Autopsy Reports of Pulmonary Carcinoma

Survey in Los Angeles County Hospital for 1951

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• Of the 1,972 deaths investigated by autopsy at the Los Angeles County Hospital in 1951, 64 were attributed to bronchogenic carcinoma. However, in some of these cases the protocols did not contain sufficient data to substantiate the diagnosis or the tissue specimens were not conclusive evidence.

Although the survey left no doubt that the lung was the most common site of primary carcinoma in the series studied, a wider application of the findings is limited by the facts that patients with bronchogenic carcinoma are more likely than others to die in hospitals and that selection of cases for autopsy depends on the interest of the physician and the consent of the patient's survivors.

IN VIEW OF THE REPORT by Steiner and co-workers[5] in 1950 noting the increase in deaths from bronchogenic carcinoma in the Los Angeles County Hospital (and of similar reports from other parts of the United States[1, 4]) it seemed advisable to review carefully the autopsy reports at that institution for a more recent calendar year to determine the number of deaths attributed to cancer of the lung.

MATERIALS AND METHOD

The material for the study was obtained from records of 1,972 consecutive autopsies done at the Los Angeles County Hospital in 1951. All cases with the anatomical diagnosis of bronchogenic carcinoma were studied and the autopsy protocols and microscopic slides examined. Cancer of the lung was listed as a diagnosis in 71 cases, but in seven of these the tumor was thought to have originated elsewhere in the body or to be not the primary cause of death.

Of 380 deaths resulting from cancer, therefore (19.3 per cent of all cases studied), 64 or 16.8 per cent were attributed to bronchogenic carcinoma.

RESULTS

Of the 64 cases, 47 were in males and 17 in females. The average age for both sexes was 63 years. Thirty-five of the patients had lived in Los Angeles County between 3 and 56 years, the average residence for these being 19.4 years.

The incidence of bronchogenic carcinoma as compared with that for cancer in several other common sites in the material studied is shown in Table 1.

DISCUSSION

The present study is in agreement with the opinion of Weller[6] on the inherent weakness of statistical studies of this nature. He stated: "As is true of all cancer statistics, those dealing with primary carcinoma of the lungs and bronchi are of value only to the extent that the material units have been critically selected. The authenticity of the individual case is the crucial test. Obviously, only those reputed examples of primary carcinoma of the lung are of value on which a complete autopsy has been done. Certainly, too, there must be microscopic verification of each case, if results are to be fully accepted.... Doubtful cases should be excluded from collected series.... Also, those examples in which multiple separate masses of carcinoma are found in both lungs and primary carcinoma is not observed elsewhere, are best interpreted as instances of hidden primaries. In studies which are only statistical, the reader is at a loss to know how critical the compiler may have been in selecting his original units. . . . There is still need for statistical studies based on carefully selected and fully authenticated cases of carcinoma of the lung." Many of the protocols reviewed for this

TABLE 1.—*Comparison of incidence of bronchogenic cancer with that of other cancer—1951*

	Total No.	Per cent of all cancers
Bronchogenic carcinoma	64	16.8
Bowel (small and large including rectum)	44	11.6
Stomach	38	10.0
Leukemias and lymphomas	30	7.9
Pancreas	27	7.1
Bladder	20	5.2
Intracranial tumors	18	4.7
Prostate	17	4.4
Breast	17	4.4

From the Tumor Tissue Registry of the Cancer Commission, California Medical Association, and the Los Angeles County Hospital.

The photography was done by Edward Hamilton, College of Medical Evangelists.

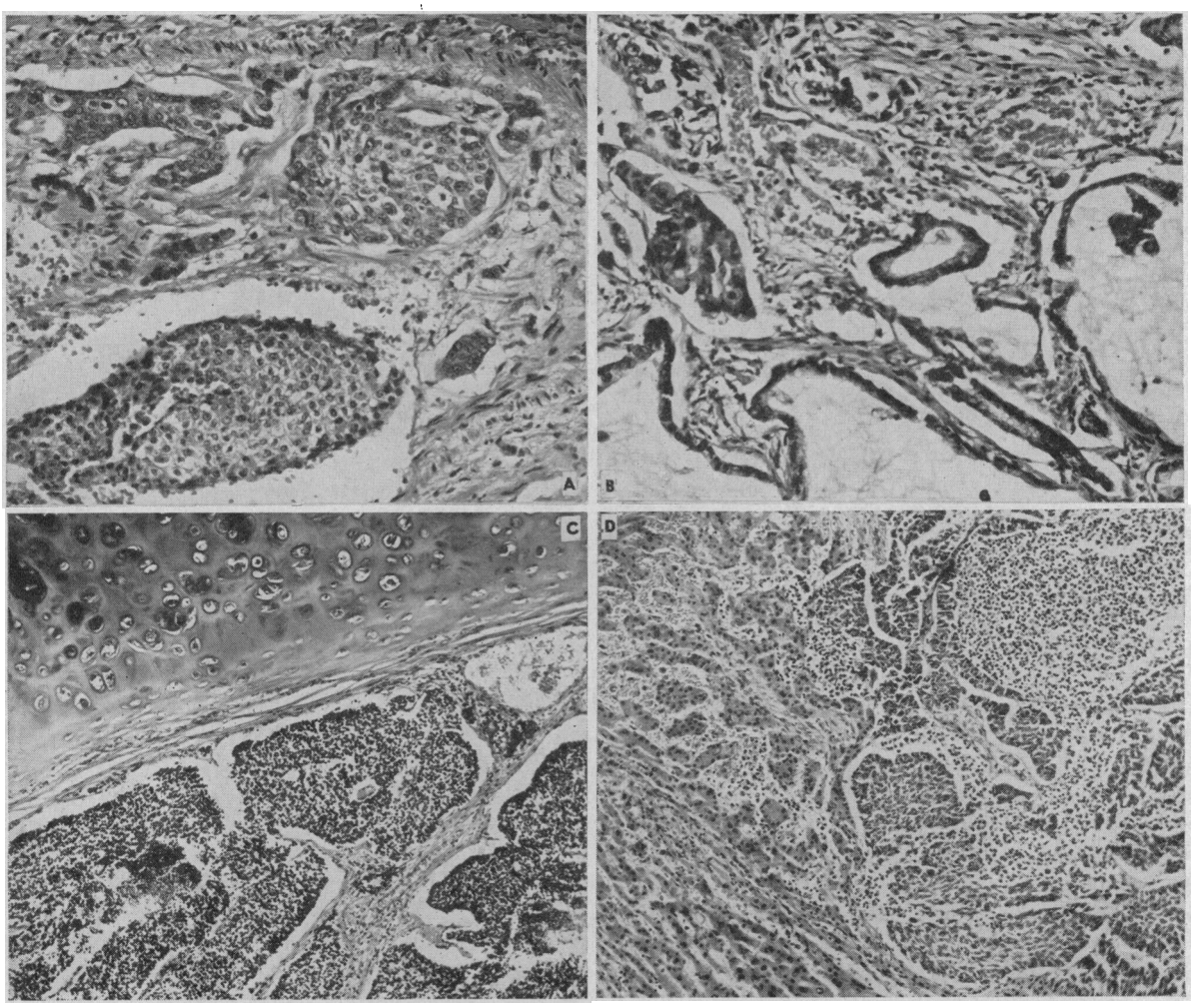

Figure 1.—These microscopic sections illustrate the apparent tendency of bronchogenic carcinoma to vary in histologic pattern. *A*—An area of squamous carcinoma. *B*—An area of adenocarcinoma from same block of tissue as *A*. *C*—Typical "oat-cell" tissue. D—Liver metastasis from tumor shown in *C*. Note epidermoid areas.

study, together with the microscopic slides, contained adequate evidence to support the diagnosis of primary bronchogenic carcinoma, but some, although the condition reported may have been cancer of the lung, were not sufficiently documented to substantiate the diagnosis.

A shortcoming was the lack of definite statements as to how carefully the gastrointestinal tract, breasts, thyroid gland and other possible sites of cancer were examined and excluded. Probably the greatest lack in this respect was with those cases classed as adenocarcinoma. Of seven protocols on cases in females, six did not report on examination of the breasts, and in four no breast tissue was available for microscopic study. Many of the microscopic slides were inadequate because the tissue had not been taken from a representative site. In only two instances in the microscopic material available for study was the origin of cancer of the lung traceable to the bronchial mucosa. In other instances, fixation was so poor that the possibility of neoplastic lesions other than bronchogenic carcinoma could not be definitely excluded. It is therefore more than a possibility that some of the lesions included as primary bronchogenic carcinomas were in fact tumors of other origin.

TABLE 2.—*Classification of bronchogenic carcinoma observed in autopsy series*

Epidermoid		18
Anaplastic		31
(Undifferentiated	13)	
(Giant and spindle	6)	
(Oat cell	12)	
Adenocarcinoma		10
(Alveolar cell carcinoma	2)	
Mixed		5
		64

In study of the slides the 18 specimens of epidermoid cancer (see Table 2) were easily classi-

fied. The 31 specimens of anaplastic cancer were subdivided as "undifferentiated" (13) "giant cell and spindle cell," (6) and "oat cell" (12). This division is perhaps unnecessary but was helpful in the study of these tumors. The undifferentiated sub-group ranged from those which had extensive dermoplastic reaction and resembled tumors frequently seen in the breast, to those with large sheets of cells in which the cells were larger and had more cytoplasm than is typical of "oat-cell" carcinoma. (The latter term is unsatisfactory because of the variance of interpretation as to what constitutes an "oat cell." It is used nevertheless to indicate a certain type of cancer of the lung with slightly spindle-shaped, small cells.) The bronchogenic carcinomas of "giant-and-spindle-cell" type were extremely pleomorphic with varying amounts of both components. The "mixed" group included tumors in which there was a mixture of any two or more of the main histologic types in the lung itself. In studying the metastatic lesions, additional patterns were noted. In two cases of typical anaplastic (oat-cell) carcinoma there were definite squamous areas in the metastatic growths (Figure 1).

Despite the previously mentioned shortcomings in autopsy reports, a great number of cases were very typical both in history and in microscopic appearance of excised material, and it can be stated without a doubt that among cases in which autopsy is done at the Los Angeles County Hospital, the lung is the most common site of primary carcinoma. This does not mean that it is the most common carcinoma occurring in patients in this area. Patients with bronchogenic carcinoma, as has been shown, have a very short life expectancy after diagnosis, in contrast with patients having other common kinds of cancer,[2] and are therefore more likely to die in the hospital than those with other tumors, such as cancer of the breast or of the stomach. Another factor may be the selection of cases for autopsy, as permission for autopsy is usually sought in the more interesting and less obvious causes of death. In Los Angeles vital statistics for the year 1950,[3] primary malignant neoplasm of the lung was listed as the cause of 5.9 per cent of all deaths from cancer; in another 3.3 per cent the cause was listed as cancer of the lung, but whether primary or not was not stated. Cancer of the stomach was the cause of death in 11.2 per cent of the deaths from cancer, and in 11.4 per cent it was cancer of the breast.

CONCLUSION

Bronchogenic carcinoma is the outstanding cause of death from cancer among cases in which autopsy is done in the Los Angeles County General Hospital. To ascertain the true proportion of death from primary cancer of the lung in the population at large, it would be necessary to have autopsies on a reasonable segment of the population, and in no case could death be attributed to bronchogenic carcinoma unless all other reasonably possible primary sites were examined and exculpated.

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