

DEFINITION

1. **Emphysema** is a condition affecting the lungs in which there is dilatation of the air spaces beyond the terminal bronchioles. This definition covers a wide variety of situations ranging from over distension of otherwise normal alveoli, as in asthma, to the widespread disruption of alveolar walls, as in emphysema associated with some cases of chronic bronchitis.
2. The physical signs are few and varied. There may be jugular venous filling during expiration, tracheal descent during inspiration or indrawing of the costal margins during inspiration. Emphysema is not always detectable by radiological examination. The diagnosis can usually be confirmed by spirometry.
3. **Chronic obstructive pulmonary disease.** The conditions chronic bronchitis, bronchial asthma and emphysema can all cause obstruction of the airways although this is not invariable. The term chronic obstructive pulmonary disease (replacing chronic obstructive pulmonary disease, chronic airflow limitation (CAL) and non-reversible obstructive airways disease (NROAD) is now used as a generic term for any combination of the condition where there is airways obstruction and a variable degree of airways hyper-activity.

CLASSIFICATION

4. Emphysema is classified pathologically according to its site and as to whether or not there is destruction or dilatation of the acinar walls.
 - 4.1. Dilatation alone.
 - 4.1.1. Unselective distribution (compensatory emphysema following shrinkage or removal of abnormal lung tissue and emphysema due to partial main bronchus destruction or obstruction).
 - 4.1.2. Selective distribution predominantly affecting the respiratory bronchioles (for example, focal emphysema due to dust).
 - 4.2. Destruction of the walls of the air spaces.
 - 4.2.1. Unselective distribution (panacinar destructive emphysema).
 - 4.2.2. Selective distribution predominantly affecting the respiratory bronchioles (centrilobular emphysema).
 - 4.2.3. Irregular distribution (irregular emphysema).
5. In practice such classification is of limited clinical value. Modern therapeutic approaches have meant that established emphysema with pathognomonic features is now less frequently seen.

CLINICAL MANIFESTATIONS

6. The most common presenting symptom is increasing breathlessness which usually appears in middle age. At first this is noticed on exercise but eventually may be present also at rest.
7. There may be a slight wheeze, cough or mucus secretion. Loss of weight may be present and is often marked.
8. The rate of progress of the disease varies widely. It may be rapid with the patient becoming severely disabled even in the absence of superadded respiratory infection.
9. The condition is rarely seen in a pure form but it usually occurs as an element of chronic obstructive airways disease, accompanying chronic bronchitis or asthma.

AETIOLOGY

10. Emphysema may occur in young adults as a result of a genetically determined **alpha antitrypsin deficiency**. The mechanism of this condition is thought to be that the lung connective tissue is digested by proteolytic enzymes which are normally inhibited by alpha antitrypsin.
11. Emphysema is most commonly found in association with chronic bronchitis. Factors important in its aetiology are:
 - 11.1 **Cigarette smoking**. This is the major risk factor in Westernized countries. It is thought that cigarette smoke causes alveolar macrophages to accumulate round terminal bronchioles. In this situation further smoke exposure then damages the macrophages with release of enzymes such as elastase. This also occurs in leucocytes in the lung periphery. As a result there is autodigestion of the alveolar walls.
 - 11.2. **Atmospheric pollution** is an important aetiological factor in the development of emphysema, particularly in non Western countries.
 - 11.3. **Infection**. Respiratory tract infections in childhood often lead to chronic respiratory symptoms in adult life. The precise nature of this relation is not known. Acute circumscribed infection in the adult on its own does not lead to emphysema.
12. Chronic bronchitis and emphysema often co-exist but the precise pathological connection between the two is not known. The presence of both conditions in the same individual may relate to shared aetiological factors such as constitutional susceptibility, cigarette smoking and atmospheric pollution.

CONCLUSION

13. **Emphysema** is an obstructive condition of the lungs caused by dilatation of the air spaces beyond the terminal bronchioles. It may occur alone or more usually as part of chronic obstructive pulmonary disease and in the presence of chronic bronchitis. A minority of cases are familial.

REFERENCES

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