

Clinical Remarks

ON
A CASE
OF
PERI-TRACHEAL DEPOSIT,
WITH
SECONDARY DISEASE OF THE
LUNGS.

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THERE can be little dispute as to the circumstances which especially call for the minute clinical investigation of any given disease. The more frequent, deadly, and curable a malady is shown to be, the more sedulous and accurate the study which it becomes necessary to devote to it. And, in this respect, it is impossible to question the common-sense opinion, that the most familiar diseases are, on the whole, the most instructive; and especially, that their history affords the most fruitful theme for the remarks of those who are engaged in clinical teaching.

But the converse of this proposition can scarcely be accepted without considerable limitation. It by no means follows that the more infrequent diseases are unworthy of special notice. Even presuming that any given malady is so rare that a physician can scarcely expect to see a second instance of it in his lifetime, still his responsibilities and motives in connexion with it, on account of this very fact, become more decided; and may fairly said to extend, beyond his own interests, to those of the science for which he lives. Just as it is obvious that our information respecting any but the commonest diseases is derived in no small degree from the observations of those who have preceded or assisted us in similar inquiries, and that nothing but a combination of the facts thus contributed enables us to know anything of the less frequent maladies, so it is evident that even the rarest lesions to which the human body is liable may possess such indirect importance as almost to demand record. Especially do they claim such a notice, either where they represent an exaggeration or deviation from an ordinary type of disease, and thus enlarge or correct our views concerning that type, or where they afford, by their symptoms, a clue to the phenomena of commoner maladies.

It is for this reason that I venture to select for the subject of the following clinical remarks, a rare form of pulmonary lesion; a form which, however unusual, has a remarkable interest, both from its bearing on the symptomatology of the organ of respiration, and from its connexion with those phenomena of the organic or sympathetic system of nerves respecting which both pathology and physiology have at present so much to learn.

S. W.—, an unmarried woman, aged twenty-two years, had suffered, during about three months, from slight cough, attended with little or no expectoration, but with some emaciation, and with amenorrhœa. Her family was free from phthisical taint. Her habits were temperate; her occupation that of a laundress; her circumstances latterly so straitened as to reduce her food below its customary standard of quantity and quality.

About a month before her admission into the Royal Free Hospital, she was suddenly seized with the severe symptoms from which she dated the present illness. Her cough became violent, and was accompanied with pain in the region of the upper half of the sternum, as well as with expectoration. She lost all appetite; her strength was prostrated; and gradually becoming worse, she applied and was admitted an in-patient on the 25th of January.

At this time her aspect was that of a person suffering from some acute pulmonary disease. Her face, pale and somewhat emaciated, had a haggard anxious look, and her nostrils worked almost convulsively with each inspiration. Her lips were of a

blue tinge, suggestive of partial asphyxia. Her skin, though hot and dry over the trunk, was colder than natural at the extremities. Her pulse was about 120 per minute; her breathing about 36; and both inspiration and expiration (but especially the latter act) gave rise to a mucous rattle, audible at some distance from her bed, and precisely like what is vulgarly known as "the dead-rattle" that immediately precedes the final agony. The voice was feeble but distinct. Her cough was frequent, and somewhat paroxysmal in character; but though loose enough to suggest an easy expectoration, this expulsive act was rarely effectual, being repeated several times before it hawked up a dull-yellow, opaque, puriform, and somewhat nummular sputum.

On examining the chest, there seemed no deficiency of movement on either side, although a forced inspiration decidedly bulged the left side a trifle more than the right. The vocal thrill was equal on both sides. The vocal resonance was somewhat more distinct on the right, especially in the subclavian region, where there was slight dulness to percussion, and where the inspiration was rather louder, harsher, and more tubular than elsewhere, and the prolonged expiratory murmur somewhat similarly affected.

It was not, however, without some difficulty that these sounds could be verified. All of them were veiled and nearly lost in the mucous rattle before mentioned, which was heard over the whole chest as a large loud sound of low tone, with irregular remissions of intensity, but scarcely any real interruptions or intermissions. It was loudest during expiration. It never approached to a liquid or bubbling sound. It was utterly unlike the harsh snoring sound sometimes produced by aneurismal interference with the larynx. Its distinctness increased as it was traced towards the manubrium.

Besides this sound, a little mucous crepitation occupied the more depending parts of both lungs—namely, the lower lobes posteriorly.

The heart, rather large and weak, appeared to be otherwise quite healthy, as did also the larger vessels. The integuments, including those of the face, were flabby and almost puffy, but there was no anasarca. The urine was scanty and high coloured, but devoid of albumen. The bowels rather constipated.

The diagnosis of the case was thus opposed by various considerations, such as together seemed quite to preclude any very definite opinion. The history pointed to a disease of the respiratory organ, seriously affecting the general nutrition, suspended at least a two-fold lesion. Difficult as it was to distinguish menstruation, and threatening asphyxia—indeed producing a partial asphyxia. The symptoms and physical signs indistinguish those trifling deviations which pointed to the right side of the chest, through the loud rattle which resounded from the larger air-passages, those deviations, once recognised, offered a *point d'appui* for conjecture. They justified the suspicion that this part of the respiratory organ was the seat of an effusion of some kind, such as occupied the lung, and prevented its play. The characters of the sputum seemed to add, that this effusion either excited the secretion of puriform mucus into the neighbouring small bronchial passages, or itself merged into pus which was expelled through these canals. But while much of the right side of the chest seemed to be occupied by this deposit or effusion, part of the left also offered slighter indications of similar disease, and a little mucous crepitation could even be distinguished in the posterior and lower parts of both lungs. There seemed therefore to be fair ground for conjecturing the mischief to be comparatively general, either in itself, or in its reactions upon the neighbouring tissues.

Turning to the chief local feature of the case—the noisy rattle already described—the two suggestions that perhaps most naturally offered themselves as explanations were instantly dismissed with a negative. There was nothing to indicate either disease of the larynx, on the one hand, or the presence of an aneurism on the other. Indeed the sound itself was quite unlike any of the various sounds produced by either of these two causes which I have ever listened to. It was neither the sound of air rushing through an occluded trachea, nor the sound of air rushing through a glottis constricted by disease, or by reflex irritation of the laryngeal nerves; but an exact imitation of the "dead-rattle." Its characters suggested the vibration of no very large quantity of a dense semi-fluid mass in the trachea and bronchi: its point of greatest intensity (over the manubrium) precisely corresponded to this suggestion. So far as one dared hazard a conjecture, it seemed to be due to some interference with the mechanism of expectoration in this part of the respiratory channel: a conjecture which was confirmed by the frequent and ineffectual efforts from time to time made by the

patient to get rid of the sputum—efforts, it may be added, utterly unlike the *thoracic* failure of this act witnessed in the worst cases of emphysema.

Under these circumstances it seemed impossible to combine all the features of the disease into any satisfactory opinion respecting its nature. Numerically, the likeliest conjecture was that of tubercle of the lung, with early and excessive disorganization of the trachea by similar deposit. But mere ulceration of the trachea could scarcely give rise to the above signs of obstruction, except under circumstances such* as there was nothing to justify the suspicion of in this case. Again, such lesions rarely extend into the bronchi; and are usually anticipated and exceeded by similar laryngeal mischief, discoverable by its ordinary symptoms.

The negative evidence derivable from the sputum was equally inconclusive. The absence of lung-tissue under the microscope only justifies an inference of the absence of tubercular disease where there has been a more sedulous and frequent search than this case afforded me an opportunity of making: to say nothing of the possibility of a puriform secretion from the bronchi adjoining a solid and hitherto unsoftened tubercular mass. In like manner the very suspicious nummular aspect of the sputum was partially explained by the small quantity expectorated, and by a possible resorption of its watery parts during the comparatively long delay to which it was thus subjected in the bronchi. Lastly, while the physical signs were scarcely compatible with the supposition of acute phthisis, there was more asphyxia, and less fever, than in any case of the latter disease which has ever fallen under my notice; and the low temperature of the extremities was unaccompanied by the oedema which often accompanies that failure of circulation which ushers in death by pulmonary phthisis.

There could be little doubt that the patient was almost moribund on her admission, and past all hope of that reaction which the comforts and the treatment of an hospital sometimes bring about—even in cases where, as in this instance, the desperate state present seems due to neglect or privation almost as much as to disease.

She was treated by a small blister over the sternum, as well as by mustard poultices and turpentine stupes to the neighbourhood of this region. After a gentle aperient dose of castor oil, she began to take a mixture consisting of one-eighth of a grain of the hydrochlorate of morphia, with about ten minims of chloric ether, and a little dilute hydrochloric acid, every three or four hours. Strong beef-tea and wine were also given frequently in small quantities, and a little brandy (about three ounces in the twenty-four hours, diluted with cold water) was soon substituted for the wine. Under this treatment, she appeared, during about thirty-six hours, to rally from the threatening state of exhaustion and dyspnoea in which she was first admitted. In the evening of the second day following her admission, she had a violent paroxysm of pain and dyspnoea, ending in complete collapse, from which she was only aroused by a full dose of aromatic spirit of ammonia, with a little opium, judiciously administered by Mr. Curran, the resident medical officer to the hospital. A few hours later, a threatening of a similar attack appeared to be staved off by similar measures. But she gradually sank, and died, in a state of tranquil and painless exhaustion, on the 29th of January.

The body, examined about sixteen hours after death, was but imperfectly rigid. On careful dissection, it exhibited the following appearances:—

The heart was relaxed and flabby; its left ventricle uncontracted; its right ventricle distended with a tolerably large quantity of dark blood. Its valves were healthy, as were also the large vessels arising from it.

The right lung had not collapsed over about one-third of its anterior surface, including its middle and most of its upper lobe. All this portion of it had a pale-red or flesh-coloured hue, defined by an abrupt, wavy margin from the neighbouring collapsed and healthy-looking pulmonary tissue. A similar appearance, of less distinctness, engaged a very small portion of the anterior surface of the left lung, near its root.

The larynx, trachea, oesophagus, and lungs were next removed in a mass, and subjected to further examination. The diseased portions of lung were nowhere absolutely devoid of crepitation when compressed. But in the amount of this crepitation they contrasted with the somewhat dark and engorged healthy lung in their neighbourhood just as remarkably as they did in respect of colour. Indeed, all the portions in which this colour and consistence were best marked had a specific gravity

enabling them to sink readily in spring-water. Their section allowed the expression of a whitish, albuminous-looking juice from the pulmonary lobules, and of a purulent fluid from the cut orifices of the smaller bronchi. The characters of this pus were identical with those of the matter expectorated during life.

On dissecting carefully around the bifurcation of the trachea, it was found that the anterior aspect of the fork of this tube was occupied by a dense, dull, yellowish-white mass, about half an inch in thickness, of extremely tough and fibrous consistence, and about one inch deep in the vertical direction. The right side of this mass extended along the root of the lung in front of the right bronchus, where it became fused into the fibrous capsule of a calcified bronchial gland, that seemed to bound it in this direction. To the left side it spread, as a layer of rapidly-decreasing thickness, for a short distance over the root of the left lung. Upwards it reached, on the right side, a little way along the trachea, and was loosely connected with an oblong bronchial gland (also calcified in its centre) here: towards the left side, it crossed obliquely over the trachea, to become moulded, with a great and sudden increase in its thickness, (here three quarters of an inch,) upon the left third of the tracheal circumference, for about an inch and a half, just avoiding the oesophagus and its attachment to the respiratory tube. The areolar tissue attaching the aorta and great vessels to this mass was almost everywhere reduced to a scanty (and therefore rather tense) network; but it was nowhere so deficient as to bring the mass into immediate contact with them, far less to imply any fusion with their coats. But at the left side and lower part of the trachea, the mass was completely agglutinated to this tube, resting upon it by a firm immovable union, which evidently depended on the complete involvement in the disease of the normal areolar tissue; so that a section showed the cartilages of the trachea immediately bounded by the new substance. Just at this line of junction the mass was in one place softened, and apparently detached from the subjacent cartilage. The exact degree in which the calibre of the trachea had been diminished by the pressure of this adventitious deposit, it was difficult to determine after laying open the tube. But there could be no doubt that a considerable effect of this kind had obtained during life. Indeed, even after removing the lungs from the body, and thus relieving the parts of that surplus pressure which the pulmonary deposit must probably have brought about, the influence of the mass on the trachea was well shown by its separating the adjacent rings of the adherent trachea to a distance from each other amounting to at least twice or thrice that elsewhere intervening between the neighbouring cartilages. This local elongation of the trachea must obviously have sufficed to effect a considerable diminution of its calibre, such as would impart a much greater efficacy to the further pressure or flattening of the tube by the deposit which occupied its circumference. The inferior laryngeal nerve of the left side was stretched and flattened over the deposit, and was also thickened and redder than natural in the same place. But it was not further involved in the disease.

On examining thin sections of this mass under the microscope, with the aid of various reagents, it could be seen that it consisted of an adventitious deposit, for which the original areolar tissue constituted a kind of stroma. The new mass was, in fact, imbedded in the old areolar network, the white and (especially) the yellow elements of which were visible in the form of tightly-stretched meshes, the interstices of which were so distended with the adventitious substance that they could only exhibit their ordinary curling and hooked appearance at the extreme edges of any given section. The vessels which could also be seen, were here and there connected with (and apparently occupied by) large compound cells, closely resembling those of the spleen, and, like them, containing what appeared to be blood-corpuscles in various stages of disintegration. The new substance itself consisted chiefly of delicate and indistinct fibres, analogous to the ordinary fibrous development of plastic lymph; with this fibrous mass, however, were mingled so many granular and indistinctly-nuclear particles, as to give the whole a somewhat larger amorphous constituent than is usually found in new fibrous tissue. Near the softened part, this amorphous element was more abundant; so much so, as almost to suggest its approximation to the characters of tubercle.

The pulmonary disease—which, though nowhere traceable by direct continuity into the tracheal, approached very near it, and, on the right side, increased in intensity almost directly with this propinquity—offered some analogies with the tracheal. The lung was infiltrated with a large quantity of albuminous

* Amongst which circumstances I may especially allude to one I have known fatal—namely, the detachment of a valvular flap of mucous membrane by ulceration, blocking up the larynx during the inspiratory act.

fluid, in which were floating pus-cells and "mucous corpuscles," together with innumerable epithelial cells. The latter were evidently the ordinary epithelia of the pulmonary lobules, abnormal in nothing save in their quantity, and in the polyhedral forms which close packing had forced them to assume. The lobules were indeed many of them almost stuffed with these epithelial particles, which, adherent to the lobular membrane, had either been washed out or broken down in the centre of the lobular cavity. The capillaries of the diseased lung were singularly empty of blood corpuscles; while they were almost everywhere bulged, at short intervals of their length, by large ($\frac{1}{1200}$ in. diam.) cells containing refractile granules, like the more sparing and less uniform bodies of the same kind found in the tracheal deposit. In some instances the membrane inclosing these granules appeared to be deficient over part of their exterior: rarely it was absent all around them, so that they were merely granules aggregated in a spherical mass, not enclosed within a cell-wall. They seemed to be nowhere free in the lobules, except under circumstances which referred this extra-vascular site to accidental violence. No destruction or lesion of lobular tissue could be detected.

The connexion between the above appearances and the symptoms present during life is sufficiently obvious; and scarcely requires any notice, save perhaps in one or two of its details.

Firstly, as regards the remarkable rattle present at the bifurcation of the trachea, there seems to be a full explanation of its close similarity to the "dead-rattle" of the final agony. This sound depends on a collection of mucus in the trachea and the larger bronchi,—mucus which remains there, fluctuating backwards and forwards with each expiration and inspiration, because the respiratory apparatus has lost, either the sense to appreciate, or the power to expel it, or both of these conditions of its ejection simultaneously. Now just as the identity of sound argues a similar physical cause in the form of the tough puriform mucus which here drifted to and fro in the adjacent segments of the trachea and bronchi, so it is impossible to avoid referring the peculiar difficulty of expectoration present in this case to the failure (from a different cause) of the motor element of this act. The trachea was rendered immovable and uncontractile by the mass which was apposed (and mechanically united) to its outer surface; and hence all expectoration became extremely difficult. It would scarcely be logically fair to analyse the mechanism of expectoration in order to prove this proposition, because to do so would oblige me to argue in a circle in order to obtain what seems to be the chief detail of interest derivable from this marked feature of the case. But assuming that causative relation of the tracheal lesion and symptom, to which their connexion inevitably leads us, this case appears to reflect some light on that mechanism itself, by indicating how much the mobility—not to say the contractility—of the trachea and bronchi aids the sudden and coincident opening of the glottis, and expiratory movement of the chest in ejecting obstructive quantities of mucus from these parts of the respiratory channel.

But what relation shall we assign to the tracheal and pulmonary lesions? This question it is by no means easy to answer with exactness.

In the first place, however, it seems clear the two lesions were in no sense identical with each other. To say nothing of the discontinuous character of the two, as seen in attempting to trace one into the other, or to pass along the root of the lung from the trachea to the pulmonary disease, their histological details show still more important distinctions. The one was a new and adventitious deposit, the other contained no tissues really foreign to the healthy structures. The one involved the starvation, and had begun the destruction, of the original textures in and amongst which it was seated: the other not only had not attacked them, but might almost be said to have exalted—even while it disturbed—their nutritive (as distinguished from their functional) changes.

Lastly, the symptoms as well as appearances afford some grounds for the conjecture that one dated from a remote period, while the other was of comparatively recent occurrence: in short, the pulmonary lesion appeared to be in some sense secondary to, and consequent upon, the earlier deposit around the trachea and bronchi.

What connexion the calcified bronchial glands had with the tracheal deposit it is difficult to decide. But from the probability that the disease of these glands was itself more or less tubercular, I am induced expressly to point out that neither of the two other lesions had the slightest resemblance to tubercle. Without venturing to say anything unduly in favour of the objective way of studying the disease known as tuberculous,

(even at a time when the disease seems to be investigated by some in what I cannot but think a dangerously subjective manner,) I may at least state that neither fibre nor epithelium is tubercle; and that both the microscopical and the general appearance of each of these two deposits would justify an unqualified contradiction of their having this import.

Assuming the secondary character of the pulmonary lesion, it becomes interesting to inquire how it was caused by the tracheal deposit. As there was no appearance of the latter exerting any pressure on the pulmonary arteries, and no analogy between the state of the lung and that gangrenous condition which obstruction of these vessels is often known to bring about, we can scarcely regard them as the medium of causation.

A different set of organs seems to supply the requisite medium of connexion between the two lesions. The tracheal deposit evidently involved, at its lower part, many of those filaments of pneumogastric and sympathetic nerve which unite to form what is called the anterior pulmonic plexus on the root of the lung: and thus must probably have brought about, not only a considerable though slow compression of the filaments, but especially an obstruction of their supply of blood, such as would imply a still more effective disorganization. At any rate, the state of the lung was somewhat similar to what is seen in animals as the result of injury or section of the pneumogastric: a state which involves, first an exudation, and next a disease, sometimes ending in a diminished total vascularity of the pulmonary tissue. The regulative office of this organic nerve in relation to the calibre of the vessels, seems precisely akin to that of the sympathetic in other parts of the body; and thus explains the close analogy seen between the effect which, for example, the extirpation of the superior cervical ganglion has on the mucous membrane of the eye, and the section of the pneumogastric often has upon that of the lung. Indeed, there is fair ground for supposing that this effect of section may be imitated by other lesions of the pneumogastric. In the "Transactions" of the Pathological Society will be found a dissection by me of an aneurism, the wall of which had involved this nerve, and apparently thus given rise to a kind of bastard pneumonia, by no means unlike that present in this interesting case.

I scarcely like to pursue the subject further by inquiring whether similarly careful necropsies might not tend to explain some of the more anomalous instances of lung-disease from time to time met with in hospital practice, or whether any modifications in the circumstances of such lesions could really cause their appearances to resemble what we should be likely to confound with phthisis as well as with pneumonia. A single instance is scarcely a suitable basis for conjectures of this kind, however analogy and probability might confirm them. But one proposition may, I think, be deduced from such a case:—that, founded as rational Medicine is on Pathology, it has yet much to derive from descriptive Anatomy and Physiology, as well as from that field of Microscopic and Chemical investigation which has of late years been so fruitful, and therefore so beset, with explorers.

After all, however, it is the treatment which most interests the practitioner of our art. And little as it accomplished in the above case towards preventing, or even deferring, the fatal event, it could hardly be doubted that it relieved pain, supported strength, checked the agony of dyspnoea, and, I might even hope, produced a comparative *euthanasia*. The means adopted were neither novel nor unusual. But it has been lately suggested by an eminent chemist, that alcohol, inasmuch as it checks the formation of carbonic acid in the system, *must* be hurtful wherever there is a tendency to asphyxia, it seems necessary to protest against such a syllogism. It would not, indeed, be difficult to expose its deficiency as an argument. But it is more satisfactory to refer it to experience as a fact. And nothing but want of space prevents me from definitely quoting one or two rare (and all but fatal) cases, in which the empirical evidence in favour of stimulants of this kind have been quite complete;—in which, for instance, alcohol and ether have, to all appearance, repeatedly controlled the paroxysms of partial asphyxia caused by a pulmonary deposit, and thus mediated the complete restoration of the patient.

Brook-street, Grosvenor-square, Feb. 1857.

DR. ELISHA K. KANE, THE ARCTIC TRAVELLER.—We deeply regret to learn that this indefatigable explorer is now lying quite ill at Havana. His many friends and admirers will deeply regret to learn that his health is in a critical condition. We sincerely hope that he may yet recover, and live to enjoy the rich harvest of fame and honour he has so fairly won.—*Pennsylvanian*.