

# Anatomy-Based Management for Radiofrequency Ablation of Recurrent Thyroid Tumours

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## DESCRIPTION

The most prevalent subtype of thyroid malignancies, accounting for more than 90% of cases, are Differentiated Thyroid Cancers (DTCs) which include papillary and follicular tumours. Primary thyroid cancer is often treated with surgery, Radioactive Iodine (RAI) ablation, and hormonal therapy. With a disease-specific survival rate of up to 90% after a 10 year follow-up, DTC has a great prognosis and a low mortality rate. However, depending on the risk of recurrence, the neck has a recurrence rate that varies from 20-59%. The current recommendations for recurrent malignancies call for a second procedure followed by thyroid hormone treatment or RAI ablation. Reoperation is advised as a usual course of treatment; however fibrosis and deformation of the normal neck anatomy may raise the risk of problems.

Recent research suggests minimally invasive therapies for benign thyroid nodules and recurring thyroid malignancies using ultrasonography (US)-guided ablation techniques, such as laser, radiofrequency, and ethanol ablation. The use of RFA (Radiofrequency Ablation) on the thyroid is governed by a number of international standards. Also published are guidelines for the thermal ablation of benign thyroid nodules from several international associations. The Korean Society of Thyroid Radiology proposed thyroid RFA guidelines in 2012 and 2018, covering a wide range of aspects of the treatment of benign thyroid nodules and thyroid malignancies. Additionally, new researches have examined these global standards for RFA of benign thyroid nodules.

The Italian Scientific Society, the European Thyroid Association, and the Cardiovascular and Interventional Radiological Society of Europe have merely discussed suggestions for RFA of recurrent thyroid cancer, whereas only the KSThR has proposed guidelines for RFA of recurrent thyroid cancer. For curative or palliative purposes, the KSThR advises RFA in patients who are at high surgical risk or who have turned down prior surgery.

Previous research has examined the fundamental ablation technique, pre-procedural assessment, effectiveness, and risks of RFA for recurring thyroid cancer. Both in short- and long-term studies, RFA have had therapeutic effectiveness rates of 95.1%

and 99.5%, respectively. There is a paucity of comprehensive technical information on enhancing RFA's efficacy and reducing problems, despite the fact that numerous research have reported on the fundamental ideas and effectiveness of RFA for recurrent thyroid tumours.

According to the KSThR recommendations, RFA may be used to treat recurrent thyroid cancer in individuals who are at high surgical risk or who prefer to forego further surgery. The recommended treatment options fall into two categories: curative ablation and palliative maintenance. Total ablation of any recurrent malignancies seen on an ultrasound is referred to as curative ablation. When three or fewer recurring lesions are evident on a neck ultrasound and there are no metastatic tumours present outside of the neck at the time of treatment, several studies advise conducting curative ablation for recurrent thyroid malignancies. Recurrent thyroid cancer that is either producing cosmetic or symptomatic issues or that is on the verge of invading vital structures including the trachea, skin, esophagus, nerves, or arteries is treated with palliative care.

Additionally advised for post-procedure evaluation is thyroid-specific CT. A CT scan is necessary to assess the effectiveness of treatment since a well-treated tumour exhibits a size reduction and the absence of enhancement. A decrease in serum Tg levels is crucial for determining treatment effectiveness following RFA, hence it is frequently assessed during the follow-up period. Particularly for tumours that are big or involve crucial structures, the alleviation of tumor-related symptoms is crucial for assessing therapy effectiveness. Because it is challenging to assess the impairment of crucial structures, tumor-related symptom reduction may be a good indicator of an ablation's efficacy.

Numerous studies, including a meta-analysis, have shown that RFA of recurrent thyroid tumours has good clinical outcomes. In terms of curative treatment for recurrent thyroid cancer, the overall notion of the clinical outcome is well established, while the clinical outcomes for palliative management of recurrent thyroid cancer are more challenging. Since complete tumour eradication is challenging to attain and most malignancies require combined therapy, the palliative management of tumours involving vital structures is more cautious.

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Pain and discomfort are the most common RFA consequences; however they typically go away within a few minutes to hours. Pain might radiate to the teeth, jaw, head, and chest at times. Lidocaine injections may be used to lessen local discomfort, thus the operator should assess the patient's symptoms during RFA and administer Lidocaine when they express local pain. Following RFA, a number of consequences have been documented,

including discomfort, bleeding, nerve damage, and skin burns. Alternative thyroid cancer treatment with good results and minimal complication rates is US-guided RFA. For the efficient treatment of patients who have a high surgical risk or who refuse to undergo repeated surgery, a detailed understanding of neck anatomy and the RFA process is helpful.