

Lung Cancer

Lung cancer remains a leading cause of cancer death worldwide, with approximately 90% of cases related to smoking. In the United States alone, approximately 173,000 new cases of lung cancer were diagnosed in 2004. Advances in technology and medical imaging are allowing identification of more patients with early stage lung cancer than ever before. Despite these advances, approximately 160,000 Americans will die of lung cancer this year, representing approximately 28% of cancer deaths in the United States. More Americans will die of lung cancer than from breast, prostate and colon cancers combined. Utilization of the best current technology results in an overall five year survival rate of lung cancer of about 15%. Because of the low survival rate, new chemotherapy agents and in particular, newer technologies are being integrated into treatment regimens.

Radiofrequency Ablation

Radiofrequency ablation (RFA) is one of the newest technologic concepts, the clinical applications of which continue to be developed. In some cases it has advantages over traditional chemotherapy and radiation therapy, but can also be used in conjunction with these more traditional treatment options, as is often done at the Upper Michigan Cancer Center of Marquette General Health System, to enhance patient survival and improve quality of life.

Surgical removal of a lung tumor has been and will continue to be the standard of care in the treatment of lung cancer. Unfortunately, not all patients are candidates for surgical removal of tumor, possibly due to spread to lymph nodes or because of illness such as heart or kidney disease which would not allow them to tolerate open surgery. While RFA has many properties similar to surgery, it is a relatively new technology.. However, while long term studies of its effectiveness are only now underway, early studies do show some promise of outcomes very similar to surgical removal of early stage lung cancers.

Image guided RFA may be able to be used in these patients for two purposes. One would be for definitive therapy and in a few cases, possible cure of the tumor, where there has been no spread of tumor to lymph nodes or other organs. A second option would be “palliative” treatment, where RFA is not intended for cure but is utilized as an adjunct - for shrinkage of tumor before chemotherapy or radiation therapy, to reduce symptoms related to tumor growth such as chest pain or shortness of breath, to reduce pain in cases where tumor has spread, or to slow regrowth of tumor in patients who have had previous radiation therapy or surgery and cannot be retreated.

RFA is not suitable in all patients who have lung cancer. Surgical removal remains a mainstay of treatment when possible. If tumor spread to lymph nodes and other organs is too extensive, there may also be no role for RFA due to little chance of increased survival or improvement in symptoms. In some of these cases, chemotherapy or radiation therapy, or some combination of treatment options, may offer benefit to patients.

Radiofrequency ablation is usually performed as a short-stay procedure. Patients are usually admitted the day of the procedure and are discharged to return home the morning following the procedure. Utilizing anesthesia, most patients are placed asleep for the procedure.

During the procedure, a special ablation needle (figure 1) is advanced through the skin in to the lung, similar to a biopsy procedure. Using CAT scan guidance, the needle is directed toward and advanced into the tumor. An electric current is then applied to the needle, resulting in heating of the tumor cells around the needle and eventual cell death. Depending on the size and configuration of the tumor, several needle placements may be required in a single session, in an attempt to achieve maximal desired tumor death.

At the conclusion of the procedure, the needle is removed and a bandage placed. There are no incisions or sutures. Risks of the procedure are small. Rare complications include bleeding and infection. The most common complication, occurring in about 10-15% of cases, is some degree of lung collapse (pneumothorax). In the great majority of cases, collapse is minimal and requires no treatment. A minority of cases do require placement of a small catheter through the chest wall to allow air to escape and the lung to re-expand, the tube typically being removed the following morning.

Patients are usually seen in the interventional clinic 3-4 weeks after the procedure. Like any cancer treatment, patients that undergo RFA require close follow-up examination and typically, CAT scan or MRI imaging is performed at 3 month intervals for at least one year. One advantage of RFA is the ability to perform repeat ablations, if necessary, for tumor recurrence. Previous ablation does not significantly limit the ability to repeat the ablation procedure. If necessary, ablation can often be repeated on several separate occasions.