a Verres needle adapted with a one way valve designed to treat uncomplicated spontaneous pneumothorax and to overcome the shortfalls of the method of aspiration advocated by the BTS guidelines. We used pre-production equipment provided by Rocket Medical plc. A Verres needle, normally used to establish a pneumoperitoneum in laparoscopic surgery, is used to insert the cannula. It has a spring loaded blunt tip that retracts into the needle upon pressure while passing through the thoracic wall. On entering the pleural cavity the spring loaded tip rapidly protrudes, shielding the needle and preventing visceral damage. At this point there is a palpable and audible click which indicates that the needle has traversed the thoracic wall. The sheath is advanced over the Verres needle. It is thicker than those of intravenous cannulae and thus resists damage from the chest wall and external kinking. The Verres needle is then removed.

Rather than aspirating air, the patient is encouraged to expire against gentle resistance. This raises intrathoracic pressure, forcing air from the pneumothorax via the cannula. Due to the one way valve, air cannot return. Furthermore, the one way valve has been adapted to whistle when air passes through it, so once the pneumothorax has resolved there is no whistling. At this point a check *x* ray is indicated. Conversely, an air leak will be indicated by continuous whistling.

We have used this equipment several times with no complication and describe a typical example of its use. A 23 year old man with a primary spontaneous pneumothorax fulfilled the BTS criteria for simple aspiration. With patient consent the Verres needle was introduced under local anaesthesia into the fifth intercostal space in the anterior axillary line. The click as the blunt tip of the Verres needle sprung forward indicated that the drain was in the pleural cavity. The patient was encouraged to expire against gentle resistance. On expiration the drain whistled. After 5 minutes the whistling stopped. A check *x* ray was taken which showed complete resolution of the pneumothorax. The patient was discharged and a review with *x* ray 3 and 10 days following the procedure revealed no complication or recurrence of the pneumothorax.

Other devices are available which detect placement of cannulae in the pleural space.