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November 23, 1979

Mr. Richard B. Worsham
Attorney at Law
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Subject: Donald Temmen
Your File: 4-00-2788-1

Dear Mr. Worsham:

Pursuant to your recent request I have reviewed the available medical records on the above named 52 year old man who died February 14, 1977 from a poorly differentiated adeno carcinoma of the right lung. He apparently had been sick only one year and initially had only some vague right chest discomfort which resulted in an admission to the Providence Hospital on February 15, 1976.

The tumor was found to be nonresectable at the time of operation February 18th. He ultimately received Cobalt-60 at the University of Michigan Radiation Therapy Department, but obviously to no avail in changing the ultimate fatal course of the disease.

The patient was employed by the Advance Glove Company for a number of years where he was seriously exposed to different powdered and liquid chemicals, the more notorious of which is PVC, polyvinyl chloride. This plastic and its close relatives have been implicated in the production of cancer including adeno carcinoma of the lung.

ADMISSION TO PROVIDENCE HOSPITAL, attending physician:
February 15 to 25, 1976 (11 days) G. Cyrowski

The patient gave a history of having seen some other private physician recently (date and name not specified) for "gut pains". An upper GI series was done and this allegedly showed that the lower esophagus was pushed to the left by a possible mediastinal mass. The patient denied any history of coughing, dysphagia or chest pain.

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He did have some vague right sided chest discomfort.

The patient gave a history of smoking 20 to 30 cigarettes per day for approximately 40 years.

His past medical history revealed the following:

- 1) an appendectomy 30 years earlier;
- 2) patient drank alcohol socially.

Physical examination was essentially normal with no lymphnodes being detected.

The patient underwent an esophagram on February 16, 1976 and this showed an 8 x 10 cm soft tissue density in the region of the mid esophagus causing displacement of the esophagus to the left.

On February 17, 1976 bronchoscopy and esophagoscopy were performed by Dr. Cyrowski and both procedures found no lesion.

On February 18th Dr. Cyrowski performed a thoracotomy on the right chest. "A coin lesion about the size of a 50 cent coin in the right middle lobe was found. The metastatic lymphnodes and all the mediastinal nodes were hardened which looked metastatic. Biopsy of the pieces of the tumor was performed and revealed adeno carcinoma, and metastatic lymphnode was also biopsied and sent frozen section and returned as same diagnosis. So, this was considered to be unresectable."

The tissue report dated February 18, 1976 stated that the histologic features are certainly consistent with a primary poorly differentiated adeno carcinoma of the lung.

On February 17th a liver and spleen scan were performed and the first organ was noted to be slightly enlarged but otherwise were normal.

A chest x-ray performed February 22nd showed the mass density in the right hilar region remained unchanged.

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The Discharge Summary dictated by Dr. Cyrowski stated that the patient had far advanced mediastinal metastasis. It was this latter finding which undoubtedly was compressing the esophagus and leading to the presenting complaints and findings in the upper GI series (which report is not available). Dr. Cyrowski felt that the prognosis for the patient was poor.

UNIVERSITY HOSPITAL-RADIATION THERAPY SERVICE
Attending doctor: Juan V. Fayos, M.D., Chief of the
Radiology Therapy Service

The patient was first seen at the University of Michigan Out-Patient Department on March 10, 1976 where treatment with Cobalt 60 was begun. Over the next 55 days until May 3, 1976 the patient received a total dose of 6030 rads. His body weight at the beginning of treatment was 137 pounds and at the conclusion of treatment was 140½.

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Follow-up x-ray films of the chest revealed the following:

- April 15, 1976: Convex fullness right mid-mediastinum at the level of the hilum. The peripheral lung fields were clear.
- July 1, 1976: No change. First visit after radiation. Pain in right ribcage and cough. No supraclavicular or axillary lymphnodes.
- September 9, 1976: Difficulty in swallowing last two to three weeks. Pain right ribcage and shortness of breath as before. Return to clinic in two months.

The medical care and condition of the patient is unknown from September, 1976 until early February, 1977.

McPHERSON COMMUNITY HEALTH CENTER, Howell, Michigan.
February 2 to 14, 1977 (13 days)

The patient was probably admitted for terminal nursing care. He gave a history of being unable to eat, and for the past two months could take liquids only. For the

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several days prior to admission he had been unable to take even the liquids and complained of pain.

The physical examination showed the patient to be severely emaciated. Respirations were 18. No lymph-nodes were found.

The clinical impression was:

- 1) Stricture of esophagus due to extrinsic compression.
- 2) Possible aspiration pneumonia.

The progress notes by the attending physician showed on February 7th that no aggressive treatment was planned; on February 8th the patient could not swallow any liquid.

Laboratory work done February 3rd and 6th each showed a marked anemia of approximately 9.4 grams (61g) and a total white blood count of 21,000 to 23,000 with approximately 84% PMN's.

A chest x-ray on admission February 2nd showed density centrally in the lungs consistent with edema. There was questionable superimposed pneumonia in the right lower lobe.

The patient expired on February 13th at 0253 a.m. The Death Certificate signed by Ron Y. Gu, M.D., stated that the immediate cause of death was cardiac arrest, due to as a consequence of aspiration pneumonia and of one month's duration and cancer of the mediastinum of one year's duration.

There was no autopsy and the body of the deceased was donated to the Department of Anatomy, University of Michigan Medical School.

DISCUSSION

This patient was 52 years old at the time of his death from a poorly differentiated adeno carcinoma of the lung. It would appear that the primary tumor was in the right

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middle lobe of the right lung and metastasized early to lymph nodes at the root of the lung or hilum. In reality, it was the metastasis to the regional lymph nodes which were more serious and which resulted in the compression of the esophagus. It should be recalled that the presenting complaints of the patient to his original physician were "gut pains". Actually it was the ever increasing compression of the esophagus which caused his inability to swallow solid food and finally even liquids. From the medical records available at the University of Michigan Radiation Therapy Service, the Cobalt 60 treatment for 55 days did not significantly impede the growth of this rather highly malignant tumor. Whether an additional course of radiation therapy was ever considered is not known at this time. Likewise it is also unknown whether any chemotherapy was ever considered or administered to the patient.

From publications of the University of Michigan Hospital Bulletin approximately 1958, we know that a number of lung tumors have been present for 13 months on average according to the presenting symptomatology of patients. It is quite obvious that this poorly differentiated tumor (and therefore more malignant) was present for a long time prior to admission to the Providence Hospital in early 1976. My personal estimate is that the tumor in the right middle lobe had been present for 9 to 12 months with the emphasis near the 12 months time by virtue of the extent of involvement of the mediastinal lymph nodes.

My personal opinion is that there is a double etiology for the lung cancer in this patient. His personal history showed that he had been a cigarette smoker of 1 pack per day for approximately 35 to 40 years. He was in a high risk category from the cigarette smoking according to figures published by the American Cancer Society.

However the type of employment which this patient had plays a significant contributory role to the development of his lung tumor. From August of 1955 until at least February of 1976, if not longer, the patient worked for a single employer where he had very significant exposure

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to chemicals. He was stated to have been a production manager in a plant where only a few employees worked and one of his responsibilities was to mix plastics. The precise duration of exposure cannot be stated with certainty at this time; it is my calculation that it may have been as long as 21 years.

At least one of the chemicals to which the deceased was exposed was polyvinyl chloride. It is well documented that vinyl chloride monomer is contained in numerous plastic materials of the PVC type. A World Health Organization report tentatively estimates that the human intake of vinyl chloride, based upon a limited range of food analyses, is on the order of 1 microgram per person per day.

Vinyl chloride has been shown to be carcinogenic in animals by the oral route. The experiments of Viola employing Wistar albino male rats showed that exposure to vinyl chloride for 4 hours a day, 5 days a week, for 12 months produced tumors in the skin, lungs and bones. When tumors were produced in the lung it was of the adeno carcinoma type usually.

To date the greatest publicity has been given to the development of angiosarcoma of the liver in workers exposed to vinyl chloride. This patient did not have this type of malignant tumor of the liver which is invariably fatal.

Numerous authors have commented as to the possible cocarcinogenic effects of other exposures with vinyl chloride, particularly benzene, cigarette smoking, and arsenic.

Monson, et al studied workers in a VC plant and in a vinyl chloride polymerization plant and found a statistically significant elevation of deaths due to cancer. For example, 13 cases of lung cancer were noted among 161 white deceased males which represented a 60% excess of deaths above the expected frequency of this cancer.

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The National Institute of Occupational Safety and Health study of 930 white males observed an excess mortality rate for cancers of the respiratory system (as well as other systems too). One significant finding was that the majority of observed cancer deaths in this study population did not occur until at least 15 years following exposure to VC.

Certainly the alleged working conditions at the plant where the deceased was employed were not in accord with good manufacturing practices to prevent undue exposure to irritating or hazardous substances. The Deposition of James C. Edwards, dated November 10, 1978 (father-in-law of the deceased) indicated that he observed only 1 fan for a room of an apparent size of 70 feet by 70 feet by 12 feet. He also alleged that the patient had sometimes appeared like a snowman being covered with powder materials which he was mixing. There was no hood over the mixer, according to his testimony.

The failure to employ a mask, good ventilation or a hood over a mixer collectively would result in considerable inhalation of foreign substances into the respiratory system and probably were significant contributing factors to the death of this patient.

Sincerely yours,

Robert D. Laird, M.D.

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