CLINICAL LECTURE ON INTERLOBULAR EMPHYSEMA OF THE LUNGS.

Delivered at the Bristol General Hospital,

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INTERLOBULAR or interstitial emphysema of the lungs—by which is meant the presence of air in the interlobular and subpleural connective tissue owing to rupture of air vesicles—is a condition to which very little practical importance commonly attaches, and it is therefore dismissed in a few words in the majority of textbooks. It is probably true that as a rule it gives rise to no definite symptoms or physical signs; but in exceptional instances it may prove of grave moment. I wish to direct your attention to two such instances which have recently come under our observation in this hospital; in the one pneumothorax resulted, and in the other severe pulmonary symptoms and subcutaneous emphysema were produced.

CASE I.—A boy, aged 3 years and 9 months, was admitted with the following history: For six months he had suffered from a slight cough. One day, three months before admission, during a rather severe fit of coughing he was suddenly seized with intense dyspnoea, the surface becoming much cyanosed. After this he had an illness described as "low fever," lasting about a week; he complained of pain in the epigastrium and shortness of breath, and his mother noticed that his heart was beating on the right side instead of the left. On admission, the heart's impulse was just inside the right nipple, and the mediastinum was displaced to the right border of the sternum; a tympanic percussion note existed over the whole of the left side of the chest: the bell sound was easily obtained, but amphoric echo, metallic tinkling, and succession splash were absent. No rales were heard in the chest. The physical signs were, therefore, those of a pleural cavity full of air, not communicating with the lung tissue, and entirely free from the fluid that results from inflammation. On the insertion of a fine aspirator needle, the outer end being protected with lint soaked in carbolic lotion, odourless air escaped with each expiration, not great in amount, and gently, as if there were no marked intrapleural pressure. Further exploratory puncture with a hypodermic syringe proved that there was no fluid in the cavity. As a result of the tapping the heart came over to the left, but much air still remained in the pleura. Subsequently the side was repeatedly aspirated, with the view of exerting traction upon the collapsed lung. Nothing but air was at any time removed. The heart gradually regained its normal position, the lung expanded, and the signs of pneumothorax disappeared, though the process of recovery extended over several months.

If surgical conditions, such as fracture of ribs and direct wound of lung or pleura, are excluded, pneumothorax in children may result from tubercle, pneumonia with softening on the surface of the lung, gangrene of lung, decomposition of an empyema, and interlobular emphysema. In the case which I have just related I believe that it was due to interlobular emphysema, with rupture of the pleura and escape of the effused air into the pleural cavity, for there was no evidence of the existence of any other morbid condition, and the attack distinctly dated from a paroxysm of cough; and further, there was throughout a total absence of inflammation of the pleura, which is an acknowledged feature of pneumothorax from interlobular emphysema. An exceptional point in the case is the long persistence of the effusion. Usually air is rapidly absorbed when it has found its way either into an internal cavity or into the interstices of tissues (of this, Case II is an example), but here a simple pneumothorax brought about the same conditions as are produced by a persistent effusion of fluid; that is to say, displacement of heart and compression of lung, extending over several months. In spite of the physical signs, the only hypothesis upon which this can be satisfactorily explained is that for some time a more or less continuous leakage of air into the pleural cavity took place; but if this was the case, it is remarkable that no inflammation was set up.

A word with regard to the treatment adopted. Thoracocentesis is not uncommonly needed in uncomplicated pneumothorax, almost exclusively to relieve the intrapleural pressure caused by the continued entry of air into the cavity. A hollow needle or fine trocar should be used, either with a tube attached to its outer end opening under an antiseptic solution, or, as in the present instance, simply with a piece of lint soaked in such a solution hung over it. I

have seen puncture attended by the happiest results where death has been imminent from the intrathoracic pressure of the effused air. This patient, however, is the only one in whom I have ever found it necessary to use the *aspirator* in uncomplicated pneumothorax, with the object of exhausting the air in order to exert traction upon a collapsed lung. The instrument was used repeatedly for this purpose, and ultimately the expansion of the lung was secured.

CASE II.—This illustrates the occurrence of subcutaneous emphysema as the result of interlobular emphysema of the lungs. A boy, aged 11, was admitted into the hospital with the following history: He had always been delicate; two years before the present illness he had had an attack of pleurisy on the left side; since then he had not seemed so strong, but no definite symptoms existed beyond a slight hacking cough. On the day of admission he came home from school complaining of headache, and cried with the pain; soon after he said he had a difficulty in breathing, which passed off and again recurred twice; the second time he was found gasping for breath and blue in the face. A medical man who was called in said that there was an obstruction in the trachea, and that the boy must go to the hospital to have the windpipe opened. On admission the patient was almost moribund and nearly insensible, the conjunctiva retaining only slight sensibility; the surface was cold and dusky, and the face was of a purplish-black colour. Respiration was slow, spasmodic, and gasping; the chest walls were nearly fixed, and the diaphragm did not seem to be acting at all. There was a frequent spasmodic attempt at cough. Loud whistling rhonchi were heard over the whole chest, but no moist sounds. There was no evidence of tracheal or laryngeal obstruction. Extensive subcutaneous emphysema existed: most marked on the left side, where it reached from the neck to Poupart's ligament and backwards to the spine; on the right side it was present chiefly about the neck and the supraclavicular fossa. The boy was placed in a steam tent and stimulants were applied, and in an hour he had much improved. The dyspnoea and cyanosis gradually disappeared, and the patient slept comfortably during the night. Next day he seemed very well, except that a spasmodic cough came on when he sat up in bed; respiration was now chiefly thoracic; inspiration was loud and clear, but expiration could scarcely be heard, and loud whistling rhonchi were still audible over both lungs. There was very slight relative deficiency in movement, resonance, and breath sound over the whole of the left side; this persisted, and was probably due to thickening of the pleura as a result of the attack of pleurisy before mentioned. The patient continued to improve rapidly; on the following day the lungs were clear, and on the sixth the subcutaneous emphysema had entirely disappeared, and the boy went out apparently quite well. The temperature throughout was normal.

The following I take to be the explanation of the course of this case. Rupture of some portion of lung tissue led to escape of air into the interlobular and peribronchial tissue (interlobular emphysema); the air thus effused found its way extensively through the areolar planes of the affected lung, and on arriving at the root of that organ passed down the root of the other lung in its connective tissue. The result was great obstruction to the normal entry and exit of air, inasmuch as a considerable proportion of that contained in the lungs was outside the air passages, and therefore fixed; hence the intense dyspnoea and cyanosis, the fixation of the chest walls, and the presence of rhonchi due to the external pressure of the escaped air upon the bronchial tubes. From the root of the lung the air passed through the mediastinum to the base of the neck, and thence over the surface of the trunk. Air is, as a rule, readily absorbed from any tissue into which it may have found its way, and in this case the patient fortunately held out long enough for its removal to be accomplished.

Interlobular emphysema is rarely met with, but is more common in children than in later life. It is, indeed, stated that in young children, as in some of the lower animals, the pulmonary lobules are separated from one another by distinct intervals occupied by connective tissue which are not met with in adults—an anatomical peculiarity favouring the escape of air into the interalveolar tissue. The commonest cause of interlobular emphysema is forcible retention of a large quantity of air in the lung by closure of the glottis during exertion. It has been produced by the efforts of parturition and of defaecation, by the lifting of heavy weights, during coitus, by paroxysms of rage, excessive laughter, and hysterical convulsions; but it is most commonly occasioned by the severe fits of coughing which occur in croup, whooping-cough, and bronchitis; and hence its greater frequency in children. It may be due to forced inspiration and expiration in conditions of intense dyspnoea and impending asphyxia, to extensive collapse of lung, and to ulceration of the trachea. Pepper mentions a case where it occurred during the course of acute tuberculosis in a child 4 months old, and another in a child of 13 months, where it was due to destruction of lung tissue by abscesses resulting from pneumonia; and Walsh gives an instance in phthisis in which it was apparently caused by the breaking down of the lung by hæmorrhage.

Usually it does not give rise to any definite phenomena. Wilson Fox¹ says: "The symptoms of this condition are few and doubtful until subcutaneous emphysema is produced. Sudden and rapid increase of dyspnoea, with augmented clearness of the percussion note, have been observed in some cases; but the auscultatory signs are not significant." Walsh quotes a case of phthisis in which, after profuse hæmorrhage, a percussion resonance like that of pneumothorax occurred at both sides of the back of the chest, the cause of which was made clear in a few hours by the appearance of subcutaneous emphysema.

The occurrence of pneumothorax from rupture of the pleura in interlobular emphysema (as in Case 1) is said by Hertz to be more common than the forcing of the air through the root of the lung and the mediastinum into the subcutaneous connective tissue. The production of subcutaneous emphysema is an accident almost limited to early childhood. Of 25 cases collected by Roger, 20 occurred in children; and of these instances of "general emphysema in children," as Roger calls them, 6 occurred under the age of 2 years, 10 between 3 and 4, and only 4 between 10 and 15. My own patient was 11 years old.

It is not easy to account for the interlobular emphysema in the second case which I have described. The causes of this condition may be grouped under two heads:

1. Violent strain upon healthy lungs, as in the case of croup.

2. Normal or abnormal strain upon diseased lung tissue, as in the instances of abscess, acute tuberculosis, and pulmonary hæmorrhage before mentioned.

In this boy there was no evidence of the existence of lung disease. It is true that he had had pleurisy two years before, but this had apparently left behind nothing but a thickened pleura (which, by the way, possibly prevented the occurrence of pneumothorax). The boy is said to have cried with headache; this is the only history of any unusual strain. If the crying had been that of passion, it might be accepted as a sufficient explanation; but headache tends to inhibit all unnecessary exertion, and it is difficult to believe that a boy with a headache would cry with energy enough to bring any undue pressure to bear upon his lungs. The rupture of pulmonary tissue was therefore due, presumably, to the presence of some weak point—not actually diseased—in its structure, which gave way under no unusual pressure.

The case illustrates an important fact with regard to interlobular emphysema which is perhaps not always sufficiently recognised—that it may exceptionally produce the gravest symptoms. The patient was almost suddenly seized with dyspnoea, which rapidly became so intense as to lead a medical man to conclude that there was an obstruction in the windpipe necessitating immediate tracheotomy; and on admission to the hospital an hour or two after the onset of the symptoms the boy appeared moribund from asphyxia. In its extreme form interlobular emphysema has caused sudden death. Ollivier records the case of a man who fell down dead in a quarrel, from the asphyxia entailed by extensive interlobular emphysema. Leroy d'Etiolles demonstrated on animals that forcible lung inflation might, by the production of interlobular emphysema, cause death as suddenly as the division of the medulla oblongata; and Martini enumerates it amongst the modes of perpetrating infanticide.

It is obvious that no direct treatment can be adopted in interlobular emphysema; all that can be done is to relieve symptoms, and in grave cases to endeavour to prolong life until the effused air is absorbed. Where the secondary subcutaneous emphysema is extensive, some authorities recommend puncture of the skin.

DEATH OF A FOOTBALL PLAYER.—An inquiry was held at St. Helens on May 7th touching the death of William Ellaby, who died from injuries received in a football match. The evidence showed that deceased was "dribbling" the ball down the field, when a player on the opposite side, named Gaskell, in tackling kicked him on the ankle. Ellaby played to the close of the game, but the ankle began swelling, and he was removed to the hospital, where he died. The jury returned a verdict of "Accidental Death," it being proved that the deceased stated before his death that the affair was a pure accident.

¹ Diseases of the Lungs and Pleura, 1891.

CYSTS OF THE TONSILS, NOSE, LARYNX, AND EAR.¹

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It is no part of my object to bring before the reader an exhaustive account of the occurrence of cysts in these parts. Indeed, with but slight digression, I shall confine myself mainly to a short statement of facts which have come under my own observation.

A careful perusal of English, American, and Continental works on throat diseases will reveal the fact that cysts of the tonsils are rarely if ever mentioned. It is, however, quite common to meet with small whitish-yellow areas, both on the glands themselves and in their immediate neighbourhood. I do not refer now to the cheesy accumulations which are often found partially extruded from a mucous follicle or crypt, and which are easily pressed out as cheesy ill-smelling plugs. In the class of cases to which allusion is intended, the deposit is covered by a layer of mucous membrane, and the appearance presented is, owing to this fact, somewhat similar to a pointing pustule. Careful inspection reveals, also, that the yellowish area bears upon its surface a fine vascular network. After puncturing and exercising a small amount of pressure on the adjacent parts, a somewhat cheesy nodule of white colour becomes extruded, differing only in the absence of fœtor from the cheesy masses above referred to. The condition just described is practically a cyst due to retention of exuded matter and desquamated epithelium, either within a gland or a crypt. I have, however, met with very definite *retention cysts in the tonsils* on two occasions. In both cases the patients were females. In neither was pain complained of, but only discomfort. On the affected tonsil was seen a yellowish-white area of considerable size over which small vessels ramified. Incision gave exit in each case to about a drachm of cream-like fluid, resembling pus, and without any odour or even bad taste. In my first case I immediately excised a considerable portion of the outer wall, while in my second I contented myself with evacuating the retained secretion, and telling the patient to return if any renewal of discomfort ensued. In the former I know that a perfect cure resulted, while, as the latter has not returned with any complaint, I presume that a similar result followed simple incision in her case.

These cases have appeared to me of sufficient interest to record, because both from my own experience and from my reading I believe them to be extremely rare. The etiology of such cysts can be very simply explained. Although in the human subject it is doubtful whether glands usually discharge into the crypts, yet we must remember that within them there is constantly occurring a destruction of the epithelium and an exudation of leucocytes presumably associated with more or less fluid. If, then, owing to previous changes of an inflammatory nature, a crypt has been changed into a closed cavity, we may expect it to become filled with creamy contents, such as were present in the two cases just described.

In the naso-pharynx cystic formations may occur in exactly the same manner. Tornwaldt ascribed them to retention of fluid in what he described as the bursa pharyngea. It is now, however, believed that this cavity, when present, is merely a result of inflammatory changes in one of the furrows of the pharyngeal tonsil.

Cysts of the nose are by no means very common. Hydatid cysts and the dermoid variety have both been described, and, through the kindness of Mr. Caird, I was enabled to see a case in which one of the latter had been spontaneously extruded from the nose. The nasal chambers, afterwards examined, gave no evidence of either the seat of attachment or mode of origin.

Johnson, Lefferts, and Horsley have described cystic growths arising from the turbinated bodies. I do not know whether these were merely instances of degeneration of mucous polypi or primary cysts. In Horsley's case the

¹ Read before the Edinburgh Medico-Chirurgical Society.