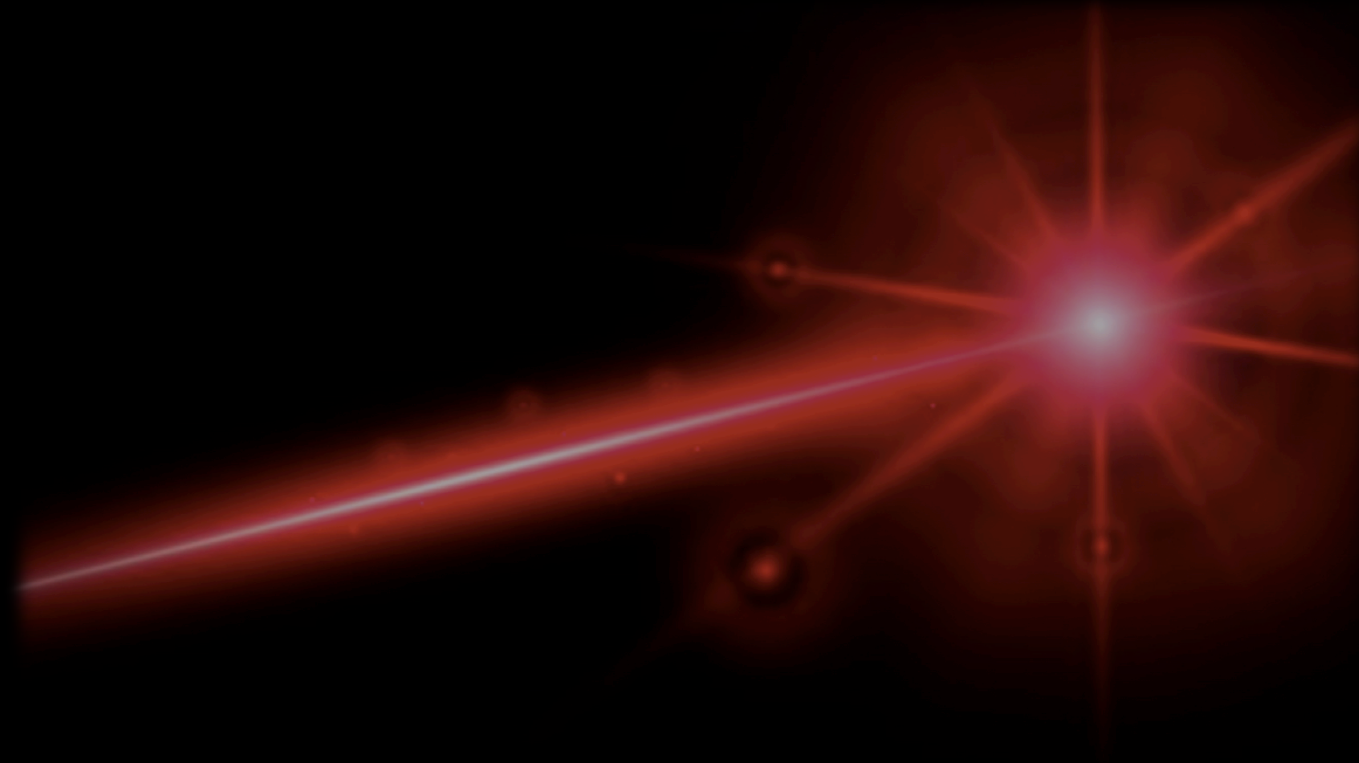


INTERESTING CASE

Laser airway surgery



R1 เกียรติศักดิ์/อ.สิทธิพงษ์

INTERESTING CASE

- Case : Thai male 49 years old
- Diagnosis : Left laryngeal papillomatosis
- Operation : Micro direct laryngoscope with
 CO₂ laser excision with change tube

Male 49 years old

Chief complaint

มารับการผ่าตัดชิ้นเนื้อบริเวณเส้นเสียง

Know case CA glottis S/P tracheostomy

R1 History

History

- Present illness : - 1 month PTA มีอาการเสียงแหบ กลืนลำบาก หายใจไม่ออก หอบเหนื่อย
 - ไป รพ.นวมินทร์ *ใส่ ETT [upper airway obstruction] >> Tracheostomy No. 8.5* ปัจจุบัน หายใจได้ ไม่หอบเหนื่อย เสียงแหบ กลืนอาหารลำบาก พบก้อนเนื้อบริเวณ left vocal cord จึงส่งตัวมารักษาต่อ รพ.รร.6

Past History

- *Know case CA glottis [T₂N₀M₀]*
- *Smoking 30 pack years [Quit 3 months]*
- No current medication
- No history of allergy
- No alcohol drinking

Previous surgery

- *Tracheostomy under GA 1 month PTA*
- *Micro DL with biopsy under GA : no complication*

R1 Physical examination and investigation

Physical examination

- Vital Signs : BT 36.6 °c HR 56 bpm RR 16 min BP 122/75 mmHg BW 65 kg, Height 161 cm, BMI 25.1 kg/m²
- GA : good consciousness, E₄V₅M₆
- HEENT : not pale conjunctivae, no dry lips/dry tongue
- Respiratory : lung clear and equal both lung
- CVS : normal S₁,S₂, no murmur

Physical examination

- Airway : *Tracheostomy tube No. 8.5*
 - Mallampati grade 1
 - Thyromental distance > 6 cm
 - Mouth opening > 3 cm
 - No prominent incisor
 - Upper lip bite test class II
 - No limit ROM of neck

Physical examination

- *FOL : Left TVC whitish fungating mass papillomatous lesion, normal TVC movement, normal tracheal, no granulation tissue*

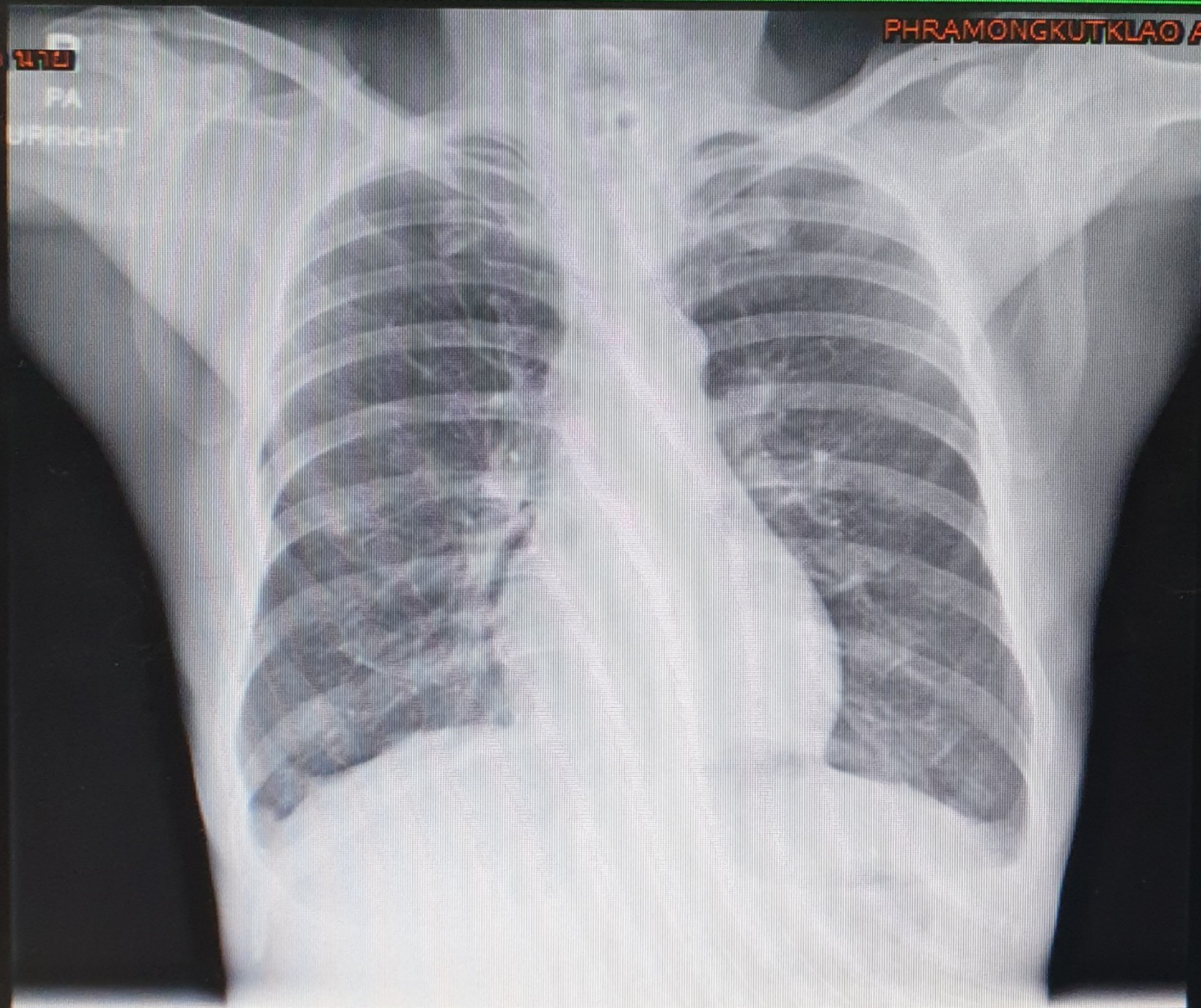


Investigation

- CBC : Hb 12.2 %, Hct 38 %, platelet 291,000 /mm³
- BUN 14 Cr 0.77 mg/dl GFR 96 ml/min/1.73m²
- Electrolytes : Na 145 K 4.1 Cl 112 HCO₃ 22
- CXR : no infiltration
- EKG : Sinus bradycardia rate 46 bpm
- *CT neck : ill define enhancing lesion Lt TVC
0.8*1.1*1.2 cm oval shape*
- *Covid test : negative*

0171

PA
UPRIGHT



Rate 46 . Sinus bradycardia..... Rate: 30
Short PR interval..... PR <110ms

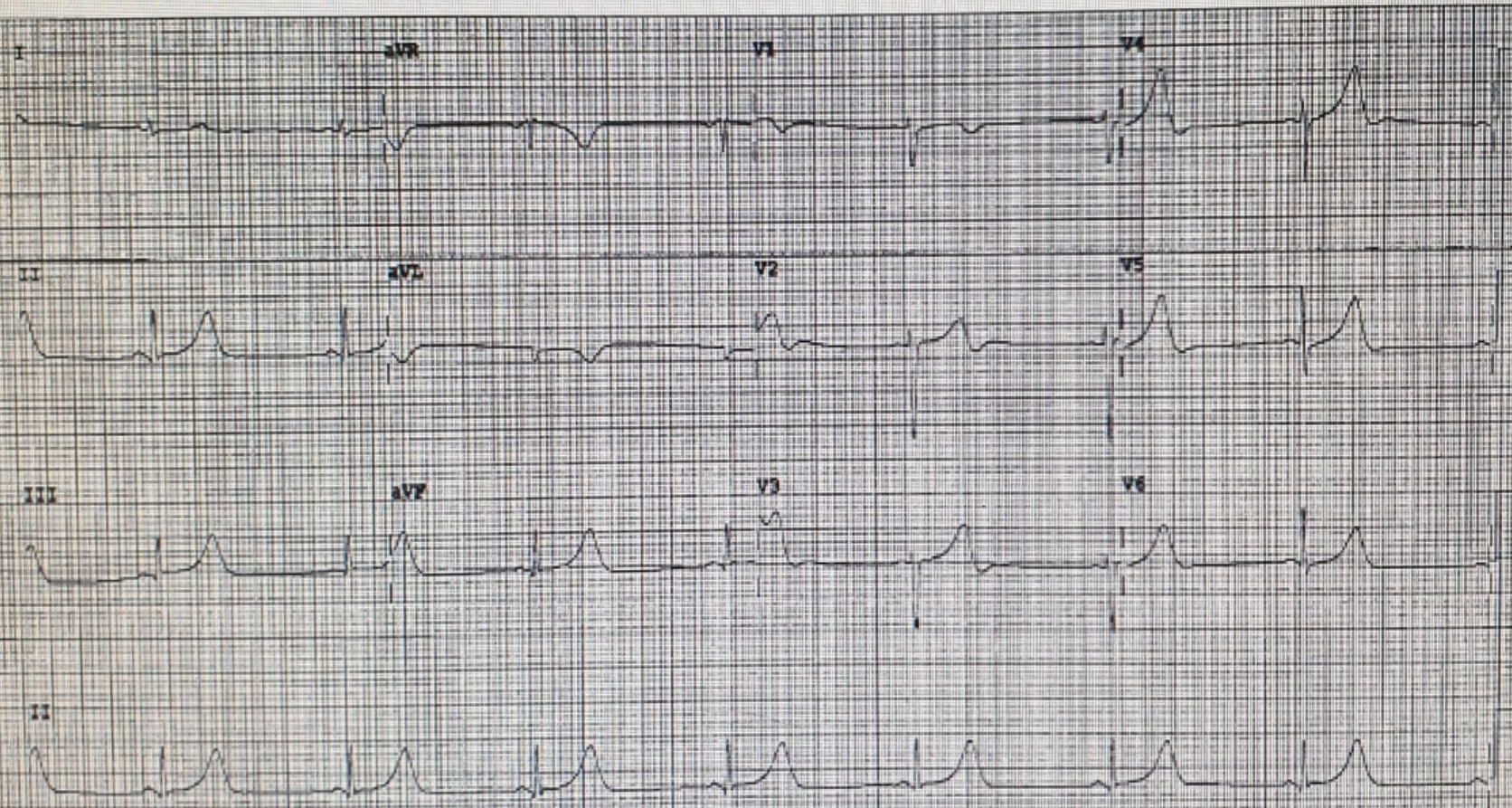
FR 105
QRS 86
QT 532
QTc 466

--AXIS--
P 61
QRS 98
T 83

- BORDERLINE ECG -

Unconfirmed Diagnosis

12 Lead: Standard Placement



Device: Speed: 25 mm/sec Limb: 10 mm/mV Chest: 10.0 mm/mV F 50-0.50-100 Hz W 100B CL P?

R1 Problem list and ASA classification

Problem list

1. Left laryngeal papillomatosis
2. CA glottis S/P tracheostomy
3. Smoking [30 pack years, quit 3 months]

ASA Class II

R2 Preoperative evaluation and preparation

Preoperative evaluation

- Patient factor
- Surgical factor
- Anesthetic factor

Patient factor

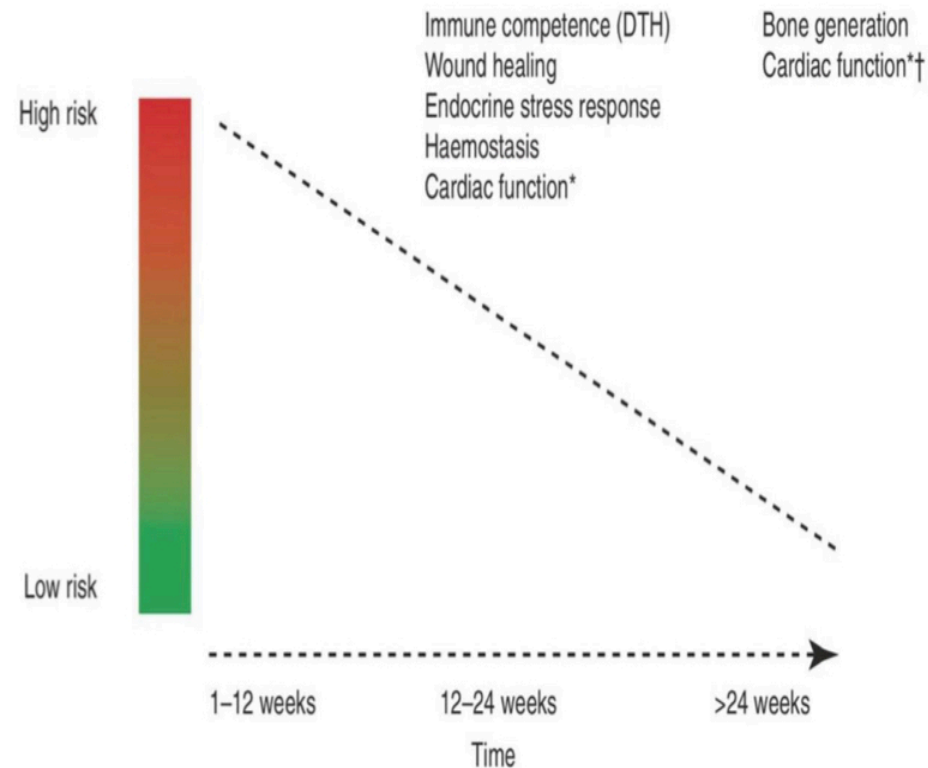
- CA glottis S/P tracheostomy
- Smoking [30 pack years, quit 3 months]

Patient factor

- CA glottis S/P tracheostomy [no metastasis]
- On tracheostomy No. 8.5
- O₂ sat room air 98 %
- No dyspnea, no stridor

Smoking [30 pack years, quit 3 months]

Effects of smoking cessation



12-24 hrs	Decreased COHb
1-2 wks	Recovery of ciliary function Decreased airway hypersensitivity
2-6 wks	Decreased sputum production
>6 wks	Normal immune function
6-8 wks	Improved tracheobronchial clearance Optimal timing for surgery

Surgical factor

- Laser surgery
- Intra operative bleeding [low-risk]
- Airway fire

Laser

*“ Light amplification by stimulated
emission of radiation ”*

CO₂ laser

- CO₂ laser most widely use laser
[longer wavelength, less tissue penetration]
- Absorbed by water contained in blood and tissue
- Invisible beam [unobstructed view of lesion]
- *Misdirected laser >> may cause cornea injury*
[limited penetration 0.01 mm]

Nd:YAG laser

- *Neodymium:yttrium-aluminum-garnet* laser
- Poorly absorbed by water
- Deeper penetration tissue > CO₂
- Tissue edema > CO₂
- Can cause retina damage
- *Ruby, Argon : ophthalmic surgery*

TABLE 70.1 A Sampling of Various Kinds of Lasers Available for Clinical Use

Type	Gas or Solid	Wavelength* (nm)	Color	Fiberoptic Transmissible?
Helium/neon	Gas	633	Red	Yes
Argon [†]	Gas	500	Blue-green	Yes
CO ₂	Gas	10,600	Invisible (far infrared)	No
Ruby	Solid	695	Red	Yes
Nd:YAG	Solid	1064	Invisible (near infrared)	Yes
KTP	Solid	532	Green	Yes



Specific eye goggles

Laser type	Colour	Prevention
CO2	Invisible [far infrared]	Clear plastic/glass
Nd-YAG	Invisible [near infrared]	Green
Argon	Blue-green	Orange
KTP	Green	Red

Advantages of laser

- Precise lesion targeting
- Minimal bleeding
- Minimal edema / tissue reaction
- Preservation of surrounding structures
- Rapid healing / less postop pain

BOX 70.3 Some Otolaryngologic Clinical Situations in Which Laser Techniques Can Be Useful

Nose

- Turbinate reduction
- Septoplasty
- Removal of nasal obstructions, polyps, synechia
- Treatment of rhinophyma
- Treatment of keloids and hypertrophic scars

Oropharynx and Pharynx

- Vaporization of papillomas, leukoplakias, and hemangiomas
- Tumor surgery (e.g., partial glossectomy)
- Laser-assisted uvulopalatoplasty
- Tonsillectomy

Larynx

- Removal of vocal cord polyps and granulomas
- Epiglottectomy
- Cordectomy
- Arytenoidectomy

Tracheobronchial Tree

- Treatment of tracheal stenosis
- Removal of nodules, polyps, tumors, and fibromas

Ear

- Surgery of the stapes
- Laser-assisted myringotomy
- Cholesteatoma

Preoperative preparation

General preparation

- NPO
- Informed consent
- Warm IV fluids
- intubation equipment
- Anesthetic machine
- Force air warmer
- IV anesthetic drugs

Specific preparation

- Laser tube
- Extra ETT [airway fire]
- Eye goggle [laser specific]
- Mask N95
- Wet towels for eyes of patient

Intraoperative monitoring

- Standard monitoring
 - EKG
 - NIBP
 - Pulse oxymetry
 - ETCO₂

Anesthetic consideration

R3

Anesthetic consideration

- Most challenging field
- Competition and share airway
- Surgical exposure VS adequate ventilation
- Obstructive lesion in the airway
- Complication of anesthesia & surgical technique

Aim of anesthetic management

1. Adequate ventilation
2. Maximum expose of the larynx
3. Motionless vocal cord
4. Deep enough to avoid laryngospasm
5. Rapid recovery
6. Airway fire prevention

Anesthesia techniques

- *Ideal technique*
 - Simple
 - Complete control airway , No risk of aspiration
 - Clear motionless surgical field
 - No risk airway fire
 - Cardiovascular stable
 - No time restrictions on the surgeon
 - Safe emergence, Pain free

Anesthesia techniques

Closed system

- Endotracheal tube
 - Laser resistant
 - Not laser resistant
- Trachostomy
 - Tracheostomy tube
 - Metal tube
 - Spiral tube
 - Small endotracheal tube

Open system

- Jet ventilation + TIVA
 - Jet above cord
 - Jet below cord
- Intermittent apnea
- Spontaneous ventilation

Anesthesia techniques

Choice	Advantage	Disadvantage
Close system	<ul style="list-style-type: none">- Protect airway- Control airway- Control ventilation- Minimal pollution- Et CO₂ monitoring- Routine technique	<ul style="list-style-type: none">- Limitation of visibility and surgical access- Risk of laser airway fire
Open system	<ul style="list-style-type: none">- Complete laryngeal visualization- Minimal risk tube-related trauma to glottis- Laser safety	<ul style="list-style-type: none">- Unprotected lower airway- Require specialist equipment, knowledge and experience

With tracheostomy tube

- Standard TT with cuff
- Silver TT [joint connector]
- *Laser tube, spiral tube via stroma*

No tracheostomy tube

- MLT tube
- Laser tube
- Jet ventilation
- Intermittent apnea
- Spontaneous ventilation

Ideal ET-tube for laser used

1. Non-flammable
2. Easily applied
3. Small size

TABLE 70.2 Some Types of Laser Endotracheal Tubes in Clinical Use

Name	Description	Intended Use
Laser-Flex	Airtight stainless steel corrugated spiral with a PVC Murphy eye tip and double cuffs. More information is available at http://www.cardinal.com/us/en/distributedproducts/ASP/43168-145.asp .	CO ₂ or KTP lasers
Laser-Shield II	Silicone rubber tube wrapped with aluminum and wrapped over with Teflon. More information at http://assets.medtronic.com/en/flipbook-us/files/assets/basic-html/index.html#190	CO ₂ or KTP lasers
Lasertubus	Soft white rubber, reinforced with corrugated copper foil and an absorbent sponge; double cuffed. More information at http://www.myrusch.com/images/rusch/docs/A20C.pdf	CO ₂ or KTP lasers
Sheridan Laser-Trach	Red rubber design with embossed copper foil and outer covering designed to reduce damage to mucosal surfaces and vocal cords. More information at	CO ₂ or KTP lasers

Laser Resistant Endotracheal Tubes

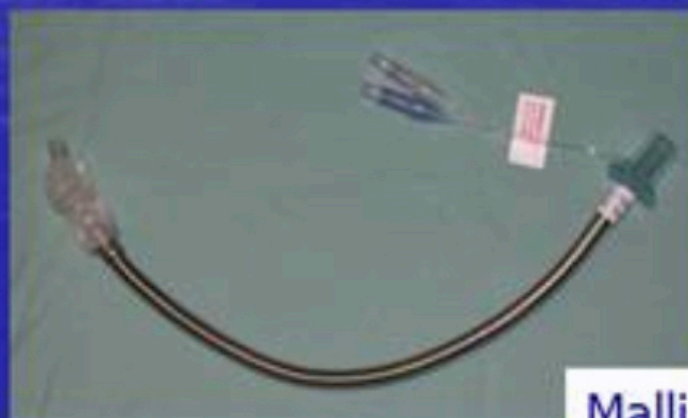


Red rubber
ETT wrapped
with
protective
metal foil

Xomed Laser-Shield II,
aluminum wrap, silicone
based tube & cuff



Sheridan red rubber
tube & cuff, wrapped
with copper, fabric



Mallinckrodt
Laser Flex,
stainless steel, 2
PVC cuffs

Laserflex tube

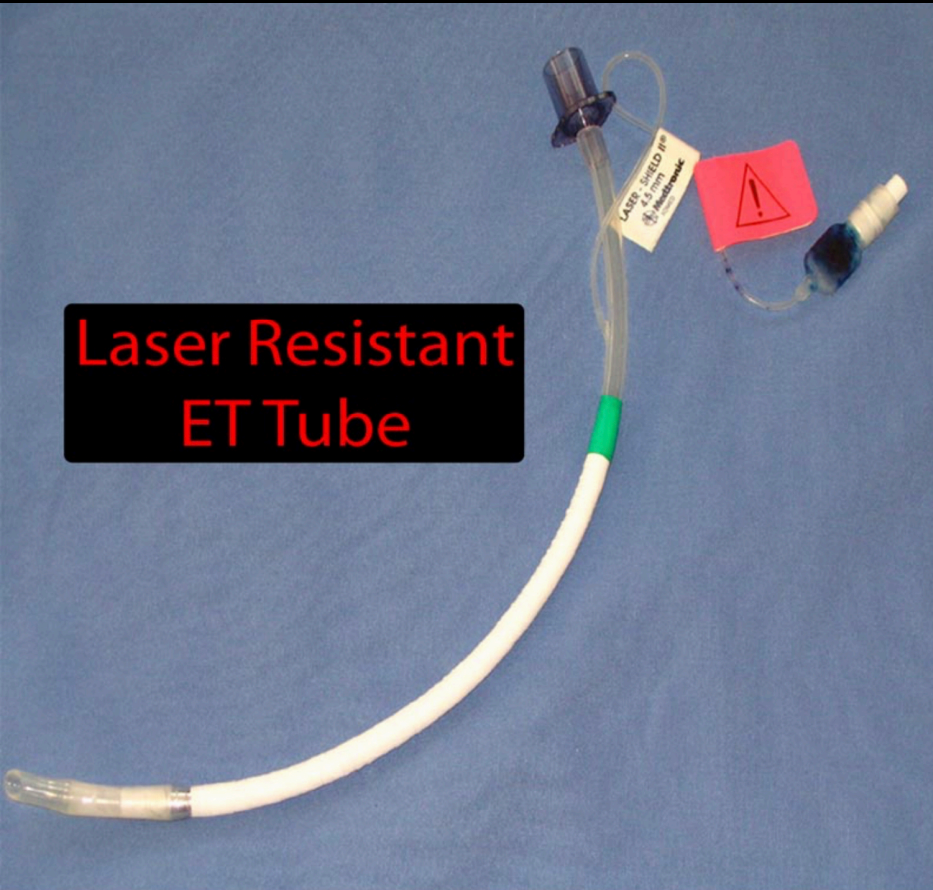


©drrahmatorlummc

- Non-flammable, large size
- NO.6 for men , No.5 for women

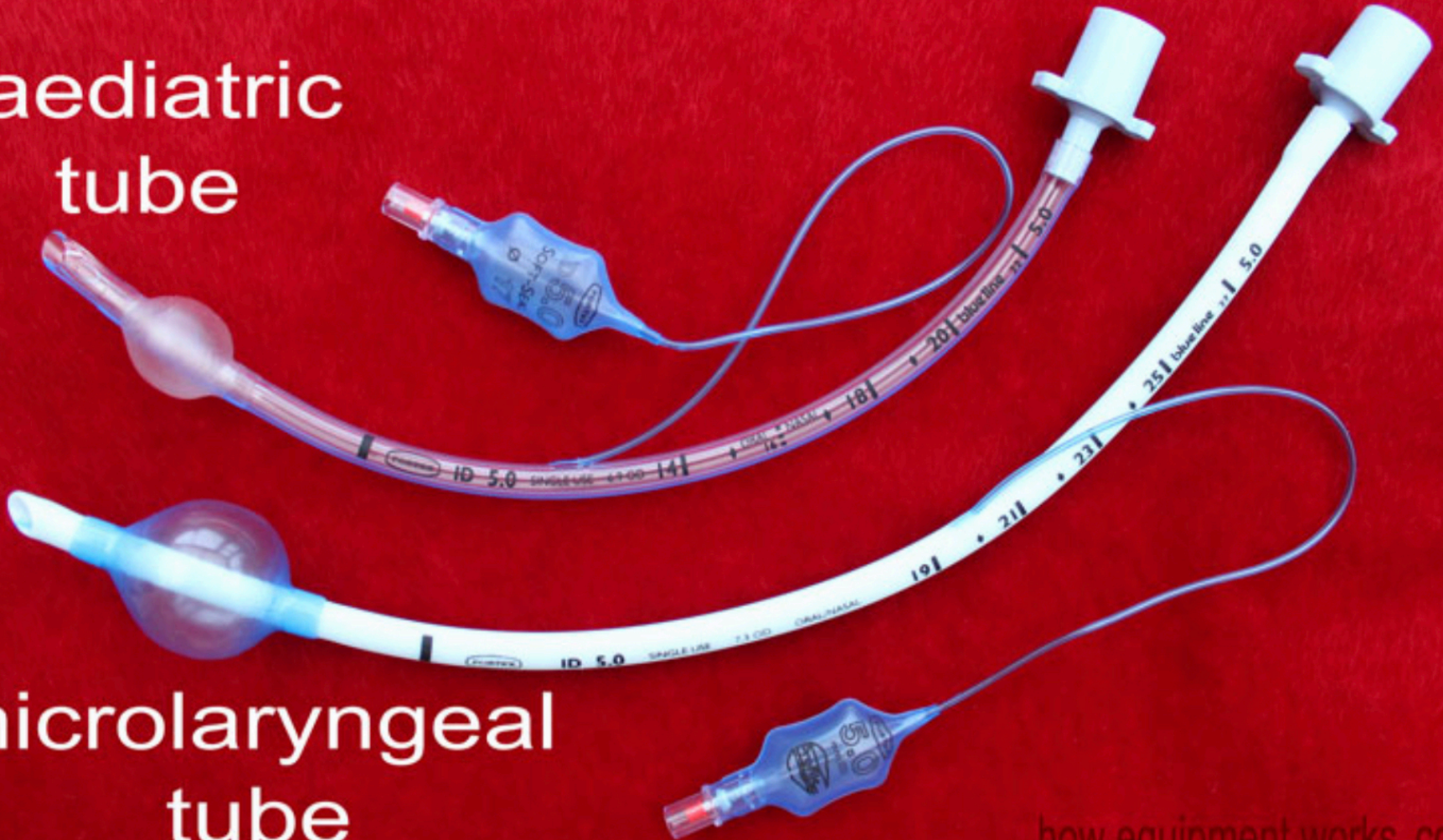
Laser shield

Laser Resistant
ET Tube



Microlaryngeal tube [MLT]

paediatric
tube



microlaryngeal
tube

Advantages and Disadvantages of ET Tube Types

<u>Type of tube</u>	<u>Advantages</u>	<u>Disadvantages</u>
PVC	Inexpensive, nonreflective	Low melting point, combustible
Red rubber	Puncture resistant, nonreflective	Highly combustible
Silicone rubber	Nonreflective	Combustible , turns to toxic ash
Metal	Combustion resistant	Reflects laser, flammable cuff, cumbersome

Open systems

- Spontaneous ventilation
- Intermittent apnea
- Jet ventilation

Spontaneous ventilation

- Maintain ventilation by patient
- Assisted ventilation
- TIVA
- *Supplement with local/topical anesthesia*
- *Blunt laryngeal response*
- *Monitoring adequate hypnotic stage*

Intermittent apnea

- Hyperventilation > intermittent tracheal extubation
- *Period of apnea 5-10 min*
- *Keep SpO₂ > 90% ,EtCO₂ 40-60 mmhg*
- TIVA
- Incidence of awareness 4%

Choice	Advantage	Disadvantage
Spontaneous ventilation	<ul style="list-style-type: none"> - Complete laryngeal view - Evaluate vocal cord function - Good for stable patient with compromise airway 	<ul style="list-style-type: none"> - Oxygenation & ventilation more difficult to assess - Motion surgical field - Risk of aspiration - Risk of awareness
Intermittent apnea	<ul style="list-style-type: none"> - Immobile surgical field - Complete laryngeal view - Laser safety 	<ul style="list-style-type: none"> - Interruption to surgery for reintubation - Potential trauma through multiple reintubation - Risk of aspiration

Jet ventilation

Approaches

1. Supraglottic approach
2. Subglottic approach
3. Transtracheal approach

Contraindicaiton

- *Upper airway obstruction*
- *Poor pulmonary compliance*
- *Morbid obesity*

Jet ventilation

- Vary tidal volume with thoracic compliance
- *Ventilatory rates of 10-20/min*
- *Jet pressure*
 - *5-10 psi in children*
 - *20 psi in adult and increase until adequate chest movement [< 30psi]*

Jet ventilation	Advantage	Disadvantage
Supraglottic	<ul style="list-style-type: none"> - Tubeless surgical field 	<ul style="list-style-type: none"> - Rely on surgeon to adequate ventilation - Vocal cord movement - Blow debris into the airway - No PAWP/EtCO₂ monitor - No control FiO₂
Subglottic	<ul style="list-style-type: none"> - No vocal cord movement 	<ul style="list-style-type: none"> - Catheter in surgical field - Risk barotrauma - Risk of airway fire
Transtracheal	<ul style="list-style-type: none"> - Tubeless surgical field 	<ul style="list-style-type: none"> - Contraindicated in tight stenosis - No PAWP/EtCO₂ monitor

Anesthesia technique

*GA with Laser tube [via stroma] with
controlled ventilation*

Airway fire [Triad]



Alcohol-based Skin Preps, Surgical Drapes, Patient

ETT, face mask, suction, LMA, Gauze

OPERATING ROOM FIRES ALGORITHM

Fire Prevention:

- Avoid using ignition sources¹ in proximity to an oxidizer-enriched atmosphere²
- Configure surgical drapes to minimize the accumulation of oxidizers
- Allow sufficient drying time for flammable skin prepping solutions
- Moisten sponges and gauze when used in proximity to ignition sources

YES

Is this a High-Risk Procedure?

An ignition source will be used in proximity to an oxidizer-enriched atmosphere

No

- Agree upon a team plan and team roles for preventing and managing a fire
- Notify the surgeon of the presence of, or an increase in, an oxidizer-enriched atmosphere
- Use cuffed tracheal tubes for surgery in the airway; appropriately prepare laser-resistant tracheal tubes
- Consider a tracheal tube or laryngeal mask for monitored anesthesia care (MAC) with moderate to deep sedation and/or oxygen-dependent patients who undergo surgery of the head, neck, or face.
- Before an ignition source is activated:
 - *Announce* the intent to use an ignition source
 - *Reduce* the oxygen concentration to the minimum required to avoid hypoxia³
 - *Stop* the use of nitrous oxide⁴

Fire Management:

Early Warning Signs of Fire⁵

Fire is not present;
Continue procedure

HALT PROCEDURE
Call for Evaluation

FIRE IS PRESENT

AIRWAY⁶ FIRE:

- IMMEDIATELY, without waiting**
- Remove tracheal tube
 - Stop the flow of all airway gases
 - Remove sponges and any other flammable material from airway
 - Pour saline into airway

NON-AIRWAY FIRE:

- IMMEDIATELY, without waiting**
- Stop the flow of all airway gases
 - Remove drapes and all burning and flammable materials
 - Extinguish burning materials by pouring saline or other means

If Fire is Not Extinguished on First Attempt
Use a CO₂ fire extinguisher⁷
If FIRE PERSISTS: activate fire alarm, evacuate patient, close OR door, and turn off gas supply to room

Fire out

Fire out

- Re-establish ventilation
- Avoid oxidizer-enriched atmosphere if clinically appropriate
- Examine tracheal tube to see if fragments may be left behind in airway
- Consider bronchoscopy

- Maintain ventilation
- Assess for inhalation injury if the patient is not intubated

Assess patient status and devise plan for management

OPERATING ROOM FIRES ALGORITHM

Fire Prevention:

- Avoid using ignition sources¹ in proximity to an oxidizer-enriched atmosphere²
- Configure surgical drapes to minimize the accumulation of oxidizers
- Allow sufficient drying time for flammable skin prepping solutions
- Moisten sponges and gauze when used in proximity to ignition sources

YES

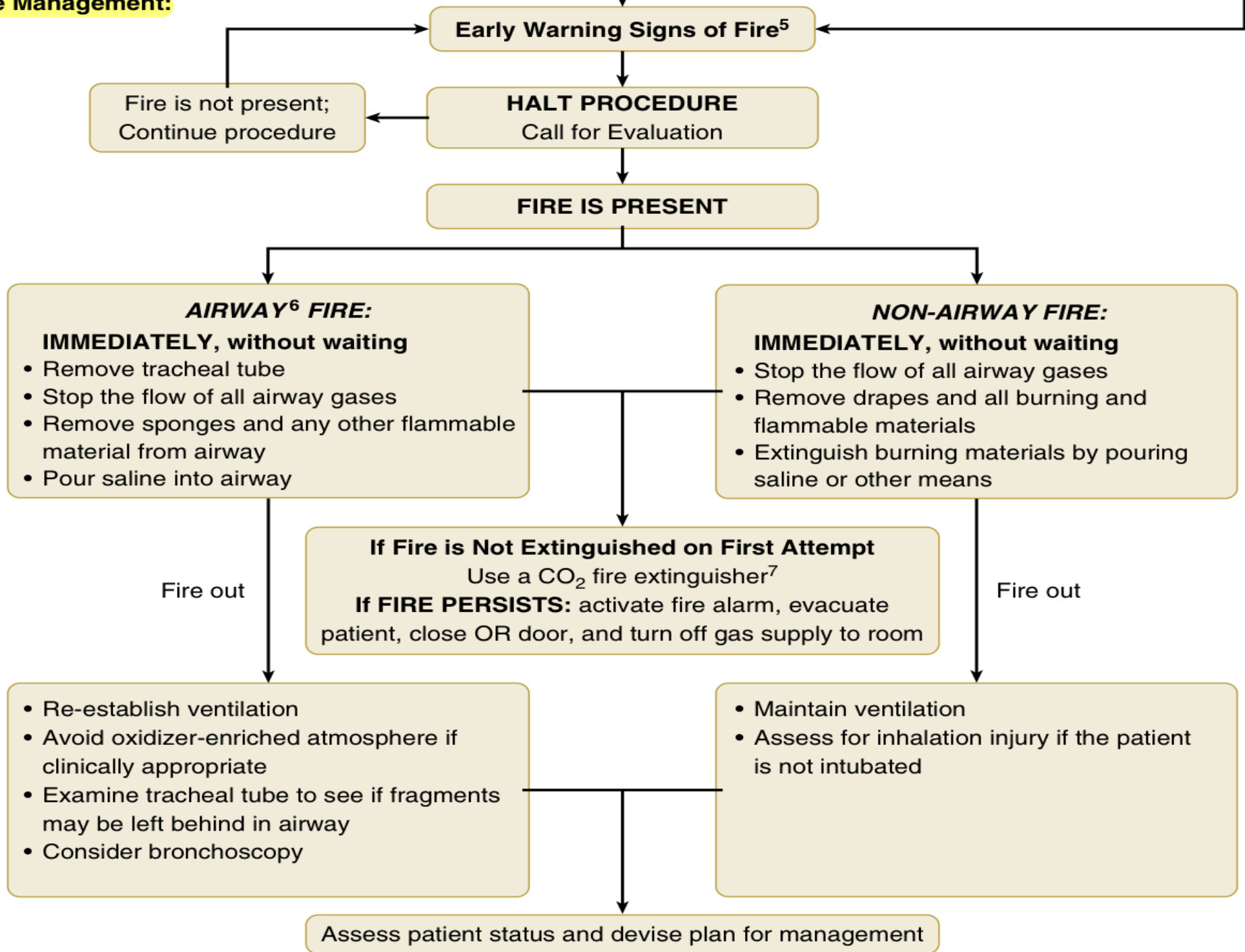
Is this a High-Risk Procedure?

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to an oxidizer-enriched atmosphere

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Fire Management:



Early Warning Signs of Fire⁵

Fire is not present;
Continue procedure

HALT PROCEDURE
Call for Evaluation

FIRE IS PRESENT

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IMMEDIATELY, without waiting

- Remove tracheal tube
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- Remove sponges and any other flammable material from airway
- Pour saline into airway

NON-AIRWAY FIRE:
IMMEDIATELY, without waiting

- Stop the flow of all airway gases
- Remove drapes and all burning and flammable materials
- Extinguish burning materials by pouring saline or other means

If Fire is Not Extinguished on First Attempt
Use a CO₂ fire extinguisher⁷
If FIRE PERSISTS: activate fire alarm, evacuate patient, close OR door, and turn off gas supply to room

• Re-establish ventilation

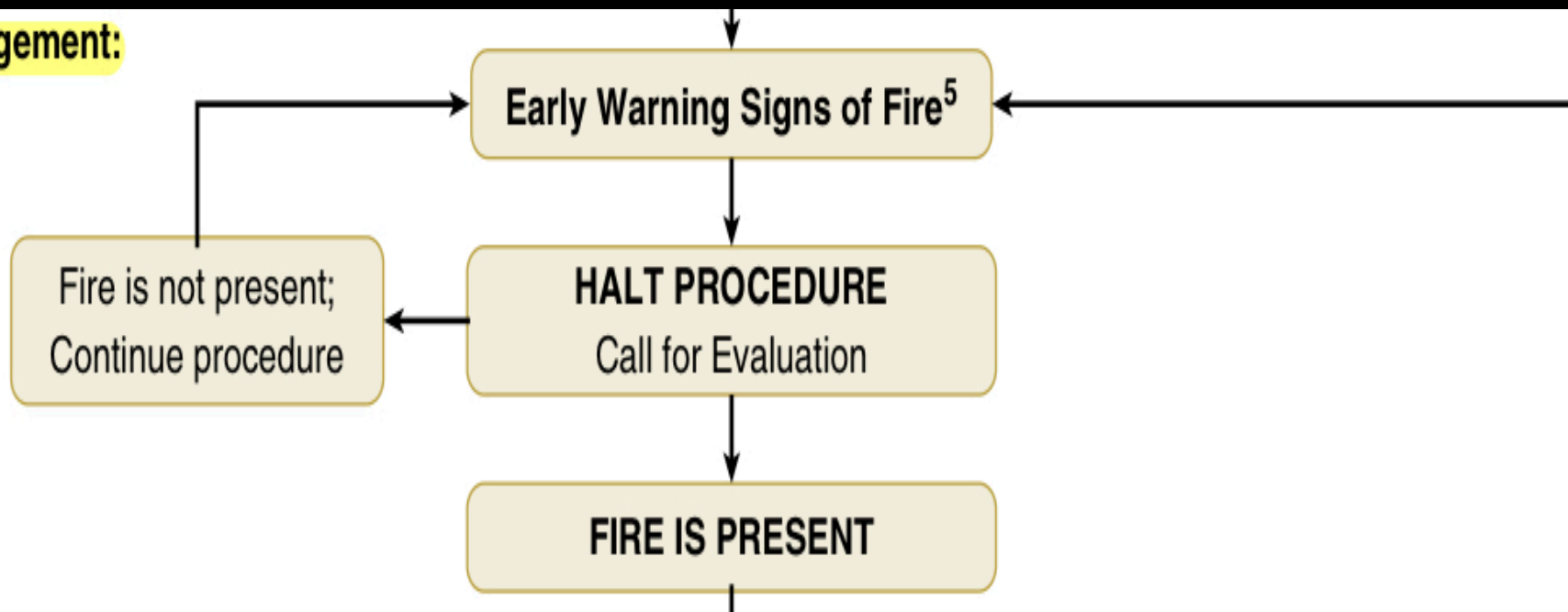
- Avoid oxidizer-enriched atmosphere if clinically appropriate
- Examine tracheal tube to see if fragments may be left behind in airway
- Consider bronchoscopy

• Maintain ventilation

- Assess for inhalation injury if the patient is not intubated

Assess patient status and devise plan for management

Fire Management:



- Early warning sign
 - Unexpected flash, flame, smoke, heat, sound
 - Discoloration of drapes or breathing circuit
 - Unexpected patient movement or complaint

AIRWAY⁶ FIRE:

IMMEDIATELY, without waiting

- Remove tracheal tube
- Stop the flow of all airway gases
- Remove sponges and any other flammable material from airway
- Pour saline into airway

NON-AIRWAY FIRE:

IMMEDIATELY, without waiting

- Stop the flow of all airway gases
- Remove drapes and all burning and flammable materials
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Fire out

Fire out

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- Examine tracheal tube to see if fragments may be left behind in airway
- Consider bronchoscopy

- Maintain ventilation
- Assess for inhalation injury if the patient is not intubated

Assess patient status and devise plan for management

BOX 70.2 Management of Airway Fires

Prevention and Preparedness

1. Keep the O₂ concentration at approximately 30%, or less if possible. Use an O₂/air mixture. Avoid N₂O.
2. Use a “laser-safe” endotracheal tube.
3. Inflate the endotracheal tube cuff with dyed normal saline to provide an early indicator of cuff rupture.
4. Use a pre-prepared 50-mL syringe of saline to extinguish any fire, and flood the surgical field if a fire occurs.
5. Have an extra endotracheal tube available for reintubation in case a fire occurs.
6. Inform the surgical team working on the airway of any situation in which high concentrations of O₂ are being used.

In the Case of an Airway Fire

1. Stop lasering. Stop ventilation. Turn O₂ off (as well as N₂O if it was mistakenly in use).
2. Inform the surgical team, and assign someone to call the control desk for help.
3. Remove the burning endotracheal tube* and drop it in the bucket of water, if available.
4. Put out the fire with your improvised fire extinguisher.
5. The area should be flushed with saline.

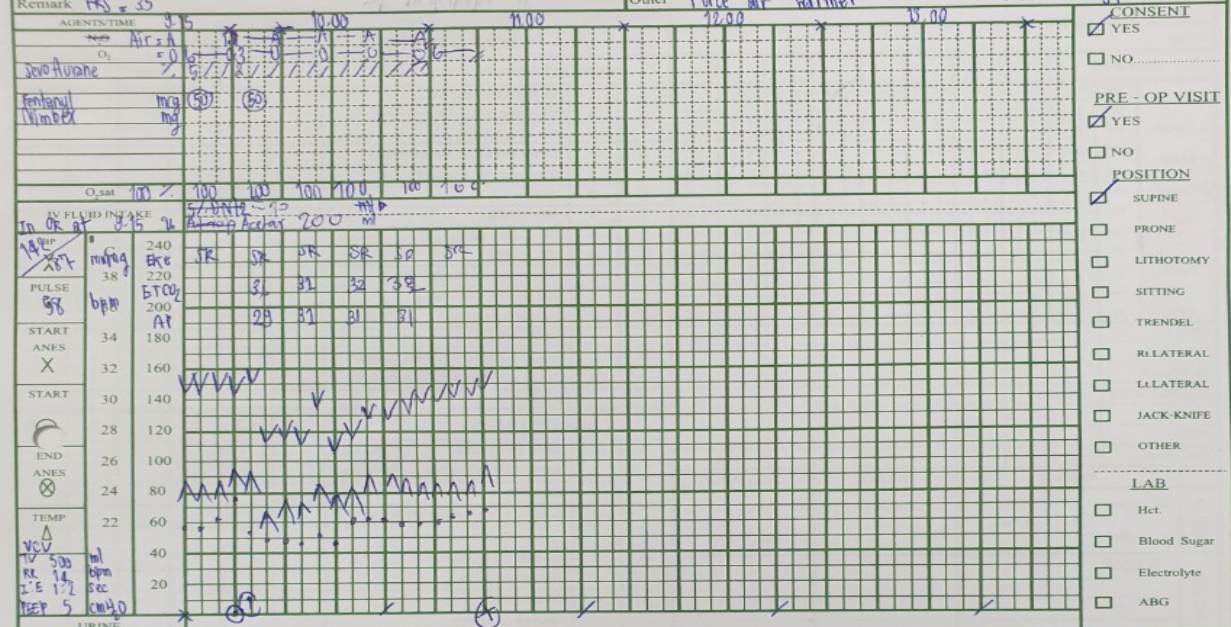
When the Fire Is Extinguished

1. Ventilate the patient with 100% O₂ by facemask (or supraglottic airway if appropriate).
2. When the patient is stable, assess the extent of airway damage. Consider using a ventilating rigid bronchoscope; debris and foreign bodies should be removed.
3. Reintubate the patient if significant airway damage is found.
4. When appropriate, arrange for admission to an ICU.
5. Provide supportive therapy, including ventilation and antibiotics, and extubate when appropriate.
6. Tracheotomy may be needed.

OPERATION

Phramongkutkiao Hospital Anesthetic Record

Date: 28.11.14 HN: 35657163 AN: 7108164 ASA 1 @ 3 4 5 E WT: 65 kg HT: 161 cms Hct: 38 %
 Name: นพ.วิมล วชิราภรณ์ Age: 49 Y Sex: M BI Group: - BI Request: -
 Ward: 813 ENT Code: 309 Op. No: 36 - 1 PRE-Medication: -
 Anesthetic technique: GA & laser tube Service: ENT Monitoring: NIBP, O₂ Sat, EKG, KTCO, A-line, CVP, PAP, TEMP.
 Remark: FRS = 35 Other: Force air warmer ROOM No. 31



URINE: - BLOOD: - FLUID: 5% D₅W 1200 ml (hold) IV. CATH. NO. 20 SITE LH TOTAL URINE OUTPUT - ml

PRECURARIZATION: - mg
 INDUCTION AGENT: Propofol 80 mg, Sevoflurane 5%
 INTUBATION AGENT: Nimbec 2 mg
 INHALATION AGENT: Air 100%
 M. RELAXANT: - mg
 SEDATIVE: - mg
 AN. GESIC: Fentanyl 100 mcg
 RE. CASE: Propofol 2.5 mg + Atropine 1.2 mg

AIR WAY: NASAL ORAL
 TRACHEAL TUBE: NASAL ORAL
 ONTT No. 8.5 mm ID
 OTHER: equal, one ss vidisic & Mistrap tape
 SIZE: laser 6.0 DEPTH: 7.0 cms
 TECHNICAL DIFFICULTY: nil
 ATTEMPT: 1 BY: Dr. Vichai
 INDUCTION PERIOD: SMOOTH INDUCTION SPASM
 EMERGENCE: SLEEP CRYING
 TRACHEAL-TUBE SPONTANEOUS
 PRE-OP diag: @ laryngeal papillomatosis
 OPERATION: Micro DL with CO₂ laser excision & change tube (Trakit No. 8)
 SURGEON: Dr. Vichai & Dr. Vichai
 ANESTHESIOLOGIST: Dr. Vichai & Dr. Vichai

TREATMENT: @ Acetar 1000 ml
 FLUID SUMMARY: DEXTROSE-WATER 12.5 ml, DEXTROSE-SALINE 200 ml, ACETATE/LRS 200 ml
 COMPLICATION: none
 POST-OP diag: same
 EBL SUCTION: minimal ml
 SWAB: minimal ml
 TOTAL: minimal ml
 DRAIN: - PACK: -
 SCRUB NURSE: Dr. Vichai, Dr. Vichai
 CIRC NURSE: Dr. Vichai
 TIME: 1 HR. 30 MIN

Anesthetic technique: GA \bar{c} laser tube Service: ENT Monitoring: NIBP, O₂Sat, EKG, ETCO₂, A-line, CVP, PAP, TEMP. ROOM No. 31

Remark: FRS = 35 Other: Force air warmer

AGENTS/TIME: 9:00, 10:00, 11:00, 12:00, 13:00

Agents: Air 5A, Sevoflurane, Fentanyl, Vimblex

O₂sat: 100%

IV FLUID INTAKE: In OR at 9:15 200 ml Acetate

Vital Signs:

Time	BP	HR	ETCO ₂	SpO ₂
9:15	142/87	58	36	100
9:30	142/87	58	31	100
9:45	142/87	58	32	100
10:00	142/87	58	31	100

START ANES: 34

START: 30

END ANES: 24

TEMP: 36.5

VCV: TV 500 ml, RR 14 bpm, I:E 1:2, PEEP 5 cmH₂O

URINE: 5 ml

BLOOD: 5 ml

FLUID: 5 ml, DN 2 (V) 878 ml, 100 ml (hold)

IV. CATH. NO. 20 SITE LH

CONSENT: YES

PRE-OP VISIT: YES

POSITION: SUPINE

LAB: Hct, Blood Sugar, Electrolyte, ABG

At 9.15 start

- NIBP 142 / 87 mmHg
- HR 58 bpm
- On TT No.8.5 from ward
- Fentanyl 50 mcg
- Inhalation induction sevoflurane up to 6 %
- Cisatracurium 8 mg iv
- **Change Laser tube No.6 depth 7 cm**

Anesthetic technique: GA \bar{c} over tube Service: ENT Monitoring: NIBP, O₂Sat, EKG, ETCO₂, A-line, PAP, TEMP.
 Remark: FRS = 35 Other: Force air warmer ROOM No. 31

AGENTS/TIME	9.15	10.00	11.00	12.00	13.00
Air 5A	100%	100%	100%	100%	100%
O ₂	5.0	5.0	5.0	5.0	5.0
Sevoflurane	1.7	1.7	1.7	1.7	1.7
Fentanyl	50 mcg	50 mcg			
Wimbex					
O ₂ sat	100%	100%	100%	100%	100%
IV FLUID INTAKE	5% DVT	200 ml			
In OR at	9.15				
BP	142/87	142/87	142/87	142/87	142/87
PULSE	98	98	98	98	98
START ANES	X				
START	30				
END ANES					
TEMP					
VCV	TV 500 ml	RR 14 bpm	I:E 1:2 sec	PEEP 5 cmH ₂ O	
URINE					
BLOOD					
FLUID	5% DVT	200 ml (hold)			

At 9.35 start operation

- Eye goggles and N95 [staff]
- Fentanyl 50 mcg before start laser excision
- Maintenance : Air:O₂:Sevo , 1.7:0.3:up to 2%

CONSENT

YES

NO.....

PRE - OP VISIT

YES

NO

POSITION

SUPINE

PRONE

LITHOTOMY

SITTING

TRENDEL

Ri.LATERAL

Li.LATERAL

JACK-KNIFE

OTHER

LAB

Hct.

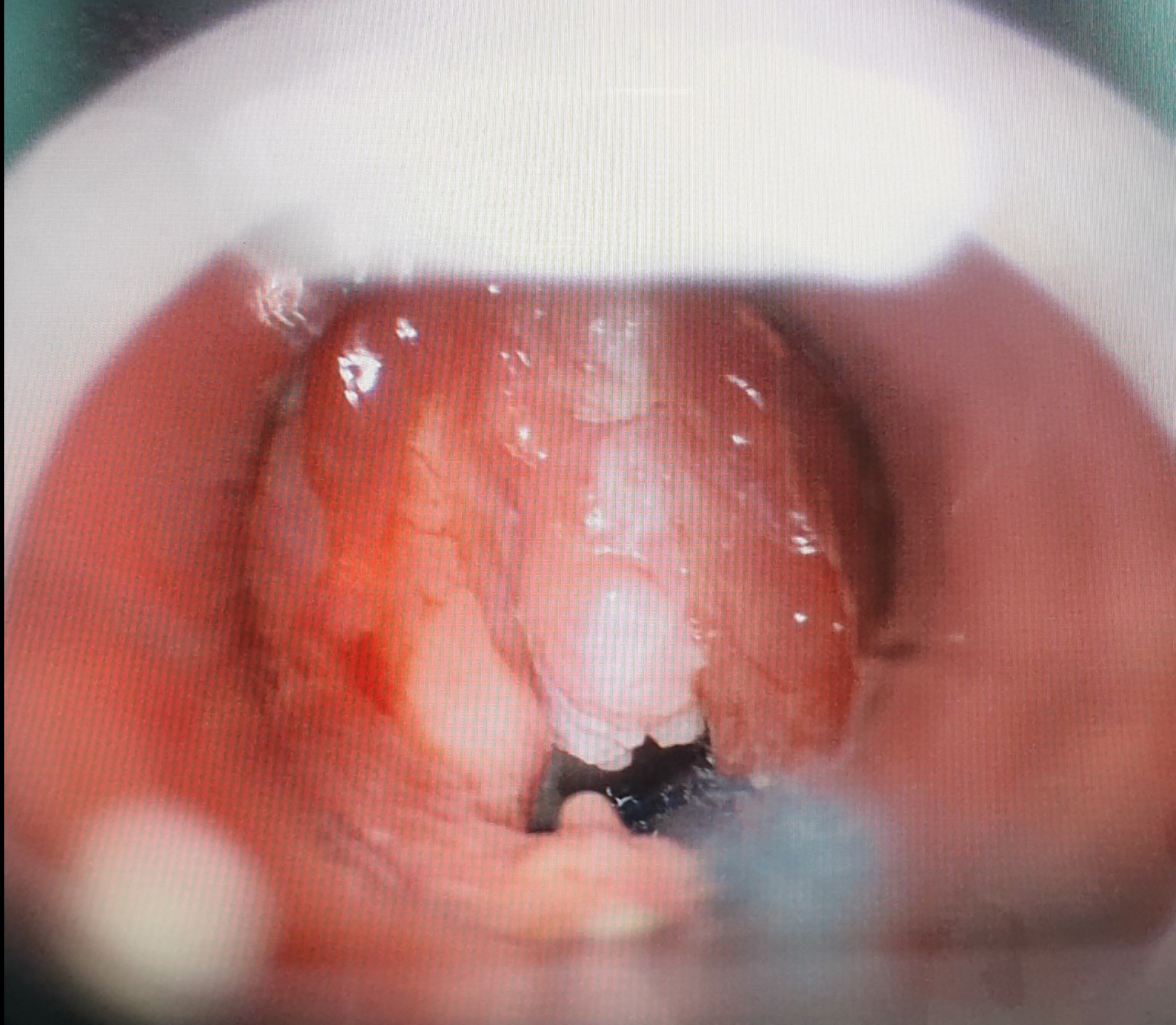
Blood Sugar

Electrolyte

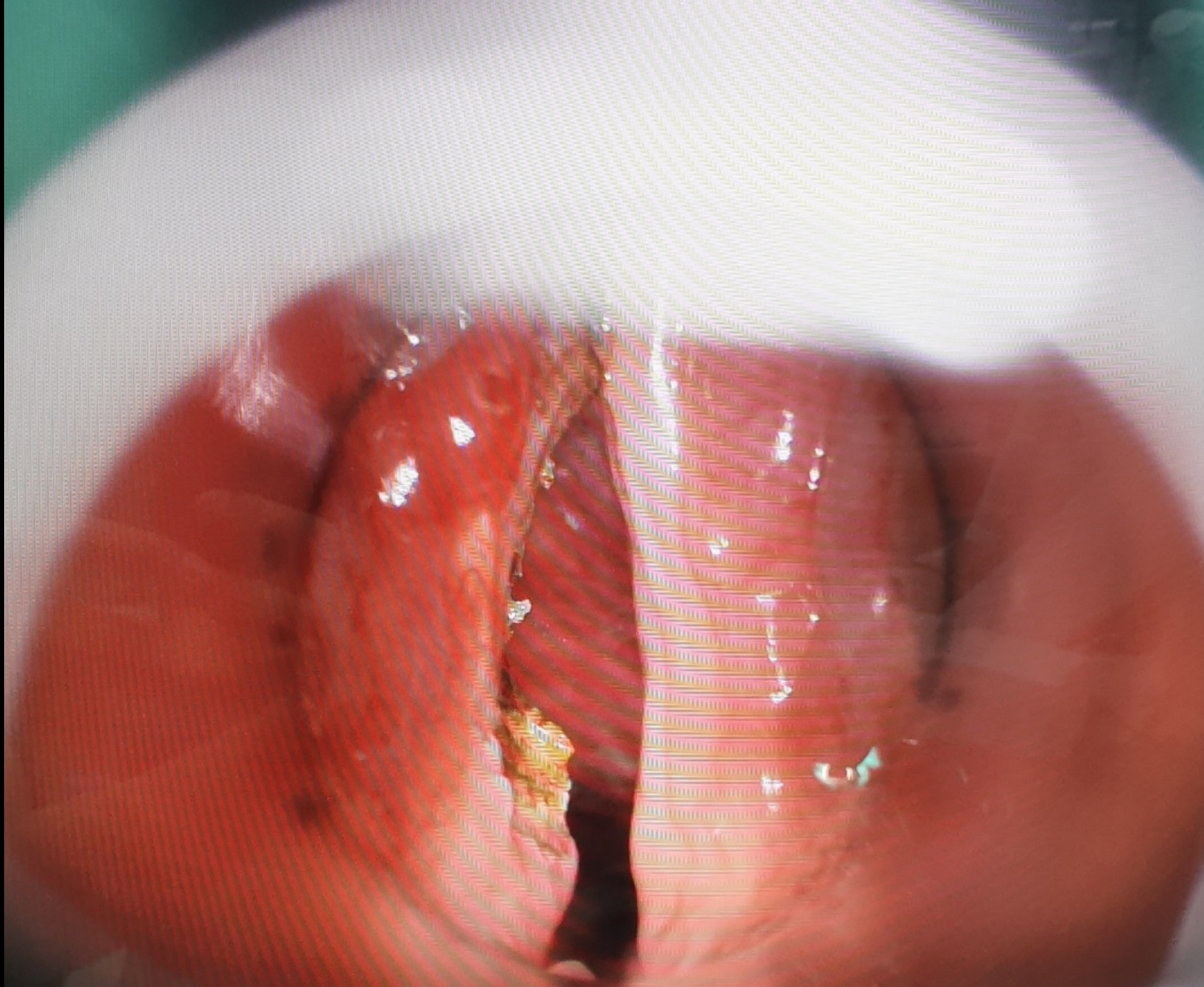
ABG

TOTAL URINE

OUTPUT — ml







Anesthetic technique: GA \bar{c} laser tube Service: ENT
 Monitoring: NIBP, O₂Sat, EKG, ETCO₂, A-line, PAP, TEMP.
 Remark: FRS = 35 Other: Force air warmer ROOM No. 31

AGENTS/TIME	9.15	10.00	11.00	12.00	13.00
Air 5A	100	100	100	100	100
O ₂	5.0	3.0	3.0	3.0	3.0
Sevoflurane	5.0	3.0	3.0	3.0	3.0
Fentanyl	50	50			
Wimbex					
O ₂ sat	100%	100	100	100	100
IV FLUID INTAKE	5% DVT 200 ml	Acetar 200 ml			
In OR at	9.15				
BP	142/87	120/80	120/80	120/80	120/80
PULSE	98	98	98	98	98
START ANES	X				
END ANES					
TEMP					
VCV	TV 500 ml				
RR	14 bpm				
I:E	1:2				
PEEP	5 cmH ₂ O				
URINE					
BLOOD					
FLUID	5% DVT 200 ml	Acetar 200 ml			

At 10.45 end operation

- Operation time 1 hr 30 mins
- Reverse: neostigmine 2.5 mg + atropine 1.2 mg
- Total narcotic : fentanyl 100 mcg
- Acetar 200 ml
- Change laser tube >> TT No. 8.5

CONSENT

YES

NO

PRE - OP VISIT

TRENDEL

Ri.LATERAL

Li.LATERAL

JACK-KNIFE

OTHER

LAB

Hct.

Blood Sugar

Electrolyte

ABG

TOTAL URINE OUTPUT — ml

Postoperative day 0

S : ตื่นรู้ตัว ถามตอบทำตามสั่งได้ *ไม่มีหายใจเหนื่อย รับประทานอาหารได้
ระคายเคืองเล็กน้อย มีเสมหะ* ปัสสาวะออกดี

O : V/S BT 36.9 °C BP 122/75 mmHg HR 56 bpm RR 16 b/m

Lung : clear both lung, no stridor

A+P : Left laryngeal papillomatosis S/P Micro DL with CO₂ laser
excision post op day 0

- ตื่นดี กินได้ plan off IV
- Fentanyl 50 mcg IV prn q 4 hr
- Paracetamol [500] 1 tab PO prn q 6 hr
- งดใช้เสียง 7 วัน , นัด F/U 1 wk

Postoperative day 1

