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Isaac A. Adler

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Classics in Oncology

Primary Malignant Growths of the Lung

Isaac A. Adler, A.M., M.D.

Introductory

Is it worthwhile to write a monograph on the subject of primary malignant tumors of the lung? In the course of the last two centuries an ever-increasing literature has accumulated around this subject. But this literature is without correlation, much of it buried in dissertations and other out-of-the-way places, and, with but a few notable exceptions, no attempt has been made to study the subject as a whole, either the pathological or the clinical aspect having been emphasized at the expense of the other, according to the special predilection of the author. On one point, however, there is nearly complete consensus of opinion, and that is that primary malignant neoplasms of the lungs are among the rarest forms of disease. This latter opinion of the extreme rarity of primary tumors has persisted for centuries. Within the last few decades attempts have been made to combat this dogma, but even now the overwhelming majority of medical practitioners rarely, if ever, think of a diagnosis of tumor of the lungs, and the ubiquitous tuberculosis, with its multiform clinical appearances and its plastic adaptation to all ages and all conditions of mankind, is ever

ready to furnish, to all but a very few, a comfortable and satisfactory diagnosis.

Most textbooks hardly notice lung tumors, and if they give the subject any consideration it is, for the most part, insufficient. Thus the well-known and still authoritative textbook on Diseases of the Lungs and Pleurae, including Tuberculosis and Mediastinal Growths, by Sir R. Douglas Powell and P. Horton-Smith Hartley (5th Edition, 1911), while treating at length of thoracic tumors and of mediastinal tumors, etc., has scarcely more than one page to cover the entire subject of carcinoma and sarcoma of the lungs. The excellent book of A. Fränkel¹ and the admirable chapters on carcinoma of the lungs in the latest edition of Wolff,² as well as a few other publications,* attempt a more comprehensive presentation of this type of tumor, but they seldom get into the hands of the medical public at large, and so it happens that the general practitioner is not in a

*Credit must be given here to Alfred v. Sokolowski, Klinik der Brustkrankheiten, Vol. I, Berlin, 1906, and his study of primary malignant and non-malignant neoplasms of the bronchi and lungs. He seems to consider bronchial carcinoma extremely rare—much more rare than primary tumors of the lung. He has a chapter of about 15 pages devoted to lung tumors, citing several cases of his own experience. He goes rather quickly over the pathology and diagnosis of carcinoma and in the same way hurries over sarcoma without bringing in anything notably new.

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position to diagnosticate a primary lung tumor as often as might be, and the belief in the extreme rarity of these cases is still maintained. To add to these difficulties, even the diagnoses made on the autopsy table are not always reliable. There are still careless or insufficiently trained persons called upon to do this rather delicate work. It may happen also that the most careful and searching autopsy will not furnish the true diagnosis until a thorough microscopical examination has been made. Take for example the case of Walter Kretschmar;³ also of Morelli.* This latter case is remarkable for a number of unusual features: the youth of the patient—a female aged 28—the sudden onset after cold, with fever and cough, the clinical symptoms of a pneumonic consolidation in right base with pleural effusion and endocarditis. The sputum showed diplococci. On autopsy both lungs showed white nodules, corresponding to blood vessels, and connective tissue strands not infrequently seen after pneumonic processes. No tumor could be recognized, and only upon microscopic examination were nests of epithelial cells discovered in the lymph spaces of the fibrous tissue, and epithelial clusters in the alveoles and in the alveolar septa.

Furthermore, v. Hanseemann⁴ relates that in his experience at the Friedrichshain Hospital there were 711 carcinomata out of 7,790 autopsies, of which 156, or 21.94 percent, were not diagnosed during life, not even as tumors. Among these 156 cases there were 16 bronchial and pulmonary tumors. Is it not somewhat humiliating to realize that the difficulties of diagnosis are still so great as to prevent the best and most experienced medical men, with all the advantages of a large hospital, from discovering almost one-fifth of all the carcinomata that come before them? If these figures hold good generally, about one-fifth more carcinoma cases should be added to our ordinary statistics. Another important addition to the difficulties to

be contended with lies in the fact that in many countries, as for example our own, justly claiming an advanced stage of civilization, the overwhelmingly great majority of the dead are not subjected to any post-mortem examination, and the death certificates on which burial permits are officially given are often ludicrously insufficient. For this reason the United States Census is entirely useless for our purposes. As an example of the misleading diagnoses and insufficient observations which hamper one in getting up the literature of this subject, look up the following: *Two Cases of Melanotic Tumors in the Lungs*.⁵ Reliable autopsies, in the majority of cases, there are not, and many autopsy notes that have been recorded are so insufficient in their data and descriptions that a conclusive opinion on the case cannot be formed. The same applies to the clinical notes. It is therefore impossible to say, from the figures given by the United States Census concerning causes of death, how many persons mentioned as having died from tuberculosis, pneumonia, or kindred diseases, may not really have died from lung tumors.

Considering all this, it seems primarily necessary to procure enlightenment on the question: Are malignant tumors of the lung as rare as has been supposed? And if they are not so rare, is their more frequent occurrence due to a supposed general increase in the incidence of malignant growths? Williams,⁶ an enthusiastic exponent of the increase of carcinoma as a whole and the corresponding decrease of tuberculosis, supports his view with a great mass of statistical figures, of which some few are quoted here (Table 1).

As to Newsholme's contention⁷ that the registered increase is only apparent, being actually due to improved methods of diagnosis and death certification, Williams's answer is that (1) the uniformity in increase is too marked to be due to improved diagnosis, and (2) the very improvements cited have also caused subtractions from the cancer total, since many diseases formerly erroneously

*Table I, No. 201 (*not reprinted here*).

called cancer are now given their true names. Nencki is quoted in this connection⁸ as giving the increase in cancer death-rate in Switzerland from 114 in 1889 to 132 in 1898 (per 100,000 living). In Table 2 Williams gives figures for other countries.

Other important statistical work to be consulted is that of Robert Behla,⁹ the great standard work, in four volumes, of Juliusburger,¹⁰ and the work of News-holme.¹¹ Looking carefully over these statistics, it is the writer's opinion that the statistics of Williams, as well as all statistical material thus far collected, with a great deal of care and labor, have not succeeded in proving conclusively that there is a real increase in the incidence of cancer and a corresponding decrease in the incidence of tuberculosis. The fact may turn out to be so, but at this writing can by no means be considered as proven. The only figures which in the course of time will give us the means of definitely solving problems such as this will be those obtained from hospitals, where the material is more uniform, where the best modern methods of observation and diagnosis are applied, and where finally the autopsies and microscopical examinations are done with the utmost care. Reports of life insurance officers, statistics taken from books of registrars and recorders, where only the causes of death are mentioned, cannot be effectively utilized.

It has been shown, especially by the researches of Behla just quoted, that some sort of influence of occupation or trade may possibly be considered a factor in the incidence of carcinoma. If so, this factor is of very slight significance and may, at least for the study of lung tumors, be entirely disregarded.

It is the conviction of the writer, and he shares this belief with many others—the mention of whose names and criticism of whose work need not be entered upon here—that there is no absolute increase in the incidence of carcinoma. Nevertheless, the incidence of malignant neoplasms of the lungs seems to show a decided increase. It has been stated that

TABLE 1
CANCER INCIDENCE
IN ENGLAND AND WALES

1840
2,786 CASES

A proportion to total number of deaths of 1:129, or 177 per million living.

1905
30,221 CASES

A proportion to total number of deaths of 1:17, or 885 per million living.

TABLE 2
DEATHS FROM CANCER
(Incidence per 100,000)

Paris, France	1865	84
	1900	120
Germany	1872	59
	1900	71
Berlin	1870-1882 . .	57
	1899	109
Italy	1880	21
	1905	58
United States	1850	9
	1900	43
New York	1864	32
	1900	63
Boston	1863	28
	1903	85
New Orleans	1864	15
	1903	82
San Francisco	1856	16
	1900	112

TABLE 3
PRIMARY CARCINOMA
OF THE LUNGS AND BRONCHI

I Time	II Place	III % of all Carcinoma	IV Total No. Carcinoma Cases	V % of all Autopsies	VI Total No. of Autopsies	VII Author
1. 1852–1867	Stadtkrankenhaus, Dresden	0.91			8,716	Reinhardt ¹³
2. 1852–1908	Patholog. Institut, Würzburg	15 or 0.93	1,607			Föckler ¹⁴
3. 1854–1885	Stadtkrankenhaus, München	8 cases		0.065	12,307	Fuchs ¹⁵
4. 1870–1888	Patholog. Institut der Universit. Kolozsvár	0	145			Buday ¹⁶
5. 1872–1889	Patholog. Institut, Bern	2 0.42	474	0.059	3,363	C. Müller ¹⁷
6. 1872–1898	Reichsgesundheitsamt, Hamburg	84 0.70	11,930	0.02	336,486	Reiche ¹⁸
7. 1873–1887	Patholog. Institut, Kiel	0				Danielsen ¹⁹
8. 1877–1884	Stadtkrankenhaus, Dresden	9 cases		0.22	4,712	Wolf ²⁰
9. 1881–1894	Patholog. Institut, Breslau	1.83	870		9,246	Pässler ²¹
10. 1885–1894	Stadtkrankenhaus, Dresden	31 cases		0.43	7,728	Wolf ²²
11. 1886–1896	Krankenhaus, München	9 1.2	706	0.10	8,727	Perütz ²³
12. 1887–1906	Patholog. Institut, Wien	68		0.17	40,000	Haberfeld ²⁴
13. 1888–1897	Patholog. Institut, Greifswald	1.78				Kaminski ²⁵
14. 1888–1905	Patholog. Institut, Universit. Kolozsvár	10 4.5	221			Buday ²⁶
15. 1895–1901	Friedrichshain, Berlin		711		7,790	Riechelmann ²⁷
16. 1899–1903	Patholog. Lab. Lubarsch, Posen	3 1.2	159	0.17	1,741	Sehrt ²⁸
17. Vor 1900	Patholog. Institut am Urban-Berlin	4	100	0.4		Feilchenfeldt ²⁹

TABLE 3
(Continued)
PRIMARY CARCINOMA OF THE LUNGS AND BRONCHI

I Time	II Place	III % of all Carcinoma	IV Total No. Carcinoma Cases	V % of all Autopsies	VI Total No. of Autopsies	VII Author
18. 1899–1904	Patholog. Institut am Urban-Berlin			0.6		Benda ³⁰
19. Zeitraum v. 10 Jahr.	Patholog. Institut, Univ. München	20 1.92				Rieck ³¹
20.		6 1.3	447			Lebert ³²
21. 1900	Patholog. Institut, Charité-Berlin	2.91 3 cases	103	0.23	1,300	Karrenstein ³³
22. 1900–1905	Urban-Berlin	31 0.61	496	0.6	5,002	Redlich ³⁴
23. 1901	Patholog. Institut, Charité-Berlin	8.86 7 cases	79	0.53	1,310	Karrenstein ³³
24. 1902	Patholog. Institut, Charité-Berlin	3.23 3 cases	93	0.31	999	Karrenstein ³³
25. 1903	Patholog. Institut, Charité-Berlin	3.19 3 cases	94	0.24	1,272	Karrenstein ³³
26. 1904	Patholog. Institut, Charité-Berlin	2.67 4 cases	150	0.28	1,399	Karrenstein ³³
27. 1905	Patholog. Institut, Charité-Berlin	0.71 1 case	140	0.08	1,313	Karrenstein ³³
28. 1906	Patholog. Institut, Charité-Berlin	4.84 6 cases	124	0.46	1,319	Karrenstein ³³
29. 1906–1908	Krankenhaus, r.d.l., München		174	0.18	945	Forstner ³⁵
30. 1907	Patholog. Institut, Charité-Berlin	3.31 5 cases	151	0.37	1,360	Karrenstein ³³
31. 1908	Stadtkrankanstalten, Hamburg	11 1.2			920	Körber ³⁶
32. 1908–1909	Patholog. Institut Krankenhaus, München	1.8	212	0.29	1,371	Nobiling ³⁷
33.	Basel	1.76				Kaufmann ³⁸
34. 1910–1911	Charité-Annalen, Berlin	0.76	141	0.05	185	Orth ³⁹

statistical research in this direction is beset with many difficulties. It may be hoped that in the course of a few years accurate and reliable figures will be available. In the meantime, however, the following table (Table 3), founded on figures collected by Karrenstein¹² and considerably amended and enlarged, will at least serve to show, not the causes, but the fact of the apparent increase. It is very significant that in 1900 the Pathological Institute of the Charité in Berlin recorded only three cases of lung tumor, while in 1906 and 1907 five and six cases respectively, were recorded. It is more significant still when the reports of the Pathological Institute of Kolozsvár from 1870 to 1880 and from 1888 to 1905 respectively, are compared. It is to be remembered that this table is made up mainly from records of pathological laboratories of fairly high standing.

There seems hardly room for doubt that the increase in the percentage of lung tumors is to be attributed mainly to the increased attention paid to these types of tumor and the greater care and more extensive microscopic investigation with which autopsies are carried out at present. As early as 1837, Stokes⁴⁰ had already remarked that in his experience lung tumors are by no means as rare, either in England or in Ireland, as was generally assumed, and Boyd* even goes so far as to assert that primary cancer is more frequent in lungs than secondary cancer, an assertion which he explains as follows: "A case of malignant deposit in the bronchial glands, infiltrating the lung, ending in ulceration and the formation of cavities, is frequently set down as one of hopeless phthisis, a post-mortem on which would be of no interest, and all record of the frequency of the disease is in consequence entirely lost." This utterance of Boyd's is probably somewhat of an exaggeration, for while it has just been shown that the belief in the extreme rarity of lung tumors, a *lusus naturae*, as it were, can no longer be maintained,

it must be conceded that these tumors belong to the class of rarer neoplasms and their incidence is out of all proportion to the frequency of occurrence of other malignant neoplasms, as for example of the female breast or the stomach.

Seeing, thus, that lung tumors are to be reckoned with more often than was formerly believed, it is to be expected that numerous problems, both pathologi-

"It cannot be a matter of indifference to the unfortunate sufferer whether his case be diagnosticated as tuberculosis or as tumor."

cal and clinical, will present themselves. Besides these problems of purely theoretical interest to the pathologist and the clinician, there is the great importance to the patient of a correct diagnosis. It cannot be a matter of indifference to the unfortunate sufferer whether his case be diagnosticated as tuberculosis or as tumor. If tuberculosis, he will be sent from one climate and one sanitarium to another, he and his family possibly deluded with false hopes, until finally secondary symptoms have cleared up the case and death has brought relief. The grave prognosis which is an integral part of the diagnosis of tumor may be of paramount importance to the patient as well as to his relatives. At all events, so much is certain, that if the diagnosis of lung tumors is to be developed so as to render it more precise, and if any reasonable attempt is to be made to convert the present desperate prognosis into one less hopeless, this great result can only be achieved if the internist shall work hand in hand and shoulder to shoulder with the surgeon. The internist must be able to furnish as early and as accurate a diagnosis as possible, so that the surgeon under favorable conditions may develop his technique as early as possible. With these few introductory words, the initial question, it is dared to hope, is answered affirmatively.

*Table I, No. 46 (not reprinted here).

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