The Early Diagnosis of Primary Lung Cancer by Cytologic Methods*

SEYMOUR M. FARBER, M.D., F.C.C.P.,
ALLEN K. McGRATH, JR., M.D.,†
MORTIMER A. BENIOFF, M.D., F.C.C.P.
and LLOYD W. ESPEN, M.D.,†
San Francisco, California

The early diagnosis of primary lung cancer remains a problem to the clinician in spite of advances in diagnostic and surgical techniques during the past 17 years. Since 1946 a new technique—the diagnosis of cancer by cytologic methods—has been applied to patients with bronchogenic carcinoma.

The clinicians who utilize this procedure are interested primarily in it as a means of discovering carcinoma in more patients and at an earlier period. As with other malignancies, bronchogenic cancers may be cured only when diagnosis is early. Delay in diagnosis—whether due to the patient’s fear or ignorance, to the physician’s low index of suspicion or, possibly, to inadequate methods of diagnosis—contributes to the present high incidence of patients with lesions that are not amenable to surgical therapy.

The fatal delays attributed to inadequate diagnostic procedures interest us here. For many years, bronchoscopic examinations have been used to diagnose bronchogenic cancers without discovering a significant number of early, curable lesions. Some bronchoscopists state that “the higher the incidence of positive bronchoscopic biopsies, the lower the number of operable patients.”13 Overholt has stressed that surgical procedures could increase the

*From the Division of Medicine, University of California School of Medicine, San Francisco Hospital and the San Francisco Department of Public Health.
†Trainee, National Cancer Institute.
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number of cured patients immediately and appreciably if diagnostic techniques were applied routinely to patients with minimal or no symptoms in the cancer age group. A method of diagnosis which offers hope of increasing the incidence of patients sent to the surgeon with curable lesions is discussed here.

**Cytologic Diagnosis**

In the past three years, we have studied 6,281 specimens of sputum or bronchial secretions from 2,066 patients with benign and malignant diseases of the lungs. These individuals represent a diversified patient population from many institutions and hospitals and were studied when there was a clinical suspicion of malignancy, even if slight, in any patient with thoracic symptoms. Eighty-five per cent of all these patients were followed to a definite clinical or pathologic diagnosis. All were studied and diagnosed by the cytologist without knowledge of the clinical status of the patient on the basis of precise cellular criteria alone.

In our series, the diagnostic results on 241 patients with pathologically proved bronchogenic carcinoma indicated that when an adequate series of specimens was examined excellent case-finding accuracy was attained. A positive cytologic diagnosis was made in 55 per cent of these patients. When five or more sputum specimens were studied, an accuracy of 90 per cent was reached. At the same time, only two proved false suspicious diagnoses were made—these occurred in the first 500 patients studied.

The cytologic method is a sensitive and reliable procedure providing that an adequate number of specimens are examined by an experienced cytologist. Because this technique is simple and relatively inexpensive, it may be used on patients with minimal chest symptoms where laboratory facilities are available. A positive cytologic diagnosis is as reliable as a positive biopsy. It is an indication for exploratory thoracotomy, if made by a capable cytologist.1,3

The historical background of this method of diagnosis, the proper utilization of technical procedures, and the morphologic criteria for malignancy in smears has been discussed in detail in a previous publication.1 The evaluation of cytologic techniques from the viewpoint of the cytologic diagnostician has been done by many investigators.2,3,4

**Clinical Application of Cytologic Diagnosis**

In order to clarify the role of this method in diagnosis, we are presenting from a clinical standpoint the experience in our cytology laboratory with 2,066 patients having varied pulmonary diseases.

A) **Surgical patients**: Cytology is of great value to the thoracic
surgeon in establishing a preoperative morphologic diagnosis of cancer especially when such a diagnosis cannot be made by other means. Our experience with patients who were operated upon after cytologic studies is presented here. It is recognized that the ultimate value of cytologic techniques in the early diagnosis of primary lung cancer remains to be established by further investigative work.

The following illustration summarizes the surgical therapy on our patients with bronchogenic cancer (see Graph).

In the 117 patients who were operated upon, a positive cytologic diagnosis was the first morphologic evidence of cancer in 33; in 26 other patients it was the only preoperative morphologic evidence. Cytologic examinations were positive in 63 of these 117 patients; bronchoscopic biopsies were positive in 35 of the 117 patients.

In the 23 patients who survived pneumonectomy for more than three months, the cytologic diagnosis was positive in 11. In nine of the 11 patients, a positive cytologic diagnosis was the only preoperative morphologic evidence of cancer. The remaining 12 patients...
patients in this group surviving pneumonectomy were diagnosed as negative by \textit{incomplete} cytologic studies. In the 23 patients, bronchoscopic biopsies were positive in four and a tumor was visualized in three additional patients.

The following case histories illustrate the value of cytologic diagnosis in establishing a preoperative morphologic diagnosis:

\textbf{Case 1:} A 61-year-old baker entered the hospital on June 9, 1948, because a routine chest x-ray film taken 10 days previously had revealed a density in the left lung (Figure 1). He had had a cough for two years, which was productive of morning sputum. On four occasions in the past year he had noted blood-streaked sputum. Also in the past year he had lost 40 pounds and noticed increasing weakness. Rales were present in the left hilar region posteriorly. A positive cytologic diagnosis was made on entry by examination of his sputum (Figure 2). On June 10, bronchoscopic examinations revealed a sanguinous exudate in the left lower lobe bronchus. Two days later a left pneumonectomy was performed and an epidermoid carcinoma of the left lung was removed. The patient is now well and at work 18 months after his operation.

\textbf{Case 2:} A 47-year-old carpenter entered the hospital on June 2, 1949, complaining of pain in the anterior portion of the left chest. This had been constant in nature for four months but now was associated with cough. At the onset of his illness, he had chills and a temperature to 103 degrees F. At this time (February, 1949), a chest x-ray film revealed a faint shadow in the left upper lung field (Figure 3). A low-grade fever and cough productive of two tablespoons of sputum daily had persisted to entry. An x-ray film taken at entry into the hospital showed a dense infiltration in the left upper lobe of the lung with questionable cavitation (Figure 4). There was marked wasting and a lag of the upper portion of the left chest. Decreased voice sounds, breath sounds and dullness to percussion were elicited in the left upper lung field. Early clubbing of his fingers was noted. The clinical diagnosis at entry was pulmonary tuberculosis with carcinoma to be ruled out. On June 10, malignant cells were found in his sputum (Figure 5). A bronchoscopic examination on
June 11 revealed a deformed carina. Malignant cells were demonstrated in bronchial aspiration smears. Ten days later the left upper lobe and lingula of the left lower lobe were removed. Pathologic study revealed a small epidermoid carcinoma of the left upper lobe bronchus. At present the patient has no evidence of recurrence.

B) Peripheral lesions: The clinician suspects carcinoma in many cases where the lesions are located in the periphery of the lung or in the upper lobe bronchi where bronchoscopic examinations are of limited value. Many of these conditions present diagnostic problems which could be solved by a definite morphologic diagnosis. It is in cases of this type that a positive cytologic diagnosis may prevent temporizing with a progressive disease.

In 60 patients in our series the lesion was demonstrated pathologically to be located in the peripheral or secondary bronchi. Of these patients, a positive cytologic diagnosis was made in 36, while in the 49 patients examined by the bronchoscopist no positive morphologic evidence of cancer was demonstrated (Table I).

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<th>RIGHT:</th>
<th>CYTOLOGY</th>
<th>Sputum</th>
<th>Bronchoscopy</th>
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<tr>
<td>Positive</td>
<td>2</td>
<td>Positive 15</td>
<td>Suspicious 5</td>
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<td>Negative</td>
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<td>Positive 17</td>
<td>Suspicious 5</td>
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<tr>
<td>Negative</td>
<td>9</td>
<td>Negative 11</td>
<td>Negative 17</td>
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| TOTAL POSITIVE | 4 | 32 | 0 |

The case of the following patient with a lower lobe lesion illustrates the usefulness of cytologic studies in establishing a definite diagnosis not obtainable by other procedures.

Case 3: A 77-year-old cook entered the hospital on December 19, 1949, complaining of weakness and a chronic productive cough of three years’ duration. On entry his temperature was 102 degrees F. He had dullness to percussion, absent breath sounds, rales, and a pleural friction rub over the lower portion of the right chest posteriorly. A chest x-ray film showed an area of increased density and infiltration in the right lower lobe (Figure 6). A week after entry, a bronchoscopic examination was performed and a slight stenosis of the right lower lobe bronchus was found. No biopsy was taken. Two days later a positive cytologic diagnosis was made on cells found in his sputum (Figure 7). The clinical diagnosis at this time was primary lung abscess. On December 31, the tenth right rib posteriorly was resected and 20 cc. of purulent fluid was aspirated. On January 5, 1950, a segmental resection of the posterior portion of the right lower lobe was performed. The pathologic diagnosis was bronchiectasis. The patient expired on January 11, and an autopsy revealed a very
small (1 by 2 cm.) epidermoid carcinoma with a papillary projection into the right lower lobe bronchus (Figure 8). The mediastinal nodes were not involved.

C) Diagnostic problems: The clinical differential diagnosis on a number of our patients with bronchogenic carcinoma included many inflammatory diseases, such as tuberculosis, pneumonitis, primary lung abscess, coccidioidomycosis, etc. In many patients a benign pulmonary disease was the first clinical impression. It is well established that primary lung cancer may simulate closely the clinical and x-ray picture of benign inflammatory disease. In nearly every patient in this group, multiple diagnoses were considered by the clinicians and roentgenologists. Tuberculosis was the first diagnosis in 30 cases; pneumonia in 10; primary lung abscess in 11; bronchiectasis in 3; and coccidioidal granuloma was considered a likely diagnosis in 3 cases. In about 50 per cent of all patients, the clinical diagnosis included a neoplasm or inflammatory disease in the diagnoses. In all cases where carcinoma was considered in the differential diagnosis, appropriate cytologic studies were requested.

The x-ray diagnoses were comparable to the above. The chest x-ray film showed a definite density in 41 patients (peripheral 78, hilar 63); atelectasis in 91; areas of infiltration in 45; pleural effusion in 35; and cavitation in 19 patients.

A positive morphologic diagnosis was established in many of these patients on the basis of positive cytologic studies alone. The case of the following patient illustrates a confusing clinical picture which was clarified by a positive cytologic diagnosis of malignancy:

Case 4: This 66-year-old pensioner entered the University of California Hospital on October 17, 1949, complaining of dyspnea and cough productive of slight amounts of sputum since 1942. He was diagnosed as having bronchial asthma. Six months before entry he lost weight and felt weak. He entered a local hospital where pulmonary tuberculosis was diagnosed on the basis of a single smear which demonstrated acid-fast organisms. Pneumoperitoneum was instituted. The patient was then referred to the University of California Hospital with a diagnosis of lung abscess, possibly due to a tumor. On examination, there was dullness to percussion, increased breath sounds, and wheezes posteriorly over the right lung field. A chest x-ray film revealed a thin-walled cavity in the right upper lobe and a right-sided aorta (Figure 9). Skin and serological tests for coccidioidomycosis were negative. A tuberculin skin test was positive 1:100. An echinococcus skin test was negative. Examinations for tubercle bacilli were negative. The clinical diagnosis was: 1) tuberculosis, 2) coccidioides, or 3) possibly lung abscess due to tumor. On October 27, a bronchoscopy was performed and revealed a normal bronchial tree. On November 2, malignant cells were found in the sputum (Figure 10). On the same day a second bronchoscopic examination was negative. On November 11, 1949, right pneumonectomy was performed. Pathologic examination revealed a small epidermoid carcinoma in a tertiary bron-
Thus leading to the abscess cavity with distal atelectasis of the right lung. No metastases were demonstrated. After a stormy postoperative course, complicated by a bronchopleural fistula, the patient expired. At autopsy the cause of death was ascribed to a bleeding duodenal ulcer.

D) **Coexistent pulmonary tuberculosis:** Recent articles have discussed the frequent association of bronchogenic carcinoma and pulmonary tuberculosis. Farber, et al., reported an incidence of 8 per cent of coexistent disease in 200 cases of bronchogenic carcinoma coming to autopsy. An increased awareness of the occurrence of pulmonary tuberculosis in the older, cancer-age group, together with advances in the surgery and chemotherapy of tuberculous patients, makes it essential that coexistent cancers be discovered early.

In many patients the clinical picture is obscured by the tuberculous process; in these instances cytology may be of great value. In our series of 241 patients with primary lung cancer, 12 had coexistent tuberculosis proved by pathologic studies. In an additional 10 patients the sputum showed acid-fast bacilli. In the pathologically proved cases (10 autopsies, two pneumonectomies) cytologic examination gave a positive diagnosis in nine; it provided the only premortem diagnosis in six.

The following patient had coexistent pulmonary tuberculosis and bronchogenic cancer of the left lung which was diagnosed before death by cytologic studies:

**Case 5:** A 51-year-old clerk entered the hospital in August, 1949. He complained of a productive cough, weakness, and dyspnea of two years duration. He had noted blood-streaked sputum on several occasions. He had pleuritic chest pain and a 20-pound weight loss in the month prior to admission. On entry a temperature of 101 degrees F. was recorded and nonlocalized wheezes were elicited on examination of his chest. A chest x-ray film showed inflammatory disease in the left upper lung and pleural pericardial adhesions (Figure 11). Tubercle bacilli were demonstrated in his sputum on several occasions. A month after entry his chest x-ray film revealed an increase in the inflammatory disease in the left lung field (Figure 12). Sputum examinations on September 28 revealed malignant cells (Figure 13). In December, 1949, the patient expired. Subsequent autopsy revealed chronic pulmonary tuberculosis with cavitation and coexistent bronchogenic carcinoma in the left lung.

E) **Routine screening:** A promising application of cytologic studies is being carried out at the present time. In conjunction with a routine chest x-ray survey, examinations are being made of the sputum and bronchial aspirations of patients with chest lesions when malignancy is suspected. It is hoped that early cases with minimal symptoms will be discovered by the routine chest x-ray films and that cytologic techniques will be of aid in establishing a prompt diagnosis in many of these patients.
The use of cytologic techniques to screen patients in the cancer age group with pulmonary disease, whether carcinoma is suspected or not, is now being evaluated by this laboratory. Over four hundred patients with various diagnoses have been studied by routine examination of a single sputum specimen. Positive cytologic diagnoses have been made in three patients. One patient has refused to re-enter the hospital and another awaits pathologic proof of malignancy. The history of the third patient is given below:

Case 6: This elderly Chinese man entered a hospital on December 31, 1949, with vague complaints of pain in his chest of five days' duration. As nearly as could be determined through an interpreter, his only other symptom was a productive cough of five days' duration. He was dyspneic and had a temperature of 104 degrees F. on entry. Chest examination revealed a lag of the right chest and signs of consolidation over the right lower lobe. Microscopic examination of his urine revealed hematuria which persisted throughout his hospital stay. A chest x-ray film showed a patchy infiltration in the right lower lobe (Figure 14). The clinical impression was pneumonia, with tuberculosis to be considered. He was given penicillin and became afebrile a week after entry. Sputum examinations for acid-fast organisms were negative. On January 16, his chest film showed clearing of the infiltration in the right lower lobe (Figure 15). On the same day, as part of our routine screening of all patients with pulmonary disease, a single cytologic examination of his sputum was made. Malignant cells were found (Figure 16). On January 24, bronchoscopic examination revealed a small amount of blood in the right upper lobe bronchus. Cystoscopic examinations were non-contributory and the hematuria remained unexplained. Chest x-ray examination on January 25 showed right hilar adenopathy and residual infiltrations in the right lower lobe (Figure 17). On January 31, bronchoscopic re-examination revealed only injected membranes of the tracheo-bronchial tree. Bronchial smears were taken and cytologic study revealed no malignant cells. Repeated cytologic studies of the sputum consistently showed malignant cells of an epidermoid type (Figure 16). On February 13, after six weeks' of hospitalization, the patient was discharged to the out-patient clinic. An exploratory thoracotomy is being considered.

F) Bronchogenic carcinoma (unconfirmed): One hundred and twenty-one patients with bronchogenic carcinoma were diagnosed clinically in our series; and in these cases either no pathologic studies were made or biopsies were negative. None of these patients was considered amenable to surgical therapy. In 50 patients positive cytologic diagnoses established a diagnosis of malignancy and aided the clinician in determining prognosis and palliative therapy.

G) Metastatic lung cancer: One hundred and twenty patients with proved or clinically diagnosed lung cancer from various pathologically proved primary malignancies were in our series. In 22, malignant cells were demonstrated and served to establish a premortem diagnosis.
H) Other malignancies: Twenty-one patients with lymphoma were examined by cytologic techniques when the clinician considered bronchogenic carcinoma in the differential diagnosis. Forty-seven patients with nonpulmonary malignancy without demonstrable parenchymal or bronchial involvement were studied. In all these patients, the cytologic diagnosis was negative.

I) Benign pulmonary diseases: Included in the 2,066 patients studied by cytologic methods because malignancy was suspected were 1,208 patients with benign chest diseases. These various non-malignant chest conditions included: pulmonary tuberculosis, 310 cases; various forms of pneumonitis, 240 cases; bronchiectasis, 84 cases; heart disease, 138 cases; and primary lung abscesses, 44 cases. Other miscellaneous conditions were: bronchitis, pulmonary infarct, bronchial asthma, emphysema, emphysema, benign neoplasms of the lung, etc.

In many of these patients, the clinical picture of lung carcinoma was simulated by benign pulmonary conditions, while in others the possibility of malignancy was remote. One patient with a primary lung abscess proved by lobectomy and one with chronic esophagitis and pneumonitis proved by autopsy had cells "suspicous for malignancy" reported present in their sputum early in our experience with cytologic diagnosis. Extensive follow-up of all patients to final clinical diagnosis has revealed two false positive diagnoses in the last 1,600 patients studied. With the exception of the two patients above, the remaining cytologic diagnoses in this group of patients were negative. Cells characteristic of other chest diseases, such as tuberculosis and bronchial adenomas, have not been observed by us.

It must be stressed that a negative cytologic diagnosis does not rule out lung cancer but must be carefully evaluated with other findings in the individual case. It has been determined that repeated cytologic examinations of five specimens or more increase the diagnostic accuracy to 90 per cent of cases with pathologically proved bronchogenic cancer. Thus, repeated examinations should be made while all other indicated diagnostic procedures are being carried out.

Discussion

In recent years, the numerous difficulties inherent in diagnosing carcinoma of the lung has been stressed by many workers. Early in the course of the disease the symptoms may be minimal in severity and confused with "cigarette cough," bronchitis, and other benign chronic chest conditions. A well-advanced bronchogenic carcinoma simulates other diseases, and accordingly, a positive diagnosis often cannot be made on the basis of clinical or
x-ray evidence. Overholt and Schmidt found that the average patient had symptoms for 3.8 months before consulting a physician; an additional 1.6 months passed before the first x-ray film was taken; and an added period of 4.6 months passed before a pathologic diagnosis was finally made.

Since most thoracic surgeons prefer an explicit preoperative diagnosis, morphologic evidence is desirable in order that patients with curable bronchogenic carcinoma may reach the operating table at an early time. Since a positive cytologic diagnosis has been proved to be reliable morphologic evidence of lung cancer, the clinical utilization of the method in relation to other diagnostic procedures will be analyzed in our series of patients:

In every case in this series of 241 patients, the clinician ordered cytologic studies after a suspicion of cancer was gained by clinical and x-ray studies. In seven instances, the patients were first examined after pulmonary lesions suspicious for neoplasm were demonstrated by a routine chest roentgenogram. None of the cases studied by routine application of cytologic techniques are included in this group of 241 pathologically proved bronchogenic cancers.

The relationship of positive cytologic diagnosis to other ordinary pathologic methods of establishing a morphologic diagnosis is presented below. In those cases where a positive cytologic diagnosis was the first morphologic evidence of cancer, the average time
lapse before tissue section proof was two and one-half weeks. In 12 cases, cytologic diagnoses were the only positive premortem diagnosis.

TABLE II: CYTOLOGIC DIAGNOSIS

<table>
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<th>Diagnosis</th>
<th>Percentage</th>
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<tr>
<td>First morphologic diagnosis</td>
<td>47 per cent</td>
</tr>
<tr>
<td>Coincident morphologic diagnosis</td>
<td>46 per cent</td>
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<tr>
<td>Reported after morphologic diagnosis</td>
<td>7 per cent</td>
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The clinical application of cytologic diagnosis to the detection of bronchogenic cancers at an earlier stage of their growth has been discussed. At present these techniques, if applied properly, make it possible to diagnose accurately a large number of cases of primary lung cancers. Earlier diagnoses will be made when these procedures are applied immediately after a clinical suspicion of cancer is gained. Earlier diagnoses will be made when this diagnostic method is utilized on patients with suspicious chest lesions detected by routine chest x-ray film surveys. Earlier diagnoses will be made when patients with any pathologic chest conditions—whether cancer is suspected or not—are routinely examined by cytologic methods. The clinician will realize that these methods of application should yield a number of diagnoses on patients with curable lesions.

The ultimate limitations of cytologic diagnosis of curable lung cancer may be questioned. As has been repeatedly demonstrated, carcinoma of the cervix may be detected in situ and at very early stages of growth by cytologic studies.\textsuperscript{14,15} Investigative work by Appel and Bronk has suggested that very early lesions of bronchogenic cancer exfoliates cells which may be detected by cytologic methods.\textsuperscript{16,17} These authors transplanted Brown-Pierce carcinomas of the testes into the lungs and bronchial tree of rabbits. Swabs were introduced into the trachea of these animals and cytologic studies were made of the bronchial secretions so obtained. In 58 per cent of the rabbits, malignant cells were found on the sixth day. By the end of the third week, 100 per cent were positive. In order to correlate the appearance of tumor cells in the bronchial secretions with the appearance of grossly recognizable tumors in the lung, the animals were sacrificed as soon as positive bronchial smears were obtained. In none of the animals showing tumor cells in the bronchial secretions at six days could tumor be recognized grossly, but small nodules of tumor could be demonstrated microscopically. The earliest time at which a tumor could be recognized grossly was 10 to 20 days following transplantation.

In conclusion, we believe that early diagnosis of lung cancer can be achieved by cytologic techniques as soon as this procedure is immediately applied to all patients suspected of having carcinoma,
to patients with equivocal lung lesions detected by routine chest film surveys, and as a routine screening procedure to selected patients with cough and sputum. There is little theoretical limitation to the diagnosis of very early malignant lesions by cytologic examinations of sputum and bronchial secretions.

**SUMMARY**

1) Six thousand two hundred and eighty-one specimens of sputum or bronchial secretions from 2,066 patients were studied by cytologic techniques. Two hundred and forty-one patients had bronchogenic cancer diagnosed by pathologic studies.

2) A positive cytologic diagnosis was made in 55 per cent of these 241 patients. When five or more sputum specimens were examined, the accuracy rose to 90 per cent.

3) The clinical applications of cytologic diagnostic techniques are discussed:
   a) Cytology is of value to the thoracic surgeon in establishing a reliable preoperative morphologic diagnosis of lung cancer.
   b) A positive cytologic diagnosis may be made in many cases where the lesions are located in the periphery of the lung or upper lobe bronchi where bronchoscopic examinations are of limited value.
   c) Difficult diagnostic problems may be solved when a definite morphologic diagnosis of cancer is made by positive cytologic studies.
   d) In patients with coexistent pulmonary tuberculosis and bronchogenic carcinoma, cytologic studies may clarify a confusing clinical picture.
   e) Cytologic studies of sputum may be utilized as routine screening procedures on patients with minimal or no pulmonary symptoms.

4) In our series of pathologically proved bronchogenic cancer, a positive cytologic diagnosis was made oftener and sooner than other morphologic diagnoses. In 47 per cent of these cases cytology was the first diagnostic procedure to establish a morphologic diagnosis.

5) *Earlier diagnoses will be made* when cytologic techniques are applied immediately after cancer is suspected.

6) *Earlier diagnoses will be made* when this diagnostic method is utilized on patients with equivocal lung lesions detected by routine roentgen surveys.

7) *Earlier diagnoses will be made* when patients with cough and sputum—whether cancer is suspected or not—are routinely studied by cytologic techniques.
RESUMEN

1) Se estudiaron mediante técnicas citológicas 6,281 especímenes de esputo o de secreciones bronquiales de 2,066 pacientes. Doscientos cuarenta y un pacientes tenían cáncer broncogéno diagnosticado por estudios patológicos.

2) En el 55 por ciento de esos 241 pacientes se hizo un diagnóstico citológico positivo. Cuando se examinaron cinco o más especímenes de esputo, la exactitud ascendió al 90 por ciento.

3) Se discuten las aplicaciones clínicas de las técnicas del diagnóstico citológico:
   a) La citología es de valor al cirujano del tórax en establecer un diagnóstico morfológico preoperatorio confiable de cáncer pulmonar.
   b) Se puede hacer un diagnóstico citológico positivo en muchos casos en los que las lesiones están situadas en la periferia del pulmón o en los bronquios de los lóbulos superiores, en los que los exámenes broncoscópicos son de valor limitado.
   c) Se pueden resolver difíciles problemas diagnósticos cuando se hace un diagnóstico morfológico bien definido de cáncer mediante estudios citológicos positivos.
   d) En pacientes en los que coexiste la tuberculosis pulmonar y el cáncer broncogéno, los estudios citológicos pueden clarificar un cuadro clínico confuso.
   e) Pueden utilizarse los estudios citológicos del esputo como procedimientos rutinarios en pacientes con síntomas pulmonares o mínimos o ausentes.

4) En nuestra serie de cánceres broncogéneos comprobados patológicamente, se hizo un diagnóstico citológico positivo más frecuente y tempranamente que otros diagnósticos morfológicos. En el 47 por ciento de estos casos la citología fue el primer procedimiento diagnóstico que estableció el diagnóstico morfológico.

5) Se harán diagnósticos más tempranos cuando se apliquen las técnicas citológicas a penas se sospeche el cáncer.

6) Se harán diagnósticos más tempranos cuando se utilice este método diagnóstico en pacientes con lesiones pulmonares equivocadas descubiertas en catastros roentgenográficos rutinarios.

7) Se harán diagnósticos más tempranos cuando se estudie rutinariamente, mediante técnicas citológicas, a pacientes con tos y esputo, ya se sospeche o no el cáncer.

RESUME

1) Six-mille-deux-cent-quatre-vingt-un échantillons de crachats ou de sécrétions bronchiques provenant de deux-mille-soixante-six
malades ont été étudiés au point de vue cytologique. Chez deux-cent-quarante-et-un malades, on constata anatomiquement l'existence d'un cancer bronchique.

2) Chez ces deux cent quarante et un malades, un diagnostic histologique put être fait dans 55% des cas. Quand on examina pour un malade au moins cinq échantillons de crachats, les résultats positifs s'élevèrent à 90%.

3) L'auteur discute les applications cliniques de l'examen cytologique des crachats:

   a) La cytologie a une grande valeur pour le chirurgien thoracique et permet de faire un diagnostic pré-opératoire du cancer du poumon.
   b) La cytologie permet le diagnostic dans bien des cas où les lésions sont situées à la périphérie du poumon ou à l'extrême sommet, régions où un examen bronchoscopique n'a qu'une valeur limitée.
   c) L'examen cytologique, quand il permet le diagnostic du cancer donne la solution du problème des diagnostics difficiles.
   d) Quand, chez un malade, co-existent une tuberculose pulmonaire et un cancer bronchique, l'examen cytologique apporte de la clarté à un tableau clinique confus.
   e) L'examen cytologique des crachats doit être utilisé systématiquement chez les malades qui n'ont que des symptômes pulmonaires minimes ou même inapparents.

4) Dans nos séries de cancers bronchiques démontrés anatomiquement, c'est l'examen cytologique qui permit le plus souvent et le plus rapidement de faire le diagnostic. Dans 47% de ces cas, l'examen cytologique fut le procédé qui permit de suspecter les lésions.

5) Le diagnostic sera plus précoce quand on appliquera systématiquement l'examen cytologique après toute suspicion de cancer.

6) Le diagnostic sera fait plus précocement lorsque cette méthode de diagnostic sera appliquée au malade atteint de lésions pulmonaires précises, découverte lors d'examens systématiques.

7) Le diagnostic plus précoce sera fait quand, chez des malades atteints de toux et d'expectoration, que le cancer soit suspecté ou non, l'examen cytologique sera fait systématiquement.

REFERENCES