

# LUNG TRANSPLANT FOR BRONCHOALVEOLAR CARCINOMA

By: Gil Lederman, M.D.

New technology continues to search for new applications to improve human life. Organs of the body can be transplanted from one patient to another. Yet, when to perform such transplants and evolution of data are crucial to the outcome of innovative approaches in medicine. Transplants here mean someone else's lung is placed into the patient's chest to replace the cancerous one.

Historically, transplants were not routinely carried out for cancer patients since immunosuppression - suppression of the immune system - was felt to be likely to allow cancer to regrow or other cancers to generate. That might be changing now!

A new analysis just published in the prestigious New England Journal of Medicine by Garver et al, evaluated patients with bronchoalveolar carcinoma treated with lung transplantation.

Bronchoalveolar carcinoma is a relatively rare form of adenocarcinoma. Adenocarcinoma is one of the most common cancers afflicting the lungs. The bronchoalveolar cancer lines the alveolar walls. The alveolar walls are those that are responsible for interacting between air and blood so that oxygen can transfer into body.

There is felt to be an increasing incidence of bronchoalveolar carcinoma. Now about 3% of lung cancers are of this type. This would translate to approximately 6000 Americans diagnosed annually. Fortunately, patients in general with bronchoalveolar carcinoma live longer than those with the more common adenocarcinomas.

Yet, while adenocarcinomas are known for their property to disseminate throughout the body, bronchoalveolar carcinomas are known for the propensity to spread within the lungs. This has made aggressive local therapy important but difficult.

In an analysis recently undertaken of seven patients with bronchoalveolar carcinoma treated with transplantation, results were tabulated and reported. Cadaver donor means the lung came from a person after death. For these patients, one or both lungs were removed and replaced by a cadaver donor. Care of the patient after transplant was similar to those undergoing lung transplantation for non-malignant reasons.

The authors performed genetic analysis of the first cancer and then if recurrent, of the subsequent bronchoalveolar carcinoma. This was to define whether subsequent cancers were new or metastatic. Interestingly the patients all were between 33 and 57 years of age with five of the seven being women. Six of the seven were non-smokers while one patient had smoked 36 pack years.

Four patients had conventional treatment consisting of surgery early on. Three had no treatment prior to transplantation. All patients having surgery had recurrence of their cancer after standard surgical techniques. Thereupon they underwent lung transplantation.

After transplantation, three had no evidence of recurrence while four did indeed recur. The time with no cancer after transplantation varied from ten to 56 months. The patient with 56 months disease-free recurrence has no cancer at this time. Another patient is 43 months without cancer and the third is 23 months being cancer free.

Of the four patients with recurrence after transplant, one had microscopic focus in a biopsy and more extensive recurrence has not been seen. Recurrence in two other patients who were treated with further resection of the lung and both are free of re-recurrence four and eighteen months after.

Another patient had recurrence after transplantation. That patient had resection of the transplanted lung followed by a second lung transplantation. The patient died nine months later after multiple pulmonary complications including recurrence of the bronchoalveolar carcinoma in the transplanted lung.

There was also evidence of cancer at the time of autopsy in the transplanted lung but not elsewhere in the body. Analysis of the recurrent cancers after transplantation showed they were indeed similar to the original tumors in three patients.

However, chromosomal analysis in three patients showed that there was different DNA analysis from the original tumor in the recurrent cancer. In two other patients there was also identical tumor at both times.

The authors reported, "These results support the notion that recurrent bronchoalveolar carcinoma found in the donor lungs originated in the recipients."

The authors attempted to analyze where in the transplanted lungs did the cancer arise. There was a question whether cancer cells washed back into the transplanted lungs from normal tissues in the patients such as the trachea. The authors also suggested that the bronchoalveolar carcinoma metastasized elsewhere in the body and then returned to the lungs to grow.

Researchers concluded that, "Because all the recurrences appeared to have originated from a microscopic disease extent at the time of transplantation, it is interesting that suppression of the cell mediated immunity required for allograft survival did not clearly enhance the spread or growth of extra pulmonary foci of bronchoalveolar carcinoma. Further examination of tumor genotypes particularly in the context of genes commonly mutated in lung cancers may help define differences that are associated with the variable clinical course of these patients after transplantation."

This data is important for those with a cancer predisposed to remain but recur within the lung. There are those with this type of cancer who may wish to investigate this unusual treatment modality. Perhaps this approach is a sign that transplant as treatment for cancer may be considered in the future. One would imagine selected cases where widespread metastatic potential is limited, yet local control is difficult to obtain via conventional means.

We have used stereotactic radiosurgery, which is a very precise method of radiation to treat bronchoalveolar carcinoma. Our control rate – meaning cessation of growth, shrinkage or disappearance of the cancer in the treated field – remains at about 90%. We have a group of expert physicians to evaluate each. The beauty of our program is that radiosurgery, non-invasively and in a short period of time can control most lung tumors.

For those with questions, please call us directly at 212-CHOICES or e-mail: [gil.lederman@rsny.org](mailto:gil.lederman@rsny.org). We also have seminars open to the public for those interested.