

# LUNG CANCER IN THE NINETEENTH CENTURY

*by*

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LUNG cancer is today a common disease of uncommon interest. The earlier records of it, or rather the brief glimpses we can obtain of it, are instructive. As Fenwick said in 1882, 'there are numerous and interesting facts to be gleaned by a careful collation of the cases hitherto recorded of this disease'.

## *Aetiology*

First, lung cancer was attributed to a diathesis; later, certain aetiological links were forged. Among those who held that a hereditary taint was probable were Loomis (1875) and Ingals (1892). In common with others, they found that men were affected more often than women, the age incidence being mainly between forty and sixty.

According to Fagge and Pye-Smith (1891), Hesse in 1878 published a paper in which he drew attention to the high incidence of lung cancer among Schneeberg miners. This evidence had merit. Osler (1892) himself was impressed. 'It is a remarkable fact,' he agreed, 'that the workers in the Schneeberg cobalt mines are very liable to primary cancer of the lungs.'

Tobacco was not yet suspect. However, Bruen (1885) anticipated modern trends when he remarked that the disease might be 'linked with some cause of irritation'. But, alas, he did not expatiate on the matter.

## *Incidence*

The old investigators also did battle with the question of the frequency of the disease. Many believed that it was a rarity. Thus, Hasse (1846) of Zurich spoke of 'a malady so rare as the present one'. Owing to this conception, Davies (1835) of London counselled that the affection should 'occupy much less of our time'. Indeed, John Hughes Bennett (1849) of Edinburgh once wrote: 'This is the only case of cancer of the lung which I have ever met with; so that I presume that the disease rarely attacks this organ in Scotland.'

A few observers, and Graves (1834) was among them, were wary. Graves, for example, advised that the disease should 'be studied with the view of enabling us to recognize the true nature of similar cases when they again occur'. Walshe (1843) was equally circumspect. 'It is important,' he affirmed, 'for the practitioner to be aware that cancer of the lung is far from being an affection of such uncommon occurrence as is generally supposed; and careful study of the valuable papers on the subject . . . cannot be too strongly recommended.' In the same vein was Kilgour (1850) satisfied that intrathoracic cancer was 'more common than it is supposed to be by the profession'.

The true incidence of lung cancer during this period eludes us. A handful of cases were recorded by individual observers. Adam (1879) spoke of three cases 'occurring within a comparatively short time'. Similarly, Hanford (1889), a physician to Nottingham General Hospital, said that he had met three cases in his practice within a year. As late as 1881, Fraser had to apologize to the Medico-Chirurgical Society of Edinburgh for his inability to present more than 'a single case in which the disease occurred as a primary affection'.

Coats (1896) of Glasgow throws light on the predicament of incidence when he reminds us that 'the erroneous conceptions of the frequency of this disease are largely related to the difficulty of clinical diagnosis'.

In time, the occurrence of the disease was better appreciated. Towards the close of the century, we meet with the revealing statement of Finlayson (1895-7). In reporting a case, he said that 'the physical examination is very strikingly suggestive of cancer of the lung, now that we know that such (disease) existed'.

### *Clinical Features*

In respect of clinical features, let us touch on a few outstanding points.

Today, the need to exclude lung cancer whenever adequate treatment fails to clear up chest complaints in patients of the cancer age groups is widely appreciated. Stokes, as early as 1842, stressed the need for vigilance whenever 'we see a patient attacked with severe symptoms of pulmonary disease *which resist ordinary treatment*'. 'This circumstance,' he continued, 'is not without its value in the diagnosis of the heterologous diseases of the lung.' He knew that 'in cancer of the lung the accompanying signs of irritation are observed to be either uninfluenced by treatment, or, if they are removed, they return again and again without apparent cause'.

In this connection, Blakiston's (1848) case report is noteworthy: Active treatment also failed to make the least impression on the disease, and the trachea and oesophagus were seen to be gradually compressed. The true nature of the affection was then suspected, but, from its rarity, it was not confidently diagnosed.

Presenting symptoms may be extra-pulmonary. Not infrequently, they are cerebral, as in the case reported by Greene in 1843. Incidentally, Greene also observed that deposits deep in the frontal lobes did not give rise to pain.

A field which is of current interest was spotlighted in 1865 by Cockle, who wrote an early monograph on intrathoracic growths. He made the point that 'deposits in the brain and irritation of the meninges play an important part in the clinical history of thoracic cancer'. He was clearly well in advance of his time when he said that 'disturbed cerebral functions so frequently coexist with intrathoracic cancer as to render their study, under such association, deserving of much more careful attention than has hitherto been devoted to them'.

Growths spreading from the thorax may lead to paralysis of the cervical sympathetic nerves. In 1839, John Reid, a Scottish medical scientist, not only drew attention to a case reported in the literature, but also correctly surmised that certain oculo-facial signs generally followed. As shown elsewhere (Onuigbo,

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1958), John Reid anticipated Horner, the Swiss ophthalmologist, who reported a single case of the syndrome in 1869. By 1858, the state of the knowledge of this syndrome was such that Ogle was able to review the literature on it. The premier place of John Reid in recognizing this syndrome (now attributed to Horner) was, in fact, accepted by William Gairdner (1855–6) and Argyll Robertson (1868–9) before 1869.

### *Diagnosis*

According to Cockle (1865), a Dr. Baron was the first to diagnose lung cancer during life—a feat achieved in 1819. In the succeeding years, diagnostic acumen was to grow as a result of the publication of a treatise on the subject by Stokes (1837). This celebrated Dublin authority marshalled twenty-one points to assist in the diagnosis of carcinoma of the bronchial tree.

To appreciate the dilemma of the old masters in diagnosis, let us read Graves' (1834) graphic commentary on a case:

Aneurism, circumscribed pleuritic effusion, and enlargement of the heart; pleuropneumonia, pleurisy, and hepatization, in consequence of previous pneumonia; solidification from tubercles, &c. &c., were each successively advocated: as for myself, I became quite tired of the difficulty of attempting to explain the phenomena observed . . . and latterly, however erroneously positive I had been when I first took the man under my care, I gave up all further attempts at diagnosis.

No less candid was John Hughes Bennett (1858), then Senior Professor of Clinical Medicine at Edinburgh: In none (of ten cases) did any combination or succession of signs exist which could induce any one to pronounce that pulmonary cancer was present.

At the close of the first half of the century, the position with regard to clinical diagnosis was still such that Dunglison (1848) could merely say that 'difficult as the task is, (lung cancer) has been diagnosticated during life'. By the close of the second half of the century, it became 'quite possible', as Steven (1891) tells us, 'to arrive at a tolerably accurate knowledge of these affections before death takes place'.

Both Marshall Hall (1837) and William Gairdner (1856–7) found that differential diagnosis often lay between lung cancer, aneurysm, and tuberculosis. A not uncommon error was to mistake a neoplasm for an effusion. Of this difficulty Stephen Paget (1896), author of one of the earliest monographs on thoracic surgery, said that there were 'few physicians of really great experience who have not made this mistake once, or more than once'.

Turning to physical methods of diagnosis, we find that Laennec (1834) held that 'the stethoscope ought to point out the existence of the medullary tumour of the lungs, when this is of considerable extent'. Skoda (1853), another great diagnostician, taught that percussion was helpful only when 'encephaloid disease of the pleura (was) of considerable extent'. However, Hope (1834) added that 'encephaloid tumours, even of considerable size, are not indicated by percussion and auscultation if the surrounding lung be healthy'. Addison

(1846) pointed out that 'auscultation and percussion alone are insufficient' for differential diagnosis, adding that paracentesis was, on occasion, diagnostic. But Trousseau (1870) accepted no 'positive sign' for recognizing cancerous pleurisy during life.

As the nineteenth century was drawing to an end, accessory diagnostic tools were coming to hand. It was delightful to come across Austin Flint's (1866) prophetic view. 'It is possible,' he said, 'that the microscopical characters of cancer may be discovered in the sputa.' Schwalbe achieved this aim in the early nineties. The problem of sputum cytology was extensively studied by Hampeln (1898). His conclusions are evergreen: 'There are many details of size, shape, character of nucleus, and staining properties that, when considered in relation to their source, may enable an experienced observer to draw conclusions of value.' Farber and his colleagues are, therefore, in error when they state in their 1950 survey of the evolution of cytological techniques in lung cancer diagnosis that 'until the beginning of this century' such methods 'were not thought to have much diagnostic significance'.

The last decade of the nineteenth century not only witnessed the advent of the X-ray but also ushered in bronchoscopy. Mann (1920) gives a thorough account of the growth of this diagnostic device. Kirstein, he finds, 'first obtained a direct view of the vocal cords and the forking of the trachea, on 23 April 1895'. 'We may look upon this date,' he went on, 'as the birthday of direct laryngoscopy, the forerunner of bronchoscopy.' According to this account, Killian profited from this simple beginning and within the last remaining years of the century placed bronchoscopy on a more or less sound footing.

### *Pathology*

From Orr's (1857-8) report, we gather that necropsy diagnosis of lung cancer 'excited a good deal of attention'.

Not infrequently, as Bartholow (1880) reported, growths were found to involve one lung only. The right organ was reported to be more commonly invaded. However, Fox (1891) found that 'statistics on this point vary'. It is, therefore, of interest that in a recent thesis Gazayerli (1935) also noted that there was much 'conflicting evidence' on this score.

Fuller (1867), Galloway (1892) and others believed that growths arose in the lymph nodes and only later came to invade the bronchus. As West (1884) puts it, 'they originated in the lymphatic tissues at the root of the lung, and only affected the lung by direct extension'.

Finlay's (1885) account shows that in a specimen:

the main portion seemed to be in the neighbourhood of the root of the lung; but whether it originated in the lung, pleura, or glands could not be determined. Its tendency seemed to be to spread rather on the surface of the lung than internally, but it was noted that there was much new growth round the bronchus and its divisions . . .

Hanford (1889) held the present-day view: 'Necessarily of hypoblastic origin, they usually, if not invariably, commence in the mucous membrane of the

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bronchi.' It may be noted in passing that Orth (1878) observed what gained recent publicity, namely, that cancer metastatic to the lung itself may also attack the bronchial mucosa.

The relationship between lung cancer and gangrene of the distal lung substance was not understood at the time of Stokes (1837) but was known to Walshe (1871). The importance of obstruction in its causation was noted by Fox (1891). The occurrence of cavitation in the tumour mass itself was noticed by Williams (1840).

Local spread was fully described. Walshe's (1871) account was rather picturesque:

Primary cancer may infiltrate the tissue; or spread from the root of the organ in irregularly tuberosus form; or hang in pedunculated masses from the surface of the lung; or festoon its free margin with rows of fringed processes.

Lymph node metastasis was well documented. Fox (1891) noted that spread to adjoining nodes was usually centrifugal. Fagge (1886) observed that such lymphatic invasion was generally unilateral or 'at least far more marked on one side than on the other'. Coats (1895-7) encountered retrograde metastasis to distant abdominal nodes. Fuller (1867) found that distant axillary and cervical nodes could be involved, although, as Bruen (1885) also brought forward, near by bronchial nodes may be by-passed. Walshe (1871) knew that lymph nodes might escape invasion altogether and both Williams (1840) and Steven (1891) discerned that lymphadenopathy was not necessarily an evidence of malignant implication of the nodes themselves.

Distant spread was probably neglected. In Hanford's (1889) view, remote organs like the liver and the kidneys suffered most often. Most others were of the opinion that lung cancer seldom metastasized widely. Hasse (1846) wrote that 'other organs participate only in rare instances'. Fox (1891) concluded that 'secondary affections of the other organs are comparatively infrequent in the case of primary intrathoracic tumours'. So did Strümpell (1893).

Byrom Bramwell (1888) and Risien Russell (1899) held that bronchial carcinoma was the commonest source of intracranial metastases. Strümpell (1893) thought that breast cancer shared this notoriety with lung cancer.

The frequency of adrenal secondaries was overlooked. Byrom Bramwell considered such deposits remarkable and reported a single case in 1877. It is probable that the adrenal growth was mistaken as the primary. In a case in which growths abounded in the right lung, right bronchial nodes, and right adrenal, West (1879) said, 'the seat of the primary growth being, it is clear, in the suprarenal capsule'. But Samuel Wilks (1859) of Guy's did not believe that 'the suprarenal capsules are ever primarily affected' by cancer, nor did Roberts (1876). Modern opinion on this is divided but Willis (1952) is in support of Samuel Wilks's contention.

With regard to the routes of metastasis, opinion has not changed. Although Fried said in 1948 that 'observers of the past held that carcinoma disseminates essentially by way of the lymphatics', I find that then, as now, lymphatic spread

was accepted as far as to the lymph nodes and blood spread to remote organs. On this point, Bell and Stokes (1848), Handfield Jones (1861) and Hawthorne (1895–7) may be consulted, with special reference to lung cancer. During the 1830's when metastasis was beginning to be unravelled, Hodgkin had the hunch that blood vessels were 'in some way connected with the extension of the disease'. In the next decade, Thomas Watson of King's College lectured that

these (cancer) germs are probably carried sometimes through the lymphatic vessels to absorbent glands in the vicinity of the primary growth: but there can scarcely be a doubt that the *blood* is the main channel by which the seeds of this dreadful malady are conveyed from its first to its subsequent sites.

In the succeeding decades this idea was faithfully handed onwards, notably by James Paget (1853), Virchow (1860), Campbell De Morgan (1874), Augustus Pepper (1884) and Coats (1895).

Turning to histology, we find that pleomorphism in the cellular nature of lung cancer led to differences in opinion. In consequence, the old literature was as controversial as the writings of today on the question of the commonest cell type met. While Osler (1892) indicted squamous cell forms, Fox (1891) considered them uncommon. In fact, Bristowe (1876), declined a discourse on pulmonary tumour types, being convinced that 'in the present state of our knowledge . . . it would be an excessive and needless refinement to discuss them separately'. It is well to remember, too, that it was not until the third decade of the present century that the carcinomatous nature of oat cell growths was elucidated.

Another difficulty was often encountered. As Laennec (1834) reminds us, Bayle was responsible for delineating lung cancer from tuberculosis and calling it 'cancerous phthisis'. As he further tells us, lung cancer was formerly regarded 'as constituting a variety of consumption'. The great Virchow (1860) knew that even at autopsy lung cancer could be confused with tuberculosis. 'In the midst of cancerous masses also,' he remarked, 'cheesy spots occur which look exactly like tubercles.' He was satisfied that one would 'in many cases be altogether unable to arrive at any decision from merely examining the specimen'. Coats (1896), another great pathologist, was also in no doubt as to the truth of this view.

### *Treatment and Prognosis*

The symptomatic remedies of the past were of little avail. They need not detain us. One of Walshe's (1854) prescriptions may, however, be quoted. 'Small bleedings,' he directed, 'give temporary relief, but they cannot, of course, be often repeated.'

There would seem to be need to emphasise how powerless and how despondent the early physician was. In his clinical lectures, Salter (1869) painted a vivid picture of despair. 'With regard to *treatment*,' he said, 'gentlemen, I need not tell you that I have nothing to tell you.' The hushed audience heard him 'doubt if we can in such a case put off the final catastrophe for a single hour'. In 1896,

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Stephen Paget in his textbook of thoracic surgery said, 'The most that can be done, and, so far as we can see, that ever will be done, is to withdraw the effusion'. Today, we do look forward to some successes after surgery. The gloom of yesteryears is being lifted.

### *Conclusion*

In this study nineteenth-century views on the intriguing subject of lung cancer have been reviewed. The scattered writings of the past on the aetiology, incidence, clinical features, diagnosis, pathology, prognosis and treatment of lung cancer are of present interest.

All through the old literature there is manifest awareness of the imperfection of current knowledge as well as continual striving toward perfection. In 1872 Risdon Bennett said of lung cancer, 'In proportion as our experience enables us to accumulate materials for a more complete natural history, we may expect to render the diagnosis easier.' Today, this objective is still with us. Happily, current efforts are in gear with progress.

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