

Radiofrequency ablation shrinks thyroid nodules and relieves symptoms while preserving function

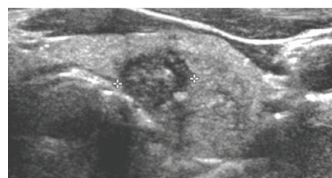
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UCLA interventional radiologists have built one of the country's highest-volume programs for treating benign thyroid nodules with radiofrequency ablation (RFA). While the procedure has been used to treat benign thyroid nodules for decades internationally, here in the U.S. the only treatment options until recently have been resective surgery or radioactive iodine for autonomously functioning "hot" thyroid nodules. While these treatments are effective in managing symptoms, many patients will require lifelong treatment for hypothyroidism. With RFA, interventional radiologists are able to shrink thyroid nodules and relieve symptoms without the risks of surgery and while preserving the thyroid gland. The procedure offers the additional benefit of providing excellent cosmetic outcomes, shrinking unattractive nodules and leaving no visible mark at the needle-puncture site.

Large, benign thyroid nodules put pressure on other structures in the neck and can cause difficulty in swallowing, voice changes, cough and pain. They also cause bulging in the neck that patients often find cosmetically problematic.

Thyroid RFA is performed under local anesthesia as an outpatient procedure. Using ultrasound guidance, the needle electrode is positioned within the nodule and electrical current at the tip of the needle produces high temperatures that kill cells in the nodule. The dead cellular material is resorbed by the body over time and the nodule shrinks in size. "What we've seen is that if you select patients correctly — those whose nodules you can treat appropriately and thoroughly — cosmetically those results have been really good, and the symptomatic results are even better," states Michael L. Douek, MD, professor of radiology and radiology director at UCLA Santa Monica Medical Center. "We routinely see volume reductions on the order of 80% or even better." Dr. Douek observes that while patients usually report rapid symptom relief, visible shrinkage of the nodule occurs gradually over a period of weeks to months. After one month, patients typically see a 20-to-50% reduction in nodule volume, with 80% reduction seen at six months or more. Many nodules shrink by up to 95% years after ablation.



Before and after ultrasound images. Initial ultrasound image (top) shows a nodule with a volume of 13 mL. Seven months following RFA, the nodule is 96% smaller, with a volume of < 1 mL (bottom). The patient experienced complete resolution of both compressive symptoms and cosmetic concerns.

Thyroid RFA is very well-tolerated, with some mild bruising and soreness following the procedure, but no real recovery time needed. It has a very good risk profile, typically with lower rates of complications than surgery, and without causing permanent hypothyroidism.

Treating small thyroid cancers with RFA

Beyond its use in treating benign thyroid nodules, RFA is beginning to be used to treat papillary thyroid microcarcinomas (PTMCs) in patients with low-risk tumors.

There has been a sharp increase in the number of thyroid cancers being diagnosed. It is thought that the rise in cases is due not to more cancers but to better detection. While it was accepted practice for many years to treat all cancerous thyroid nodules with surgical resection, there is now a trend toward active surveillance, monitoring them with ultrasound and delaying surgery until the nodule proves to be biologically active. "We are probably vastly overtreating many indolent cancers that will never spread, never grow, never do anything," states Dr. Douek.

RFA is emerging as an attractive middle ground between active surveillance — which requires that patients be followed with ultrasound exams regularly for life — and surgical treatment that comes with the risks inherent in surgery, including the possibility of rendering patients hypothyroid for life. UCLA interventional radiologists have begun treating carefully selected PTMC patients with RFA and have had good results, though the numbers are still small. Current selection criteria include only small (10mm or less), indolent nodules. "We don't want to treat aggressive tumors with RFA — those that have already spread to nodes or exhibit ultrasound or molecular features that are suggestive of an aggressive variant," explains Dr. Douek.

Dr. Douek notes that while RFA can be an good option for treating small, indolent thyroid cancers, the minimally invasive procedure does not yield a surgical pathologic specimen, as does surgical resection. This means that there is limited ability to characterize tumors or treatment margins, information that might be used to individualize subsequent care for surgical patients. **R**