

# SOLITARY LUNG METASTASIS

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IN 1938 Barney and Churchill<sup>1</sup> reported the successful treatment of a patient who had a primary tumor of the kidney and an accompanying metastatic lesion in the right lung. This patient is believed to be the first successfully treated by surgical removal of the primary neoplasm and subsequent excision of the metastatic lung tumor. During the next nine years there were five reports of similar case histories in which the surgeon had deliberately undertaken to remove a pulmonary metastasis after resection of a primary neoplasm elsewhere. It has been only in recent years, however, that the philosophy of treatment of a solitary pulmonary metastasis has attracted widespread interest and promises to become an accepted surgical procedure. The most comprehensive report that has appeared in the literature to date is that of Alexander<sup>2</sup> who collected approximately 19 unreported case histories which could be classified in this category. Blades and Effler<sup>3</sup> in February, 1948, reported 9 cases of solitary metastasis that had been resected following the removal of the primary tumor. Considerable discussion on this subject was carried out at the meeting of the American Association of Thoracic Surgery in 1949. A complete report of the transactions will be published by that organization. The impression was gained, however, that the majority of thoracic surgeons today accept the philosophy of resection of a solitary lung metastasis in selected cases.

It has long been recognized that primary neoplasms frequently undergo a distinctive life cycle. Certain tumors have a predilection for early widespread metastases, whereas another type may have a late spread with comparatively few metastatic lesions. Many tumors will have a predilection for a metastasis to certain viscera while others will more commonly invade by direct extension only into the adjacent tissues. From the information that we have accumulated in the treatment of solitary lung metastasis, it appears that certain tumors are capable of attaining large size without acquiring the increasing tendency to metastasis. Renal and uterine adenocarcinomata have frequently demonstrated this unusual property. Likewise, a single metastasis may appear simultaneously with the discovery of the primary tumor or many years after its removal. Whereas most neoplasms pursue a pattern characteristic of their cell type, each is still capable of a bizarre individual manifestation.

Surgical resection of a solitary lung metastasis can scarcely be classified as a basic principle of surgery. In the author's opinion, it is a matter of personal philosophy and must remain as such until there have been sufficient cases and time to arrive at basic conclusions. It has been rather common practice in the profession at large to accept the premise that the presence of a metastasis renders prognosis hopeless. There is certainly evidence at this time to indicate that this conclusion is not always justifiable. When a primary

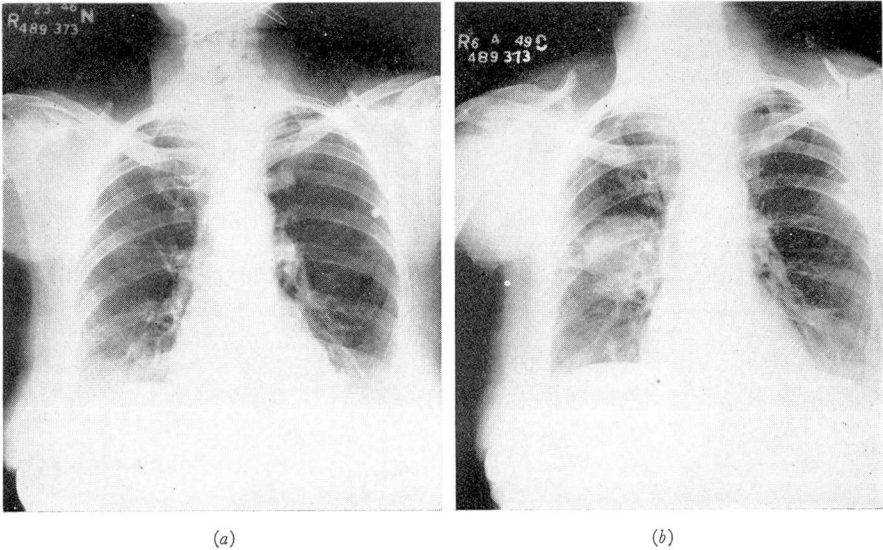


FIG. 1. (a) Routine roentgenogram of chest made at time of first admission to hospital. (b) Chest film three years later demonstrating large intrapulmonary solitary metastasis.

neoplasm is amenable to resection and no metastases are present, there is no question that it should be removed for the ultimate safety of the patient. Postoperative observation of such cases will occasionally reveal the unexpected appearance of a solitary metastasis in the pulmonary parenchyma. Frequently this will be detected on the progress roentgenogram of the chest and will be manifest before the onset of symptoms. Unless the lesion is amenable to roentgen therapy or can be successfully resected, the ultimate prognosis becomes hopeless and the patient will eventually die of this primary neoplasm. If there are no contraindications to surgery and careful examination reveals no other metastases, it would seem that the patient has a good deal to gain and very little to lose by resection of the metastatic pulmonary lesion. It goes without saying that the patient or his family should be confronted with the available facts and acquainted with all the risks involved. Although most of the patients operated upon for a single metastasis will eventually have an unfavorable outcome, the small number who do obtain cure and the larger percentage who receive prolongation of life are ample justifications of this procedure.

### Case Report

A 69-year-old white housewife reported at the Cleveland Clinic on July 23, 1946, because of an unusual vaginal discharge that appeared in April of that same year. Menopause had occurred twenty years prior to the occurrence of the sanguineous vaginal discharge. In addition to this complaint, the patient had been a known diabetic for three years and had been controlled by dietary measures alone. Physical examination at this time was not remarkable and on July 25, 1946, cervical dilation was carried out and material obtained by curettage of the uterus contained microscopic evidence of a well differentiated adeno-

carcinoma. On August 24, 1946 the patient was operated upon by Dr. George Crile, Jr., and a panhysterectomy performed. The subsequent pathologic report stated that there was a well differentiated adenocarcinoma of the fundus of the uterus with moderate extension into the myometrium. The fallopian tubes and ovaries were entirely negative from the standpoint of neoplasm. The patient made an uneventful postoperative recovery and was discharged from the hospital on September 3, 1946. A routine radiographic examination of the chest prior to this operation was reported as essentially negative (fig. 1a).

The patient returned to the Cleveland Clinic seven months later for re-examination. At this time she was free of all symptoms and manifested a weight gain of approximately twelve pounds since operation. Examination on November 23, 1948, did not reveal evidence of recurrence or metastatic neoplasm.

On June 4, 1949, the patient returned complaining of a severe cough which had been present for approximately three months. According to the patient, the cough was not productive except for an occasional bit of phlegm which she felt arose from the pharynx rather than the tracheobronchial tree. The significant findings on examination at this time revealed a weight loss of almost fifteen pounds and radiographic evidence of a mass in the right hilar

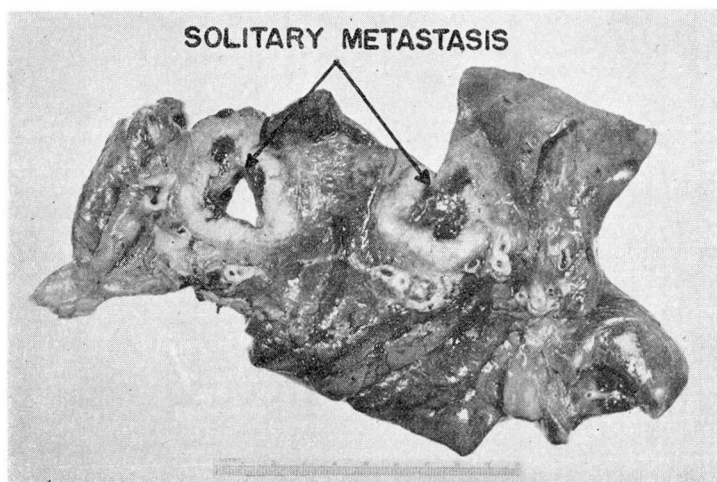


FIG. 2. Resected right lung which has been transected to demonstrate large cavitated solitary lung metastasis. Microscopic studies confirm clinical impression of adenocarcinoma from the uterus.

region. The remainder of her studies were essentially normal and the patient was advised to be admitted to the hospital for further study and treatment. The patient was hospitalized on June 22, 1949, and a careful physical examination failed to reveal any other evidence of neoplasm. Radiographic examination of the chest demonstrated an irregular globular mass in the right mid lung field which was interpreted by the roentgenologist as neoplasm, either a bronchogenic carcinoma or a solitary metastasis (fig. 1b).

On June 23, 1949 a right thoracotomy was performed and the lung carefully examined. A mass, roughly the size and shape of a lemon, was found in the right hilar region that seemed to involve both the upper and middle lobes. It appeared to be reasonably well encapsulated and an attempt was made to biopsy its wall. When a small portion of the capsule was excised, the mass was found to contain a liquid necrotic material that was amenable to aspiration, leaving a large cavity. Frozen section examination revealed it to be a metastatic adenocarcinoma that had undergone central cavitation and appeared to be metastatic from either

uterus or bowel. Due to the location of the tumor at the hilum, lobectomy was not feasible so a right total pneumonectomy was carried out. This procedure was accomplished without difficulty and no other evidence of metastases was demonstrated. Recovery from this operation was surprisingly uneventful and the patient was ambulatory on the third postoperative day. The diabetic element was easily controlled by a simple dietary regime based on 1600 calories. The patient was discharged from the hospital to home convalescence on July 2, 1949.

The final pathologic report revealed a neoplasm located between the bifurcation of the right mainstem bronchus. The lesion was 4 cm. in diameter with a necrotic cystic central portion and it appeared to be well circumscribed. The microscopic diagnosis was adenocarcinoma compatible with secondary adenocarcinoma of uterine origin. The neoplasm was well differentiated with extensive necrosis and no evidence of secondary lymph node involvement in the seven glands that were examined (fig. 2).

## Comment

The surgical treatment of solitary lung metastasis is indicated in selected cases. Long and careful follow-up examinations are necessary to arrive at conclusions as to the degree of cure or palliation that will be obtained. A solitary metastasis may be present at the time the primary neoplasm is first detected or, as in the reported case it may appear years after the removal of the primary tumor. Brezina and Lindskog<sup>4</sup> report a pneumonectomy in 1943 for a tumor that proved to be a metastatic adenocarcinoma of uterine origin in a patient who had undergone hysterectomy thirteen years prior to that time. With the knowledge that metastases may appear well beyond the accepted five-year period, the surgeon who will undertake to excise apparent solitary metastasis must in turn be extremely cautious before proclaiming a cure. A truer valuation of this surgical philosophy will necessitate the study of a large number of cases and a long period of postoperative observation.

## References

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