Bronchogenic Carcinoma: An Analysis Of 305 Surgically Treated Patients

Rodman E. Taber

Conrad R. Lam

Jorge Robles

Follow this and additional works at: https://scholarlycommons.henryford.com/hfhmedjournal

Part of the Life Sciences Commons, Medical Specialties Commons, and the Public Health Commons

Recommended Citation
Taber, Rodman E.; Lam, Conrad R.; and Robles, Jorge (1962) "Bronchogenic Carcinoma: An Analysis Of 305 Surgically Treated Patients," Henry Ford Hospital Medical Bulletin: Vol. 10 : No. 1 , 57-62. Available at: https://scholarlycommons.henryford.com/hfhmedjournal/vol10/iss1/11

This Part I is brought to you for free and open access by Henry Ford Health System Scholarly Commons. It has been accepted for inclusion in Henry Ford Hospital Medical Journal by an authorized editor of Henry Ford Health System Scholarly Commons.
BRONCHOGENIC CARCINOMA: AN ANALYSIS OF 305 SURGICALLY TREATED PATIENTS

RODMAN E. TABER, M.D.,* CONRAD R. LAM, M.D.,* AND JORGE ROBLES, M.D.*

Eight hundred and thirty three patients with proven lung cancer have been treated at Henry Ford Hospital between January 1944 and December 1960. Three hundred and five of these patients have been subjected to operation and constitute the subject of this report.

Operability

The significantly increased incidence of bronchogenic carcinoma is now common knowledge to both the lay population and medical profession. In spite of this widely disseminated information and resulting stimulus to uncover the early or asymptomatic patient during recent years, there has resulted relatively little improvement in the operability rate. This disturbing observation is apparent when comparing the operability experience of the 1950-1955 period at Henry Ford Hospital with the succeeding 5 years. (Figure 1) A reasonably standardized policy of operative indica-

---

*Division of Thoracic Surgery.
tions and surgical technic have prevailed throughout this decade in which the operability rate has continued in our experience to remain below 50 per cent for any single year and averages but 36.6 per cent for the entire period. Inoperability has been determined largely by the demonstration of extrathoracic metastases, extension to the contralateral lung or the presence of extensive chest wall invasion. Occasional patients have been treated nonoperatively in the absence of these findings because of debility or poor pulmonary reserve due to emphysema. Operability for some patients in this group has improved however due to increasing employment of lobectomy in preference to pneumonectomy for selected cases which has allowed inclusion of some with compromised pulmonary reserve in the operatively treated group who would have been refused total pneumonectomy prior to adoption of this policy.

Clinical Data

Nine out of ten of the patients in the operatively treated group were between 40 and 70 years of age at the time of surgical treatment, however 27 were beyond 70 years. Indications for employing surgical treatment in patients past 70 years of age were based on clinical evaluation of the cardiopulmonary state rather than the chronologic age. Similar to the experience of others, 90.2 per cent of the patients were males. The symptoms of bronchogenic carcinoma were of uniform type when an obstructing endobronchial tumor was present, whereas the peripheral lesion was frequently detected in an asymptomatic stage at the time of routine chest roentgenographic examination. Patients with endobronchial lesions experienced aggravation of a "smoker's cough" if previously present, or noted onset of a dry cough. The presence of a localized wheeze on examination of the chest was the single most valuable physical finding in the patients without otherwise obvious disease. Hemoptysis was experienced by 110 (36 per cent) of the patients undergoing surgical treatment. Bleeding was uncommonly massive in amount but when of this magnitude it indicated that a far advanced lesion was present.

Diagnostic Findings

Diagnostic studies followed a uniform pattern, consisting of chest fluoroscopy with barium swallow, sputum cytologic examination and bronchoscopy if the lesion was endobronchial in type. Chest roentgenograms with barium swallow may occasionally indicate the presence of enlarged mediastinal nodes as manifested by extrinsic compression of the esophagus. Although this finding is helpful in evaluating the extent of the primary lesion, it is not regarded as a sign of categorical inoperability as some long term survivors may be expected in the presence of these findings. Bronchoscopy was performed in 255 patients, 148 (59 per cent) of which were judged positive as manifested by biopsy of a tumor mass, the finding of bronchial compression by an extrinsic mass or positive cytologic smears obtained by bronchial washings. Since positive cytologic smears may be obtained in bronchial washings from some patients with peripheral type lesions, this examination may be of diagnostic value in this group of patients as well as in those with tumors arising more proximally. Scalene node biopsy of non-palpable nodes has been employed when mediastinal node enlargement was demonstrated on roentgenographic examination of the chest or in the presence of an extensive tumor as judged by other findings.
Resectability

An aggressive attitude regarding resectability is reflected in the 81.3 per cent rate (248 patients) in this series of 305 operative procedures. This approach cannot be expected to improve the percentage of long term survivors to a great extent, however it is our belief that symptomatic therapy must occasionally include removal of bleeding neoplasms and infected pulmonary tissue which lies beyond a blocked bronchus. Partial resection of the atrial wall, intrapericardial division of the pulmonary artery over a vascular clamp, excision of the carina, sacrifice of the recurrent laryngeal nerve and en bloc resection of portions of the chest wall or diaphragm must be frequently employed if a high resectability rate is desired. Support for this policy may be derived from an analysis of survival data in this and other series\(^{1,2}\) of patients which illustrate the dismal results obtained when the tumor is not extirpated. (Table I). In spite of the employment of adjuvant radiotherapy and chemotherapy, few of the patients with non-resectable lesions survived two years and none reached the fifth postoperative year.

<table>
<thead>
<tr>
<th>Type of Resection</th>
<th>Survived 2 yrs. or more</th>
<th>Survived 5 yrs. or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resection (248 patients)</td>
<td>31.9% (79)</td>
<td>9.3% (23)</td>
</tr>
<tr>
<td>Thoracotomy and biopsy (57 patients)</td>
<td>1.8% (1)</td>
<td>0</td>
</tr>
</tbody>
</table>

Table I

Type of Resection

Pneumonectomy was the most commonly employed type of resection (171 patients) with lobectomy accounting for 73 of the 248 operative procedures. Segmentectomy was used on four occasions for lesions which proved to contain tumor of microscopic size. These lesions were usually incidental findings discovered during histologic study of a larger inflammatory mass. Lobectomy was employed more frequently for peripheral tumors, whereas pneumonectomy was commonly required for endobronchial lesions. The survival rates for the two types of resections show significant variation, however the different indications for employment of each procedure prevent accurate comparison. Whereas 59 of 171 patients (35 percent) having pneumonectomy survived two or more years, only 16 of 73 patients (22 percent) undergoing lobectomy lived this long.

Mortality and Survival

A patient who succumbed within two weeks of operation was considered as an operative mortality. Among the 248 patients who had resection of their tumors, there were 26 (10.4 percent) postoperative deaths. The operative mortality was slightly higher (12.3 percent) if the tumor could not be extirpated.
Analysis of the causes of postoperative mortality demonstrate factors related to the advanced tumor accounting for all of the deaths in the presence of a non-resectable lesion. In the group of patients with resectable tumors, pulmonary complications were responsible for the largest number of fatalities (16 of 26 deaths). Only four (1.6 percent) of the 248 patients who underwent resection of their lesions expired in the operating room and cardiac arrest accounted for each of these deaths.

Although survival for two years without evidence of recurrence after resection may indicate cure in the case of some visceral neoplasms, this observation does not apply to pulmonary tumors. Analysis of the long term survivors in this group of patients demonstrates a continued attrition throughout the follow-up period as has been noted by other authors. Of the 248 patients undergoing resection of their tumors, 31.9 percent (79 patients) survived two years or more, however this rate fell to 9.3 percent (23 patients) by the fifth year. The normal mortality rate (3 percent for 5 years) of this age group in the general population does not significantly alter these results.

Reports by others have suggested that the pathologic cell type exerts a significant influence on survival rates. As may be seen by comparison of the incidence of various cell types in the entire group of patients undergoing resection with the respective incidence in patients surviving beyond two years, this factor has been of minor importance in the experience herein reported. (Table II). It is interesting that 16.3 percent of those patients surviving two years or more after resection had undifferentiated carcinomas.

<table>
<thead>
<tr>
<th>BRONCHOGENIC CARCINOMA</th>
<th>Incidence in all surgically treated patients</th>
<th>Incidence in 102 patients surviving 2 or more years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidermoid</td>
<td>62.1%</td>
<td>54.5%</td>
</tr>
<tr>
<td>Adenocarcinoma</td>
<td>24.4%</td>
<td>24%</td>
</tr>
<tr>
<td>Undifferentiated</td>
<td>9.4%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Bronchiolar</td>
<td>4.1%</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

Table II

A significant relationship between regional lymphatic metastasis and survival is demonstrated by the number of patients surviving two years or more and in those surviving five years or more. (Table III). Extension into the lymphatic system remains the single most important prognostic finding among patients with resectable tumors which are potentially curable. When this evidence of spread is present, few (1.6 percent) patients survived beyond the second postoperative year in spite of a policy of administering postoperative mediastinal irradiation to this group. A tenfold increase in the number of five year survivors was noted in the absence of lymphatic spread.
BRONCHOGENIC CARCINOMA

A pleural effusion was diagnosed by preoperative roentgenograms or at the time of operation in 25 patients. This proved to be an ominous prognostic sign as only one patient in this group survived beyond two years following resection.

BRONCHOGENIC CARCINOMA

Relationship of survival after resection to lymphatic metastases

<table>
<thead>
<tr>
<th></th>
<th>Survived 2 yrs. or more</th>
<th>Survived 5 yrs. or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>118 patients with + nodes</td>
<td>19.4% (23)</td>
<td>1.6% (2)</td>
</tr>
<tr>
<td>130 patients with - nodes</td>
<td>43% (56)</td>
<td>16.1% (21)</td>
</tr>
<tr>
<td>248 total</td>
<td>31.9% (79)</td>
<td>9.3% (23)</td>
</tr>
</tbody>
</table>

Table III

DISCUSSION

Since many patients with resectable tumors succumb to their disease because of extrathoracic metastasis rather than recurrence in the operative area, it would appear that little improvement in survival rates can be anticipated by virtue of more radical extension of the currently practiced operative procedures. Extensive regional lymph node dissection constitutes an important aspect of cancer surgery which is readily incorporated into the resectional treatment of pulmonary neoplasms, however the presence of lymphatic metastasis in the group of patients under discussion has all but precluded survival beyond the fifth postoperative year. Avoidance of intraarterial seeding at the time of resection by primary pulmonary vein ligation may be of at least theoretical value in preventing this high rate of extrathoracic metastasis. It would appear however, that material improvement in the survival of lung cancer patients will not result from refinements and extension of the operative technic but rather must be sought through detection of the neoplasm while still confined to the lung parenchyma. This will require additional measures in the fields of preventive medicine and cancer detection beyond those currently practiced. Sputum cytologic studies and chest roentgenograms are the most commonly available detection measures which, if utilized to a greater degree, should improve the present poor showing. Sputum cytologic studies might be performed once or twice yearly along with radiologic examination of the chest in males over 40 years of age. Ninety percent of lung cancers occur in this group. Competent cytologic examination of the sputum has detected 75 percent of lung cancers in one large series of patients and should probably gain the prominence in the field of lung cancer screening that this examination has now assumed in uncovering hidden uterine cancer.

SUMMARY

In a series of 833 patients with proven bronchogenic carcinoma, 305 have been subjected to operation. Resection of the neoplasm was performed in 248 patients (81.3 percent).
There was an operative mortality of 10.4 percent during the two weeks following surgery; however, only four deaths (1.6 percent) occurred in the operating room. Seventy-nine (31.9 percent) patients survived two years or more and 23 (9.3 percent) lived beyond five years. The cell type exerted little influence on the survival rate; however, the presence of lymphatic metastasis proved to be an important indicator. The absence of metastasis in the regional lymph nodes permitted a ten-fold increase in patients surviving five or more years.

REFERENCES


