

6-1966

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Recommended Citation

Poznanski, Andrew K. and Bloor, Robert J. (1966) "Wilms' Tumor - Metastatic To The Lung: Report Of A Survivor With Radiation Therapy Only," *Henry Ford Hospital Medical Bulletin* : Vol. 14 : No. 2 , 161-166.

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WILMS' TUMOR — METASTATIC TO THE LUNG

Report of a Survivor with Radiation Therapy Only

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In most neoplasms the presence of pulmonary metastases is synonymous with uncontrollable disease. However, in some of the radiosensitive tumors such as Wilms', irradiation therapy can produce a cure. We have treated one patient who is alive and well more than five years after irradiation of bilateral pulmonary metastases from Wilms' tumor.

Many of the recent reports in the literature stress the use of chemotherapy together with radiation in the control of metastatic Wilms' tumor. There are, however, some documented examples, including our case, of apparent cure with radiation alone.

Garrett and Mertz¹ reported two such cases in a series of 23 patients with Wilms' tumor. The first was a 3½ year old who developed hilar metastases and questionable pulmonary metastases after irradiation and surgical removal of a Wilms' tumor. Both lung fields were irradiated and 4½ years later the patient had no metastases. The second case they described showed metastases and had an 18-month survival.

Lattimer et al² reported a 20-month-old male with a lesion within the right lung which was treated; the patient was alive and well five years later. Another patient described by Silver³ was a 21-month-old male with pulmonary metastases occurring seven months after operation, in whom the local area of metastasis was treated. The patient was alive 11 years later. Nesbit⁴ described a patient with pleural effusion in the right chest, thought to be due to metastatic lesion in a patient with Wilms' tumor. The patient received irradiation to the right chest and ten years after the initial diagnosis he was alive and well. Bixler et al⁵ reported a two-year-old patient who initially had metastases to one lung; this was treated locally. Later there was evidence of metastases in the right lower lung field, this was in turn irradiated. The patient was alive and well three years later.

Other less successful attempts at irradiation of pulmonary metastases from Wilms' tumor have been reported by many authors. The use of actinomycin D and other

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chemotherapeutic agents have helped produce many more survivals of patients with metastatic disease.^{6,7}

Removal of single metastasis from Wilms' tumor has been described. Most authors reported little success except in one report by Haas⁸ of an extremely slow-growing tumor. Metastasis occurred 2½ years after initial diagnosis and was present for more than 3½ years before its surgical removal. The patient survived 6½ years after lobectomy without further pulmonary metastases, but died of an abdominal recurrence.

Case Report — The patient, a male, two and one-half years of age, was admitted to the Henry Ford Hospital with an apparent renal mass. There was nonvisualization of the right collecting system on the excretory urogram and there was a large soft tissue mass on the right. A retrograde pyelogram showed a mass in the upper pole of the kidney with displacement. The patient was treated preoperatively to a tumor dose of 1600r in one and a half weeks. A right nephrectomy was performed two weeks after admission, and Wilms' tumor was found on pathologic examination.

After the operation the patient received radiation therapy in the area of the kidney, to a total tumor dose of 3200r. Chest film at the initial study was normal. Films made two months postoperatively showed some suggestion of pulmonary metastases; these became quite extensive one month later. The patient was active and appeared well except for occasional episodes of cough. The liver did not seem to be enlarged. In the absence of other metastatic disease it was felt that radiation therapy of both lung fields might be worthwhile. Therapy to the lung fields was commenced using a 9 x 16 opposed field at 200 KVP and 1.5 mm copper H.V.L. Initially the right lung was treated giving a tumor dosage of 666r in one week. The subsequent week the left lung was treated to a similar dose. The lungs were treated alternately until each lung received a tumor dose of about 2000r over a period of six weeks. Regular white count determinations were done. The lowest value was obtained one month after the beginning of radiotherapy when the count was 2400. Radiation therapy was complete five months after the operation. Near the end of therapy the patient experienced some nausea and vomiting which was controlled by Compazine. Eventually the nausea disappeared and the child returned to normal activity.

Two and one-half months after beginning of radiation therapy the patient was brought in because of temperature elevations up to 102 degrees. Wheezes were heard in the lung fields. Chest X ray showed increase in prominence in the perihilar areas. In addition, an infiltrative process was seen in the left lower lobe. The patient was placed on antibiotic therapy. The symptoms finally cleared and the patient returned to his usual activity. This episode probably represented a postirradiation pneumonitis.

One year after radiation therapy the patient was gaining weight and was quite active. He was seen at yearly intervals. Three years after radiation therapy an apparent nodule was seen over the lung fields. It was found to be an exostosis of the scapula. The patient was last seen six years after therapy and was without complaints.

WILMS' TUMOR



Figure 1

Excretory urogram, 4/28/59, shows a large mass in the right kidney.

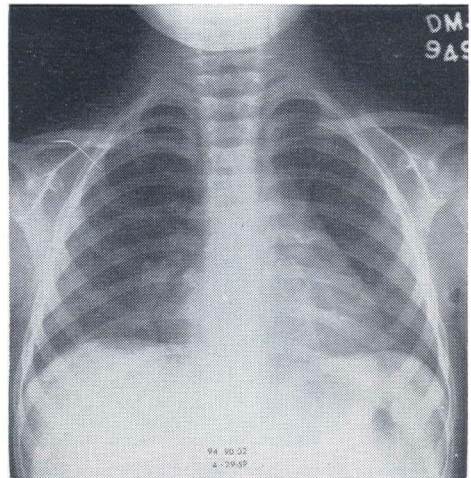


Figure 2

Chest, 4/29/59. No evidence of metastasis at the time of discovery of tumor.

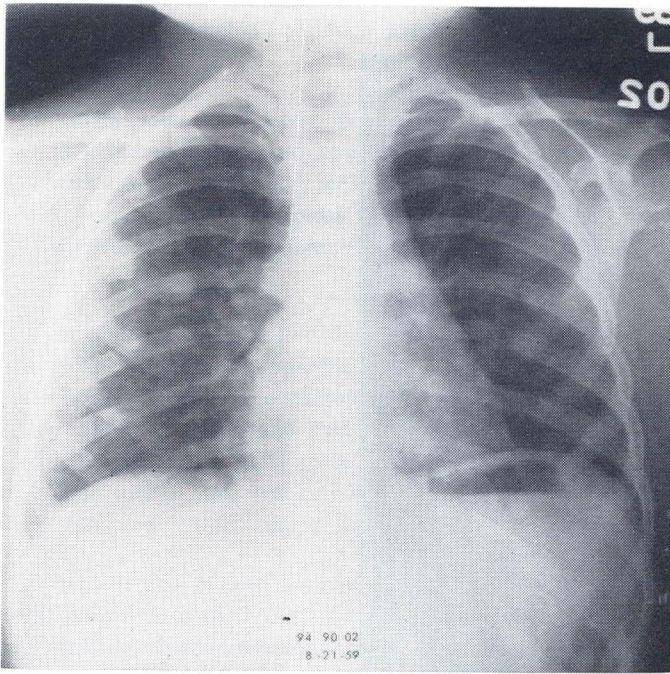


Figure 3

Chest, 8/21/59. Extensive pulmonary metastases seen bilaterally.

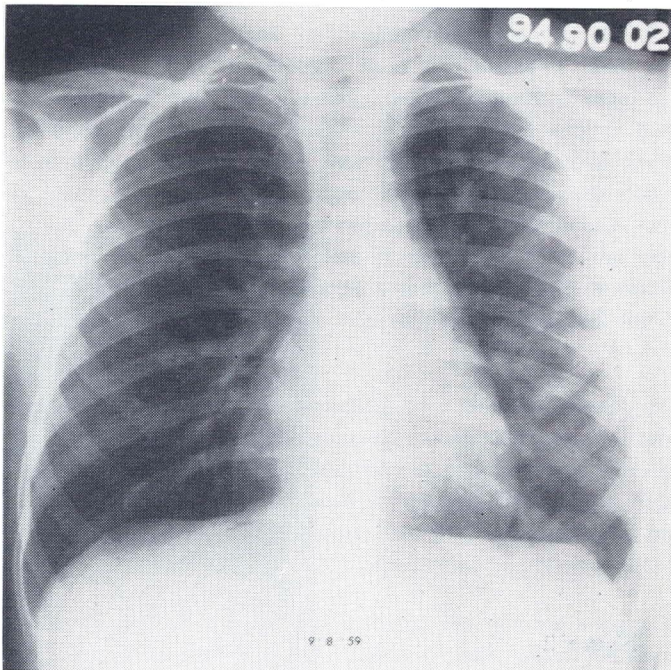


Figure 4

Chest, 9/8/59. Note the marked resolution of the metastases in the right lung which is the treated lung. The left pulmonary metastases show some progression.

WILMS' TUMOR

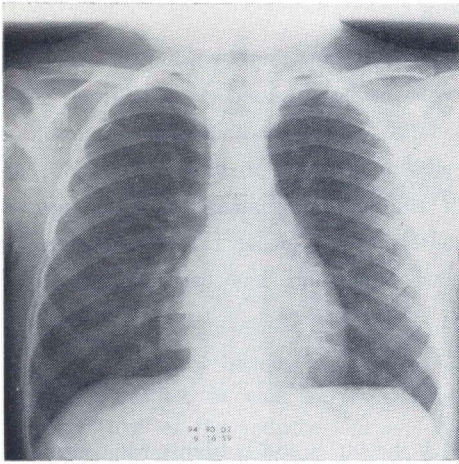


Figure 5

Chest, 9/16/59. Both lung fields now show no evidence of pulmonary metastases.

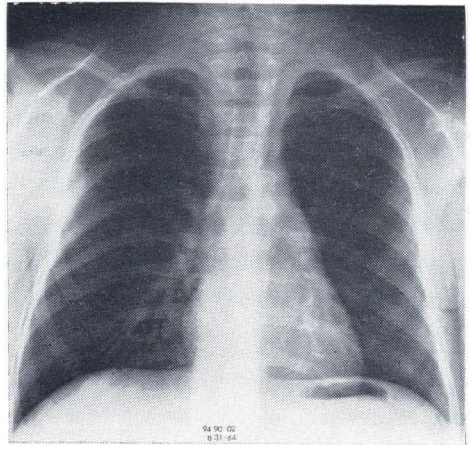


Figure 6

Chest, 8/31/64. No evidence of pulmonary metastasis is seen. Note the nodular density overlying the right lung laterally which represents an exostosis of the scapula.



Figure 7

Lateral films of the scapula show the exostosis to better advantage.

DISCUSSION

Applying Collins⁹ criterion of a period of risk, the patient, who was 2½ years old at the time of his initial tumor, can be considered cured at this time. The limiting factor in the irradiation of the lung fields is the possibility of pneumonitis occurring after therapy and perhaps the possibility of bone marrow depression, although this was not a problem in this patient and in other patients whose lungs we treated. The presence of the exostosis in the scapula following radiation therapy is not an infrequent complication of therapy to bone and has been described by Neuhauser¹⁰ and more recently by Cohen.¹¹

CONCLUSION

Since Wilms' tumor metastasizes primarily to the lungs and is highly radiosensitive, the presence of pulmonary metastasis is an indication for radiation therapy. Although the chance of cure is not great, there is little to lose. Since in the presence of pulmonary metastases not all lesions can be localized, therapy to both entire lungs seems to be the logical approach. Awareness of the possibility of radiation pneumonitis is important so that adequate therapy can be instituted. One patient with survival of more than five years after therapy of the lung is reported.

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