Cryoablation Using Liquid Nitrogen for Metastatic Lung

Cancers

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Summary:

Cryoablation with argon has been used to treat tumors, and recently, cryoablation with argon has been used to treat lung cancer. More recently, the FDA approved a device using liquid nitrogen for cryoablation. The device using liquid nitrogen is cheaper to use because it usually uses a single probe and liquid nitrogen is much cheaper than argon gas.

Cryoablation using liquid nitrogen has recently been used for primary lung cancer, achieving satisfactory results. Metastatic lung cancers, which are generally associated with several tumors, often needs several cryoablations. To date, there has been no report of treatment of metastatic lung cancer with cryoablation using liquid nitrogen. This study aims to evaluate the use of cryoablation with liquid nitrogen as a treatment for metastatic lung cancer and to use the number of treated tumors to assess preserved pulmonary function.

This retrospective, observational study of 68 patients with 121 metastatic lung tumors who were treated with cryoablation using the ProSense™ liquid nitrogen System between 2013 and 2019. Each cryoablation was generally 3 cycles of repeated freezing and thawing. The 11 patients with metastases in both lungs, each side was treated separately. Follow-up was done at a median of 32 months. With the guidance of a CT, the probe was able to access all 121 tumors.

Both primary and secondary outcomes were recorded. Local control and incidence of pneumothrorax was the primary outcome. The variance of preserved pulmonary function, 6 months following cryoablation, was the secondary outcome. Complications resulting from treatment and preserved pulmonary function were also assessed.

There was a 17% local recurrence rate (21 out of 121 tumors). Local control rate for all tumors was 73% for 3 years. Overall, the survival rate for 3 years was 56%, with the survival rate of sarcoma lower (28%) than for carcinoma (67%).

Pulmonary function after cryoablation could only be assessed in 87% of the patients. None of the patients died as a result of treatment.

The researchers found that (1) cryoablation using liquid nitrogen would be one of the treatment methods for metastatic lung cancers <2.2 cm; and (2) pulmonary function decreased significantly when cryoablation was performed for an increasing number of tumors.