

## Bilateral Pulmonary Resection Through A Median Sternotomy Approach: A Case Report

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### INTRODUCTION

Surgical resection of pulmonary metastases from controlled extra-pulmonary primary carcinomas and sarcomas is well documented.<sup>1-6</sup> Recently, there has been renewed enthusiasm for the aggressive surgical management of metastatic lung cancer. This stems in part from improved diagnostic modalities, including conventional tomography, computerized axial tomography (CAT), and the concomitant therapeutic advances in radiotherapy and sequential multidose chemotherapy.<sup>7</sup>

Patients with bilateral pulmonary metastases require staged thoracotomies, and this involves two separate anesthetics and a time delay, usually 2 to 4 weeks, between operations. Because of the well established general use of median sternotomy for intracardiac procedures and the ready access to both thoracic cavities through the sternal approach, the extended use for this problem is both attractive and justified.<sup>8,9</sup> A recent case illustrates its application.

### CASE STUDY

A 47-year-old man presented to the Veterans Administration Hospital, Columbia, Missouri, with painless swelling of the left scrotum of several

months duration. Past history was unremarkable, with no history of trauma or previous genitourinary complaints. Physical examination revealed an enlarged, rock hard left testicle. No lymph adenopathy was noted. A left orchiectomy was performed on March 4, 1980. Pathological examination revealed embryonal cell carcinoma of the left testicle. Subsequently, he received four courses of chemotherapy comprised of platinum, vinblastin, and bleomycin. In July 1980, chest roentgenograms revealed new bilateral lung nodules (Fig. 1). A retroperitoneal lymph node dissection was done July 21, 1980. Biopsies of



Fig. 1. Upright chest X-ray film showing lesions in the left upper lobe and right middle lobe.

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the lymph nodes revealed no evidence of metastasis. He was categorized to Stage III disease, and subsequent pulmonary evaluation in August, 1980, showed no change in the lung nodules. Bilateral lung tomography and computerized axial tomography confirmed a 2 x 2cm lesion in the left upper lobe, a 1 x 2cm lesion in the right middle lobe, and a 1 x 1cm lesion in the right lower lobe. A median sternotomy was performed on August 25, 1980, through which both thoracic cavities were explored. Operative findings confirmed the lesions in the left upper lobe and right middle lobe. No lesions were found in the right lower lobe. Both lesions were wedge resected with mechanical staplers. Pathological examination revealed fibrotic and necrotic tissue without any evidence of malignancy. The postoperative course was uneventful. At his last follow-up examination in December of 1980, there was no clinical or chest X-ray evidence of metastatic disease (Fig. 2).

## DISCUSSION

Hutchison<sup>2</sup> outlines several factors that must be fulfilled to justify pulmonary resection for metastatic disease. These include (1) identifiable

and resectable pulmonary lesion(s); (2) metastasis to no other organ; (3) controlled primary lesion; and (4) a significant disease-free interval. Considerable debate has been encountered over this last factor. Recently, Tahita<sup>3</sup> at Roswell Park pointed out in a series of 56 patients that the doubling time was a more reliable factor than the tumor-free interval. Patients with doubling times less than 40 days had lower survival results.

The problem of bilateral lung metastases is chiefly a problem of the preferred surgical approach. There is recent evidence to suggest that anesthesia is immunosuppressive, although only preliminary correlation of impaired immune reactivity and increased pulmonary metastasis is suspect.<sup>10</sup> In addition, several recent reviews have documented the ready access to both thoracic cavities via the median sternotomy approach.<sup>8,9</sup> Both of these factors are large determinants in favoring the present approach.

This case points out several interesting factors. Despite the presence of a lesion that was shown on tomography and CAT scan in the right lower lobe, no lesion could be palpated at surgery. It is debatable whether a blind wedge resection, or even lobectomy, should be done in such instances.



Fig. 2. Follow-up chest X-ray film at 5 months showing no evidence of parenchymal disease.

The fact that no malignancy was found is not unusual. Mandelbaum<sup>7</sup> and his group at the University of Indiana treated 21 patients who had thoracic lesions in a similar manner, and five patients had necrotic fibrotic areas without evidence of tumor. Mandelbaum nicely outlines the approach to this particular group of metastatic testicular carcinomas in his study. All patients were staged with chest roentgenograms, tomography, ultrasound, CAT scans, determination of serum beta subunit human chorionic gonadotropin, and  $\alpha$ -fetoprotein levels. Sequential chemotherapy was followed by thoracic operations when (1) there was no other extrathoracic evidence of tumor; (2) thoracic lesions persisted after a full course of chemotherapy; and (3) a solitary pulmonary lesion recurred after complete remission with the use of chemotherapy.

The use of the median sternotomy is applicable to this and other situations. Cooper<sup>8</sup> in 1978 outlined the relative indications: (1) benign lesions, including bilateral emphysematous bullae; (2) bilateral spontaneous pneumothorax; (3) bilateral multiple pulmonary arteriovenous malformations; (4) bilateral pseudolymphomas; and (5) malignant lesions such as bilateral pulmonary metastases, bilateral synchronous primary carcinoma of the lung, and thymoma with involvement of the right upper lobe.

Certain technical points have been adopted to obviate some of the technical difficulties. The mechanical stapling device\* makes wedge resections simpler and quicker. Previous sternotomy is contraindicated because of the increased difficulty of dissection. Division of the inferior pulmonary ligament allows better exposure of the lower lobes. Distal left bronchial involvement requires more tedious dissection because of the levo-position of the heart.

Recently, Bricker<sup>11</sup> extended the use of median sternotomy in doing concomitant open heart surgery and pulmonary resection.

In conclusion, the present approach is justified in those lesions where the bilaterality would subject the patient to unnecessary bilateral staged thoracotomies. Familiarity with the median

sternotomy makes the operation feasible, practical, and within the range of practicing thoracic surgeons.

\* Auto Suture, Nodels TA 30, 55, and 90 surgical stapling instruments, United States Surgical Corporation, Stamford, Connecticut 06902.

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