Chronic Pneumonitis Simulating Bronchiogenic Carcinoma

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Although there has been an improvement in the mortality, morbidity, and five year survival rates for those undergoing operative procedures for cancer of the lung, there are many afflicted with the disease who reach the thoracic surgeon too late for satisfactory surgical therapy, the only accepted curative method available today. All members of the medical profession concerned with this problem realize that a more aggressive approach is necessary in certain clinical conditions.1-2 “Recurrent” or “unresolved” pneumonias fall in this latter group. The inflammatory reaction may result from intermittent or persistent obstruction of bronchial secretions due to neoplasm or its associated pathology.

Experience with several patients, who were suspected of having bronchiogenic carcinoma, demonstrated the need for conservatism in such cases.

Case 1: A. B., a 66 year old Negro, was admitted to the hospital with a small, firm, slightly movable mass at the vertex of the scalp. This had increased in size during the preceding eight months until it measured 2 x 1.5 cm. Physical examination was otherwise not significant. Hematological determinations were normal except for the sedimentation rate of 34 mm. Smears of three sputum specimens were negative for tuberculi bacilli. The blood serology was positive, but that of the spinal fluid was negative. Roentgenograms of the thorax, postero-anterior (Fig. 1) and right lateral views, revealed a density extending from the hilum into the right lung field with overlying pleural reaction anteriorly.

History of cough, of right anterior chest pain for 18 months, and twelve pound weight loss was elicited. Bronchoscopy revealed no abnormality. Aspirated bronchial secretions utilizing paraffin sections (of cell blocks) were negative for tumor cells. The scalp lesion was excised and reported as an epidermal inclusion cyst. Several loose teeth were removed. The usual pre-operative routine was completed except that 300,000 units of penicillin were given twice daily for 12 days because of the positive blood serology. At operation adhesions were found extending from a firm mass in the upper and middle lobes of the right lung to the anterior chest wall and to the mediastinum. Pneumonectomy was performed.

The specimen consisted of the right lung weighing 500 grams. The segmental bronchi of the middle lobe and anterior segment of the upper lobe were stenosed and surrounded by a firm mass, 8 x 6.5 x 6 cm. The fairly dry lesion consisted mostly of grayish-green tissue which extended antero-laterally. At only one point was the overlying pleura dimpled and attached. The remainder of the lung parenchyma was not remarkable except for congestion due to surgery and apical subpleural emphysematous blebs. Microscopic examination revealed many macrophages with oval, eccentrically placed nuclei and many small vacuoles (stained with Scarlet Red) in the cytoplasm. These cells were seen in the areas of acute and chronic inflammation. The pathologist reported chronic pneumonitis, cholesterol type.

His condition during and following operation was satisfactory. During a period of 17 months he had three follow-up visits. Roentgenograms

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Figure 1 (Case 1): Roentgenogram showing mass in right upper lobe suspicious of bronchogenic carcinoma.

Figure 2 (Case 2): Roentgenogram showing hilar mass characteristic of carcinoma of the lung.

Figure 3 (Case 3): Roentgenogram showing hilus mass extending into the right lung field suspicious of bronchogenic carcinoma.
revealed the mediastinal structures markedly deviated to the right with some herniation of the well aerated, normal left lung through the mediastinum. The right hemithorax was opaque. Vital capacity was 45.7 per cent of normal, and maximum breathing capacity was 31 per cent of normal. The immediate post-operative dyspnea diminished. He had gained nine pounds in weight and was able to work as a janitor when last seen.

Case 2: J. J. W., a 41 year old Negro, landscape gardener, was transferred from another hospital with a cough productive of clear mucoid sputum for one year. Within the past three months two teeth had been extracted. Because of weakness he had discontinued work. Two episodes of hemoptyases, each of which included more than a cupful of blood, and was precipitated by coughing, occurred respectively one week and two days before admission. Dyspnea was noted after the first episode. After the second hemoptyasis a roentgenogram was taken and he was told of a “growth” in the right lung. Additional questioning disclosed some right chest pain and occasional expectoration of foul-smelling sputum.

Physical examination revealed several missing teeth and others in poor condition, limitation of motion of the right hemithorax, and dullness posteriorly in the right mid-thoracic area with breath sounds diminished over the same area. His hemoglobin was 11.5 grams. Tubercle bacilli were not found in smears of two sputum specimens. A roentgenogram (Fig. 2) revealed a density in the right hilar region which extended laterally and anteriorly to the pleural surface.

Bronchoscopy was performed without significant pathological findings. Bronchial secretions were negative for tumor cells. Thoracotomy revealed a firm palpable mass in the anterior contiguous portions of the upper and middle lobes of the right lung. Bilobectomy was done. Frozen section of the specimen revealed no neoplastic tissue.

The specimen consisted of the upper and middle lobes of the right lung weighing 236 grams. The pleura was smooth except for an area of scarring over the latero-posterior surface. In this area lying on both sides of the fissure, approximately 4 cm. from the periphery of the lung, was a firm rounded, fairly discrete grayish mass measuring 6 x 4.5 x 2.5 cm. Its center contained an area of cavitation (1.5 cm. in diameter) which had an ill defined wall covered by a shaggy exudate. The remainder of the specimen was crepitant to palpation. Lymph nodes about the upper and middle lobe bronchi were small, soft and anthracotic.

Microscopical sections of the mass showed interstitial chronic reaction and fibrosis. The overlying pleura was thickened by numerous dilated vessels and loose edematous fibrous tissue. Cells with clear or foamy refractile cytoplasm were present in many scattered areas. An abscess with cavitation was in the center of the lesion surrounded by large areas of organizing pneumonia. The alveoli, in a few focal areas, contained refractile vacuoles and macrophages with numerous small vacuoles giving them a foamy appearing cytoplasm. On proper staining the macrophages were seen to contain fat. Sections of lymph nodes revealed hyperplasia, hyperemia, mild anthracosis, and edema. The pathologist diagnosed chronic pneumonitis with a cavitating abscess of the right upper and middle lobes.

During and following surgery his course was uneventful and he was discharged on the 12th postoperative day.

Two months after discharge he reported seven pounds gain in weight. Physical and roentgenological examinations disclosed no abnormality of the remaining lung. Four days later he had evidence of jaundice. He was readmitted to the hospital and gave a history of two previous episodes
of “yellow jaundice.” After clinical and laboratory studies resulted in the diagnosis of acute hepatitis due to homologous serum jaundice, treatment was initiated with satisfactory results.

Seven months after operation his vital capacity was 3,000 cc. (60 per cent of normal). Laboratory examinations revealed no evidence of hepatitis. One year after operation he had gained 50 pounds and was attending school.

Case 3: L. R., a 54 year old laborer, was transferred from another hospital with the diagnosis of pneumonitis and bronchiogenic carcinoma of the right lung. Two months previously he had noted the onset of lassitude and inability to work two consecutive days because of fatigue. One month later dyspnea and anorexia were noted as well as knife-like right upper chest pain aggravated by coughing. In addition he had lost 10 pounds in weight. Cough productive of yellow, tenacious sputum developed. He was admitted to the other hospital because of fever. Aureomycin was discontinued after eight days because of marked improvement. A relapse occurred five days later and aureomycin was initiated again for eight more days. At intervals roentgenograms of the chest strongly suggested bronchiogenic carcinoma. Bronchoscopy was performed, and the aspirated secretions were interpreted as compatible with primary carcinoma, undifferentiated type.

Physical examination revealed alopecia of the left parieto-occipital region, carious teeth and pyorrhea, diminished breath sounds and occasional fine rales over the right upper anterior thorax, and exostosis of the right first metatarsal-phalangeal joint. His pulse rate was 100 and blood pressure 170/100.

Hematological, serological, and chemical examinations were unrevealing. Several sputum examinations were negative for tubercle bacilli. Roentgenograms (Fig. 3) showed a hazy indistinct infiltration of the anterior portion of the upper lobe to the right. Comparison with roentgenograms previously made revealed that originally a much larger area of infiltration had been present. The radiologist interpreted the findings as consistent with the diagnosis of bronchiogenic carcinoma.

After a review of the clinical and laboratory data the parenchymal process was considered inflammatory. However, considering his age, and the relatively large amount of residual inflammation, exploratory thoracotomy was considered obligatory. Bronchoscopy and bronchial secretions showed no evidence of neoplasm.

At thoracotomy a firm mass in the anterior portion of the upper lobe of the right lung was found adherent to the chest wall and mediastinum by firm thick vascular adhesions. A firm lymph node located inferior to the azygos vein, and several small pieces of the mass were removed, which were negative for neoplasm. Only the anterior segment of the right upper lobe was removed. The pathologist reported that this specimen showed chronic fibrosing pneumonitis.

The segmental bronchus appeared entirely normal. The peribronchial tissue was moderately firm and upon section appeared to be replaced by dull gray fibrous tissue. In no area was there evidence of neoplasm, cyst, or abscess. The accompanying lymph node appeared normal in size and consistency on viewing its surface. Microscopic examination revealed a large granulomatous area consisting of interlacing bands of fibrous tissue containing a few scattered lymphocytes and an occasional polymorphonuclear leukocyte. There were giant cells in which 3 or 4 nuclei were arranged centrally or peripherally. No areas of necrosis were seen. The overlying pleura was greatly thickened by dense hyalinized fibrous tissue in which there were a few small vessels. In some sections there were discrete areas in which the pulmonary parenchyma was entirely replaced by fibrous tissue. In these areas there were numerous lipophages and foci of acute and chronic inflammation. No evidence of malignancy was seen. Examination of the lymph node from the region of the right main stem bronchus revealed a mild lymphoid hyperplasia and a moderate amount of anthracotic pigment. The pathologist reported chronic pneumonitis, etiology undetermined, in the segment of lung removed.
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The postoperative course was uneventful and he was discharged.
One month later he was readmitted for excision of the exostosis of the first metatarso-phalangeal joint. Roentgenograms revealed no evidence of disease then or one year later when he reported that he was well.

Discussion

How aggressive should the medical profession be in the management of patients who roentgenograms reveal evidence of persisting pulmonary lesions suggesting bronchiogenic carcinoma? Clinicians who reviewed the preoperative clinical, roentgenological, and laboratory findings in these three cases did not hesitate to recommend surgery inasmuch as they could not be certain that carcinoma did not exist. Bronchoscopy, cardiorenal tests, and the patient’s general condition did not contraindicate thoracotomy in any of them. In the operating room gross appearance and palpation were found to be insufficient criteria for definitive diagnoses. The Pathology Department assumed responsibility for the histological diagnosis by doing frozen sections at the time of operation in the last two cases. Thus, the aggressive attitude of clinicians combined with the judgment of surgeons and pathologist results in better care of the patients. Undoubtedly an aggressive policy indicates that more clinicians who see patients with persistent signs and symptoms of pneumonitis should request serial roentgenograms. If this is done, more pulmonary pathology, including early cases of carcinoma of the lung will be recognized.

How long should one observe or treat medically a patient with pneumonitis (viral or atypical, unresolved or recurrent)? Experience with two other patients each of whom had a small bronchiogenic carcinoma obstructing a segmental bronchus demonstrated that one should not observe patients for long periods without taking action. The first patient, a 56 year old negro, had a cough and anorexia for one month preceded by some weakness and loss of weight. Although bronchoscopy was negative, serial roentgenograms, during one month of observation, demonstrated recurrence of segmental atelectasis and pneumonitis of the right upper lobe. The second patient, a 75 year old man, had had initial symptoms of chills and fever three months previously and was treated elsewhere for pneumonia. Subsequently he had developed weakness and loss of weight and was admitted to another hospital. It should be noted that he always had chronic cough; however, it became more productive and was intermittently sanguinous after the onset of the above symptoms. During the evaluation of complaints referable to the genitourinary and gastrointestinal systems he had another episode of pneumonitis. This was demonstrated by increase in the disease of the upper lobe of the left lung as seen on roentgenograms. Each of these patients had upper lobectomy.

Since patients should be evaluated individually, one cannot safely propose general rules for all. One may conclude, however, that it is unwise to postpone exploratory thoracotomy more than eight weeks in a 35-40 year or older person who has unresolved or recurrent pneumonia, or lobar
or segmental atelectasis, unless there is a contraindication. This type of management is especially advised if the patient is a man, has been a heavy smoker, or has significant symptoms.

Frequently the attending physician will prolong the diagnostic and observation period in cases of "pneumonitis," which have thoracic roentgenograms suggestive of carcinoma of the lung, and thus delay operative intervention too long. The results of laboratory tests made over a long period of time may be misleading and also indecisive. A negative result of the study of sputum, or bronchial secretions, does not necessarily rule out a malignant pulmonary lesion. Likewise a positive test may be erroneous (Case 3). Cases are known in which total pneumonectomy was done because of a positive Papanicolaou test of bronchial secretions or sputum; in two cases the pathologists found no evidence of a malignant lesion in the surgical specimen.

How far should a conservative policy be carried by the surgeon? After experience with Case 1 it was decided to have a histological diagnosis (of the pathological pulmonary tissue) before any significant resection was done. As a result more limited excisions were performed in Cases 2 and 3. This proved wise for no neoplastic process was present in the surgical specimens. Larger resections would have unnecessarily removed some functioning pulmonary tissue and would have been too radical. Conservative management, especially in the third patient, where a diagnosis of bronchiogenic carcinoma had been made elsewhere, was of value to the patient.

A number of authors have contributed to the development of the policy of aggressive conservatism. Paulson and Shaw emphasized the significance of pneumonitis in a study of 362 patients with bronchogenic carcinoma. They found viral or atypical pneumonias and unresolved pneumonia to be two of the commonest erroneous diagnoses which contributed to the delay in treatment. Ochsner et al reported that a lower respiratory tract infection was frequently the earliest manifestation of a bronchiogenic carcinoma. In their series of 948 patients, 55 per cent gave histories of previous respiratory tract infection diagnosed either as influenza, viral pneumonia, or non-specific pneumonitis. Such an infection was the first manifestation in 22 per cent of their patients. After their recovery from pneumonitis there were persistent symptoms! Freedlander and Wolpaw and Adams urged resection of inflammatory lesions of the lung because of the difficulty in differentiation from carcinoma. In a classic article, Waddell, Sniffen and Sweet reported that six of 10 cases of chronic pneumonitis had a preoperative diagnosis of carcinoma of the lung. There is, then, much evidence that good judgment is needed in the management of such cases.

Summary and Conclusions

In cases of viral, or atypical, and unresolved or recurrent pneumonias, with persistent roentgenological findings suggestive of carcinoma of the lung, the attending physician should consider consulting a well trained
thoracic surgeon concerning the advisability of thoracotomy for diagnostic and therapeutic purposes.

The surgeon responsible for such a patient cannot depend entirely on the results of laboratory studies of bronchial secretions and sputum. At the time of operation his decision concerning the amount of pulmonary tissue to be resected should be based on a pathological examination of an adequate biopsy of the diseased tissue.

Experience with three patients with suspicious thoracic roentgenological findings illustrates the advisability of a policy of aggressive conservatism.

RESUMEN Y CONCLUSIONES

En casos de neumonías, de virus, o atípicas y neumonías no resueltas o recurrentes con hallazgos radiológicos sugestivos de carcinoma del pulmón, el medio tratante debe considerar la necesidad de consultar con un cirujano de tórax bien preparado respecto de la toracotomía con fines diagnósticos y terapéuticos.

El cirujano responsable de tales enfermos no puede fiarse enteramente de los estudios de laboratorio de las secreciones bronquiales y del esputo. Durante la operación su decisión respecto de la cantidad de pulmón que ha de resecarse debe basarse en el examen histopatológico con biopsia adecuada.

La experiencia en tres enfermos con hallazgos roentgenológicos sospechosos a los rayos X ilustra lo aconsejable que es una actitud conservadora agresiva.

RESUME

En présence de pneumopathies à virus, ou de pneumonies atypiques, et des formes résistantes au traitement ou donnant lieu à une rechute, avec constatations radiologiques persistantes, évocatrices de carcinome pulmonaire, le médecin traitant devrait envisager de consulter un chirurgien thoracique bien expérimenté sur la nécessité de pratiquer une thoracotomie dans un but diagnostique et thérapeutique.

Le chirurgien responsable d’un tel malade ne peut pas se fier entièrement aux résultats des études de laboratoire des sécrétions bronchiques et des expectorations. Au moment de l’opération, sa décision concernant la quantité de tissu pulmonaire qui doit être réséquée devrait être basée sur l’examen anatomopathologique d’une biopsie bien exécutée du tissu atteint.

L’auteur rapporte le cas de trois malades pour lesquels les constatations radiologiques thoraciques étaient suspectes et qui illustrent l’opportunité d’un programme de “conservatisme agressif.”

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

In Fällen Viruspneumonien oder atypischen und ungeklärten oder rezidivierenden Pneumonien mit auf Lungencarcinom verdächtigen beständigen röntgenologischen Befunden muss der behandelnde Arzt in Erwägung ziehen, einen gut erfahrenen Thorax-Chirurgen zu konsultieren hinsichtlich der Zweckmässigkeit einer Thorakotomie aus diagnostischen und therapeutischen Gründen.

REFERENCES