

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

**2022 AHNS/AAO Head & Neck Surgery
Symposium for Residents & Fellows**



**Michael C. Singer, MD, FACE, FACS
Director, Division of Thyroid & Parathyroid Surgery
Department of Otolaryngology – Head & Neck Surgery
Henry Ford Health**

HENRY FORD HEALTH

1

Disclosures

- **Consultant for Medtronic**

HENRY FORD HEALTH

2

Progress



HENRY FORD HEALTH

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

HENRY FORD HEALTH

4

4 Steps To Improve Thyroid Surgery Outcomes

- **Select appropriate extent of surgery**

HENRY FORD HEALTH

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**

HENRY FORD HEALTH

6

Benign Disease



HENRY FORD HEALTH.

7

Benign Disease



HENRY FORD HEALTH.

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.

HENRY FORD HEALTH

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.

HENRY FORD HEALTH

10

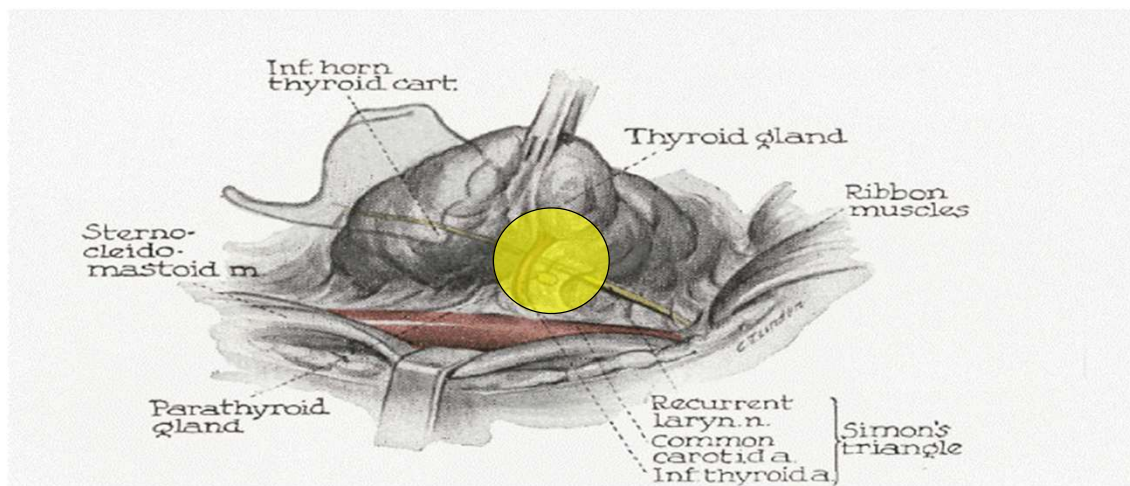
4 Steps To Improve Thyroid Surgery Outcomes

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

HENRY FORD HEALTH

11

Principles of Nerve Identification



HENRY FORD HEALTH

12

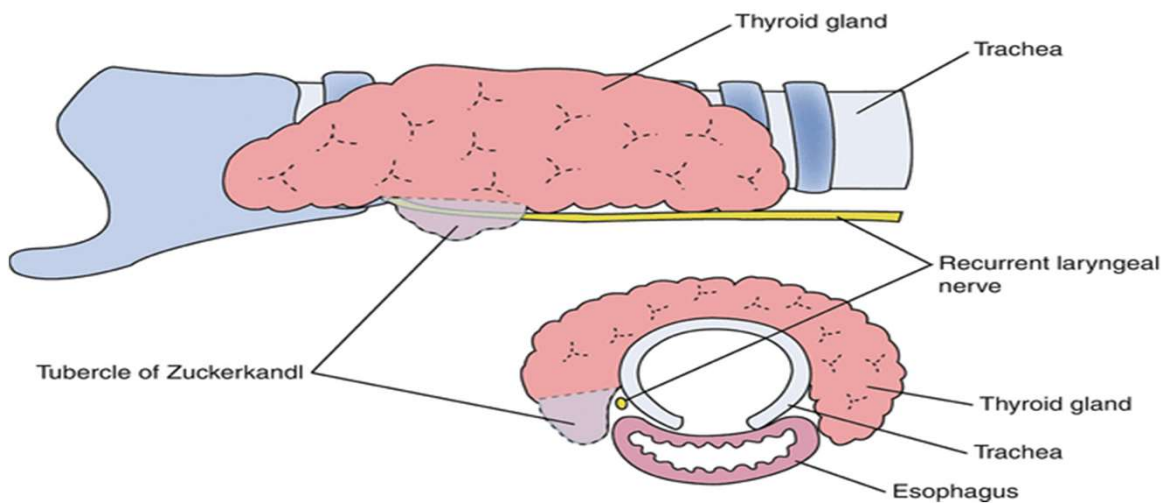
What Do I Use the Most



HENRY FORD HEALTH

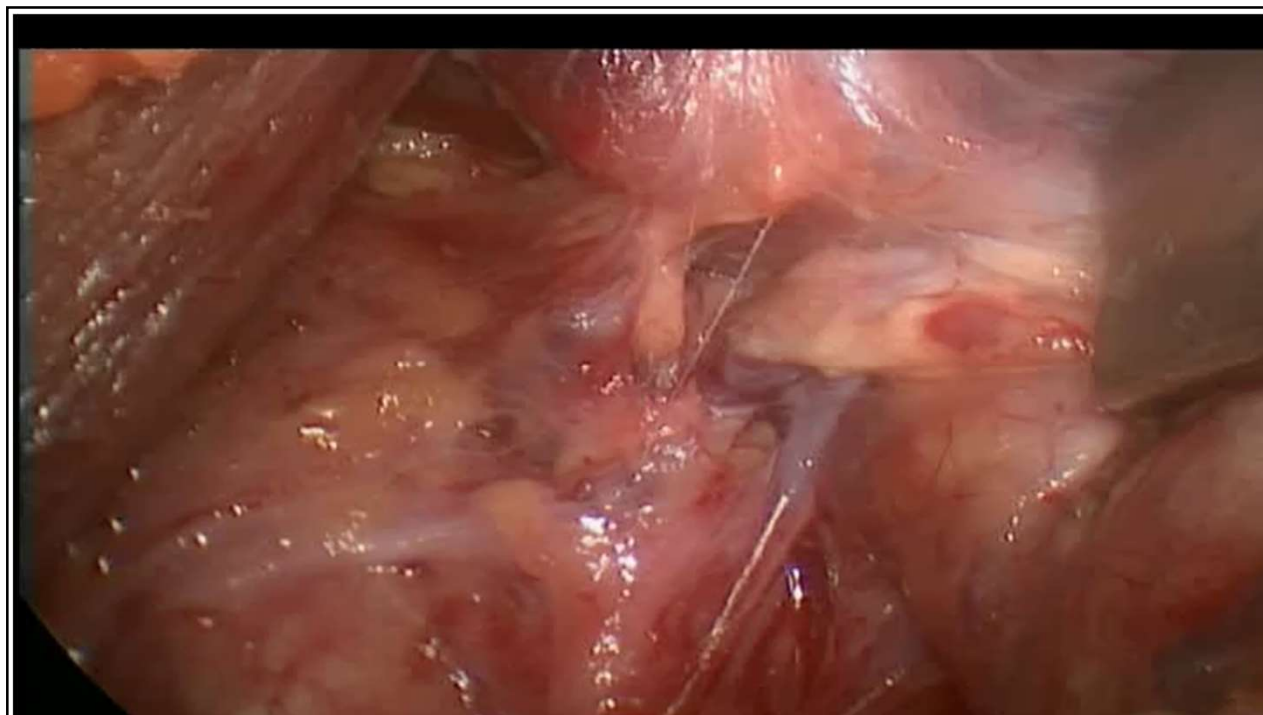
13

What Do I Use the Most

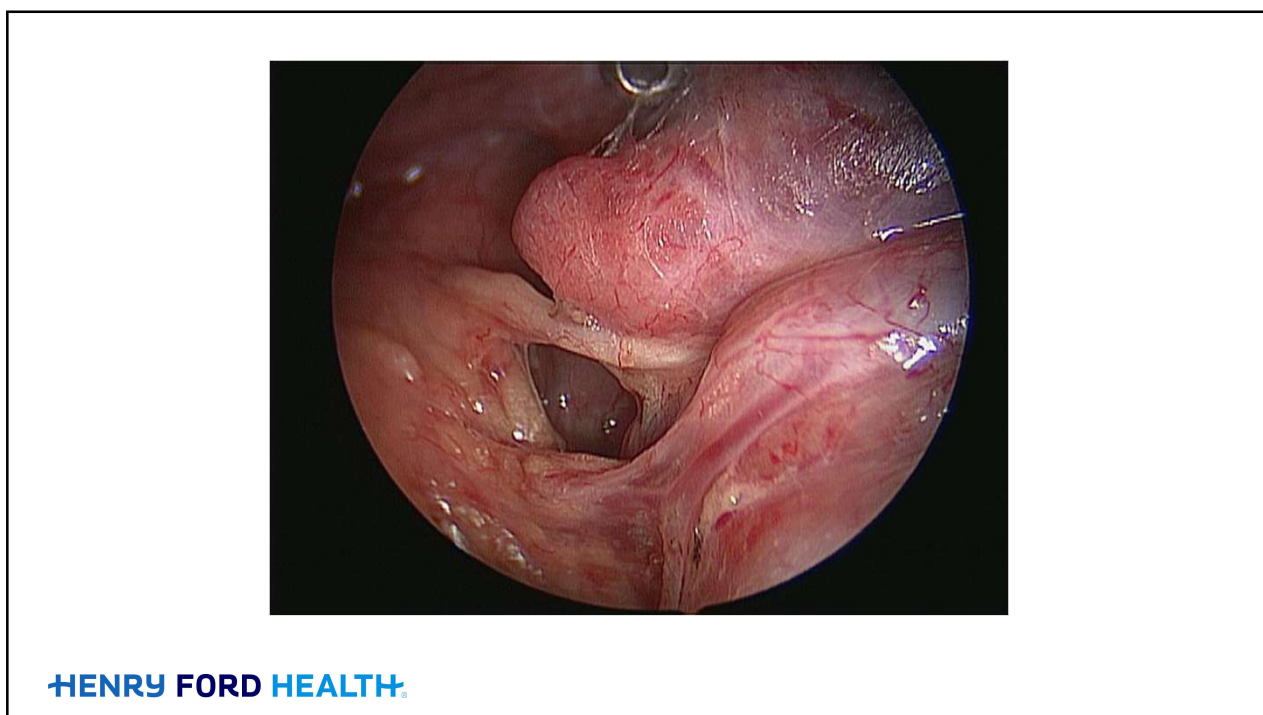


HENRY FORD HEALTH

14

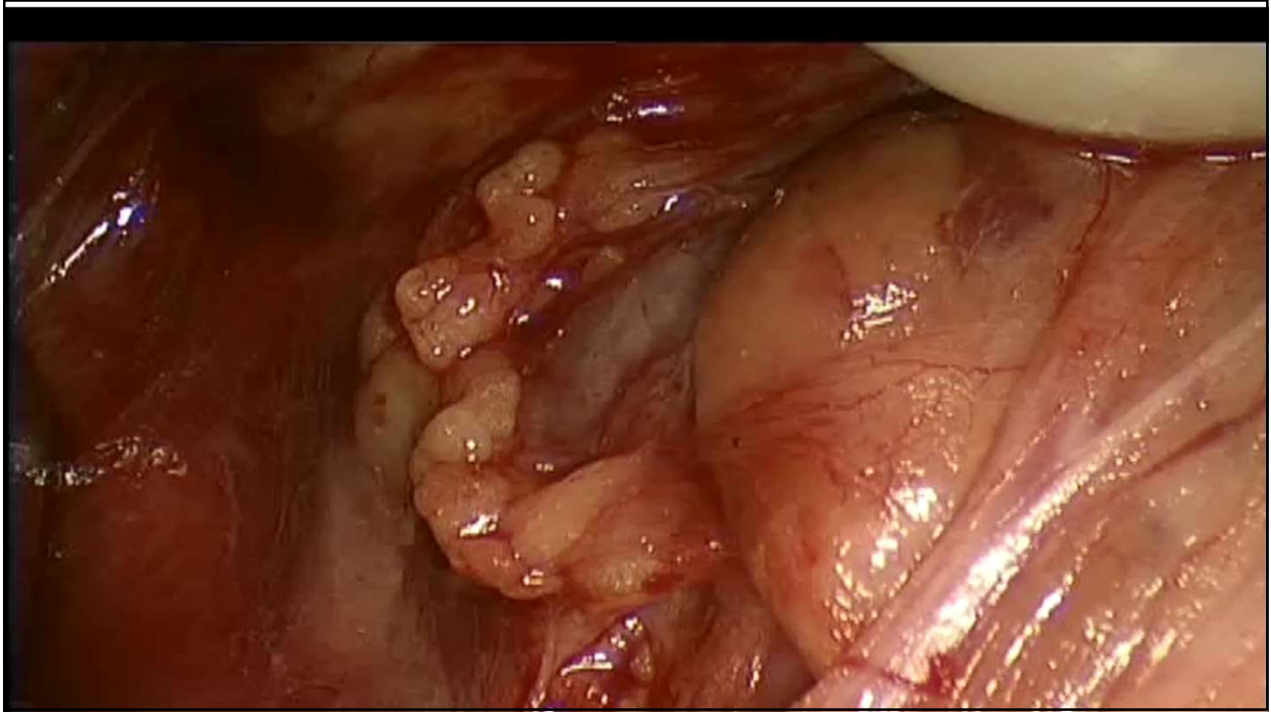


15



HENRY FORD HEALTH.

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

HENRY FORD HEALTH

18

Nerve Monitoring

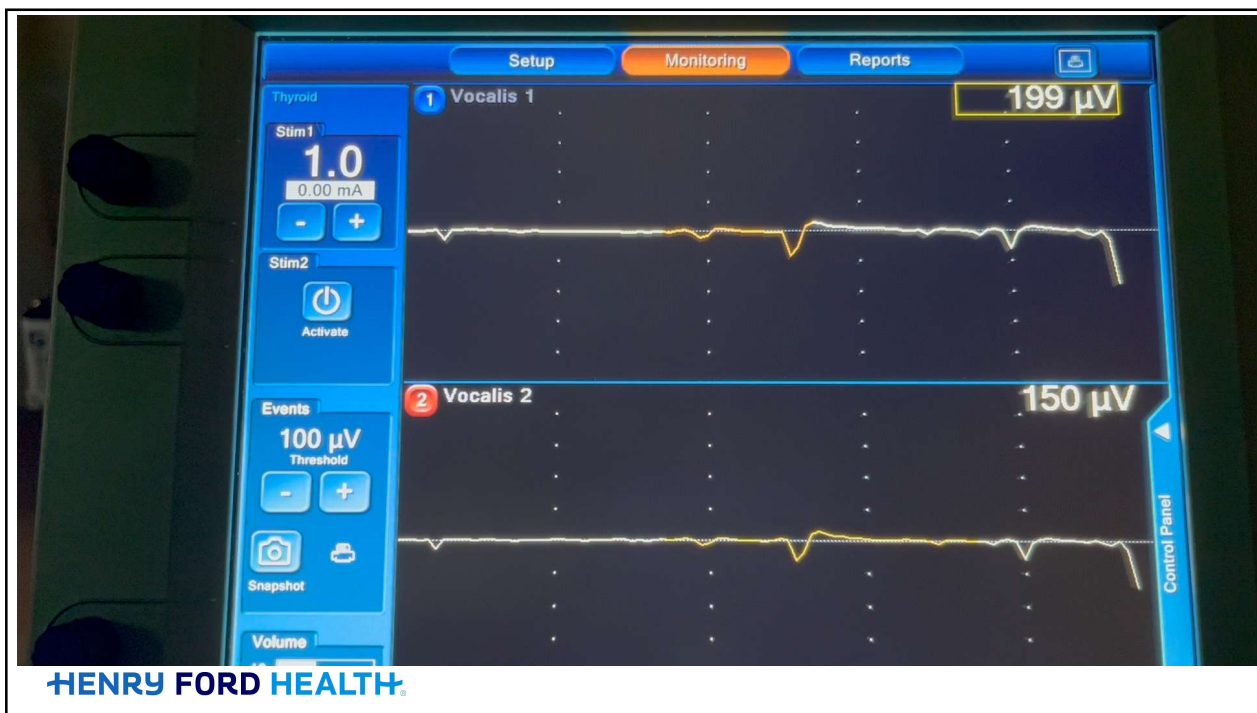
- Has become “standard of care”
- Regardless of attitude toward IONM – critical in bilateral surgery

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

HENRY FORD HEALTH

19



HENRY FORD HEALTH

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**

HENRY FORD HEALTH

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**

HENRY FORD HEALTH

22

Hypoparathyroidism

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

Even with meticulous capsular dissection at high volume centers

HENRY FORD HEALTH

23

Temporary - Impact

- Acute hypocalcemia – tingling, numbness, cramping, laryngospasm, tetany, cardiac arrhythmias
 - Must be managed carefully

HENRY FORD HEALTH

Orloff, *Thyroid*
2018

24

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



HENRY FORD HEALTH Buttner, *Endocrine* 2017

25

Permanent - Impact

Mortality in patients with permanent hypoparathyroidism after total thyroidectomy

M. Almquist¹ , K. Ivarsson², E. Nordenström¹ and A. Bergenfelz¹

Departments of ¹Surgery and, ²Psychiatry, 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

HENRY FORD HEALTH

26

Intraoperative Management

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

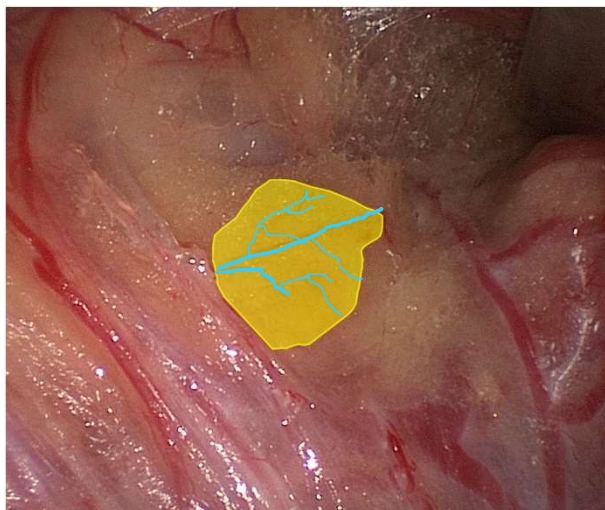


HENRY FORD HEALTH

27

Identification

- Location
- Color
- Fat
- Vasculature
- Movement



HENRY FORD HEALTH

28

Identification

- Se
- po



can

HENRY FORD HEALTH

29

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

HENRY FORD HEALTH

30

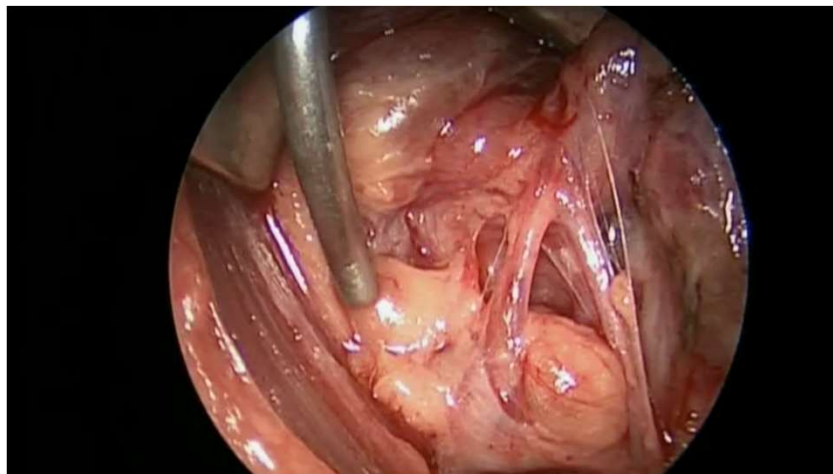
Parathyroid Autofluorescence

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



HENRY FORD HEALTH

31



HENRY FORD HEALTH

32

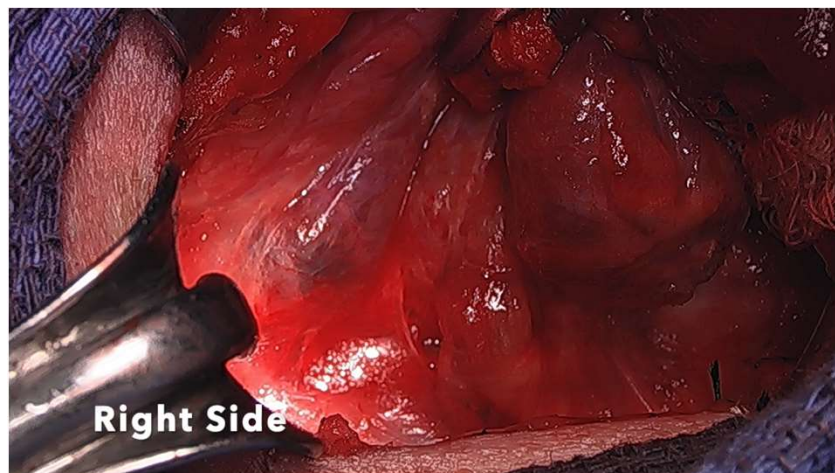
Parathyroid Autofluorescence

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



HENRY FORD HEALTH.

33

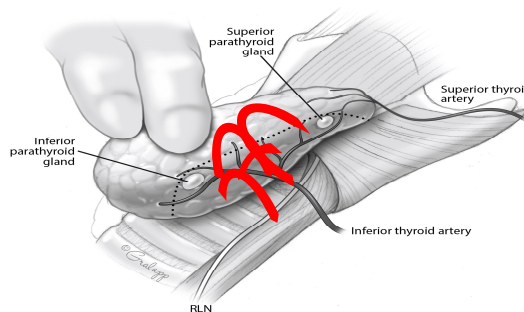


HENRY FORD HEALTH. Courtesy Dr. Eren Berber

34

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



Orloff, *Thyroid*
2018

HENRY FORD HEALTH

35

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**

HENRY FORD HEALTH

36

Thank You

HENRY FORD HEALTH