

# 4 Steps To Become A Smoother Surgeon & Improve Thyroid Surgery Outcomes

2021 AHNS/AAO Head & Neck Surgery  
Symposium for Residents & Fellows



Michael C. Singer, MD, FACE, FACS  
Department of Otolaryngology – Head & Neck Surgery  
Henry Ford Health System



1

## Disclosures

- Consultant for Medtronic



2

## Progress



3

## Thyroid Surgery Evolution

- **Dramatic evolution in the field over the last 2 decades**
  - **Impact of research**
    - Improved understanding of thyroid disease
    - Improved technology
    - Improved techniques



4

## 4 Steps To Improve Thyroid Surgery Outcomes

- **Select appropriate extent of surgery**



5

## Less is More...

- **Historically total thyroidectomy routinely performed**
- **Exposes patients to unnecessary risk in many instances**
  - **Second RLN and EBSLN**
  - **Hypoparathyroidism**
- **Movement toward less aggressive intervention when possible**



6

## Benign Disease



7

## Benign Disease



8

## Well Differentiated Thyroid Cancer

- 2015 ATA guidelines, Recommendation 35B:

For patients with **thyroid cancer >1 cm and <4 cm** without extrathyroidal extension, and without clinical evidence of any lymph node metastases (cN0), the initial surgical procedure can be either a bilateral procedure (near-total or total thyroidectomy) or a unilateral procedure (lobectomy). **Thyroid lobectomy alone may be sufficient initial treatment for low-risk papillary and follicular carcinomas**; however, the treatment team may choose total thyroidectomy to enable RAI therapy or to enhance follow-up based upon disease features and/or patient preferences.



9

## Well Differentiated Thyroid Cancer

- 2015 ATA guidelines, Recommendation 35C:

**If surgery is chosen** for patients with **thyroid cancer <1 cm** without extrathyroidal extension and cN0, the initial surgical procedure **should be a thyroid lobectomy** unless there are clear indications to remove the contralateral lobe. Thyroid lobectomy alone is sufficient treatment for small, unifocal, intrathyroidal carcinomas in the absence of prior head and neck radiation, familial thyroid carcinoma, or clinically detectable cervical nodal metastases.



10

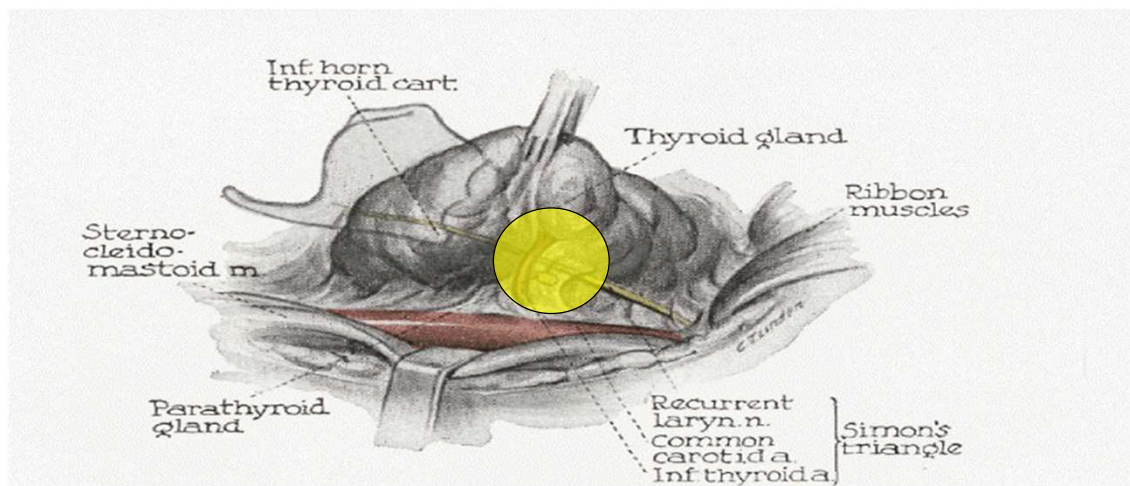
## 4 Steps To Improve Thyroid Surgery Outcomes

- Select appropriate extent of surgery
- Find the RLN in a thoughtful manner



11

## Principles of Nerve Identification



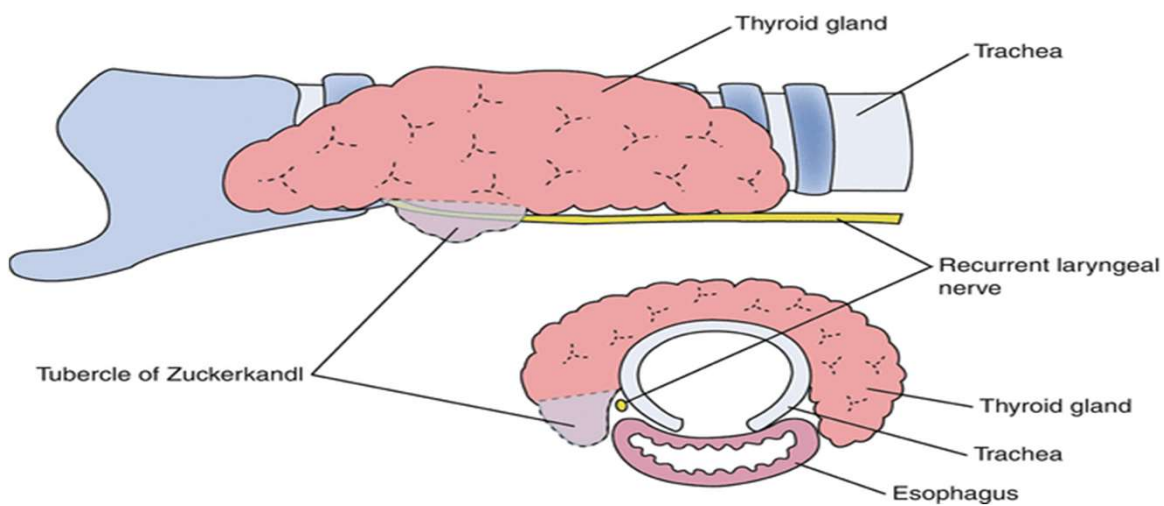
12

## What Do I Use the Most



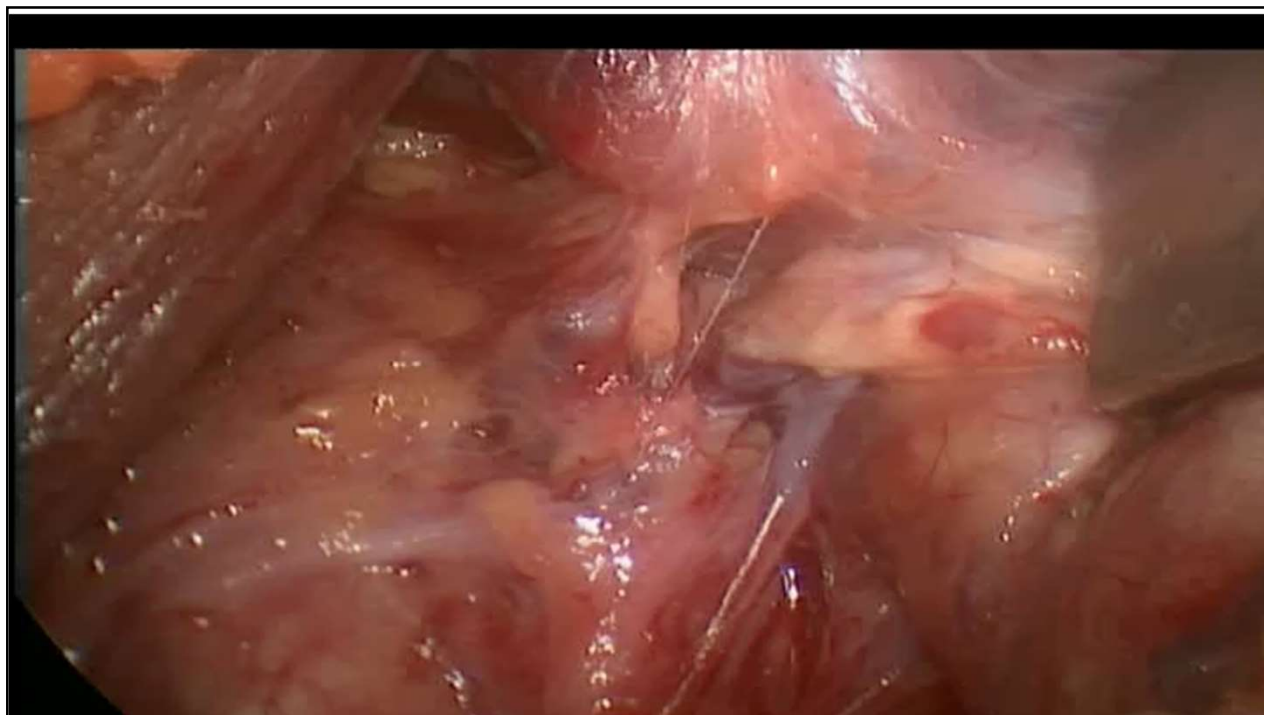
13

## What Do I Use the Most

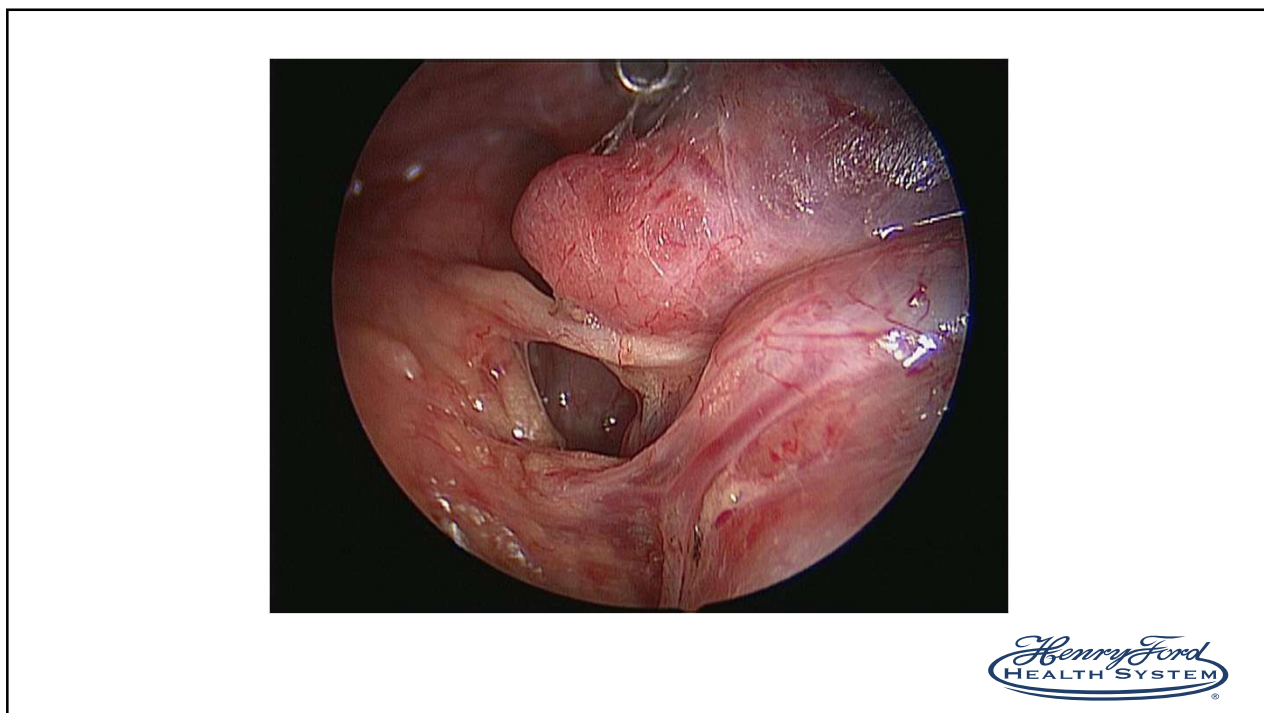


14



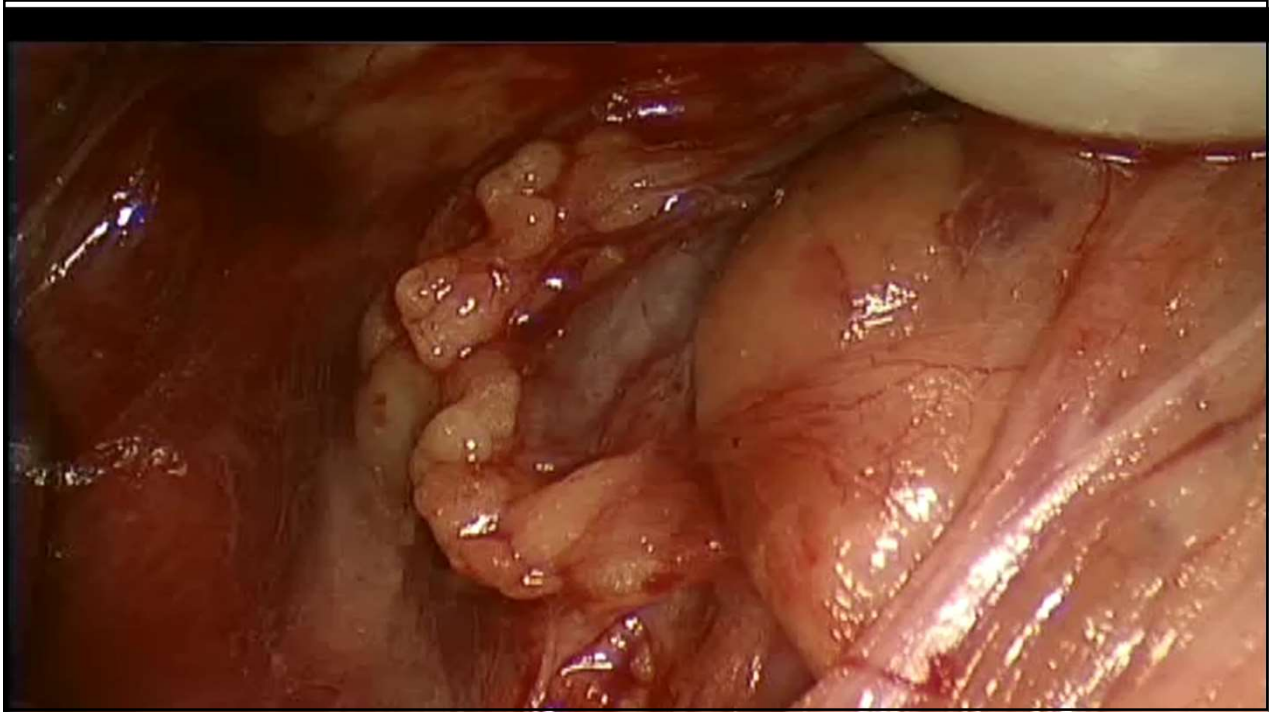


15



16





17

## 4 Steps To Improve Thyroid Surgery Outcomes

- **Select appropriate extent of surgery**
- **Find the RLN in a thoughtful manner**
- **Avoid (naive) bilateral RLN injury**



18

## Nerve Monitoring

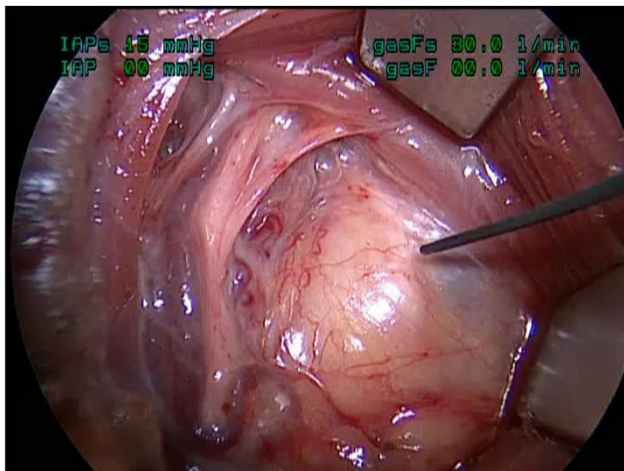
- Has become “standard of care”
- Regardless of attitude toward IONM – critical in bilateral surgery

### WHY?

- **Avoiding bilateral nerve injury is paramount**
- Test function of RLN on first side before proceeding with contralateral surgery
- Stimulation of vagus nerve through the carotid sheath



19



20

## 4 Steps To Improve Thyroid Surgery Outcomes

- **Select appropriate extent of surgery**
- **Find the RLN in a thoughtful manner**
- **Avoid (naive) bilateral RLN injury**
- **Preserve, don't just identify, parathyroid glands**



21

## The Hidden Complication

- **Hypoparathyroidism is often minimized**
  - **Nerve injuries receive more attention**
    - **Recurrent or superior laryngeal nerve complications obvious to patient and others**
    - **Management is “not a big deal”**
      - **“Just take some pills”**
    - **Harder to research**



22

## Hypoparathyroidism

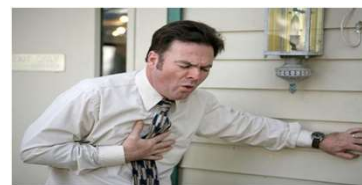
- Frequent complication
  - Temporary from 19% to 38%
  - Permanent from 0% to 5%
- Most common complication of bilateral, completion, or revision thyroid surgery



23

## Permanent - Impact

- Manageable complication, *BUT...*
- Long-term hypoparathyroidism, even with normal blood calcium:
  - Nephrolithiasis, nephrocalcinosis
  - Basal ganglia calcification, soft tissue calcification, cataracts
  - Abnormal bone metabolism
  - Neurocognitive symptoms
- Significant reduction in overall QOL



Buttner, *Endocrine* 2017



24

## Permanent - Impact

Mortality in patients with permanent hypoparathyroidism after total thyroidectomy

M. Almquist<sup>1</sup>, K. Ivarsson<sup>2</sup>, E. Nordenström<sup>1</sup> and A. Bergenfelz<sup>1</sup>

Departments of <sup>1</sup>Surgery and, <sup>2</sup>Psychiatry, Skåne University Hospital, and Department of Clinical Sciences, Lund University, Lund, Sweden  
Correspondence to: Dr M. Almquist, Department of Surgery, Skåne University Hospital, Lund University, S-221 85 Lund, Sweden  
(e-mail: martin.almquist@med.lu.se)

Almquist, *BJS* 2018



25

## Intraoperative Management

- Identification the preferred approach?
  - Data is mixed about optimal number but all agree identification important
- Intraoperative approach
  - Identification
  - Preservation
  - Evaluation
  - Reimplantation?



26

## Identification

- Several technologies/techniques being studied which can potential aid in recognition of parathyroid tissue



27

## Parathyroid Autofluorescence

- Parathyroid glands demonstrate higher near infrared autofluorescence compared to adjacent structures
- Endogenous fluorophore not yet identified in parathyroid glands
  - Could be calcium sensing receptor
- Probe based and camera based systems now available to assess autofluorescence



28

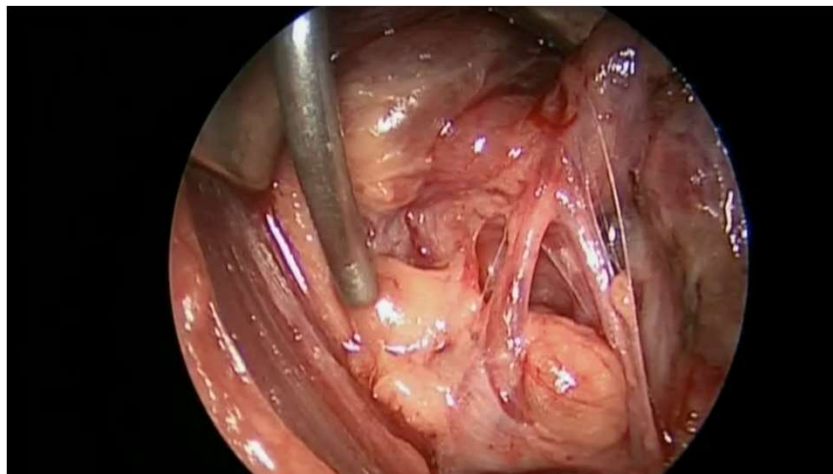
## Parathyroid Autofluorescence

- PTeye – probe based system
- Provides quantitative degree of fluorescence



Henry Ford  
HEALTH SYSTEM

29



Henry Ford  
HEALTH SYSTEM

30

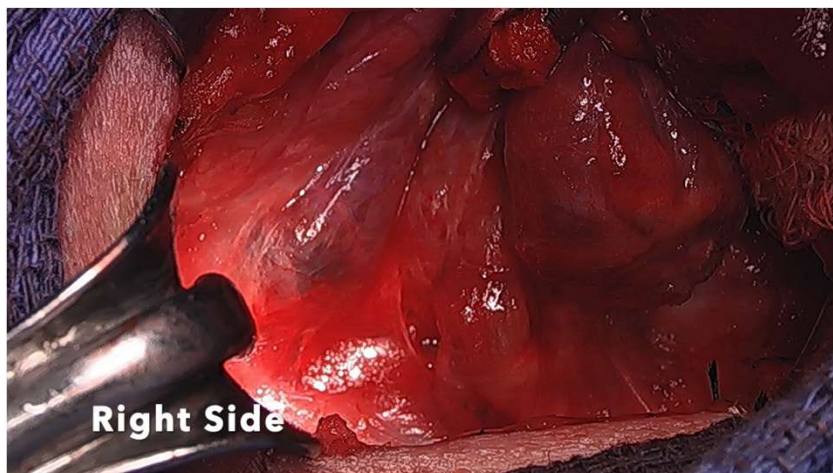


## Parathyroid Autofluorescence

- Camera based systems - Fluobeam
- Provides visual map of fluorescence



31



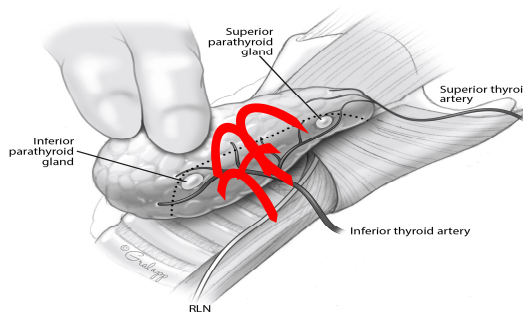
Courtesy Dr. Eren Berber



32

## Preservation

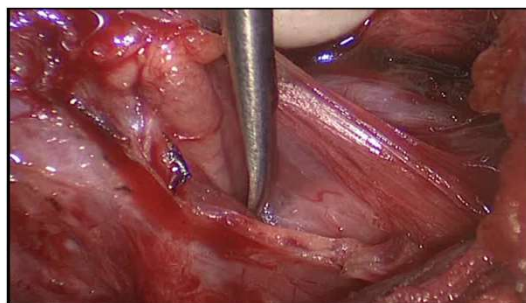
- **Capsular dissection recommended**
  - Avoid proximal ligation of inferior thyroid artery
  - Preservation of terminal vessels supplying glands
- **Gentle handling of glands, vessels, tissue**
  - Be cautious with energy devices



33

## Preservation

- **Capsular dissection recommended**
  - Avoid proximal ligation of inferior thyroid artery
  - Preservation of end vessels supplying glands
- **Gentle handling of glands, vessels, tissue**
  - Be cautious with energy devices



34

## 4 Steps To Improve Thyroid Surgery Outcomes

- **Select appropriate extent of surgery**
- **Find the RLN in a directed manner**
- **Avoid (naive) bilateral RLN injury**
- **Preserve, don't just identify, parathyroid glands**



35

# Thank You



36