LUMLEIAN LECTURES

ON THE

NATURAL HISTORY AND DIAGNOSIS OF
INTRATHORACIC CANCER.*Delivered before the Royal College of Physicians, 1870.*

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III.

PROCEEDING to the third division of my subject, or *mediastinal tumours*, we find much greater diversity in the symptoms during life, and in the effects produced on the lungs and other contents of the thorax. The complications are greater and more numerous. The lungs may be invaded or not, and either with or without ulceration. The signs of pressure may be connected mainly either with the circulation or the nerves, or simply the bronchi. And with any of these signs and unquestionable evidence of intrathoracic tumour, there may still be considerable difficulty in deciding whether we have not to do with an aneurismal, or other tumour, rather than cancer. In many of these cases, although it may not be easy to lay down rules of diagnosis for the guidance of others, it is very easy for a good practised clinical observer to decide on the real nature of the disease. But in other instances, this is very far from being the case. The coexistence of pleuritic effusion often adds greatly to the difficulties of diagnosis, as does also the early occlusion, in many cases, of the bronchi, by which all respiratory and vocal phenomena are prevented. The first illustration that I shall adduce may be regarded as a typical case. There was no difficulty in the diagnosis when first I examined the patient; and throughout, the phenomena corresponded with what might be anticipated from the increase of the growth. Nevertheless, in some of its features the case bore a strong resemblance to certain forms of aneurism.

Intrathoracic Cancer.—E. R., aged 40, married, a small spare woman of healthy aspect, was admitted into St. Thomas's Hospital, under the care of Dr. Bennett, on March 25th, 1856. She stated that she had always enjoyed good health till the beginning of the present illness; and particularly that she had never suffered from rheumatism in any form. About three months ago, she first experienced difficulty of breathing, which had gradually increased, attended by a sense of constriction across the upper part of the sternum; and of some obstructing cause situated behind the trachea, interfering greatly with her swallowing. There was neither lividity nor swelling of the features, nor anything indicative of much pulmonary obstruction, although the colouration was rather deeper than usual. The breathing, however, was forced and heaving, and accompanied by loud and prolonged stridor. The voice was unaltered, and she spoke without any difficulty. She appeared to suffer much from the pain and constriction referred to the upper part of the sternum, although the face was not expressive of great anxiety. The dysphagia was such that she would not attempt to take anything but liquids, which she swallowed with difficulty. There was nothing abnormal observed in the external conformation of the thorax; nor any particular venous turgescence. There was complete dulness, on percussion, over the whole left antero-superior region of the chest, extending across to the right of the sternum. Posteriorly, the dulness, though not so great, extended to below the angle of the scapula. The tracheal stridor interfered greatly with any examination of the respiratory sounds; but, from time to time, during the temporary subsidence of the stridor, the respiratory murmur, although feeble, could be heard over the whole right side, mixed, posteriorly, with mucous crepitation, especially towards the base of the lung. Over the whole of the right side, except towards the base of the lung, there was fair natural resonance on percussion; but scarcely any respiratory sounds could be heard on the left side; and what was heard was faint, distant, and bronchial. Pain and tenderness were complained of, on percussion, over the upper part of the sternum. There was a certain amount of cough, attended by grey, frothy mucous expectoration. The action of the heart was irregular and occasionally intermitting, but free from *bruit*; its impulse was great. The sphere of cardiac dulness was apparently much enlarged; but as the pulmonary dulness extended to the cardiac region, it was difficult to say whether it was referable to the heart or the lungs. The right radial

pulse was stronger and fuller than the left, and both were irregular. The temperature was natural, and there was not the least indication of febrile disturbance, nor of disease elsewhere than in the chest.

Such was her condition on her entrance into the Hospital. Subsequently the dulness of the left posterior region of the thorax increased, with entire absence of all respiratory sounds, and of all vocal thrill. The dyspnoea increased with paroxysmal exacerbations of great distress. She lay frequently on the face, which posture appeared to give some relief, both to the dyspnoea and to the pain referred to the top of the sternum. The action of the heart continued forcible, and the dysphagia became extreme. The pulse, especially on the left side, was exceedingly feeble, and little or no pulsation could be detected in the large vessels of the neck. Slight temporary relief was afforded by a small cupping, by antispasmodics, and by morphia. She died on April 2nd, after prolonged and extreme agony and struggling for breath.

POST MORTEM EXAMINATION.—The left pleura contained a quart of clear serum. The left lung was very much reduced in size, the upper lobe being pale and oedematous to an extraordinary degree, but crepitant throughout. Its bronchial tubes were pale, and filled with casts of transparent, colourless, jelly-like mucus. The lower lobe was crepitant throughout its greater part, but much less oedematous than the upper. The tissue retained its natural tenacity, and on squeezing it, a considerable quantity of frothy, but puriform, fluid escaped. The contents of the bronchial tubes were semifluid, opaque, and puriform. The lung, towards its root, was adherent to a malignant tumour situated in the mediastinum; and the whole of the inner surface of the lower lobe was similarly attached. A layer of dense fibroid tissue was prolonged from the tumour a little way over the surface of the lung. The right lung and the right pleura were perfectly healthy. The pericardium was healthy. The heart appeared rather larger than natural; but the ventricles were distended with partially coagulated blood, and the walls were thin. The valves were healthy. In the upper part of the anterior mediastinum, and corresponding to the position of the manubrium of the sternum, a somewhat lobulated growth was detected, which proved to be a portion of a malignant tumour, nearly as large as an ostrich's egg, seated chiefly in the posterior mediastinum, in the position of the root of the lungs. The mass was somewhat irregular in shape, and lobulated on the surface. It extended from the origin of the great arteries of the neck above, to the diaphragm below; and laterally, from one lung to the other; the root of the left being much more involved than that of the right. The greater bulk of the growth was situated in the upper half of the mediastinum, behind the ascending arch. It completely surrounded the transverse arch, and the origins of the left common carotid and subclavian arteries, without however causing their obstruction. The right branch of the pulmonary artery was free; but the left was completely surrounded by the tumour, and its calibre greatly reduced. The trachea was pushed to the right side, and its lower part surrounded by the growth, excepting on the right side. The right bronchus was free; the left enveloped by the tumour, and its sides so compressed together as to be virtually obliterated. The descending arch and the thoracic aorta, in its whole length, were completely invested by the tumour. The right pneumogastric nerve and its recurrent branch were not interfered with; but it was evident that the left was involved, and probably destroyed, though it was not traced through the tumour. The diseased mass was moulded on the anterior and left two-thirds of the thoracic vertebræ. On section, the tumour was found to consist, for the most part, of a whitish, slightly translucent, and glistening material, yielding, on pressure, a creamy juice. It was abundantly studded, here and there, with a network of opaque buff-coloured streaks and spots; and presented, at some points, extravasations of blood, and in others blackish masses, apparently indicating its origin in the bronchial glands. The mass was prolonged, in an irregular lobulated form, for some distance into the substance of the left lung. The liver, spleen, intestines, pancreas, kidneys, and peritoneum, were all healthy. In the left ovary was a malignant tumour about the size of a marble; and in the right a cyst as large as a hen's egg, filled with transparent fluid, and its lining membrane studded with small warty growths.

In this case, the condition of the lung, on the affected side, is deserving of special notice. Notwithstanding the occlusion of the main bronchus, the destruction of the left pneumogastric nerve, and the great obstruction of the corresponding branch of the pulmonary artery, the tissue of the lung had not undergone any great amount of change. It was compressed, oedematous, and to a great degree bloodless, but still retained its tenacity, and was to a considerable degree crepitant. The reverse conditions of lung are more often seen in connection with similar conditions of the nerves, and vessels, and bronchi, as will be shown in another case to be subsequently given. But, inasmuch as a considerable amount of fluid existed in the left pleural cavity, it is impossible to say how far the physical signs in the infero-posterior regions during

ife were modified by, or were dependent on, such effusion. So far as regarded the upper regions of the thorax, the evidence of a progressive tumour was unmistakable; nor did the difference in the radial pulses, or the obstructed circulation through the large vessels of the neck, shake my confidence that the symptoms were due to a malignant growth, and not to an aneurismal tumour.

In the following case (M. Riley) the phenomena differed considerably from those of the preceding. The subject was much younger, a girl in her twentieth year, and came under my observation at an earlier period, so that the thoracic symptoms could be traced from their first appearance through their various stages. At the onset the pulmonary symptoms were those of bronchial irritation, showing in the sequel that these symptoms are by no means characteristic of disseminated cancer alone, but may be the first evidence of mediastinal tumours.

Malignant Disease of the Thorax and Abdomen.—May 25, 1868, Mary Riley, aged 20, living at Brixton—a small but well-proportioned and well-nourished girl—was admitted complaining of swelling and pain of the abdomen. For five months the catamenia had not appeared, and for some time she had complained of pain of the belly. A pyriform tumour occupied the centre of the abdomen, firm and uniform to the touch, not tender, showing a close resemblance to a uterus in the fifth or sixth month of pregnancy. The breasts were a little swollen and areolæ rather dark. There was slight febrile disturbance, with a little cough. She stated that a month ago she had what was called an attack of pleurisy, and fancied that she had taken cold. She was examined by Dr. Barnes in reference to supposed pregnancy; but the result of his examination still left this question in doubt. The tumour, however, he thought was connected with the uterus. It remained stationary in size and free from movement or pain and the catamenia did not return. The febrile symptoms partook more of the character of a mild typhoid fever than any thing else, but with more than ordinary bronchial complication. The chest was everywhere resonant on percussion. Behind, there was more or less bronchial rhonchus and crepitation, particularly on the left side, and about the apex. The expectoration, which was thin mucus, was occasionally slightly tinged with blood; and it was suspected that she was phthisical. In the first week of June, the febrile symptoms had pretty well subsided; the tongue was clean and the appetite better; but the pulse was quick and the breathing a little short and frequent, and she still had slight cough. As the signs of bronchial irritation subsided, she complained of more pain of the chest, and there were here and there on the left side limited friction-sounds; but she never made much complaint of any thing, and was always rather apathetic and quiet. Towards the second week in June, there were signs of consolidation, or pressure, of the left lung, indicated by dulness and harsh and tubular breathing. The following note was made on the 15th June: Signs of mucous irritation have almost entirely disappeared; but there is extensive dulness of the left apex and side. The respiration is nowhere entirely absent, but everywhere more or less harsh and blowing. Percussion-note in the left clavicular region is tympanitic when sharply and fully struck, and of a marked "cracked pot" character, so as to be readily demonstrable to bystanders; a slighter percussion gives a completely dull sound. The "cracked pot" sound is also elicited in the suprascapular region, where there is bronchophony and tubular breathing. Respiration in right lung puerile; a little bronchial behind. Heart's sounds transmitted through the whole left lung; pulse quick; appetite fair. She is prevented from sleeping by the cough, which is accompanied by slight clear mucous expectoration. Face free from congestion, and not distressed; skin cool.—June 18th. Complete dulness of left apex, both anteriorly and posteriorly; but the "cracked pot" sound has entirely gone. Respiration heard throughout the apex, but very faint and more or less tubular, attended here and there by a little deep-seated crepitation and clicking; a little superficial creaking of a pleuritic character over the mamma. Within the last two or three days a tumour has become visible at the base of the left sterno-cleido-mastoid muscle. Some apparently transmitted respiratory murmur is heard in the lower part of the left lung.—June 21st. Dulness great over nearly the whole of the left side; but more or less bronchial breathing is to be heard in most parts. There is so little vocal fremitus on either side that any difference is not perceptible. There is to-day manifest and considerable displacement of the heart, which is beating in the epigastrium and with augmented sounds, and a systolic bruit heard along the sternum. The resonance of the right side is still good, and the respiration everywhere puerile. Decubitus is now on the left side, breathing being difficult either on the back or on the right side. She, however, rests very fairly; says she feels better; the tongue is clean and appetite better.—June 28th. Breathing evidently more difficult, though she considers herself much better. Large superficial veins, very distinct and distended, running over the front of the chest and side of the neck; heart beating forcibly in the epigastrium, and the

breathing now attended by a distinct tracheal stridor. Respiration of right side more harsh and bronchial. At each inspiration the sternal extremity of the left first rib is thrown forward so as to give the appearance of a pulsating tumour. Pulse, 140; skin cool; a little short, troublesome, but not distressing, cough.—July 2nd. Pulse very small and frequent; skin cool; cough accompanied only by a little transparent mucus; great dulness throughout the left side; left suprascapular region elevated and rounded, and some pleuritic friction is heard there; heart beating violently under the xyphoid cartilage. She complains now of shooting pain in the base of the left lung and in the neck.—July 5th. Breathing forced and heaving, and croupy noise more distinct; and there is now some dulness under the right clavicle.—July 9th. Died, having had several paroxysms of extreme dyspnoea and syncope.

The *post mortem* examination revealed cancerous disease of the anterior and posterior mediastinum, of the left lung, and of the ovaries and mesenteric glands, with effusion into the pleura and displacement of the heart. There were a few old and firm adhesions at the back of the left lung, and flakes of recent lymph elsewhere. The whole anterior mediastinum was occupied by a large, irregular, encephaloid growth, which above and to the left of the pericardium involved the anterior portion and root of the left lung. In front, the cancerous mass was also continuous with large globular masses, like enlarged glands, in the posterior mediastinum, having a similar encephaloid aspect. There was also an enlarged, similarly diseased gland, close to the origin of the left carotid artery. The outer portion of the left lung was free from cancer, but compressed and airless. Towards the root, however, the cancerous deposit was continuous into the lung tissue, involving the bronchial tubes and the pulmonary vessels, which were pervious, but compressed, and their walls completely softened and infiltrated with cancer. The right lung was healthy and crepitant, excepting a small portion of the base which was compressed. The right bronchus was slightly encroached on by the cancer, which had infiltrated its walls to some extent. The pericardium contained a little serum. The heart was displaced, its base being pushed downwards and towards the right side, so that rather more than half of the organ was to the right of the median line. The valves were healthy; the right cavities contained some partially decolorised clot; the left auricle was encroached upon by the cancer, which formed a large, rounded tumour, causing a bulging of its posterior wall on the inside. Pharynx and œsophagus healthy; peritoneum healthy; liver slightly congested; spleen small, healthy; pancreas congested; stomach and intestines pushed forward and slightly distended with gas; mucous coat of the stomach softened. Solitary glands of the ileum and colon very prominent, filled with a whitish substance. Mucous membrane of ascending colon congested. Mesenteric and lumbar glands formed a large mass of soft cancer, in some places semi-fluid. The kidneys were small, and their texture healthy. The bladder, also, was healthy.

The greater part of the pelvis was occupied by a large oval tumour, occupying the median line in front of the uterus. This tumour, on removing the parts, was found to represent the left ovary, which had been converted into a mass of encephaloid cancer. Into the greater part of this tumour, hæmorrhage had taken place; so that on section a large portion of the tumour appeared to be made up of decolorised fibrine. The fimbriated extremity of the left Fallopian tube was also involved in an irregular cancerous mass. The right ovary formed a tumour of the size of an orange, infiltrated with cancer; the corresponding Fallopian tube was healthy. The uterus itself was healthy, and of the ordinary size of a multiparous uterus. Vagina healthy. The thyroid gland and suprarenal bodies were healthy. The body was not emaciated, and there was no œdema.

Some of the cancer from the lumbar glands was examined microscopically, and the juice found to consist entirely of nuclei, mostly round, of the size and appearance of pus-corpuscles, but not acted on similarly by acetic acid; the more solid portion contained nucleated fibres, round and oval nuclei, and a few small fusiform corpuscles. The nuclei were rendered more distinct on the addition of acetic acid, and in some of them a nucleolus was visible.

This case presents many points of great clinical interest. As regards the signs of bronchial irritation and pleuritic inflammation, which were the chief symptoms referrible to the chest, in the early stages of the disease, there was great difficulty in deciding to what cause they were attributable. The history which was obtained of the case, prior to her admission to the Hospital, naturally raised the suspicion that the symptoms in question were due to tubercular disease; and her age and general appearance, and the occurrence of hæmorrhage, confirmed this suspicion. But the progress of the case and the depressed apathetic condition of the patient, led me to doubt whether the symptoms were not rather due to enteric fever, with more than usual bronchial complication, although there was no eruption detected, nor any disturbance of

the bowels. The abdominal tumour was supposed to be, in all probability, a fibroid tumour connected with the uterus, if it were not ovarian. As soon, however, as the signs of pulmonary consolidation made their appearance, associated with unmistakable evidence of excentric pressure, I had no longer any doubt of the real nature of the case, especially as with the supervention of these signs there was a remarkable subsidence and eventual disappearance of the signs of mucous irritation. The physical signs were unmistakably those of consolidation rather than of effusion. The disappearance of all signs of mucous irritation, and the non-occurrence of any evidence of ulceration, rendered it extremely improbable that the consolidation was due to tubercular deposition; and the history of the case, as well as the general symptoms at this time, contradicted the notion of pneumonic consolidation. It is difficult to explain the occurrence and subsequent entire disappearance of the tympanitic cracked-pot sound. This phenomenon, it is well known, is not unfrequently met with in connection with consolidation of the apex, both from pneumonia and pleurisy. The absence of vocal fremitus, the marked transmission of the heart's sounds throughout the lung, and the existence of an apparently pulsating tumour at the sternal end of the left first rib, are also very noteworthy. A little attention, however, soon proved that the apparent pulsation was a respiratory phenomenon, and was due to the partial dislocation and consequent movement of the end of the rib during respiration. In the later stages of the case there could be no reasonable doubt as to its real nature. The displacement of the heart; the distension of the superficial veins; the stridulous breathing; the extension of dulness across the upper part of the median line; the pain and forced breathing; and, finally, the appearance of external tumours at the base of the neck, all pointed to the existence of an intrathoracic tumour, and that of a malignant character.

The varieties in form, size, and precise situation, presented by mediastinal tumours, are very great and numerous. The particular anatomical relations of these growths, it is evident, will give to their symptoms corresponding varieties. Both the immediate and the ulterior consequences of the pressure that they exert, as well as the kind and amount of inflammatory action induced, differ greatly in different cases. A small tumour may, from its particular site, at a very early stage give rise to symptoms both of pressure and deranged innervation of great severity; whilst another will attain to a considerable magnitude before the patient experiences any distress, or before any decided evidence of pressure is manifested. Thus dysphagia has been in some instances a very early symptom, and in others has been absent throughout; and the same may be said of dyspnoea, spasmodic action, and cough. The diagnosis, in so far as relates to the direct signs of tumour of some kind, may be often easily made, when it will be difficult or quite impossible to say what that tumour is. But the diagnosis between aneurism on the one hand or cancer on the other may be approximately arrived at, by careful consideration of other circumstances, especially of constitutional condition. In more advanced stages of intrathoracic cancer, there is nothing that presents greater difficulty in the diagnosis than the kind and degree of inflammatory action that supervenes, and the existence or absence of effusion. Adhesions more or less general take place very early in some cases, and serous effusion is prevented; in others, there are few or no adhesions, and considerable effusion. Changes in the tissue of the lung, with varying degrees and forms of consolidation, are met with not infrequently; whilst in many others one or more lobes of the lung remain permeable to air up to a very late period. In no less than six of the thirty-nine cases that I have examined, there was copious effusion into the pleura. It is evident, therefore, that the mere fact of the existence of signs of effusion cannot be conclusive against the existence of cancer. But, on the other hand, it must be admitted that the physical signs of effusion are sometimes very closely simulated by a large cancerous tumour, where no effusion exists. Neither the form of the chest nor the state of the intercostals will be sufficient to protect us from error. I have met with one case in which the early history was that of recurring attacks of pleurisy, and where, subsequently, tenderness and a liquid impulse during cough over the most prominent part of the enlarged side so deceived the medical attendant as to induce him to puncture the chest—convinced that the case was one of empyema of necessity. Time would not allow of my illustrating more than a few of the varieties and clinical puzzles that are presented by mediastinal tumours.

My colleague Dr. Sutton has furnished me with the details of a case that fell under his notice, which well illustrates the difficulty of diagnosis in some of those cases where the side is dilated by the magnitude of the internal growth.

A little girl, eleven years of age, was admitted into the London Hospital, supposed to be the subject of pleuritic effusion of the left side, and suffering from great dyspnoea, with lividity of countenance. There was absolute dulness throughout the left side, before and behind. In

front, the respiration was inaudible, except under the clavicle. There was bronchial breathing close to the spine on the left side, where tactile vocal fremitus, which was elsewhere absent, could be perceived. The heart was displaced, and was felt beating to the right of the right nipple. The left side was bulged, and apparently enlarged. The epigastrium sank in during inspiration. The temperature was normal; pulse variable; respirations from 32 to 36. The diagnosis was, *very great effusion into the left pleural cavity*; and the chest was twice punctured. The points chosen for puncture were between the eighth and ninth ribs, in front and behind the angles. A little dark blood issued on each occasion, and on the second occasion something like pus. The dyspnoea increased, and the child died on March 26th. Before making the *post mortem* examination, Dr. Sutton found, on measurement, that just below the nipple the left side measured an inch more than the right; and so convinced was he of the existence of fluid, that he thrust in a trocar between the fifth and six ribs, when some brain-like substance escaped through the cannula. On laying open the thorax, the entire left side was found to be occupied by a mass of medullary cancer, which had pushed the heart considerably to the right. The left lung was collapsed and pushed backwards, and spread over the cancerous mass.

The patient was repeatedly examined by so accomplished an auscultator as Dr. H. Davies, as well as by others; and all came to the same conclusions—that the chest was full of fluid. The case, therefore, sufficiently proves how very deceptive are the ordinary physiological signs of effusion, when the side is distended by a large cancerous tumour. I believe that, in similar cases, importance may be attached to the peculiar sense of resistance under percussion which characterises a solid growth. This has sometimes been observed to a degree that has been painful to the finger under percussion. In cases of some standing, the persistence of great dyspnoea, associated with signs of pressure, will usually be in favour of a solid tumour, rather than of effusion.

There is another point of some importance in connexion with such cases as, from their history, are liable to mislead on this point of pleuritic effusion; viz., that effusion probably does occur to some extent, is absorbed, and adhesions take place long before the growth has attained sufficient size to distend the chest; whilst in others effusion of a more passive character only occurs late in the disease, long after undoubted signs of pressure have existed. In these latter cases, if they have been watched for any time, it will be found that the dulness has extended from above downwards, rather than from below upwards, except in some very exceptional instances, where the growth has invaded the lower lobes of the lung in the first instance. I need not say that but little assistance can be expected from any modification in the phenomena produced by alteration of position.

ON THE NATURE OF THE CONDITION CALLED EPILEPSY.*

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CLINICAL observation shows two very distinct conditions as the extremes of epilepsy, though the means exhibit almost every conceivable blending of the one condition with the other. The extreme conditions are expressed as *le haut mal* and *le petit mal*.

The former, characterised by violent convulsions, has loss of consciousness in variable degree, and usually has little or no mental disturbance as a secondary stage. In December 1869, in a paper on Catalepsy, published in the BRITISH MEDICAL JOURNAL, I mentioned, among others, one case of *le haut mal* which may be considered as an extreme. In it the stage of perfect unconsciousness quickly passed away, leaving most violent convulsions, during which the patient was able to observe what was passing around.

The latter—*le petit mal*—has for its dominant symptom loss of consciousness only, and this sometimes only momentary in its duration. It is always, however, followed by mental disturbance, sometimes of the most profound character. In November 1867, I published in the BRITISH MEDICAL JOURNAL the details of a remarkable case of *le petit mal*, in which a girl had cut her throat during the *non compos mentis* period which follows the *petit mal* seizure.

In discussing epilepsy, however, we have one purely physiological element to take into consideration; viz., that currents pass along the nerves in one direction only—from the periphery to the centre. The heads of the evidence of this fact I gave in a paper on Matter and Force, published in the *Journal of Mental Science* for July 1869. If we admit, as we must do, that in health there is a perfect balance of

* Concluded from page 569 of last number.