

2nd Annual Thyroid Conference

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Active Surveillance and Ablative Techniques for Thyroid Nodule Management

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No Disclosures





Disclosure:

I have no relevant financial relationship(s) to disclose with ineligible companies whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.

Learning Objectives:

- Identify selection criteria for patients who may be candidates for active surveillance of low-risk papillary thyroid cancer.
- Define radiofrequency ablation and other ultrasound-guided ablative techniques and illustrate how RFA can apply to treatment of symptomatic benign thyroid nodules.
- Determine whether non-surgical ablative techniques can be applied to patients with primary low-risk thyroid cancer, or to patients with recurrent disease who may not be surgical candidates.

Active Surveillance and Ablative Techniques for Thyroid Nodule Management:



"Watch It or Ablate It" Outline/Aims

Active Surveillance

- Define "active surveillance"
- Clarify patient selection categories:
 IDEAL, APPROPRIATE, INAPPROPRIATE
 - Identify minimum competencies for safeAS
- Understand triggers to abandon AS
 Ablation Techniques
 - History
 - The Basics

Patient Selection for RFA

- Benign thyroid nodules
- Recurrent PTC?
- Primary PTC?

ACTIVE SURVEILLANCE of PAPILLARY THYROID MICROCARCINOMA=conservative observational management strategy that avoids the risks of thyroid surgery and offers similar disease specific survival

"...at least 50,578 patients having tumors smaller than 1cm over the next 5 years who will be potential candidates for active surveillance as a treatment strategy."



Ideal Well defined single nodule without extrathyroid extension Willing Patient older than 60 with comorbidities Experienced team with high-quality ultrasound Appropriate Multifocal or ill-defined nodule, FDG-avid nodule Patient from 18-59 years old, family h/o thyroid cancer Experienced endocrinologist or surgeon with available ultrasound Inappropriate Extrathyroid extenson, N1 disease, growth >3mm Younger than 18, noncompliant Inexperienced clinician without reliable ultrasound



82 year old healthy female with incidental finding of thyroid nodule which is hypoechoic, subcentimeter, macrocalcification

FNA suspicious for PTC

Patient offered active surveillance, refused: She wanted to "do something to treat the cancer"

Pathologic Diagnosis

THYROID GLAND, RIGHT LOBE, HEMITHYROIDECTOMY:

- PAPILLARY THYROID CARCINOMA, 1.1 CM IN GREATEST DIMENSION.
- ALL SURGICAL RESECTION MARGINS ARE NEGATIVE FOR TUMOR.



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2021 ATA Guidelines: Active Active S Surveillance

Active surveillance for low-risk small papillary thyroid cancer in North American countries: past, present and future (bridging the gap between North American and Asian practices)

- All stakeholders involved in decision for maMarc P. Pusztaszeri¹, Michael Tamilia², Richard J. Payne³
 - Surgeon: (experience, remote access?)
 - Patient determines value propertion:
 - Role of the "Interventionali t" (RFA, ETOH etc.)
- Stratification of candidacy based on age
- Clinical and Anatomic factors
 - Location on US
- Molecular marker profiles
 - BRAF, TERT, TSHR, NI symporter.....???????

Gland Surg 2020;9(5):1685-1697

Active Surveillance Versus Thyroid Surgery for Differentiated Thyroid Cancer: A Systematic Review

Roger Chou,¹ Tracy Dana,¹ Megan Haymart,² Angela M. Leung,^{3,4} Ralph P. Tufano,^{5,6} Julie Ann Sosa,⁷ and Matthew D. Ringel⁸

> THYROID Volume 32, Number 4, 2022 © Mary Ann Liebert, Inc. DOI: 10.1089/thy.2021.0539

HISTORY

2009: RFAis first used for patients with thyroid nodules in South Korea

Review Article | Thyroid

https://doi.org/10.3348/kjr.2018.19.4.632 pISSN 1229-6929 · eISSN 2005-8330 Korean J Radiol 2018;19(4):632-655 Korean Journal of Radiology 2012: First Thyroid RFAGuidelines from Korean Society of Thyroid Radiology

2017 Thyroid Radiofrequency Ablation Guidelines Korean Society of Thyroid Radiology

"The Wake Up Call for Surgeons"

Inyoung Youn, MD, PhD⁶, Miyoung Choi, PhD²¹, Dong Gyu Na, MD, PhD^{11, 22}; Guideline Committee for the Korean Society of Thyroid Radiology (KSThR) and Korean Society of Radiology

DOI: 10.1002/hed.26960

ORIGINAL ARTICLE

Radiofrequency ablation and related ultrasound-guided ablation technologies for treatment of benign and malignant thyroid disease: An international multidisciplinary consensus statement Head & Neck. 2021;1-2

WILEY

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THE BASICS: WHAT IS NEEDED TO PERFORM RADIOFREQUENCY ABLATION?

THE RIGHT PATIENT

- The right disease and indications
- Willing patient
 - Desires non-operative approach
 - May be too sick for surgery, or surgery is too high-risk
 - Willing to undergo procedure under local anesthesia

THE RIGHT CLINICIAN

- Interventional Endocrinologist
- Interventional Radiologist
- Surgeon with ultrasound-guided intervention experience
 EXCELLENT ULTRASOUND IMAGING
- Consistent high-quality imaging for serial exams
- Patient has easy access to consistent imaging
 RADIOFREQUENCY GENERATOR
 RFANEEDLE
- Expressly created for thyroid and neck



THE BASICS: *WHAT IS NEEDED TO PERFORM RADIOFREQUENCY ABLATION?*



Has no idea that the impending global pandemic will hinder starting RFA Program at Emory Winship

SUMMARY OF TECHNIQUE

- 1. Comfortable supine position
- 2. Local anesthetic injection
- Skin
- Underlying strap muscles
- Thyroid capsule
- Path of needle
- 3. Hydrodissection around thyroid capsule
- •DW or saline to act as heat sink
- 4. Trans-isthmic approach to nodule
- 5. "Moving Shot" technique for 3-dimension ablation
- 6.Patient is discharged with ice pack and minimal analgesics

- Trans-isthmicApproach
- Clear anatomical landmarks
- Prevent back leakage of hot liquid
- Stability on swallowing or cough
- Avoidance of "dangertriangle"

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EFFECTS OF RFA

COMPLICATIONS OF RFA

Intensely hyperechoic while being ablated

Post-ablation:

- Hypoechoic
- Decreased vascularity
- Decreased elasticity

Success measured as:

- Relief of patient's symptoms
- Reduction of nodule size by >50%



ting ton



Are There Any Side Effects or Complications?

In a multi-center study of 1459 patients organized by the Korean Society of Thyroid Radiology, the overall complication rate following radiofrequency ablation was 3.3%. The major complication rate was 1.4%.

While uncommon, complications can be:

- Temporary voice changes, such as hoarseness.
- Slight bleeding usually disappears on its own within one day, or at the most, up to three months.
- Wound infections
- In rare cases, vomiting, cough, or seared skin at the treatment site may occur.
- Patients with AFTN ("hot" thyroid nodules) have the possibility of hypothyroidism after the procedure.

Although rare, a complication may require an inpatient hospital stay or follow-up treatment

PATIENT SELECTION: BENIGN THYROID NODULES

PATIENT SELECTION: BENIGN THYROID NODULES

Table 2. Indications for R	-A	Evidence	Delphi	Gradir	ng of	Poforoncos
Indication	Symptom	atic or Visible			ndations	References
Symptoms or cosmetic problems		or			ng	4, 9, 10, 12, 18
AFTN (toxic or pre-toxic)	(toxic or pre-toxic) Autonomous Function					
Cytopathologic confirmation ^{c)}					ng	27, 43-45
Two benign results	and					
One benign result K-						
Additional RFA	2 Benio	n Biopsies			stria U	nited Kingdom
	or					Y
	low Pick Ech	ogonici	417	Y	NA	
	i beiligii biopsy -	gii biopsy + Low Kisk Echogenic		Ly	Y	NA
or						
	ion	IA	NA			
	A 1	NA	NA			

Radiotrequency Ablation of Benign Thyroid Nodules Timothy C. Huber, MD¹ Auh Whan Pa Symptomatic or Visible or ¹ Dotter Department of Interventional Radiology. C Science University, Portland, Oregon **Autonomous Function** ²Department of Interventional Radiology, Univers Charlottesville, Virginia Semin Intervent Radiol 2021;38:377–381 and **2** Benign Biopsies eceived: April 24, 2020 Accepted: May 7, 2020 ublished online: June 8, 2020 or **1 Benign Biopsy + Low Risk Echogenicity** n Clinical or age-Guided **1 Benign Biopsy and Autonomous Function** erve Monpevssen^b Andrea Frasoldati^c Laszlo Hegedüs^d

Thyroid Nodule Patient Flow

USGFNA

10005 Result is suspicious for, or confirms malignancy RFA NOT indicated, further management as indicated

USGFNA

10005 Results confirmed to be benign (with second for confirmation if indicated)

Patient is good candidate for RFA

Patient consents to schedule procedure, completes pre-ablation questionnaire (modified ThyPRO) and acknowledges cash pay Payment is expected at time of scheduling

EMORY WINSHIP CANCER INSTITUTE

Patient or referring physician contacts Call Center Records obtained Need prior ultrasound reports, prior biopsy reports, labs within 6 months



RFA

Procedure is cash pay, patient can be provided codes for their own submission to insurance 76942, US for needle placement 60699, unlisted endocrine procedure

Patient undergoes procedure

1 month check 99213-4, 76536 Calculate volume treated nodule Complete post-ablation questionnaire Recheck TSH if ablation for toxic nodule

3 month check 99213-4, 76536 Calculate volume treated nodule Complete post-ablation questionnaire Recheck TSH if ablation for toxic nodule

6 month check 99213-4, 76536

alculate volume treated nodule Complete post-ablation questionnaire Recheck TSH if ablation for toxic nodule and not normalized vet

NPV

NPV

99204, 76536

No records, no recent workup, or both

Patient gets ultrasound, labs, scheduled for

USGFNA if indicated or if good candidate for RFA

NPV 99204, 76536

Recent records are available for review

Patient is good candidate for RFA

Patient gets ultrasound, volume of index nodule is

calculated

Patient consents to schedule procedure, completes pre-

ablation questionnaire (modified ThyPRO) and

acknowledges cash pay

Payment expected at time of scheduling

99204, 76536 Recentrecords are available for review *Patient is NOT good candidate for RFA* Patient gets ultrasound, and additional workup as indicated Further management asindicated

PATIENT SELECTION: RECURRENT THYROID CANCER

19

PATIENT SELECTION: RECURRENT THYROID CANCER



PEI FOR THYROID CANCER: CASE INTRODUCTION

2015

- 75 yo W presenting in 2015 for R level II LN-and ipsilateral thyroid nodule
 - **FNA positive for PTC**
 - S/p total thyroidectomy, right lateral neck dissection
 - Path: PTC with tall cell features
 - 2 + LN in R level II
 - Extrathyroidal extension
 - 151 mCi RAI
 - Post-ablation scan negative

2019

- Thyroglobulin became detectable
- Recurrent disease confirmed at level II with FNA
- S/p retropharyngeal and upper mediastinal LN excision
- Complication: Pharyngeal mucosal injury and repair
 2020

Progressive right level IIB disease discovered on US

TECHNIQUE

- Skin, subcutaneous tissue, needle path anesthetized with 1% lidocaine
- 3 cm, 25-gauge TB needle with 1 mL 95% EtOH

Deepest portion or pole injected first with .05 - .1 mL

> The injected portion becomes intensely echogenic, which passes within 1 minute



AMERICAN THYROID ASSOCIATION

Optimal Thyroid Health for All

		Data (in c	Data (in centimeters)				Percent Change from			
	Year	Length	Width	Depth	Volume		Prev. Measurement		Baseline Change	
Baseline		1.3	1.3	2.7	2.28					
		1.2	0.8	1.4	0.67	(-70.55%		-70.55%	

. 1

Reset

Calculate

https://<u>www.thyroid.org/professionals/calculators/thyroid-with-</u> nodules/



This systematic review included studies that reported:

- 1. Volume reduction ratio (VRR) >/= 50%
- 2. Complete disappearance
- 3. Changesin serum level of Tg
- 4. Recurrence rate
- 5. Major and minor complications

"Both RFA and EA are acceptable treatment modalities to manage locally recurrent thyroid cancers in terms of efficacy and safety for poor surgical candidates or patients who refuse surgery."



2015 ATA guidelines stated that locoregional therapies, such as EA, "may be beneficial in patients with a single or a few metastases and in those with metastases at high risk of local complications."

Haugen BR, Alexander EK, Bible KC, et al. 2015 American Thyroid Association Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer: The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. Thyroid 2016;26(01):1–133 2019 NCCN guidelines for thyroid carcinoma stated "the preferred therapy for locoregional recurrence is surgery, but EA could be considered for select patients with unresectable, nonradioiodine-avid, and progressive papillary, follicular, and Hurthle cell carcinoma."

National Comprehensive Cancer Network, NCCN Guidelines. Available at: https://www.nccn.org/professionals/physician_gls/ pdf/thyroid.pdf. Accessed July 25, 2019

PATIENT SELECTION: LOW RISK PTC

PATIENT SELECTION: LOW RISK PTC

RFA For PMC

- Same as those you would perform Active Surveillance on
 - Location, location, location, location
- Ultrasound basis for decision making
- All stakeholders involved in decision making
- Follow-up criteria??



RT THYROII

If patient is a good candidate for Active Surveillance, consider RFA



0.95 0.90 0.90 0.90 0.85 P = 0.223 - TL group - RFA group 0.80 0 12 24 36 48 60 72

7.0 (3.0) < 0.001 7.0 (3.0) < 0.001Hospitalization, days 0 Procedure time, minutes 3.24(2.3)86.0 (38.0) < 0.001 3.4(2.5)86.0 (37.0) < 0.001 Estimated blood loss, mL 20.0 (10.0) < 0.00120.0 (10.0) < 0.0010 0 Cost, U.S. dollars 2035.7 (254.0) 2274.8 (917.3) < 0.0012035.7 (254.0) 2269.1 (943.4) < 0.001Cost. Yuan 13680.6 (1707.1) 15287.4 (6164.9) 13680.6 (1707.1) 15249.1 (6340.3) < 0.001 < 0.001Complications 0 23(5.0)< 0.001 0 15(4.5)< 0.0010 2(0.4)0.1740 1(0.3)0.317 Fever Transient RLN injury 16(3.5)< 0.001 0 12 (3.6) < 0.001 0 Persistent RLN injury 0 0 0 0 0.157 0 5(1.1)0.031 0 2(0.6)Transient hypoparathyroidism 0 0 Persistent 0 0 hypoparathyroidism

Data are expressed as mean±SD or median (IQR) or number of tumors (percentages). RLN, recurrent laryngeal nerve.



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CONCLUSIONS

 BENIGN
 RFA is well established outside the USA to manage benign thyroid nodules.

 Since FDA device approval, rapidly catching on in USA.

2. RECURRENT PTC

RFA and Ethanol Ablation can be considered forpatients with recurrent PTC, for whom surgery is risky or not desired.

3. T1a and T1b PTC

Low-risk micro-PTC is very common and frequently indolent.

RFA is an alternative to AS and avoids the risks and costs of surgery.

CONCLUSIONS/QUESTIONS

CONCLUSIONS

BENIGN

RFA is well established outside the USA to manage benign thyroid nodules.

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2. RECURRENT PTC

RFA and Ethanol Ablation can be considered for patients with recurrent PTC, for whom surgery is risky or not desired.

3. T1a and T1bPTC

Low-risk micro-PTC is very common and free RFAis an alternative to AS and

WAKE-UP CALL FOR SURGEONS

"RFA may eliminate the need for most surgery for benign thyroid disease" --Lisa Orloff, MD, FACS

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Thank YOU!









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