Riduciamo al minimo le complicanze

Quali presidi?

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Contents

- Preoperative Applied Science
- Intraop- Devices
- Postop- Technology

Post-thyroidectomy Morbidity

- Thyroid disease
- Patient related
- Surgeon' experience
- Modality of surgery

Risk Factors for Bleeding

PATIENT RELATED

Anticoagulation drugs
Von Willebrand's disease
Cirrhosis/alcohol use
Haemophilia
Smoking

THYROID DISEASE

Graves' disease
Toxic adenoma
Toxic multinodular goiter
Intrathoracic gland
Re-do surgery
Cancer

TECHNIQUE

Mode of access
Bilateral exploration
Residual thyroid tissue
Experience

POSTOPERATIVE CARE

Cough
Emesis
Hypertension

Wide variability of Morbidity rates

(open thyroidectomy)

- Mortality (0.08-0.2)
- RLNP (3.5-13%)
  - Transient 5%
  - Permanent 1%
- Hypocalcemia (6%-42%)
  - Transient 30%
  - Permanent 5%
- Bleeding (0-4%)
- Wound (1-5%)

- Disphagia (0-15%)
- EBSLN injury (0-28%)
- Chyle leak (0-0.2%)
- Esophageal injury (0-1%)
- Tracheal injury (0-1%)
- Horner's syndrome (0.2-0.3%)

Barcinsky 2013
Clerici, 2021
Moreno, 2017
Du, 2018
Dralle h, 2015
Randolph GW, 2013
Dionigi G, 2019
Eurocrine Audit, 2020

Morbidity rates flexibility

- ✓ Continuous partecipation to Audit programs
- ✓ Arbitrariness for morbidity definition
- ✓ No consensus on how to grade complications
- ✓ Non-centralized surgery
- ✓ Observation time
- ✓ Prospective design analysis
- ✓ Cost of Audit

Dralle h, 2015
Randolph GW, 2013
Dionigi G, 2019
Eurocrine Audit, 2020

RLNP rates

- ✓No routine postoperative laryngeal examination

  Bergamaschi R. Am J Surg 1998 **0.3% RLNP**

- ✓Routine postoperative laryngeal examination

  Lo CY, Arch Surg 2000 **7% RLNP**

Langenbecks Arch Surg (2010) 395:327–331
DOI 10.1007/s00423-009-0581-x

ORIGINAL ARTICLE

Postoperative laryngoscopy in thyroid surgery: proper timing to detect recurrent laryngeal nerve injury

Gianlorenzo Dionigi · Luigi Boni · Francesca Rovera · Stefano Rausei · Paolo Castelnuovo · Renzo Dionigi

- The rate of RLN morbidity shows a considerable variation due to the different time intervals of FNL.
- The rate of RLN palsy was 6.4% at *T1* (53 out of 825 NAR), 6.7% at *T2* (56 out of 825 NAR), 4.8% at *T3* ($N = 40$), 2.5% at *T4* ($N = 21$), 0.8% at *T5* ($N = 7$), and 0.7% at *T6* ($N = 6$), according to different time intervals of FNL in the postoperative period.

Hypocalcemia rates

- ✓ No routine postoperative early iPTH

  Bergamaschi R. Am J Surg 1998 **5%**

- ✓ Routine postoperative early iPTH

  Bellantone R, Surgery 2000 **34%**

Morbidity due to Thyroid Disease

Thyroid Disease

Risk Factors in relation to morbidity

- ✓ Graves' disease *(Zhang D, 2016)*
- ✓ Malignancy *(Hui S, 2014)*
- ✓ Hashimoto's disease *(Dralle H, 2012)*
- ✓ Goiter with intra-thoracic extension *(Del Rio, 2010)*
- ✓ Recurrent goiter *(Randolph GW, 2020)*
- ✓ Repetitive cancer *(Randolph GW, 2020)*
- ✓ LN+ *(Miccoli P, 2013)*
- ✓ Hyperthyroidism at the time of surgery *(Dralle H, 2012)*
- ✓ Previous thermal ablation *(Dralle, 2021)*
- ✓ Weight specimen (>60g) *(Kim HY, 2009)*

Augmented reality technology for preoperative planning during thyroid surgery

- Superimpose the virtual images onto a view of the surgical field
  - Reconstruct three-dimensional (3D)
  - 3D printing

- Risk stratification (i.e.prediction of difficult thyroidectomy)
  - Artificial intelligence techniques

Bini F, Cancers 2021

Artificial intelligence techniques

THYROID
Volume 31, Number 11, 2021

DOI: 10.1089/thy.2021.0155

Varied Recurrent Laryngeal Nerve Course Is Associated with Increased Risk of Nerve Dysfunction During Thyroidectomy: Results of the Surgical Anatomy of the Recurrent Laryngeal Nerve in Thyroid Surgery Study, an International Multicenter Prospective Anatomic and Electrophysiologic Study of 1000 Monitored Nerves at Risk from the International Neural Monitoring Study Group

Whitney Liddy,[1,i] Che-Wei Wu,[2,ii] Gianlorenzo Dionigi,[3] Gianluca Donatini,[4] Yasemin Giles Senyurek,[5] Dipti Kamani,[6] Ayaka Iwata,[6,7] Bo Wang,[6,8,iii] Okenwa Okose,[6] Anthony Cheung,[6] Yoshiyuki Saito,[6,9,iv] Claudio Casella,[10] Nurcihan Aygun,[11] Mehmet Uludag,[11] Katrin Brauckhoff,[12,13] Bruno Carnaille,[14] Fatih Tunca,[5] Marcin Barczyński,[15] Hoon Yub Kim,[16,17] Emerson Favero,[18] Nadia Innaro,[19] Kyriakos Vamvakidis,[20] Jonathan Serpell,[21] Anatoly F. Romanchishen,[22] Hiroshi Takami,[23] Feng-Yu Chiang,[24] Rick Schneider,[25] Henning Dralle,[26] Jennifer J. Shin,[27,28] Amr H. Abdelhamid Ahmed,[6,v] and Gregory W. Randolph[6,29]

Artificial intelligence techniques

The Laryngoscope

Development of Artificial Intelligence for Parathyroid Recognition During Endoscopic Thyroid Surgery

Bo Wang, MD, PhD; Jing Zheng, MD; Jia-Fan Yu, MS; Si-Ying Lin, MS; Shou-Yi Yan, MD; Li-Yong Zhang, MD; Si-Si Wang, MD; Shao-Jun Cai, MD; Amr H. Abdelhamid Ahmed, MBBCH, MMSc; Lan-Qin Lin, MD; Fei Chen, PhD; Gregory W. Randolph, MD; Wen-Xin Zhao, MD, PhD

Preoperative optimization

- Pre-operative tools are still under scrutinity
- Therefore, the continue interaction with Endocrinologists & nuclear medicine is fundamental for the prediction of difficult thyroicetomy

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10 FEBBRAIO 2023 MILANO
Istituto Nazionale dei Tumori

Bini F, Cancers 2021

Morbidity due to Patient Anatomy

Anatomical Peculiarities of the Neck in Children

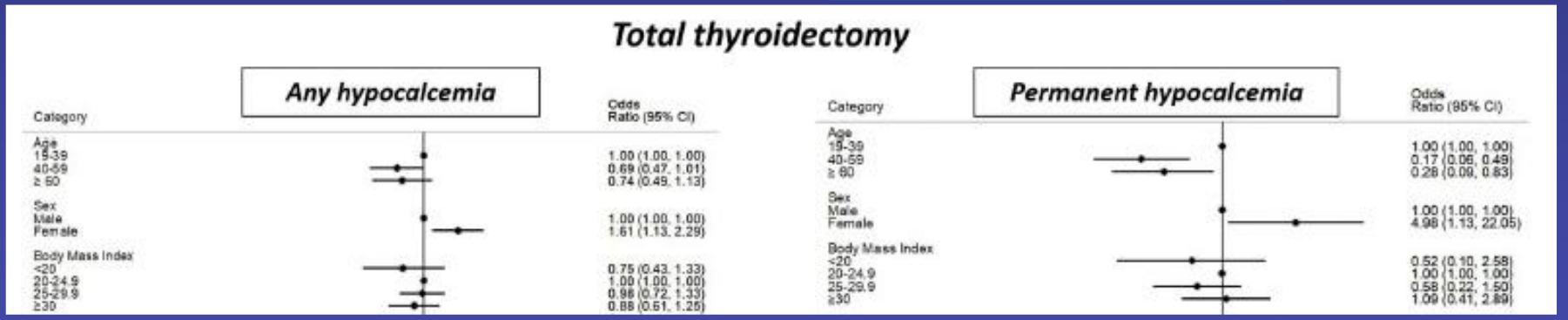
- Small thyroid gland volume
- Thin RLN
- Thin RLN branches
- Thin EBSLN
- Laryngo-tracheomalacia (softer cartilaginous framework of trachea and larynx)
- Narrow larynx and trachea
- Larynx is more anterior
- At the glottic (vocal fold) level, the larynx is approximately one third the adult size
- Larynx is situated higher in the neck
- Angle between the epiglottis and vocal cords is more acute in the infant, thus making direct visualization more difficult
- Small parathyroid glands
- Small thyroid arteries and veins
- Hypertrophic thymus
- Thymus superimposed on the thyroid gland
- Collateral RLN fibers innervate the thymus
- Possible congenital anomalies

Abbreviations: RLN: recurrent laryngeal nerve; EBSLN: external branch superior laryngeal nerve.

Zangh D, Dionigi G, Cancers 2022

Patient Anatomy

BMI is risk factor for postoperative morbidity, increase postoperative stay



Sam Van Slycke, Int J Surg 2021

Pre-operative unpredictable RLN risk situations

No.	Situations
1	Atypical RLN pattern
2	RLN anterior to the thyroid gland
3	RLN fixed, splayed or entrapped
4	RLN posterior to Berry ligament
5	Anteriorly located RLN to the Zuckerkandl's tuberculum (posterior nodule)
6	Branched RLN
7	Antevascular RLN
8	Thin RLN
9	Invaded RLN
10	Non-RLN

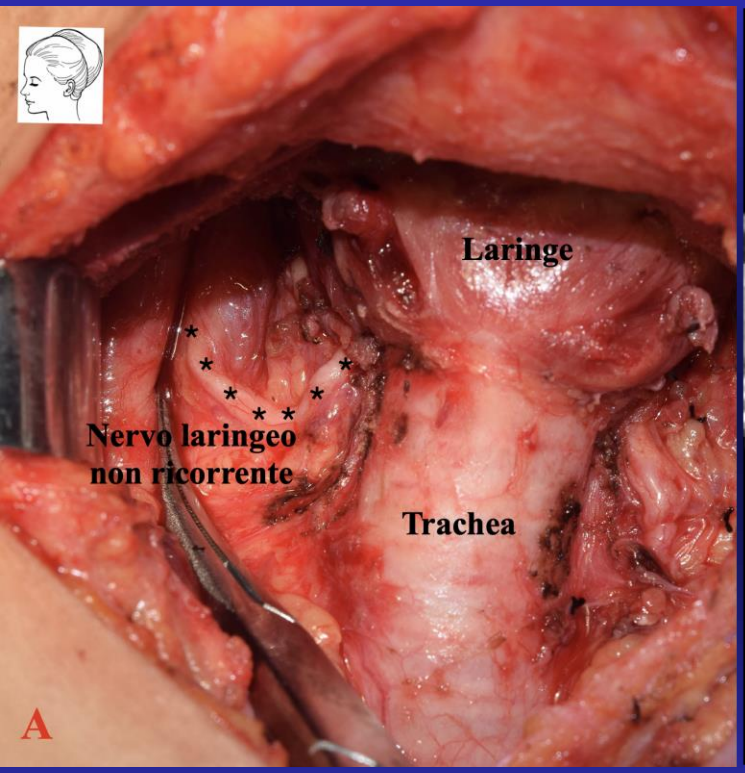
RLN = recurrent laryngeal nerve.

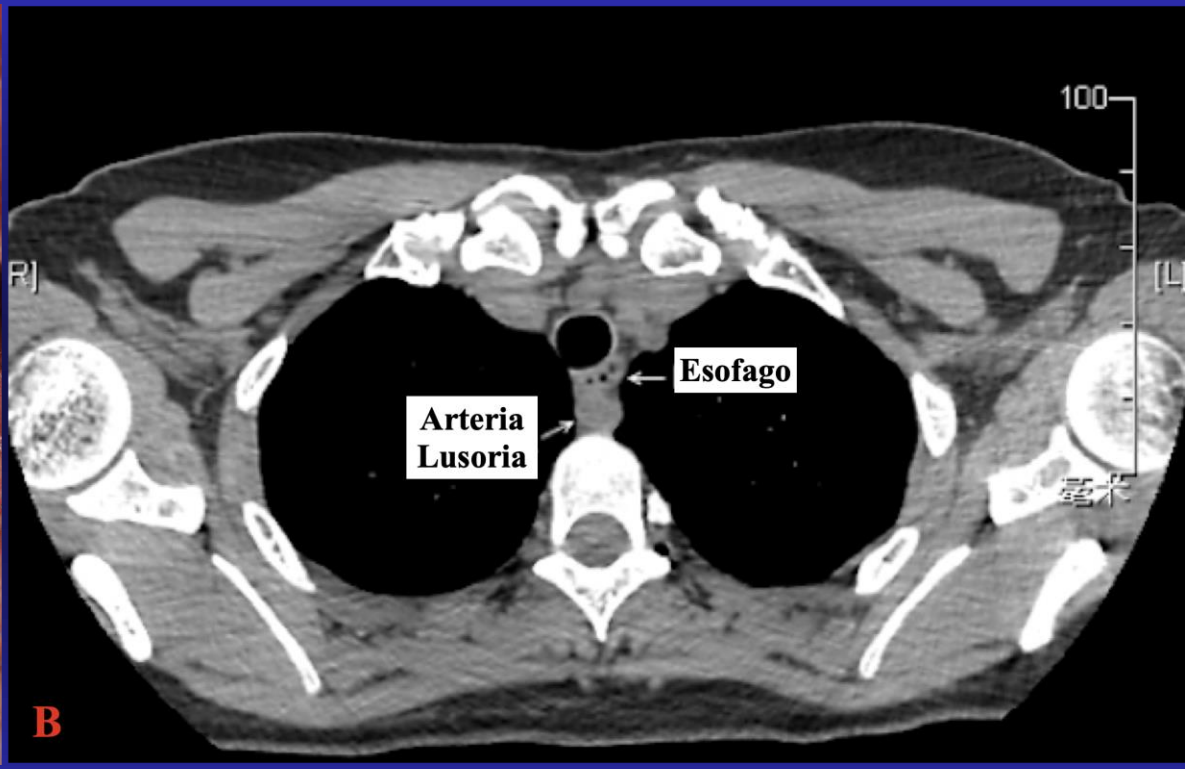
Dionigi G. J Endocr Surg 2017

Augmented reality technology for intraoperative navigation during thyroid surgery

- **Pre-operative**
  - Imaging (US, CTscan, etc.)
  - Laryngeal examination (L1)
- **Intraoperative**
  - Magnifing glasses
  - Neural monitoring (IONM)
  - Endoscopy, 3D
  - 4K
  - Florescence

CT scan for NRLN detection

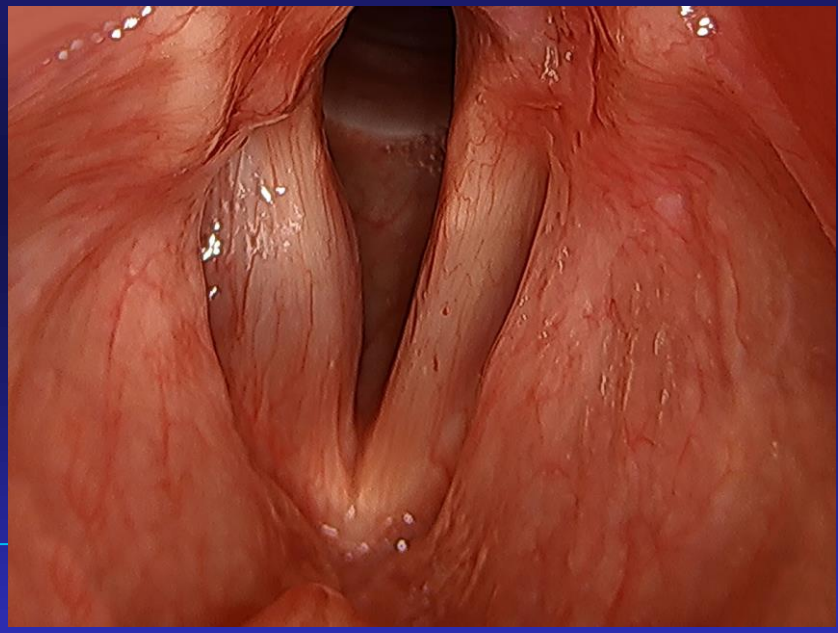




Dionigi G. World J Surg. 2013.

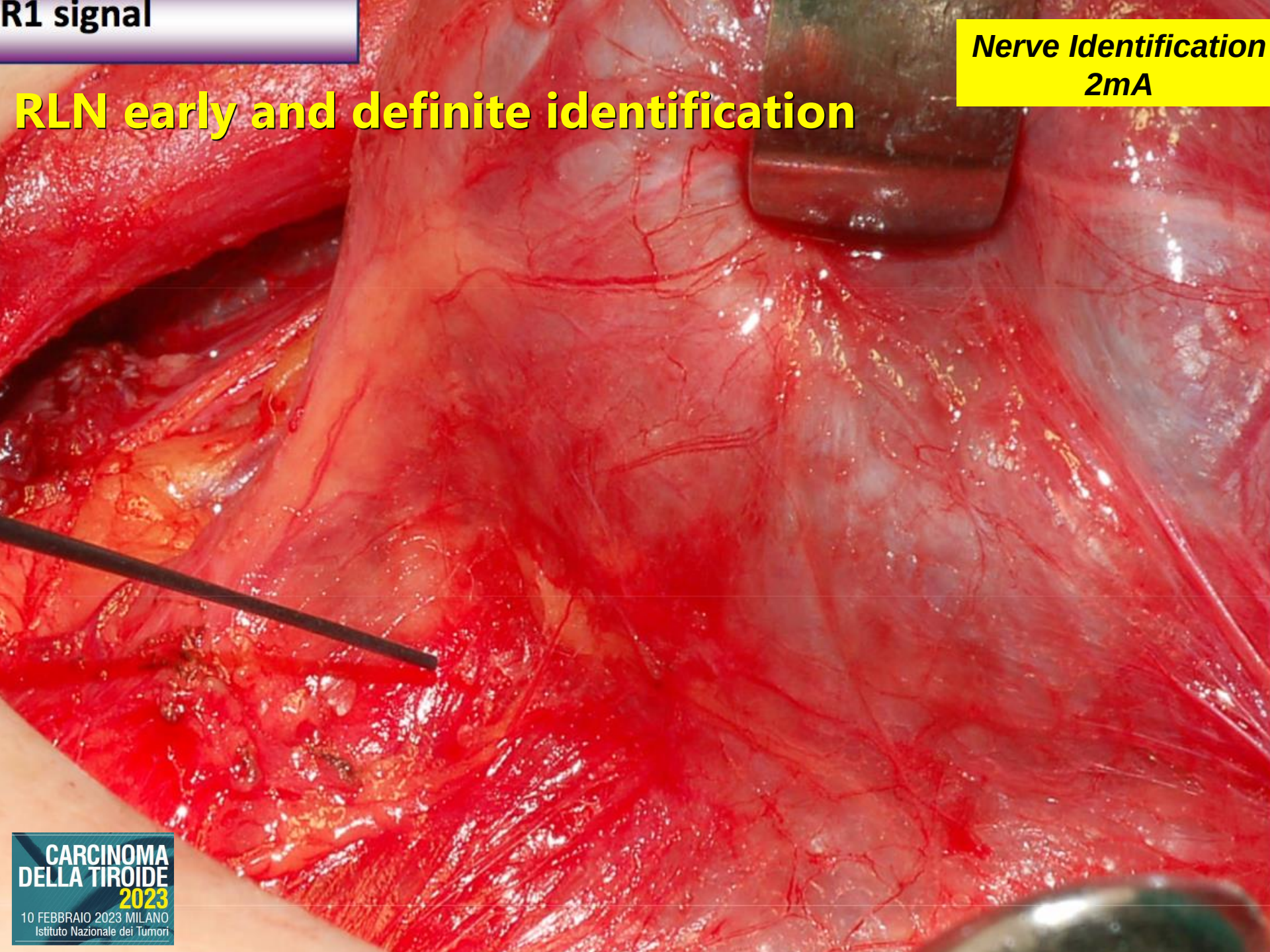
The importance of L1

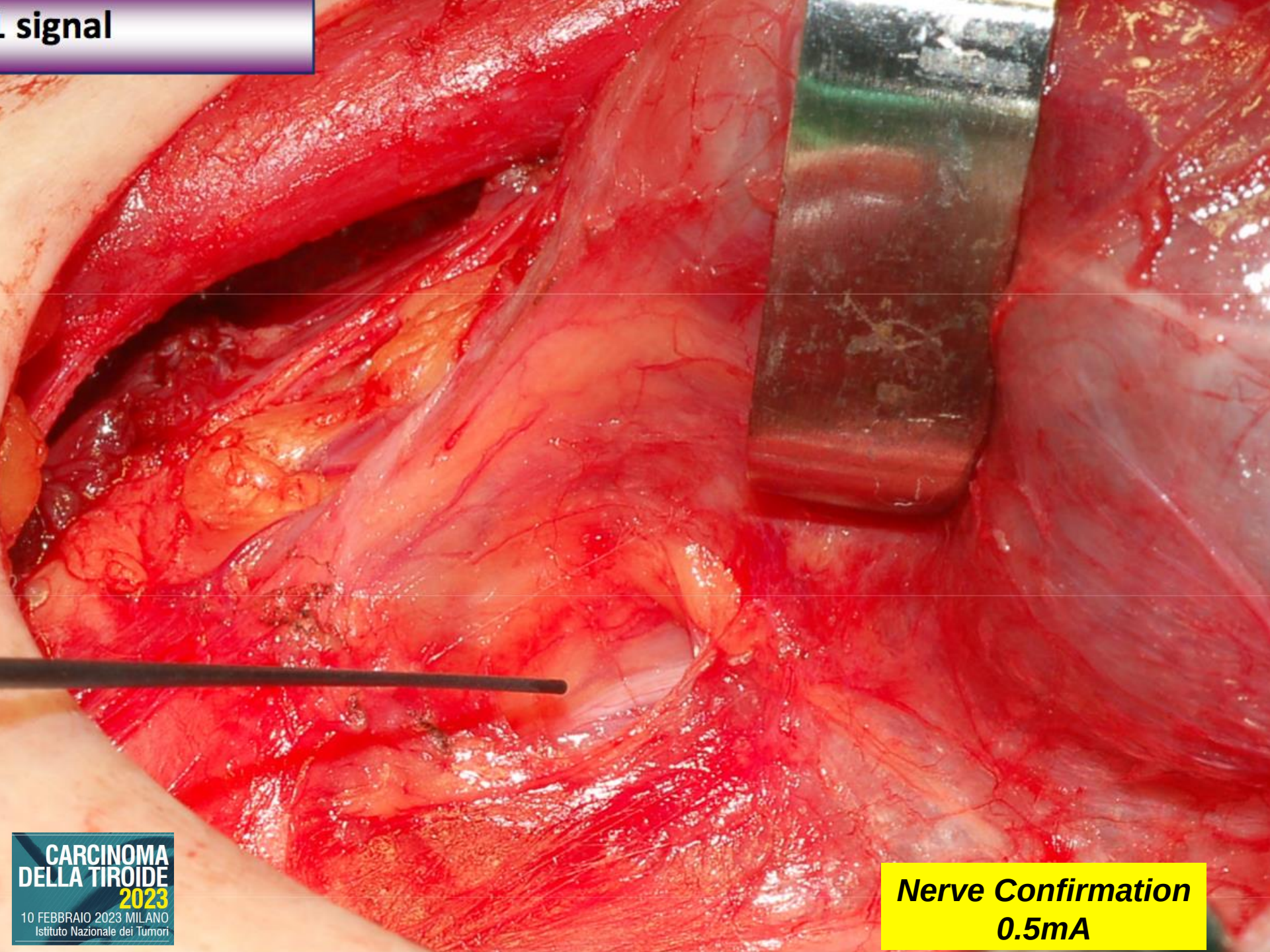
- Clinical voice assessment is insufficient *(Ferrag, 2006)*
- Screening for preop. VCP *(Randolph, 2002)*
- Legal documentation *(Dralle, 2007)*
- Enhance surgical strategy *(Dionigi, 2010)*
- Reference for IONM *(Dionigi, 2011)*



Castelnuovo P & Dionigi G. LAS. 2016

R1 signal


Nerve Identification
2mA
RLN early and definite identification


. signal
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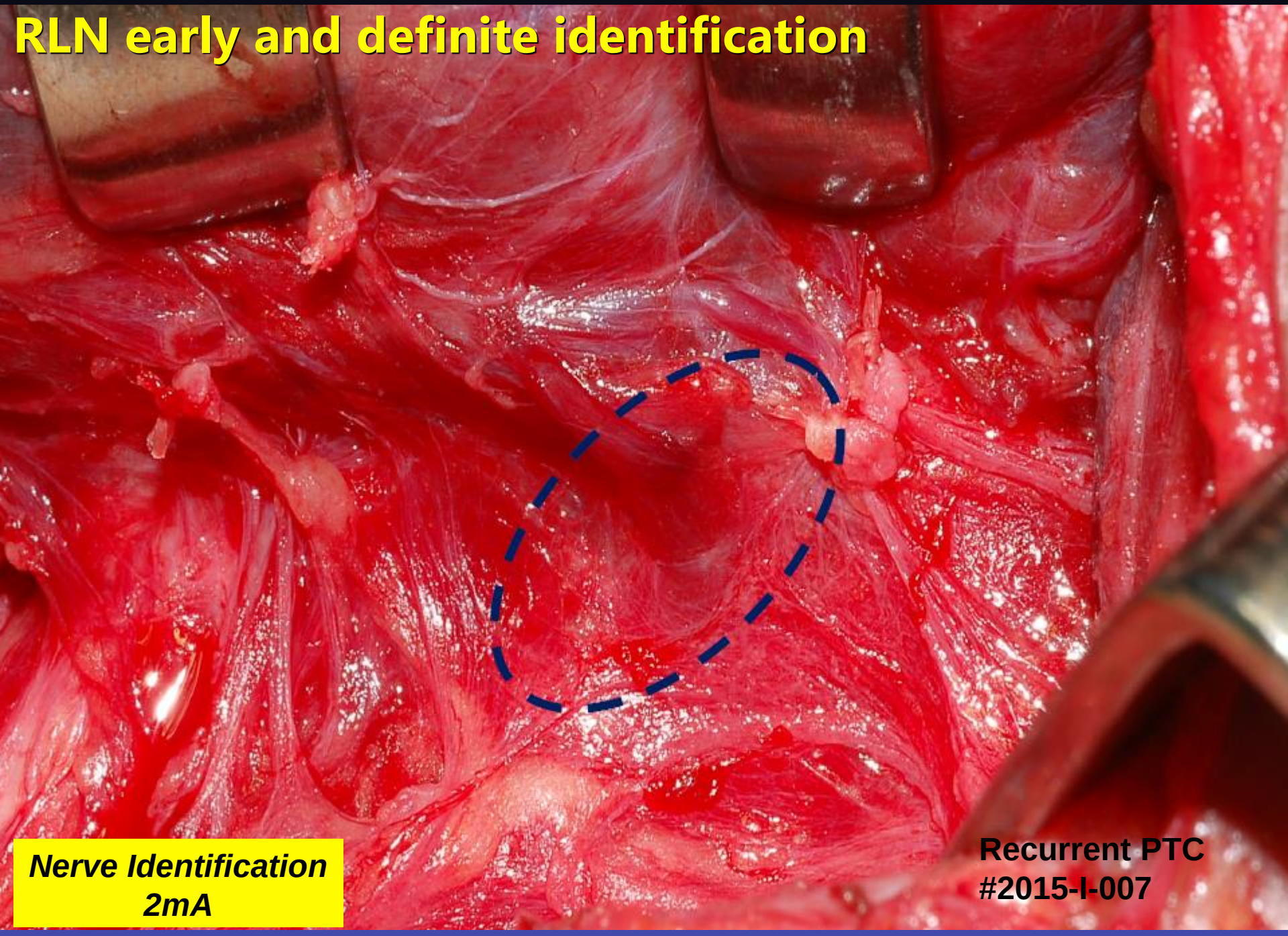
Nerve Confirmation
0.5mA

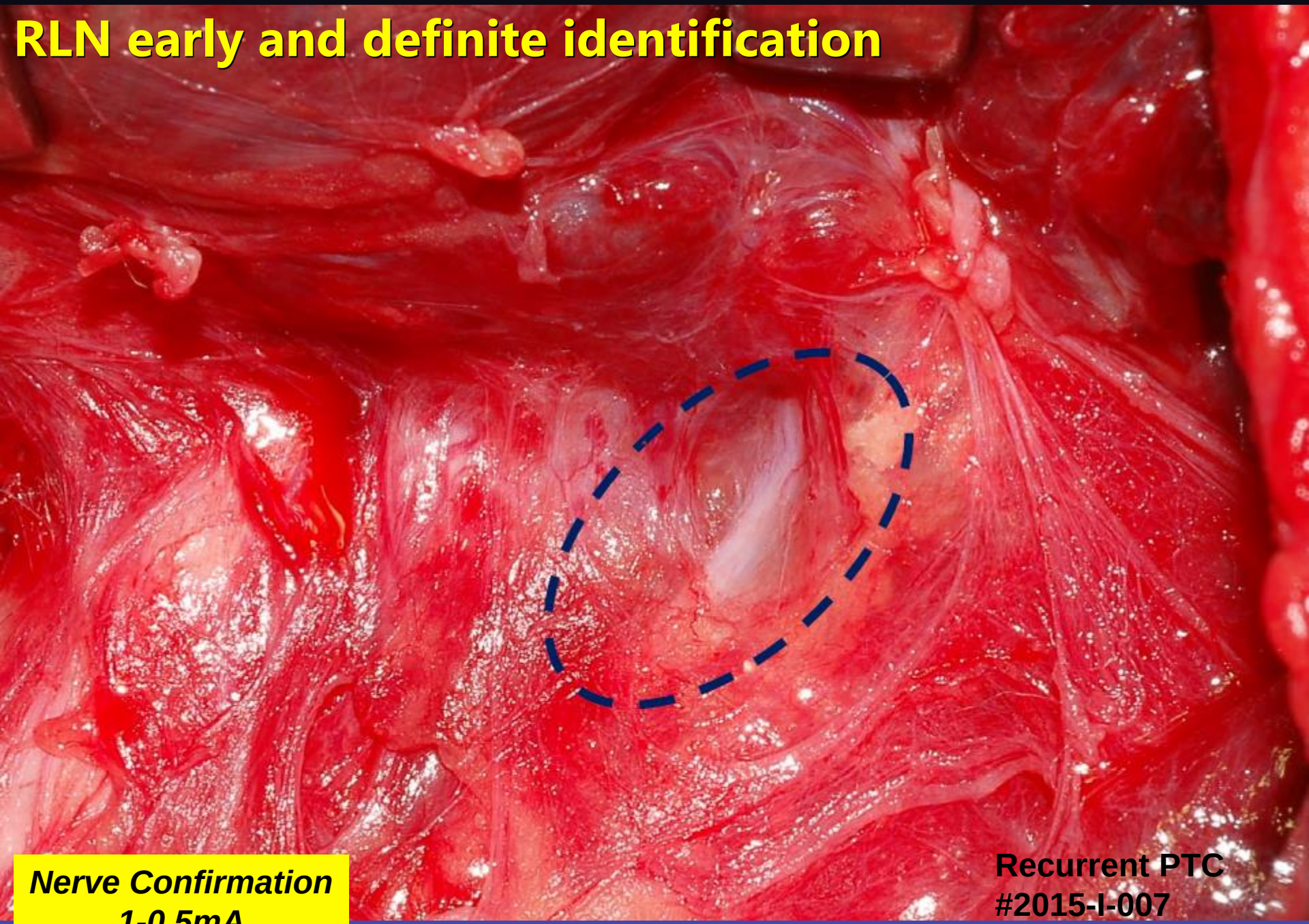
RLN early and definite identification



Nerve Identification 2mA

Recurrent PTC #2015-I-007

RLN early and definite identification



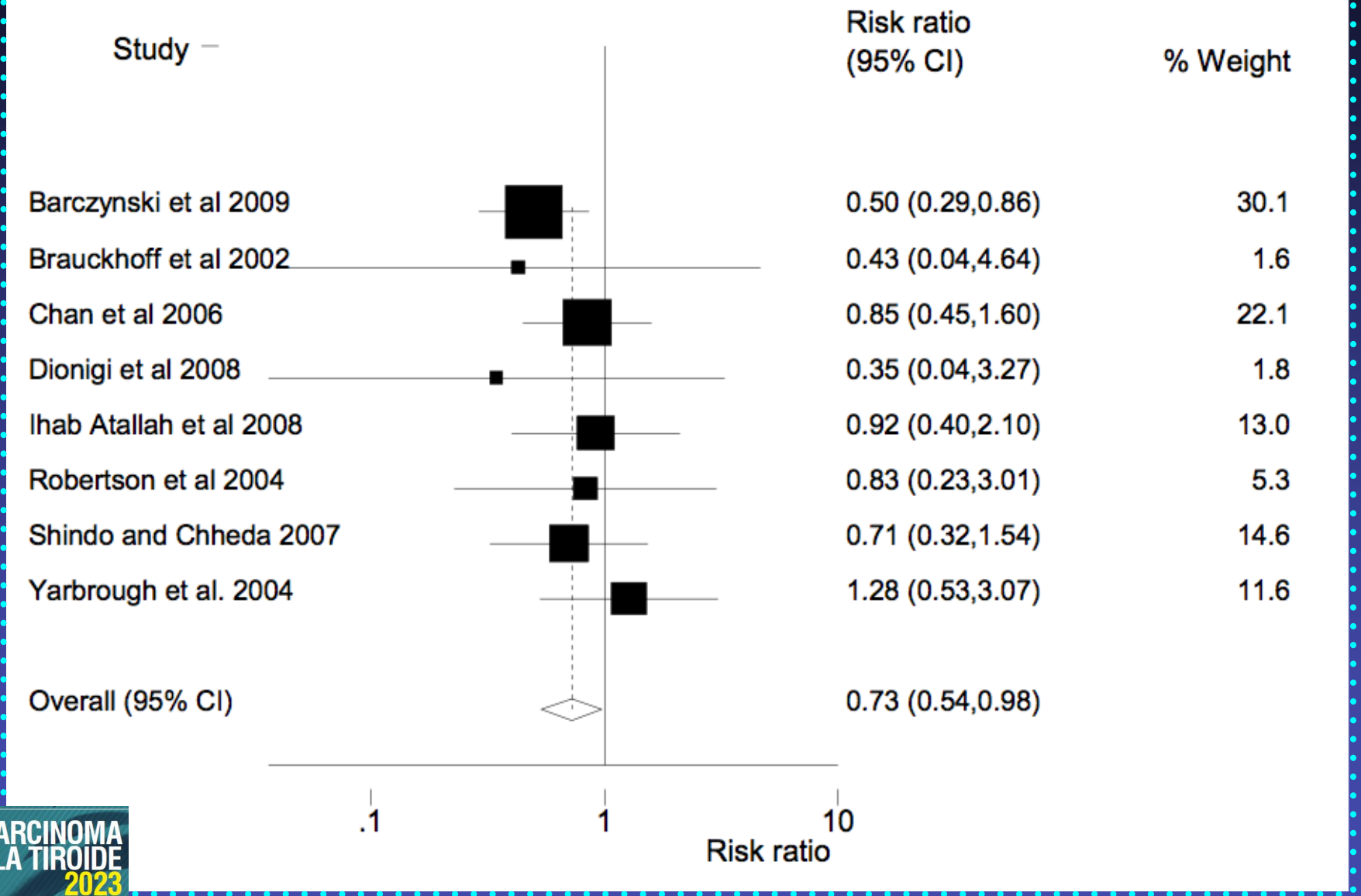
Nerve Confirmation 1-0.5mA

Recurrent PTC #2015-I-007

STANDARDIZED IONM

UPDATED META-ANALYSIS

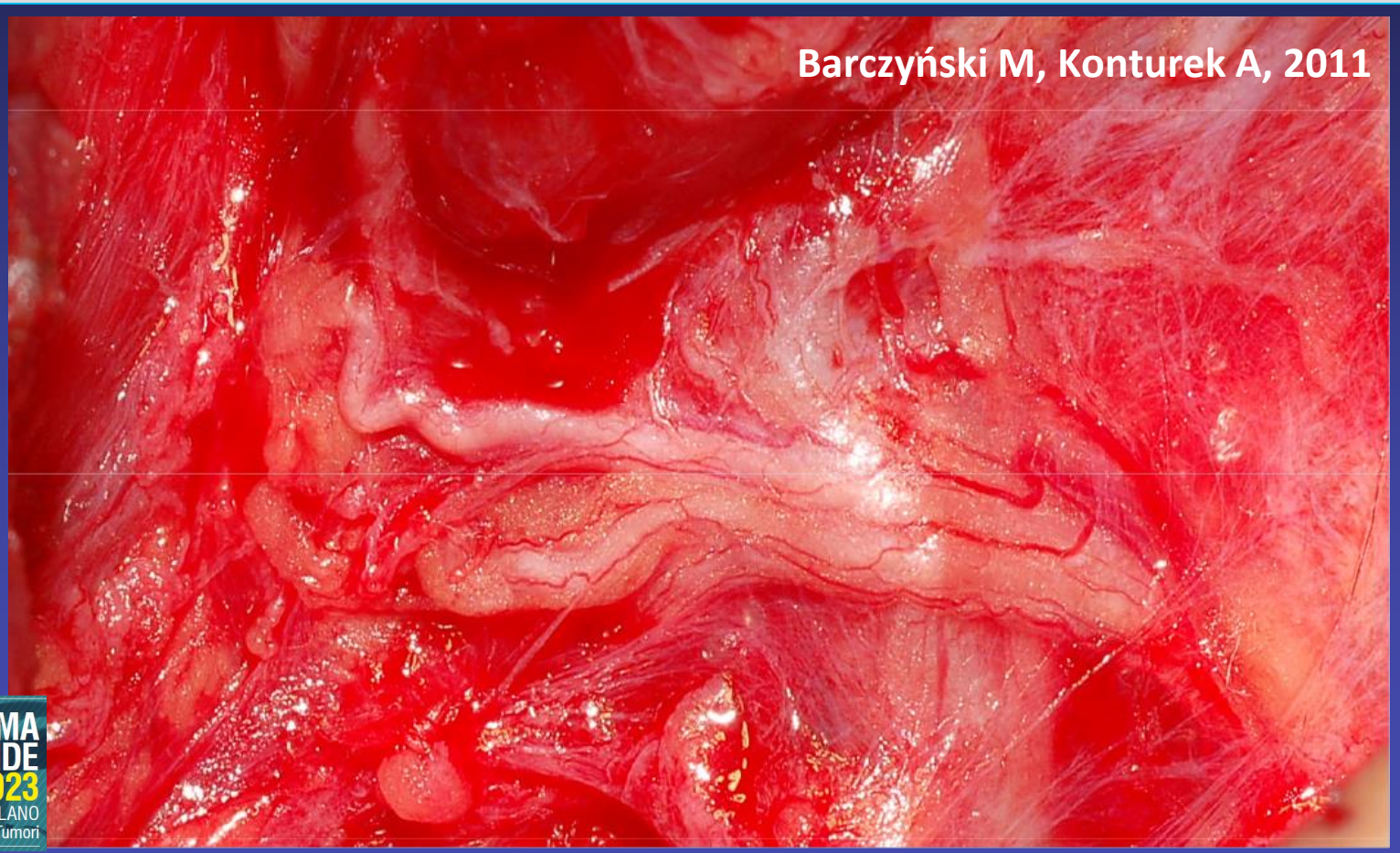
Relative risk of ***transient*** injury with/without IONM



Rulli F, Dionigi G, 2013

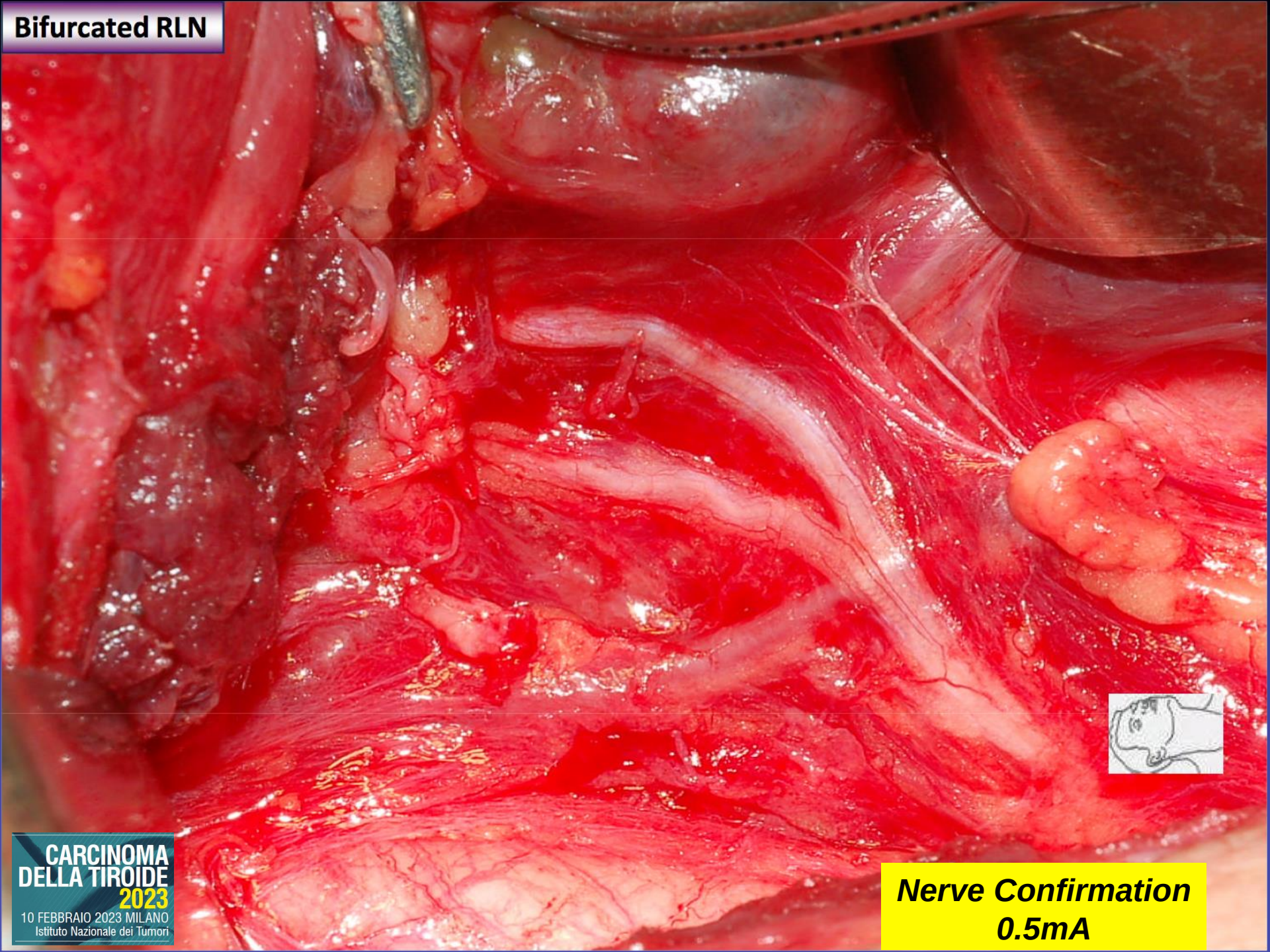
RATE OF RLN *BIFURCATION* IDENTIFICATION

Results. Among patients operated with vs. without IONM, the early RLN injury rate was 3.0% vs. 6.7% (p=0.02), including 2.0% vs. 5.0% (p=0.04) of temporary nerve lesions, and 1.0% vs. 1.7% of permanent nerve events (p=0.31), respectively. Extralaryngeal RLN bifurcation was identified in 42 (27.8%) vs. 25 (16.6%) of patients operated with vs. without IONM, respectively (p=0.001). Mean I-131 uptake following total thyroidectomy with vs. without IONM was 0.67 ± 0.39% vs. 1.59 ± 0.69% (p<0.001). I-131 uptake lower than 1% was found in 106 (70.2%) vs. 38 (25.2%) patients operated with vs. without IONM, respectively (p<0.001).



Barczyński M, Konturek A, 2011

Bifurcated RLN



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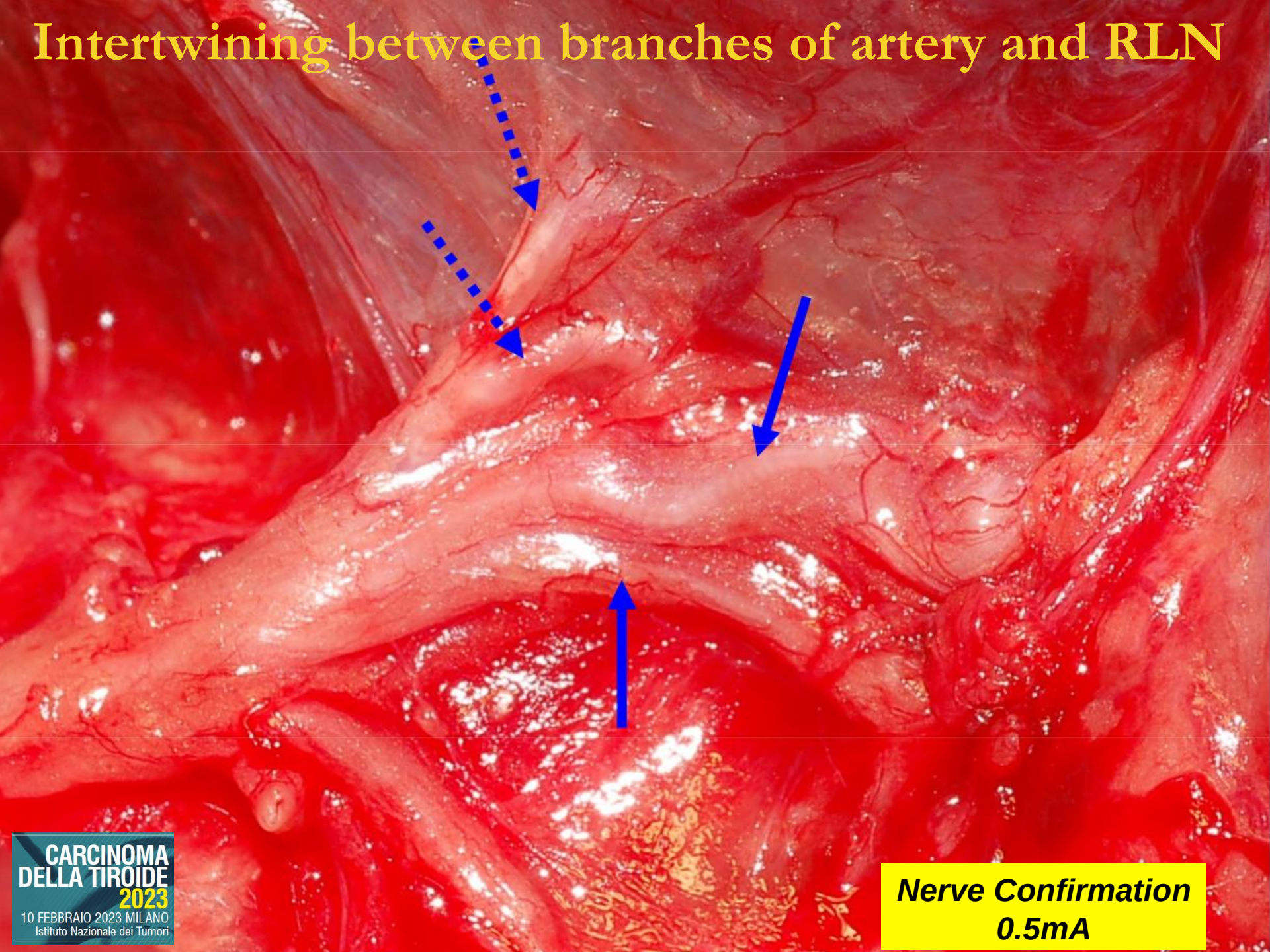
Nerve Confirmation 0.5mA

Intertwining between branches of artery and RLN



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Nerve Confirmation 0.5mA

Surgical strategy & IONM

- ***I*-IONM**

  Neural injury point mapping

  - i.e. removal of clip, ligature, binding (*Randolph G, 2008*)
  - i.e. injection of growth factor - gene therapy (*Shiotami A, 2010*)

  Intraoperative corticosteroids

  - **early recovery RLNP (*Wang LF, 2006*)**

  Stage thyroidectomy

  - **prevent bilateral RLNP**

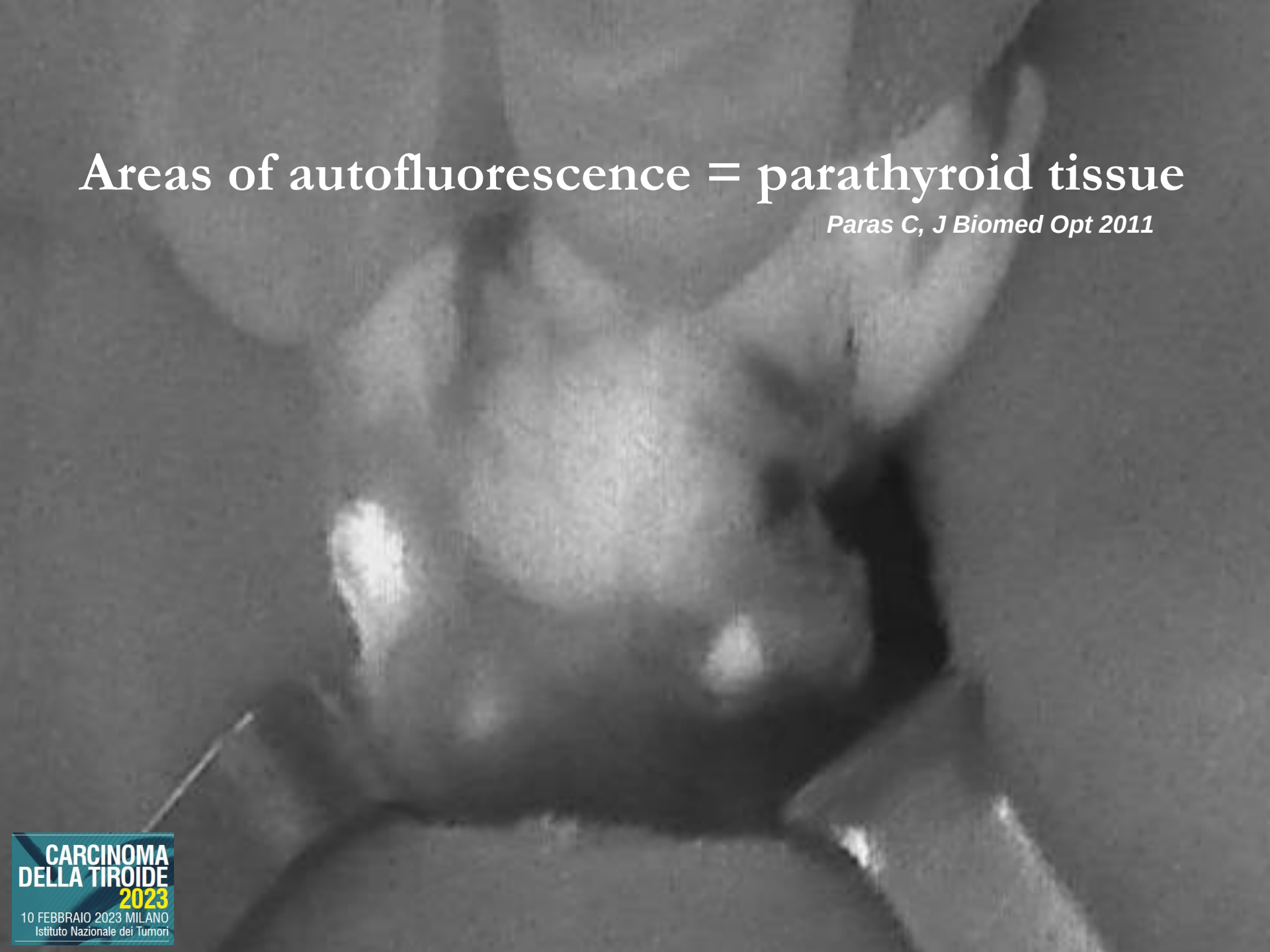
- ***C*-IONM**

  Syncronization of surgical manouvers

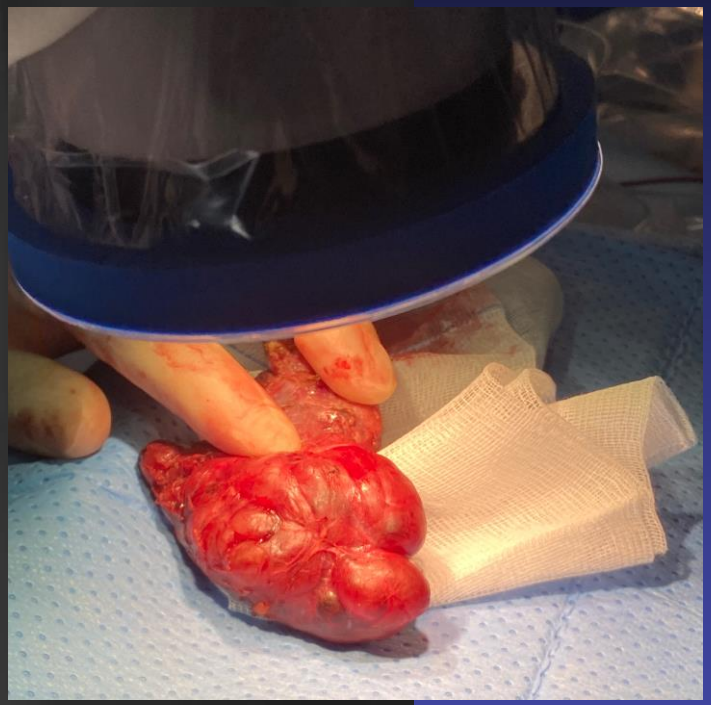
  - **possible reduction of RLNP rate (*Dralle H, 2012*)**

Areas of autofluorescence = parathyroid tissue

Paras C, J Biomed Opt 2011



Surgical dissection plan



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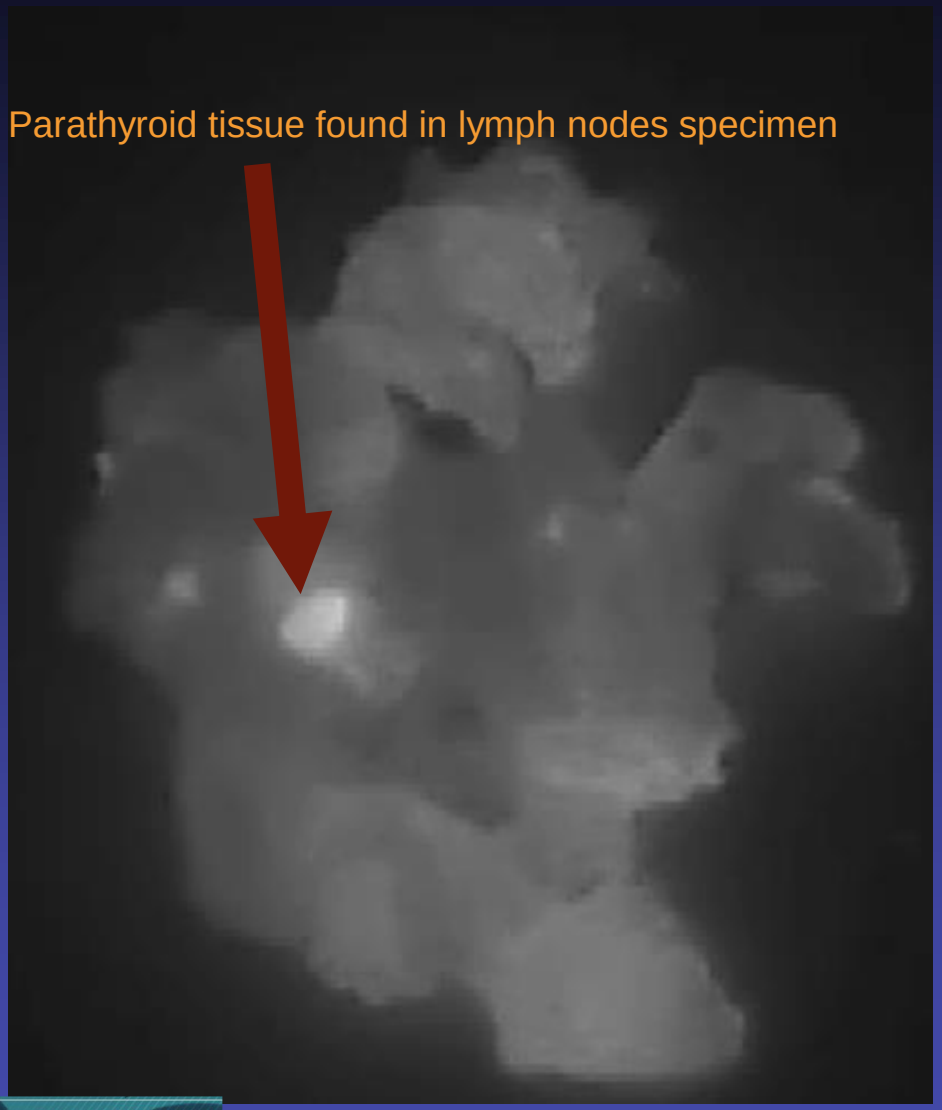
GD

Parathyroid tissue found in lymph nodes specimen



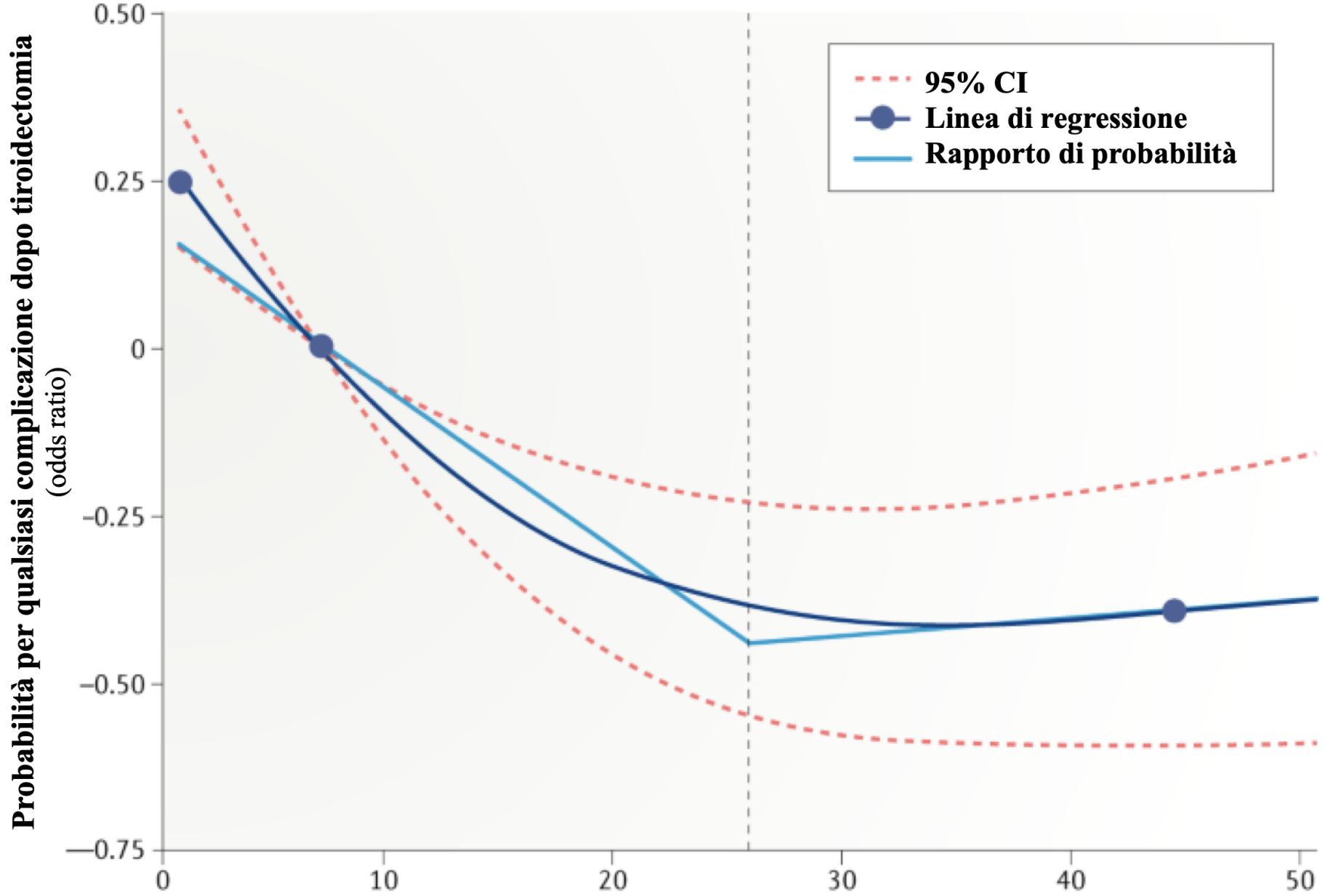
- Incidence of inadvertent removal of parathyroid gland during *thyroidectomy* is 5-10% *(Kose E, Surgery 2020)*
- Rates of inadvertent parathyroidectomy during *central compartment lymphadenectomy* are 10-22% *(DiMarco, Ann R Coll Surg Engl 2019)*
- Inadverted parathyroidectomy is associated with transient (15-35%) and permanent (5-7%) hypocalcemia rates *(Takahashi T, Laryngoscope 2021)*

Table 2. Primary and Secondary Outcomes

JAMA Surgery, 2019

Characteristic	No. (%) [95% CI] Near Infrared-Induced Autofluorescence (n = 121)	Standard Care (n = 120)	*P* Value
Primary outcome			
Postoperative hypocalcemia at postoperative day 1 or 2	11 (9.1) [4.0-14.2]	26 (21.7) [14.3-29.0]	.007[a]
Secondary outcomes			
Nadir of postoperative corrected calcium, median (IQR), mg/dL	8.86 (8.62-9.18)	8.74 (8.25-9.03)	.025[b]
Parathyroid hormone at postoperative day 1, median (IQR), pg/mL	33.2 (21.9-48.1)	28.6 (12.0-46.5)	.07[b]
Supplementation			
Calcium only	11 (9.1) [4.0-14.2]	24 (20.0) [12.8-27.2]	.016[a]
Calcium and vitamin D	6 (5.0) [1.1-8.9]	8 (6.7) [2.9-12.8]	.78[c]
Identified parathyroid glands, No.			
0	1 (0.8) [0.0-2.5]	2 (1.7) [0.0-4.0]	<.001[a]
1	2 (1.7) [0.0-4]	19 (15.8) [9.3-22.4]	
2	20 (16.5) [10.0-23.3]	40 (33.3) [24.9-41.8]	
3	40 (33.1) [24.9-41.8]	36 (30.0) [21.8-38.2]	
4	57 (47.1) [38.5-56.4]	23 (19.2) [12.1-26.2]	
Not determined	1 (0.8) [0-2.5]	NA	
Inadvertently resected parathyroid glands, No.	3 (2.5) [0-5.2]	14 (11.7) [5.9-17.4]	.006[c]
Autotransplanted parathyroid glands, No.			
0	116 (95.9) [93.5-99.9]	104 (86.7) [80.6-92.8]	.009[a]
≥1	4 (3.3) [0.1-6.6]	16 (13.3) [7.3-19.4]	
Not determined	1 (0.8) [0.0-2.5]		
Permanent hypocalcemia	0	2 (1.7) [0.0-4.0]	.15[c]
Nonparathyroid complication	3 (2.5) [0.0-5.3]	3 (2.5) [0.0-5.3]	>.99[c]
Duration of hospitalization, median (IQR), d	3 (3.0-4.0)	3.0 (3.0-4.0)	.98[b]

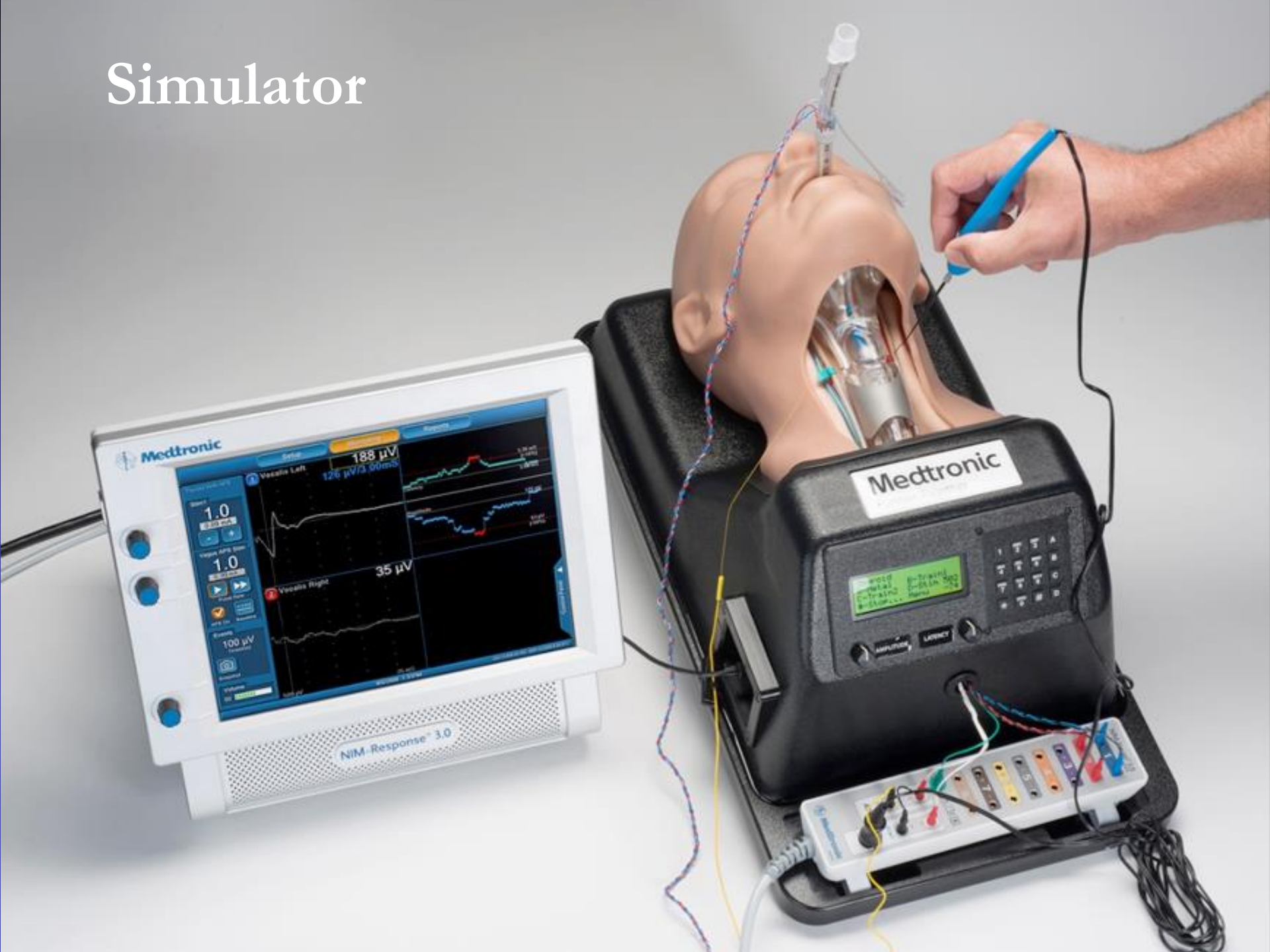
Morbidity due to Surgeon Experience

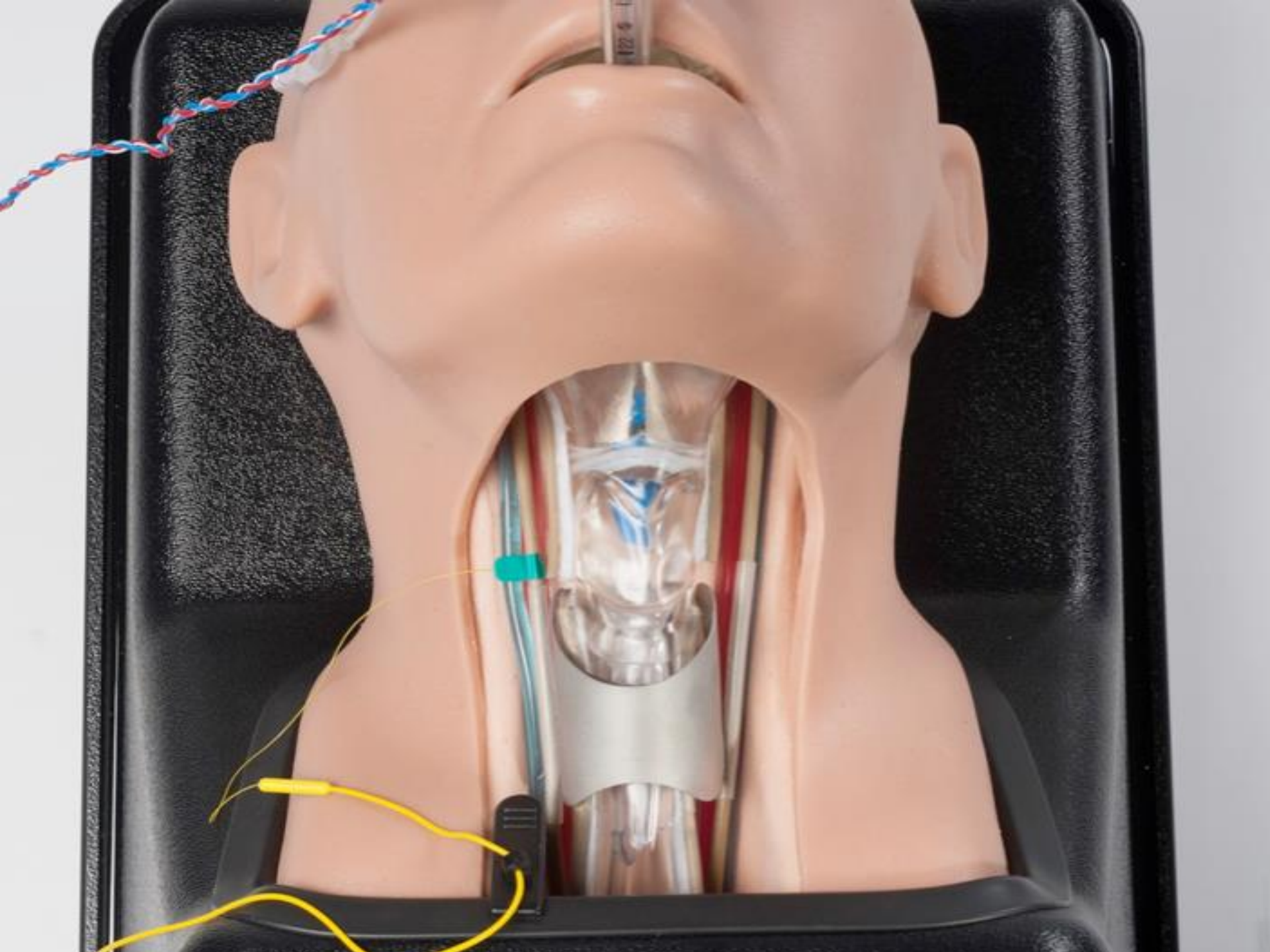

95% CI
Linea di regressione
Rapporto di probabilità
Probabilità per qualsiasi complicazione dopo tiroidectomia
(odds ratio)
0.50
0.25
0
−0.25
−0.50
−0.75
0
10
20
30
40
50
Numero tiroidectomie eseguite da singolo Chirurgo (volume per anno)

Technologies Enhancing Surgeon Experience

- Simulators
- IONM *(Dralle h, 2008)*
- Tools for refer Patients to referral Centers
  - National referral protocols/programs
  - Increase accessibility
  - Increase national comunication/coordination
  - Finance resources
  - Health system structure

Simulator


Medtronic
188 µV
126 µV/3.00ms
Vocalis Left
35 µV
Vocalis Right
NIM-Response® 3.0
Medtronic



Risk due to Modality of Surgery

World J Surg
https://doi.org/10.1007/s00268-018-04877-w

World Journal of Surgery

CrossMark

ORIGINAL SCIENTIFIC REPORT

Transoral Robotic Thyroidectomy for Papillary Thyroid Carcinoma: Perioperative Outcomes of 100 Consecutive Patients

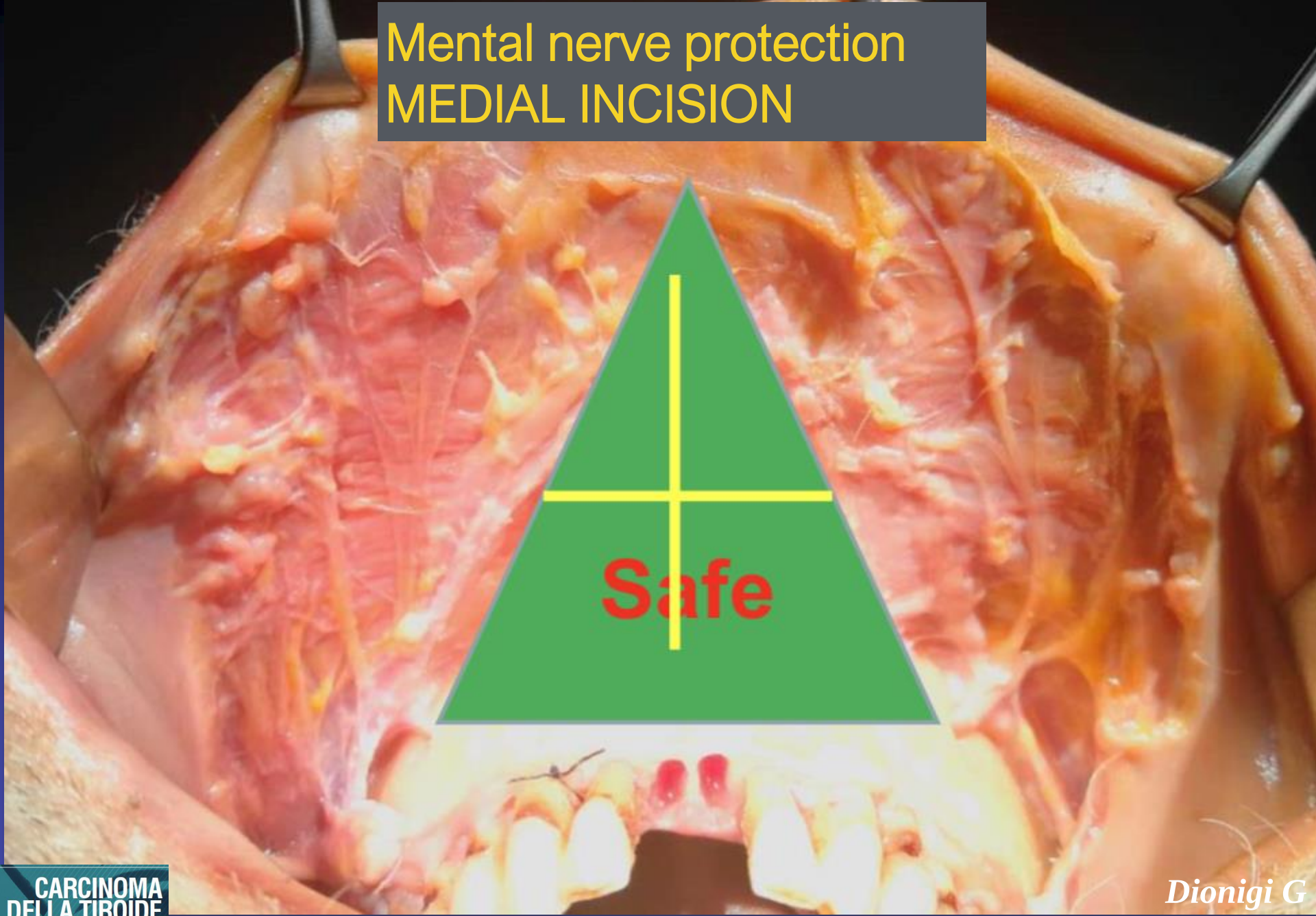
Hong Kyu Kim[1] · Young Jun Chai[2] · Gianlorenzo Dionigi[3] · Eren Berber[4] · Ralph P. Tufano[5] · Hoon Yub Kim[1]

Thyroidal complications n.2
TORT complications n.7

Table 4 Postoperative surgical complications

Variables	Value
General complications, n	
Bleeding	1
Surgical site infection	0
Seroma collection	0
Chyle leakage	0
Vocal cord palsy	
Transient	1
Permanent	0
Hypoparathyroidism	
Transient	0
Permanent	0
TORT-specific complications, n (case number)	
Mental nerve injury	0
Zygomatic bruising	2 (5, 13)
Chin flap perforation	1 (3)
Oral commissure tearing	2 (6, 27)
Dimpling on the chin	2 (21, 34)

Mental nerve protection
MEDIAL INCISION



Dionigi G

Best Practice and Research Clinical Endocrinology and Metabolism 2019

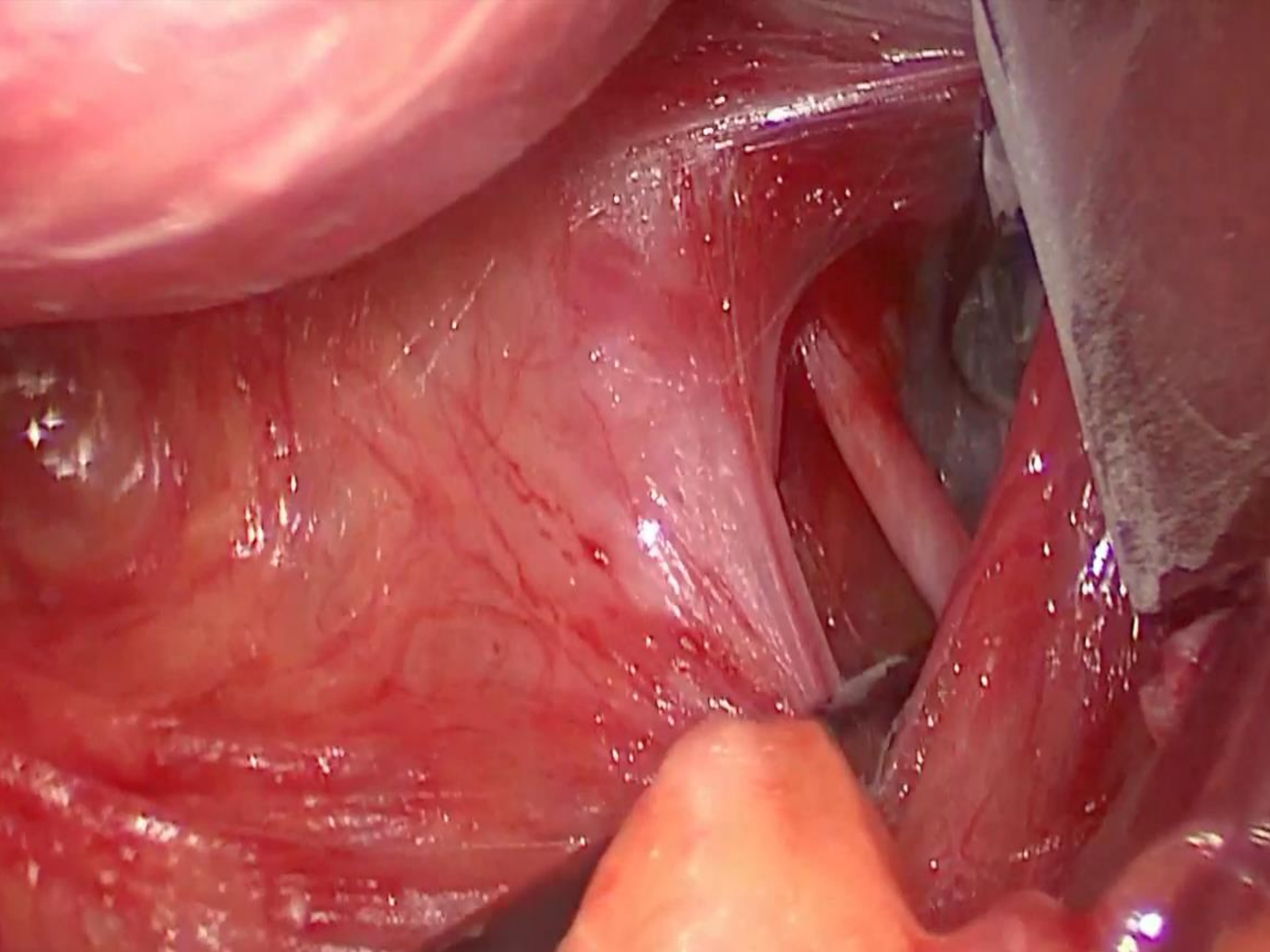
Transoral Endoscopic Thyroidectomy
Specific Complications

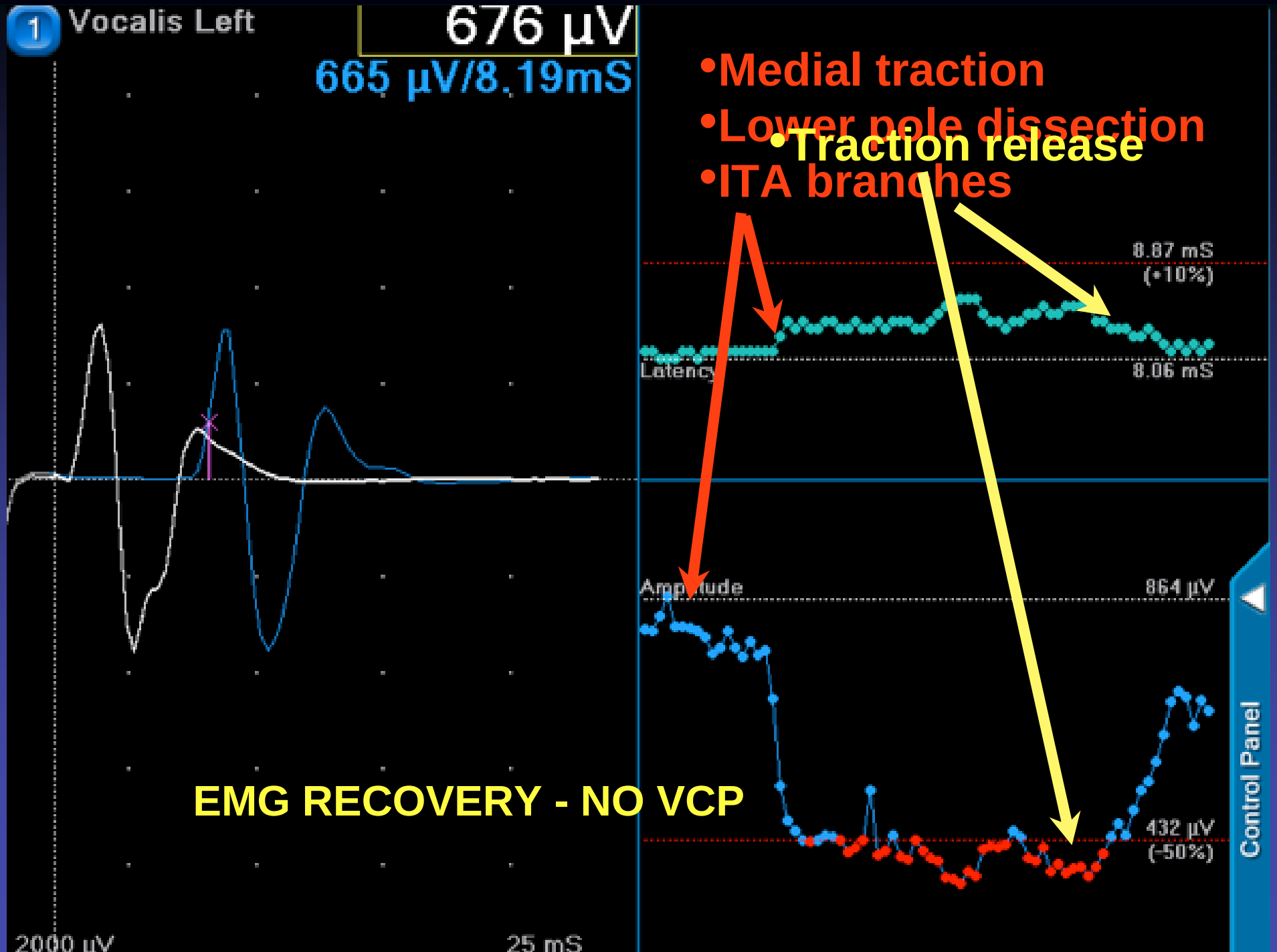
Kindly HY Kim, Korea University

Complication	Cause / Mechanism	Prevention / Solution
Mental nerve injury, causing sensory deficit of lower lip and lower chin	Oral vestibular mucosal and muscular tearing	High semicircular midline incision and vestibular tunneling for trocar insertion
Bruise over zygoma	Accidental compression of zygoma by robotic arms	Protective sponge application over zygoma
Chin flap perforation	Wrong axial (perpendicular) vestibular dissection with elctrocautery	Careful axial (parallel) vestibular dissection with blunt Mosquito forceps
Mouth commissure tearing	Excessive oral lateral port movements when 1) upper flap dissection, 2) sup pole dissection, and 3) midline closure	Oral mucosal protection sutures + Plaster application over commissures
Skin dimpling in midline of lower chin	Compression of mandible tip by intraoral midline trocar	Spontaneously recovers in 3-6 months ; 8mm midline trocar (da Vinci Xi) preferred, rather than 12mm trocar (Si)

Future directions

C-IONM




1 Vocalis Left
676 µV
665 µV/8.19mS
•Medial traction
•Lower pole dissection
•ITA branches
•Traction release
8.87 mS
(+10%)
Latency
8.06 mS
Amplitude
864 µV
EMG RECOVERY - NO VCP
432 µV
(-50%)
Control Panel
2000 µV
25 mS

Original article

Superiority of continuous over intermittent intraoperative nerve monitoring in preventing vocal cord palsy

R. Schneider[1], A. Machens[1], C. Sekulla[1], K. Lorenz[1], M. Elwerr[1] and H. Dralle[1,2]

Table 3 Multivariable logistic regression analyses of risk factors for postoperative vocal cord palsy

	Vocal cord palsy			
	Early postoperative		Permanent	
	Odds ratio	*P*	Odds ratio	*P*
Type of IONM				
Continuous	0·56 (0·42, 0·75)	< 0·001	0·03 (0·01, 0·25)	0·001
Intermittent	1·00 (reference)		1·00 (reference)	

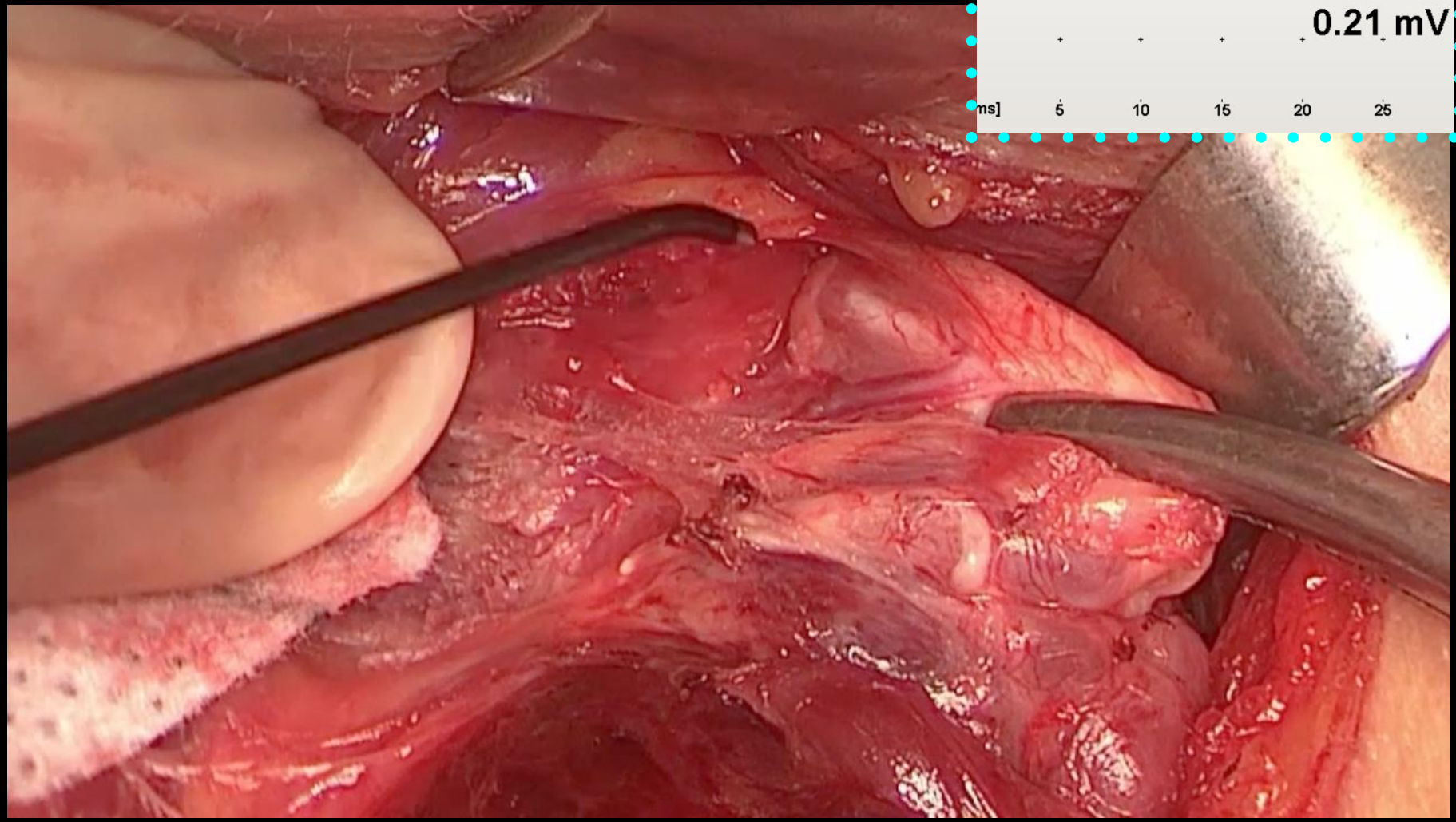
Table 4 Prediction of early postoperative vocal cord palsy by type of intraoperative nerve monitoring

	No. of nerves at risk				
	Intermittent IONM			Continuous IONM	
Early postoperative RLN palsy	Normal EMG signal	Abnormal EMG signal	Total	Normal EMG signal	Abnormal EMG signal
No	4860	40	4900	5112	18
Yes	59	65	124	9	69
Total	4919	105	5024	5121	87
Diagnostic indices					
Sensitivity (%)	52·4 (43·6, 61·2)			88·5 (81·4, 95·6)	
Specificity (%)	99·2 (98·9, 99·4)			99·6 (99·5, 99·8)	
PPV (%)	61·9 (52·6, 71·2)			79·3 (70·8, 86·8)	
NPV (%)	98·8 (98·5, 99·1)			99·8 (99·7, 99·9)	
Accuracy (%)	98·0 (97·6, 98·7)			99·5 (99·3, 99·7)	

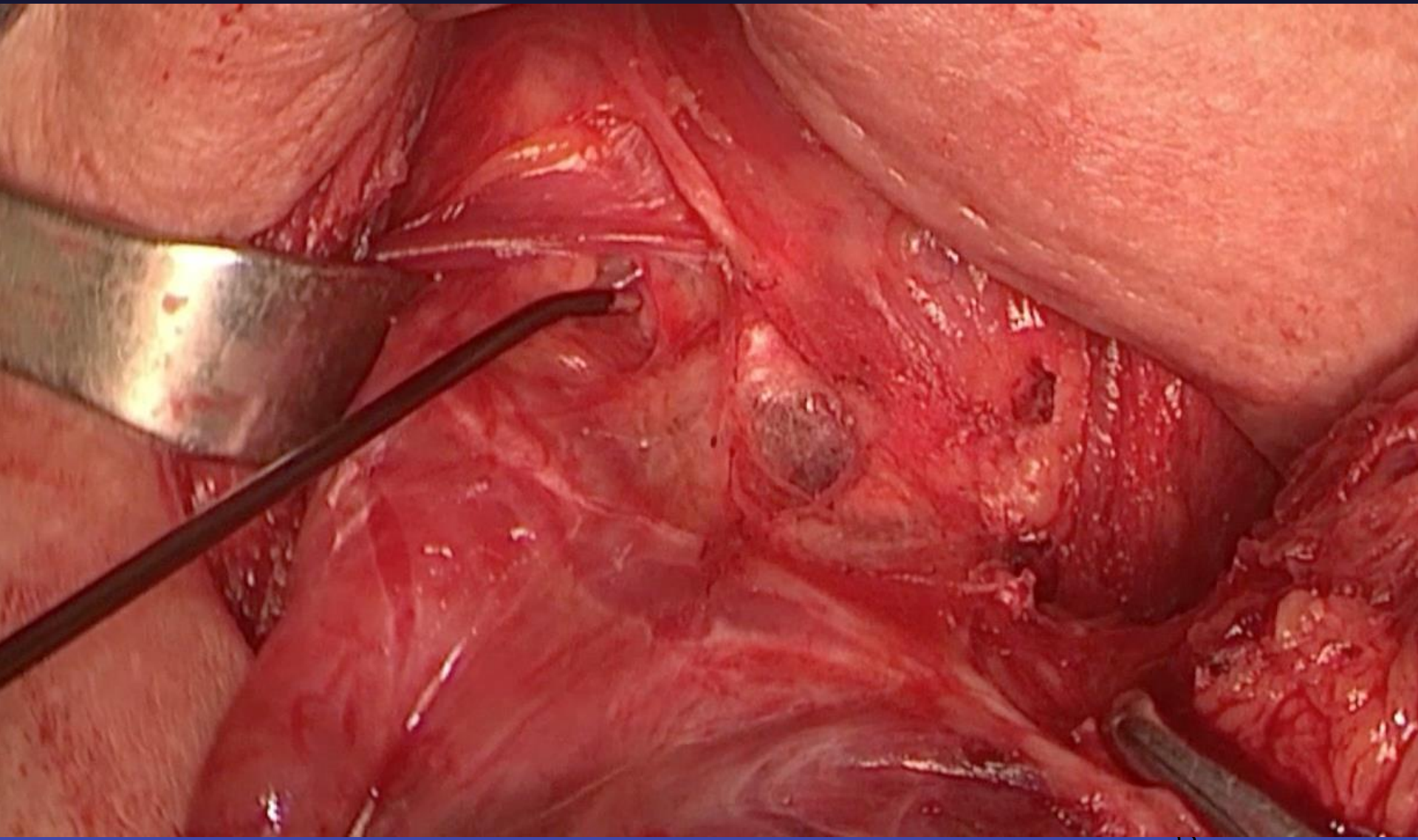
Future directions

EBSLN monitoring

Left EBSLN **Type 2B**



Dionigi G, 2016



Randomized Controlled Trial of Visualization versus Neuromonitoring of the External Branch of the Superior Laryngeal Nerve during Thyroidectomy

Marcin Barczyński · Aleksander Konturek · Małgorzata Stopa · Agnieszka Honowska · Wojciech Nowak

World J Surg
DOI 10.1007/s00268-012-1547-7

	EBSLN + RLN visualization	IONM of the EBSLN + RLN	*p* value†
EBSLN identification rate (%)	72 (34.3)	176 (83.8)	<0.001
EBSLN not identified	138 (65.7)	34 (16.2)	<0.001
Cernea type 1	26 (12.4)	100 (47.6)	<0.001
Cernea type 2A	20 (9.5)	34 (16.2)	0.04
Cernea type 2B	26 (12.4)	42 (20.0)	0.03
RLN identification rate (%)	210 (100)	210 (100)	1.0
Single-trunk RLN (%)	150 (71.4)	132 (62.9)	0.06
Bifurcated RLN (%)	60 (28.6)	78 (37.1)	0.06
Nonrecurrent laryngeal nerve (%)	0 (0)	1 (0.5)	0.31

Future directions

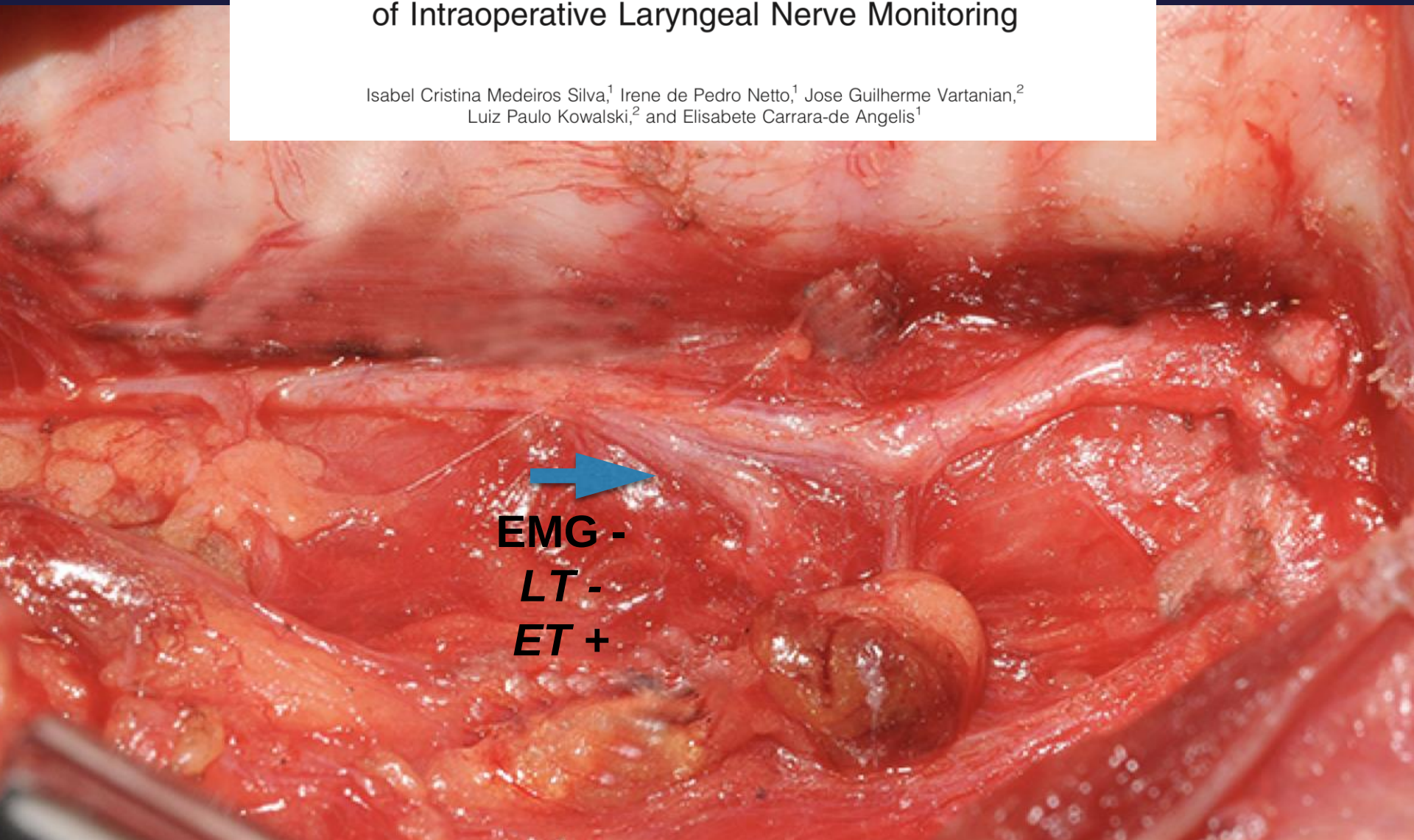
Upper aereodigestive symptoms

THYROID
Volume 22, Number 8, 2012

DOI: 10.1089/thy.2011.0118

Prevalence of Upper Aerodigestive Symptoms in Patients Who Underwent Thyroidectomy With and Without the Use of Intraoperative Laryngeal Nerve Monitoring

Isabel Cristina Medeiros Silva,[1] Irene de Pedro Netto,[1] Jose Guilherme Vartanian,[2] Luiz Paulo Kowalski,[2] and Elisabete Carrara-de Angelis[1]



Early detection of post-operative morbidity

Technology enhancing early management of morbidity

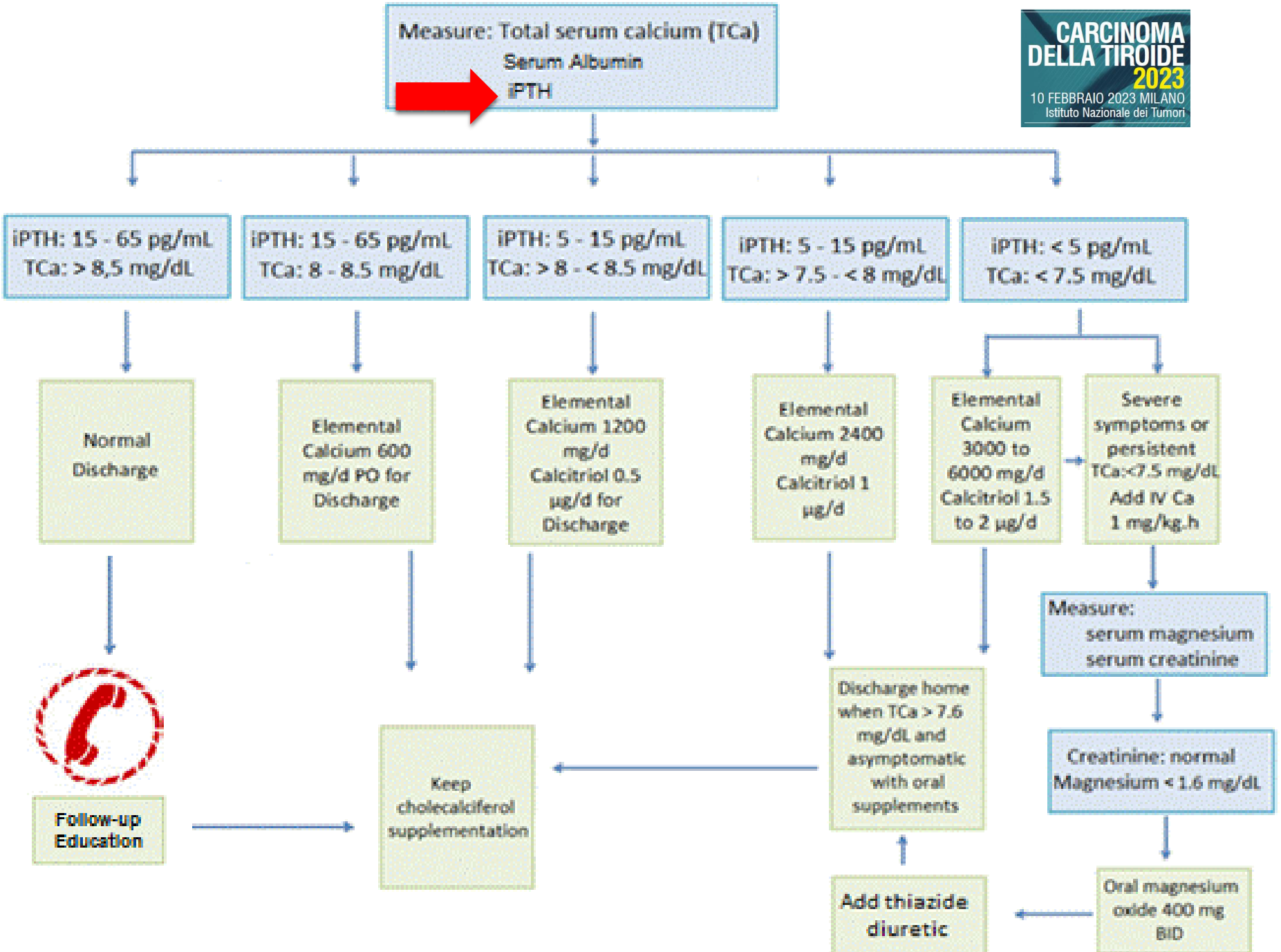
- RLN injury
  - Post-operative laryngeal examination
  - Stroboscopy
- Hypocalcemia
  - Early iPTH measurement
- Wound care

The importance of L2

- Voice assessment is insufficient *(Randolph, 2002)*
- Audit *(Randolph, 2012)*
- Early speech therapy *(Elderbagh, 2009)*
- Legal documentation *(Dralle, 2007)*
- Non-surgical VC injury *(Dionigi, 2010)*
- Reference for IONM *(Dionigi, 2011)*

Castelnuovo P & Dionigi G. LAS. 2016

Workup and management of postsurgical hypoparathyrodism



Wound care


Dimora
SILICONE FOAM DRESSING
With Border
ABSORBS MODERATE TO HEAVY DRAINAGE
10
4in x 4in
(10cm x 10cm)


kaloidon Plus
kaloidon Plus


Dermatix
Gel di Silicone Trattamento Cicatrici
Gel trasparente di silicone che asciuga rapidamente per la prevenzione e riduzione delle cicatrici immature in rilievo
Dermatix®
60 g gel


Same plast
Gel


FACE & BODY SCAR GEL
IMPROVES THE APPEARANCE OF SCARS AND STRETCH MARKS
Cicatricure
FACE & BODY SCAR GEL


REVEE
REVEE
SILICONE GEL
SILICONE GEL


CHELO TUBEX


ZERADERM
ULTRA
SCARGEL
FILTRO UV


VISIBLY REDUCES THE APPEARANCE OF
OLD & NEW SCARS
RESULTING FROM
INJURY | BURNS | SURGERY | ACNE | CUT MARKS
NEW
SKIN CARE FOR SCARS
MEDERMA®
Advanced plus
Scar Gel


VICUTIX scar
SCAR GEL

Makay, 2018

Follow-up information sheet

Post Op Care Post Transoral Thyroid Surgery

Day of Discharge: You will stay overnight in hospital after the surgery. You will be discharged home the following day.

Pain Relief: We will provide you with pain relief during and after the surgery.

Antibiotics: You will need to antibiotics for 5 – 7 days after the surgery. This is to prevent bacteria in the mouth causing an infection of the wound.

Mouthwash: Use mouthwash to clean your mouth 3 times per day for 5 – 7 days after the surgery.

Brush Teeth: You may brush your teeth as normal from the day after the surgery.

Early Mobilisation: You will be encouraged to move out of bed from 4 hours after the surgery.

Eating and Drinking: You may eat and drink normal foods on the same day after the surgery.

Showering: You may shower and shave on the same day after the surgery.

Mouth Exercises: Practice mouth exercises for 5 – 7 days after the surgery. See next page for demonstration.

No dressings are required.

Look out for unlikely complications: In the very unlikely event that any excess ooze, discharge, redness, heat, swelling or increased pain occurs please attend your G.P. Any 'pins and needles' sensations noted in hands would need quick attention by your G.P.

Follow Up: 2 weeks and 6 weeks: You will be seen by the surgical team for review of your wound at 2 weeks and results at 6 weeks post your utpatient. Appointment for same will be posted out to

Prof Redmond's private clinic you can ring 021-4941367 ointment.

Post-operative Exercises

Open mouth wide

Practice opening your mouth as wide as possible.

Smile with lips closed

Smile with your lips closed.

Cheesy Grin

Stretch your mouth as wide as possible into a smile to reveal your teeth.

Make lips disappear

Roll your lips over your teeth to stretch the skin above and below your mouth.

Pucker lips

Practice puckering your lips.

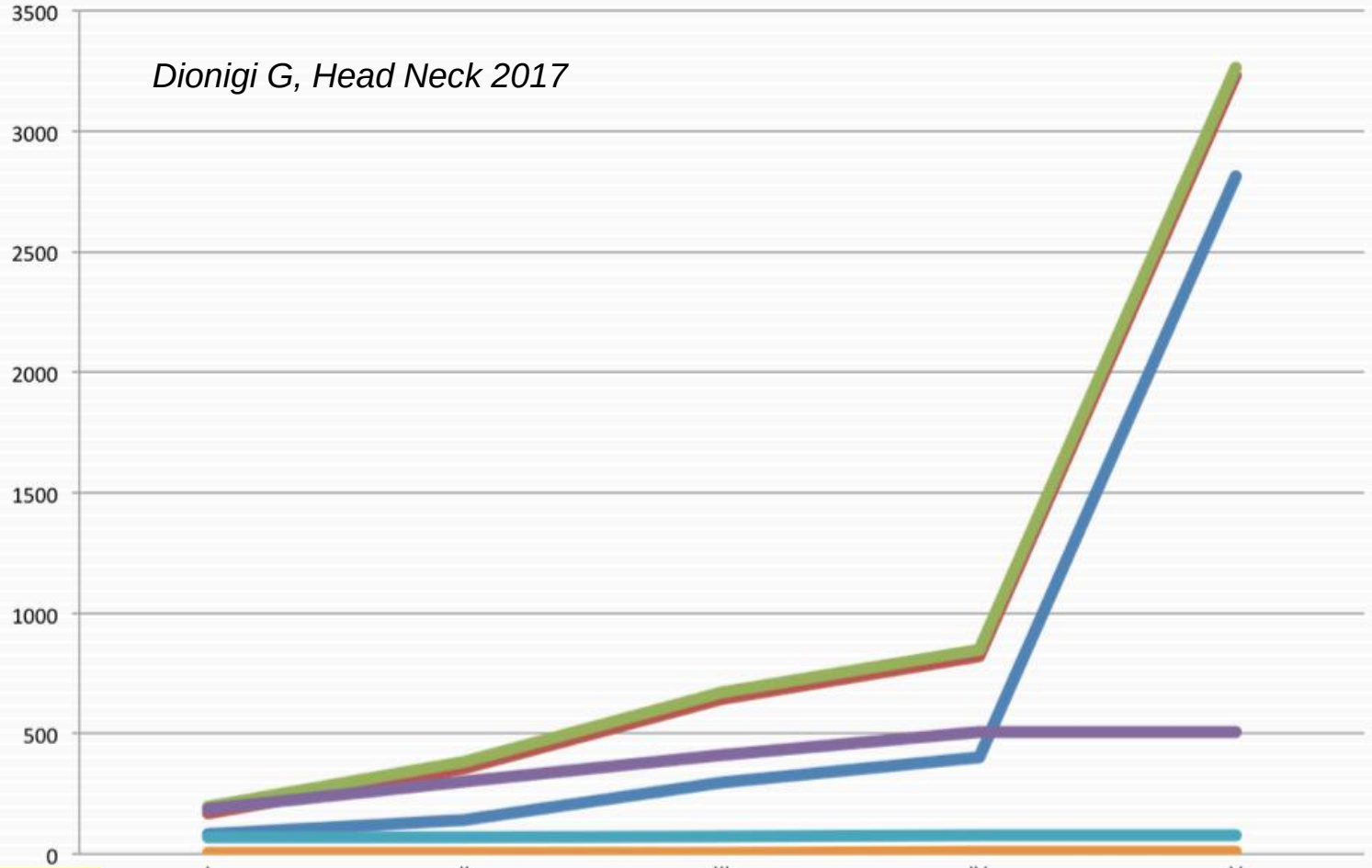
Puff out cheeks

Practice closing your lips tightly and puffing out your cheeks.

Cost of technology & morbidity

Euro

Dionigi G, Head Neck 2017



Clinica pathway

	I NO RLN INJURY	II VOCAL FOLDS FUNCTION RECOVERY WITHIN 1 MONTH	III VOCAL FOLDS FUNCTION RECOVERY WITHIN 3 MONTHS	IV VOCAL FOLDS FUNCTION RECOVERY WITHIN 6 MONTHS	V PERMANENT VOCAL FOLD PARALYSIS AFTER 6 MONTHS
NHS No exemption	80,58	140,4	297,28	400,15	2.811,75
NHS 027	167,28	355,6	640,98	821,85	3.233,45
NHS 048	195,78	384,1	669,48	850,35	3.261,95
Patient No exemption	186,65	299,2	412,35	506,75	506,75
Patient 027	69,6	70,8	72,6	76,3	76,3
Patient 048	3,6	4,8	6,6	10,3	10,3

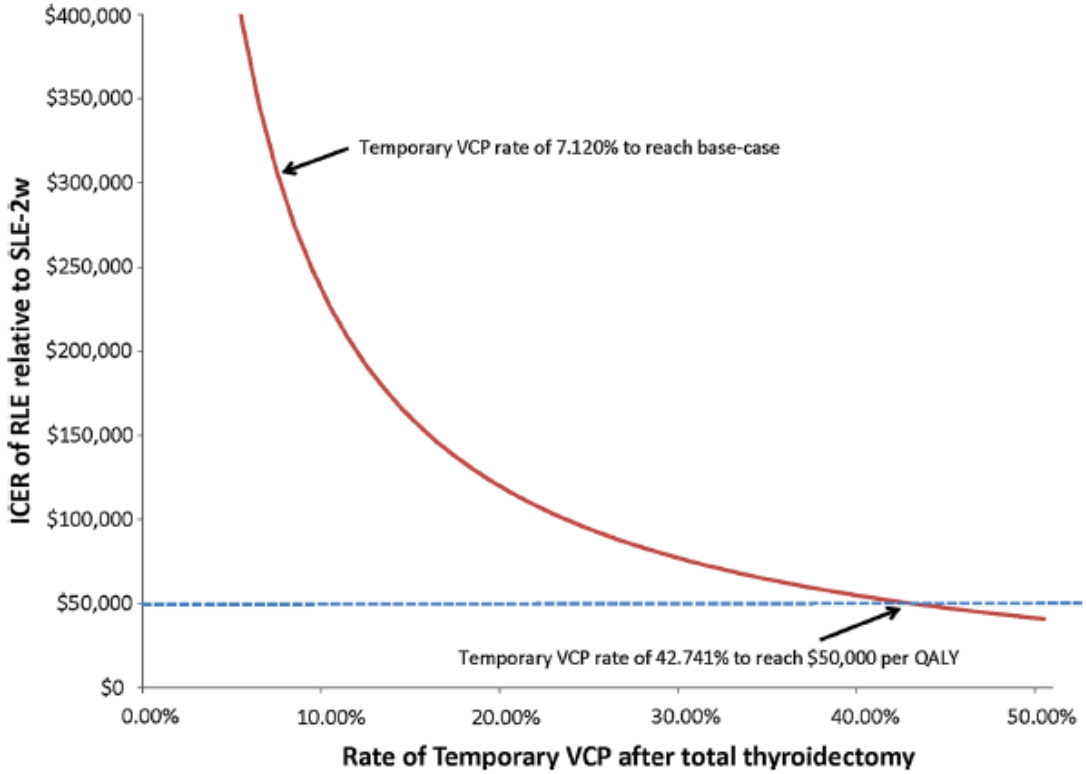
Ann Surg Oncol (2014) 21:3548–3556
DOI 10.1245/s10434-014-3770-y

Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

ORIGINAL ARTICLE – ENDOCRINE TUMORS

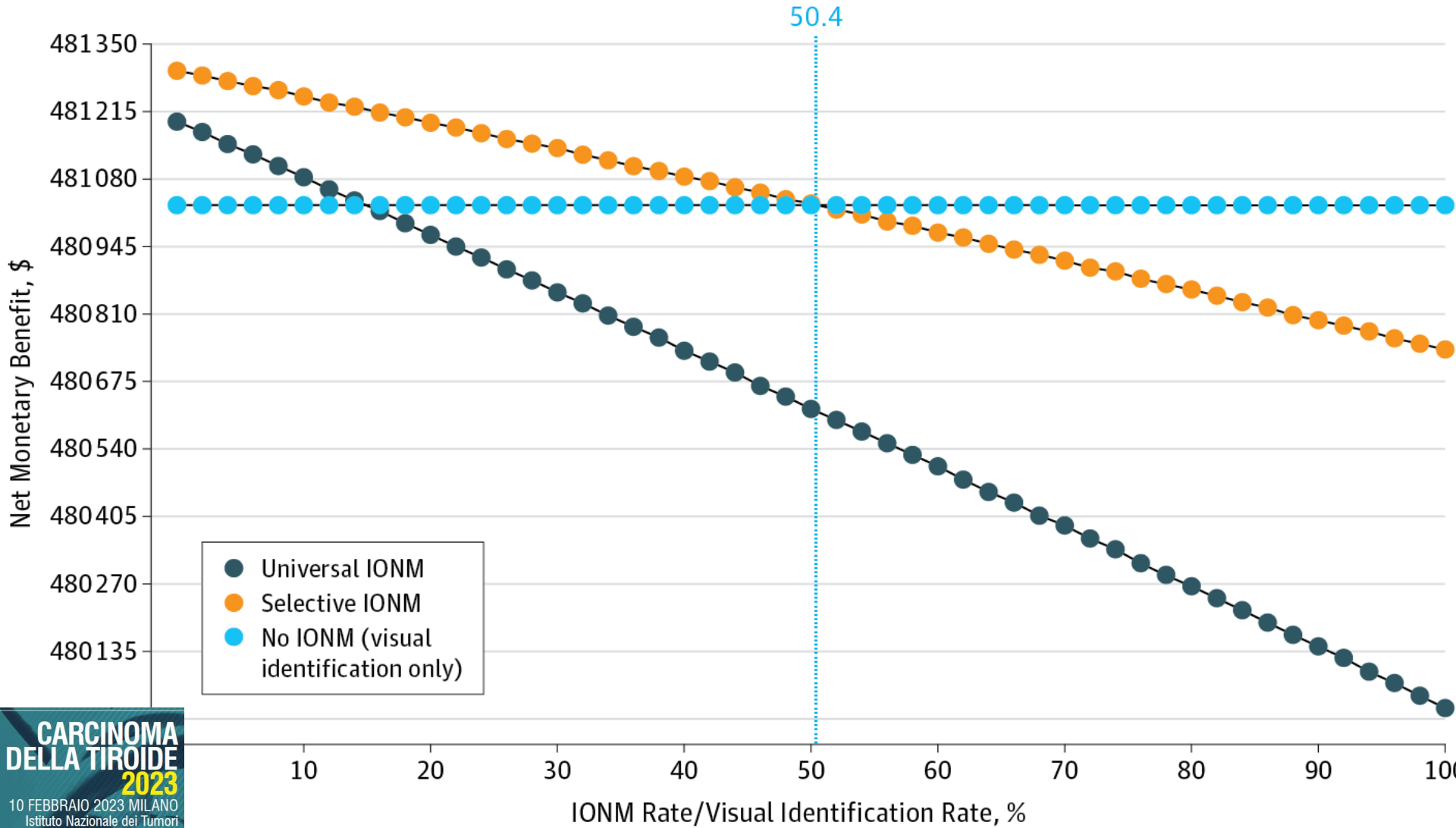
Evaluating the Cost-Effectiveness of Laryngeal Examination after Elective Total Thyroidectomy

Brian Hung-Hin Lang, MS, FRACS[1], Carlos K. H. Wong, PhD[2], Raymond K. Y. Tsang, MBChB, FRCSEd(ORL)[3], Kai Pun Wong, MBBS, FRCS[1], and Birgitta Y. H. Wong, MBBS, FRCSEd(ORL)[3]



From: **A Cost-Utility Analysis of Recurrent Laryngeal Nerve Monitoring in the Setting of Total Thyroidectomy**

JAMA Otolaryngol Head Neck Surg. 2016;142(12):1199-1205. doi:10.1001/jamaoto.2016.2860



Technology & Legal

Protocolli Gestionali Diagnostico-Terapeutico-Assistenziali in chirurgia tiroidea

Aggiornamento 2012, da sottoporre alla Consensus Conference del CLUB delle UEC, redatto da: *Carmen De Crea, Angela Gurrado, Giuseppe Cavallaro, Marco Raffaelli, Gabriele Materazzi, Maria Grazia Chiofalo, Chiara Dobrinja, Giuliano Perigli* e modificato secondo le indicazioni pervenute dai componenti del Direttivo.

Monitoraggio intraoperatorio dei nervi laringei ricorrenti (IONM)

In casi di previste particolari difficoltà tecnica (gozzi recidivi, con importante componente cervicomediastinica, tiroiditi) può rivelarsi un utile complemento tecnico l'utilizzo del monitoraggio intraoperatorio dei nervi laringei. Nel 2010 sono state proposte delle linee guida per un corretto e standardizzato neuromonitoraggio con l'intento di migliorare la qualità del IONM e limitare le inappropriate variazioni della tecnica[60].

Un corretto utilizzo del sistema IONM prevede:

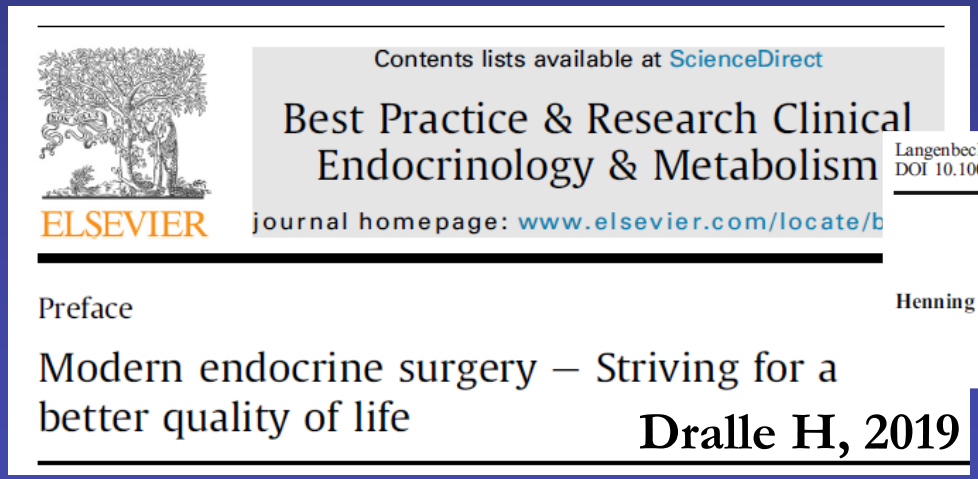
- necessità di standardizzare la metodologia d'utilizzo per evitare gli errori più comuni;
- il sistema IONM non sostituisce il giudizio clinico ed è solo uno strumento aggiuntivo;
- valore predittivo positivo relativamente basso;
- analisi costo-beneficio tuttora da effettuare;
- necessità di ulteriori ricerche focalizzate sulla neurofisiologia e patologia dei RLN;
- monitoraggio del nervo laringeo superiore;
- esclusione della tiroidectomia in anestesia locale;
- la necessità di una sperimentazione multi-centrica con gruppi numerosi e ben definiti.

Per dimostrare una riduzione della percentuale di paralisi dei RLN dal 2% all'1%, sarebbe necessario un gruppo di studio di circa 10.000 pazienti. Al momento solo uno studio prospettico randomizzato ha dimostrato che, utilizzando un sistema di monitoraggio, la prevalenza di paresi transitoria dei RLN è rispettivamente più bassa del 2.9% nei pazienti ad alto rischio e dello 0.9% nei pazienti a basso rischio[61].

Conclusion


CARCINOMA
DELLA TIROIDE
2023
10 FEBBRAIO 2023 MILANO
Istituto Nazionale dei Tumori

- Technologies improve the quality of surgery
- Some technologies are scientifically immature
- Morbidity still occurs



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journal homepage: www.elsevier.com/locate/b

Preface

Modern endocrine surgery – Striving for a better quality of life

Dralle H, 2019

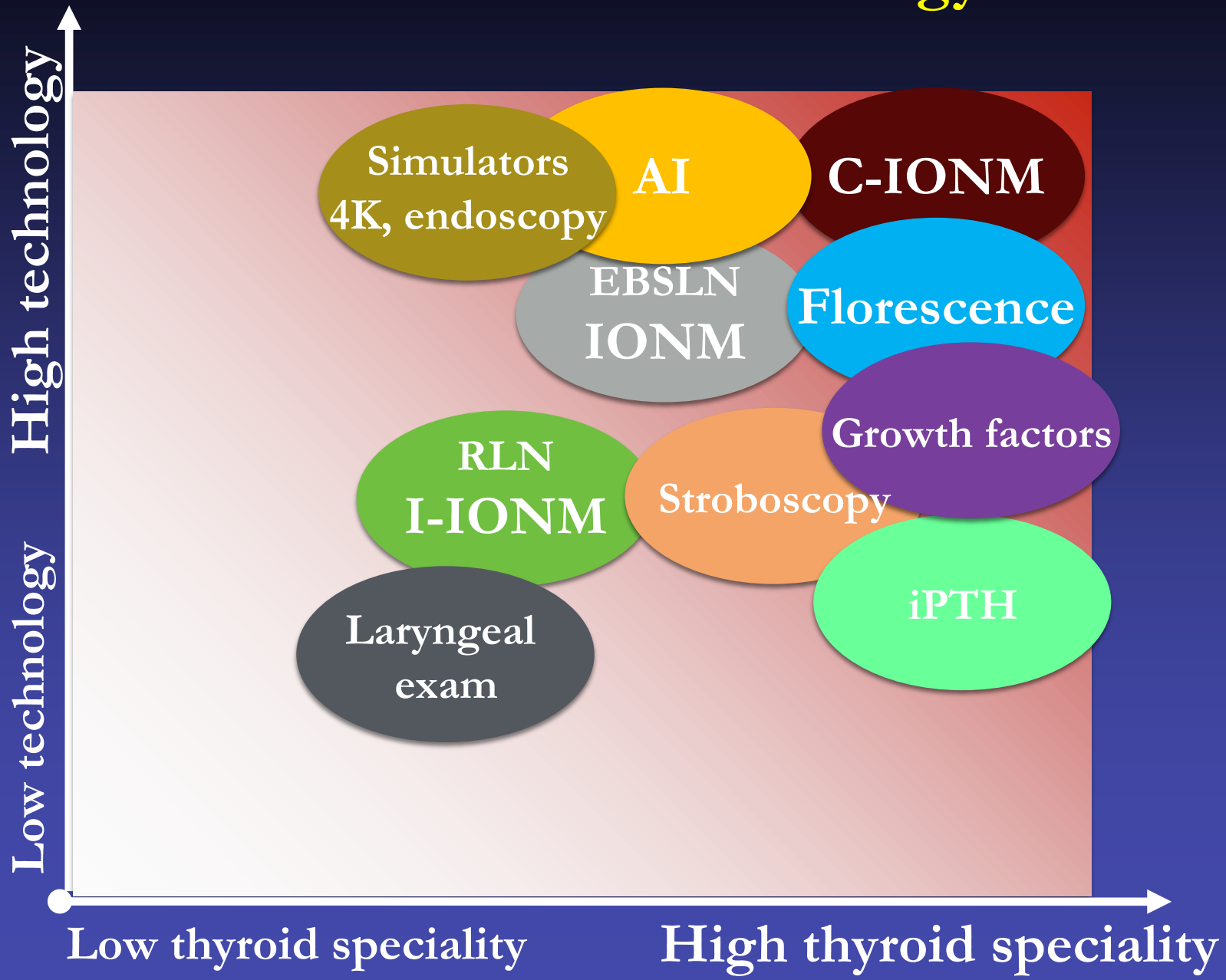
Langenbecks Arch Surg (2006) 391: 1–3
DOI 10.1007/s00423-005-0012-6

EDITORIAL

Henning Dralle

Impact of modern technologies on quality of thyroid surgery

Centralization of Technology



GRAZIE

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