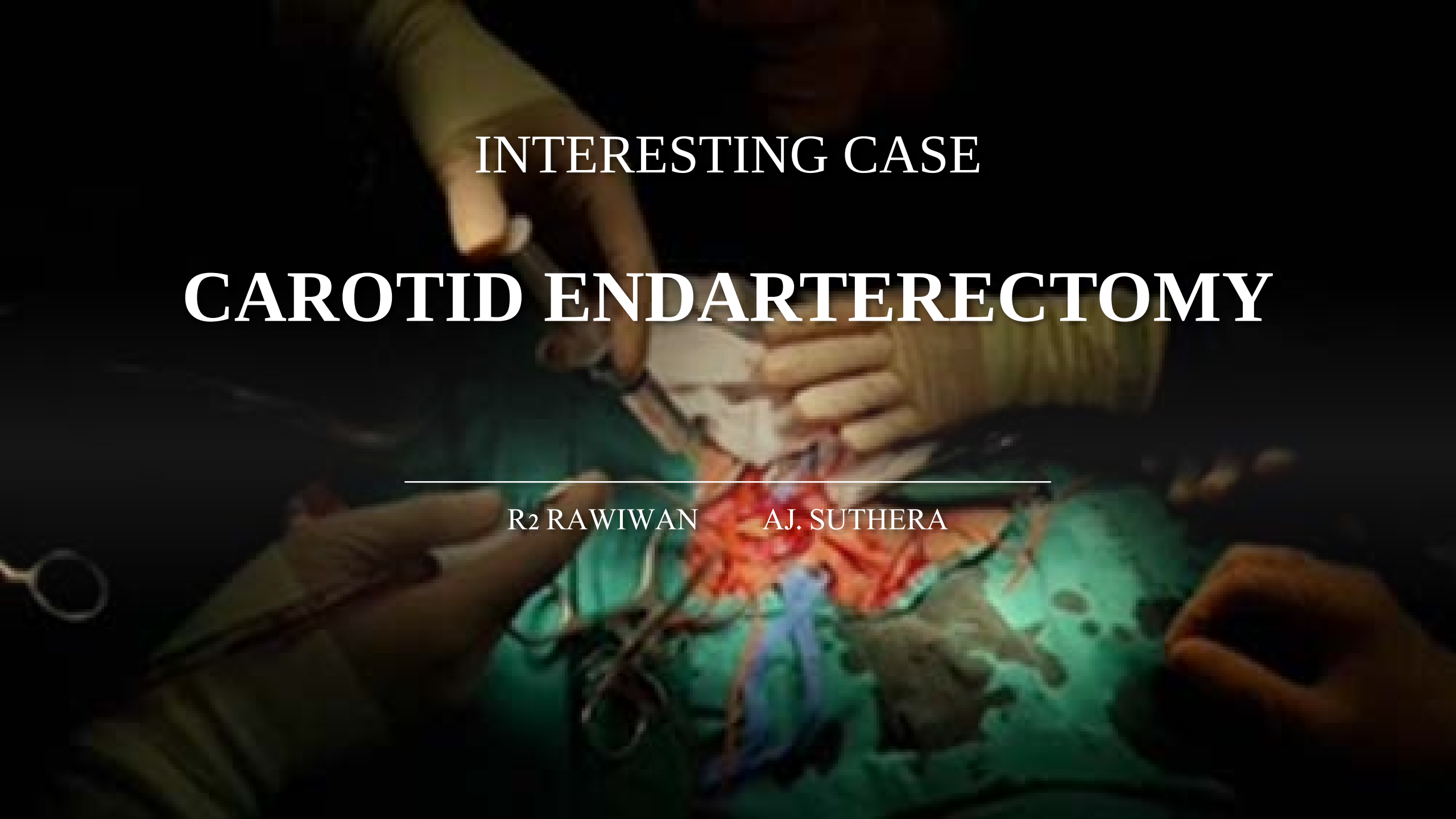


INTERESTING CASE

CAROTID ENDARTERECTOMY

R2 RAWIWAN AJ. SUTHERA

INTERESTING CASE

- CASE : Male 66 years old
- DX : Right carotid artery stenosis
- Operation : Carotid Endarterectomy (CEA)

CHIEF COMPLAINT

- CC : นัดมาผ่าตัด
- PI : 2 สัปดาร์ก่อนมาโรงพยาบาล ผู้ป่วยมีอาการหนังตาตกข้างขวา เหงื่อไหลที่ใบหน้าซีกขวาลดลง อ่อนแรงแขนและขาซีกขวา ก้าวขาไม่ได้ ไม่มีปากเบี้ยวพูดไม่ชัด ไปรักษาที่โรงพยาบาลปากเกร็ด อาการไม่ดีขึ้น มีมุมปากขวาตก หนังตาตกมากขึ้น อ่อนแรงและเดินหกล้ม ญาติจึงพามาดรงพยาบาลพระมงกุฎเกล้า>>
  DX : Acute ischemic stroke
- 1 สัปดาห์ก่อนมาโรงพยาบาล หลังรักษาอาการอ่อนแรงดีขึ้น ยังมีหนังตาข้างขวาตกเล็กน้อย
- W/U cause >> U/S พบ Right proximal ICA severe stenosis
- CT พบ Hypoperfusion of right MCA ,moderate stenosis of basilar artery
- วันนี้ แพทย์นัดมาผ่าตัดรักษาหลอดเลือดตีบ อาการทั่วไปปกติดี ไม่มีอาการอ่อนแรง หนังตาไม่ตก

HISTORY

- **Underlying disease :** HT, DLP
- **Medication** :Manidipine(10) 1 tab PO OD PC

  Atorvastatin(40) 1 tab PO HS

  ASA(81) 1 TAB PO OD PC (On ถึงเช้าวันผ่าตัด)

  Pletaal SR(100) 2 tab PO OD AC(Hold 3 day)

PAST HISTORY

- No history of food and drug Allergy
- No smoking
- No alcohol drinking
- Previous surgery : ผ่าตัดสลายนิ่วที่ไต 10 ปี PTA under SA no complication
- Functional class 1

R1

PHYSICAL EXAMINATION AND INVESTIGATION

PHYSICAL EXAMINATION

- Vital sign : BT37.2 c ,HR 78 bpm ,RR 18/min, BP 140/77 mmHg (baseline 140-150/70-80)
- BW 88 kg, Height 182 cm, BMI 26.6 kg/m2
- GA : A Thai male, good consciousness
- HEENT : not pale conjunctivae, anicteric sclerae, no dry lips/dry tongue
- JVP ; not elevate, carotid bruit positive at right site
- Respiratory : Lung clear and equal, no adventitious sound
- CVS : normal S1S2 ,no murmur, no S3 gallop, no heaving ,no thrill, PMI at 5^{th} ICS MCL,

PHYSICAL EXAMINATION

- Extremity : no pitting edema
- Neuro : E4V5M6, no facial palsy, pupil 2 mm RTLBE ,Motor grade V all extremities, Sensory intact

  Reflex all 2+ , BBK and clonus negative
- Airway : Mallampati grade 1

  Thyromental distance > 6 cm

  Mouth opening > 3 cm

  No prominent incisor

  Upper lip bite test class I

  No limit ROM of neck

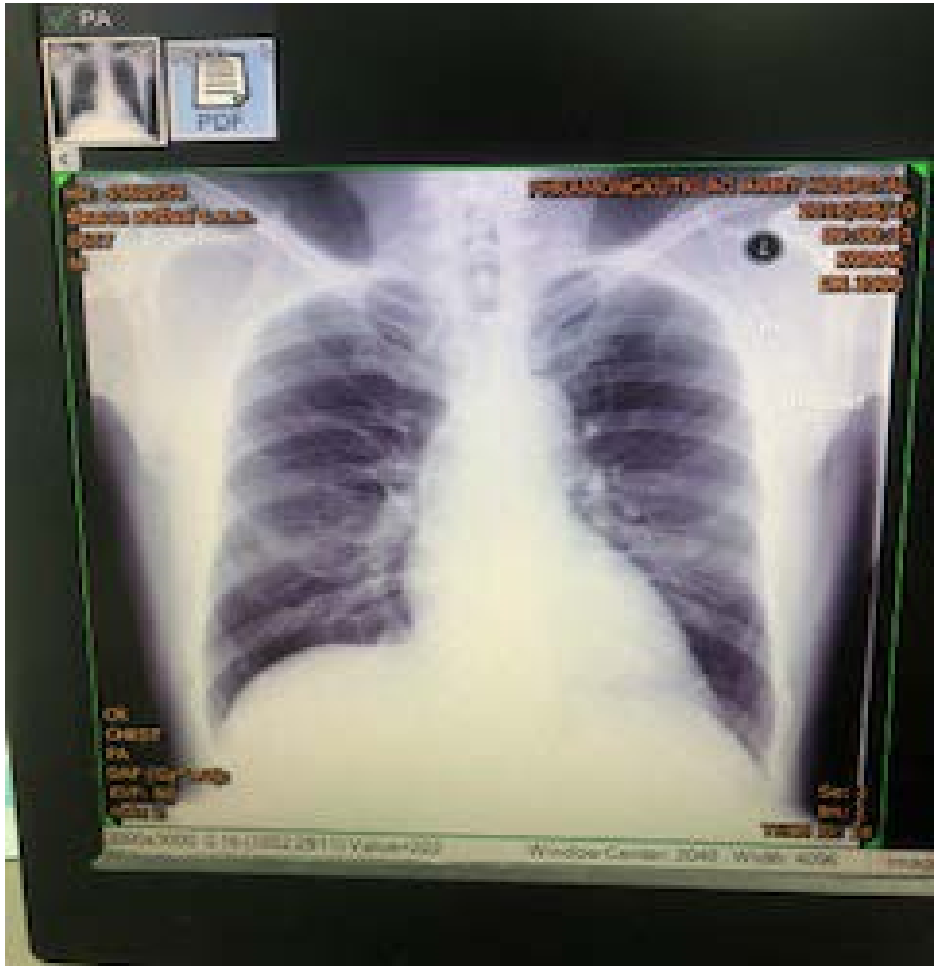
  Right lower broken tooth

INVESTIGATION

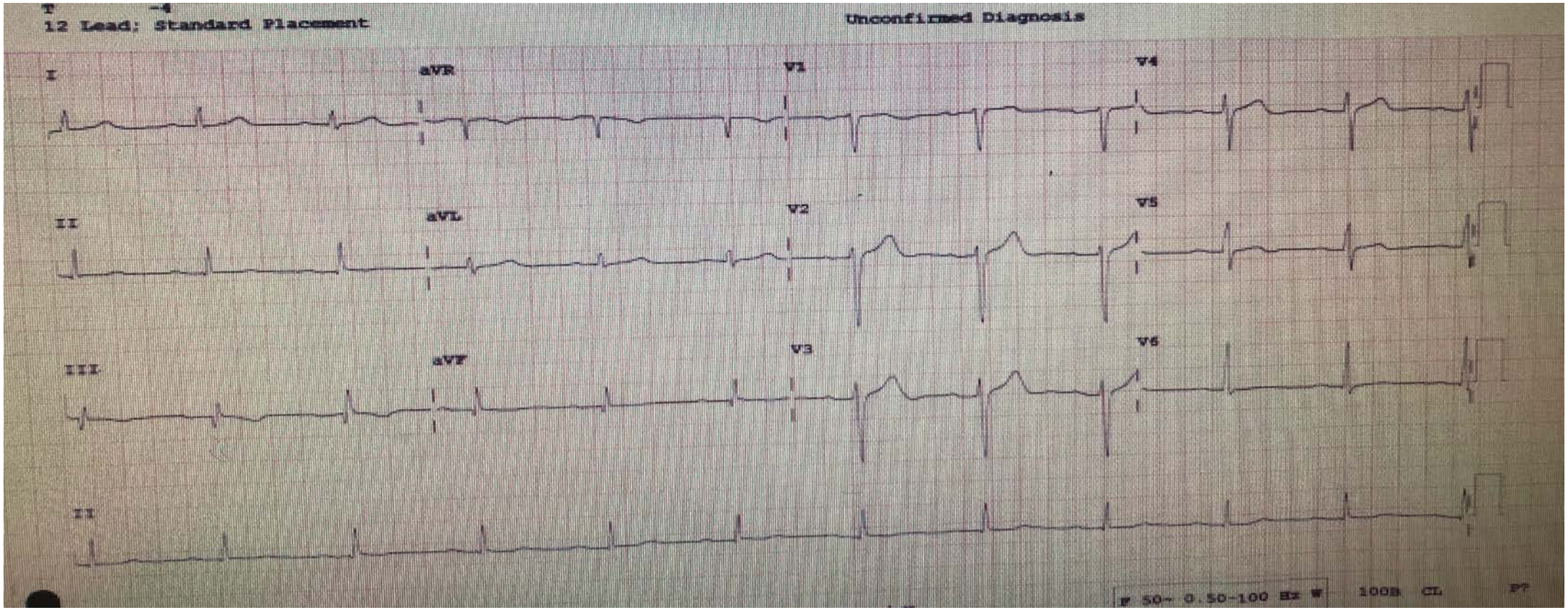
- CBC : Hb 15.3 %, Hct 47 %, Platelet 214,000 /mm2
- BUN : 14.1 , Cr : 0.89 mg/dl, GFR 81 ml/min/1.73m2
- Electrolytes : Na 140.1 K 3.74 Cl 102 HCO3 25.9
- Coagulogram : PT 10.8 INR 0.92 APTT 26.5 TT 12.2

CXR

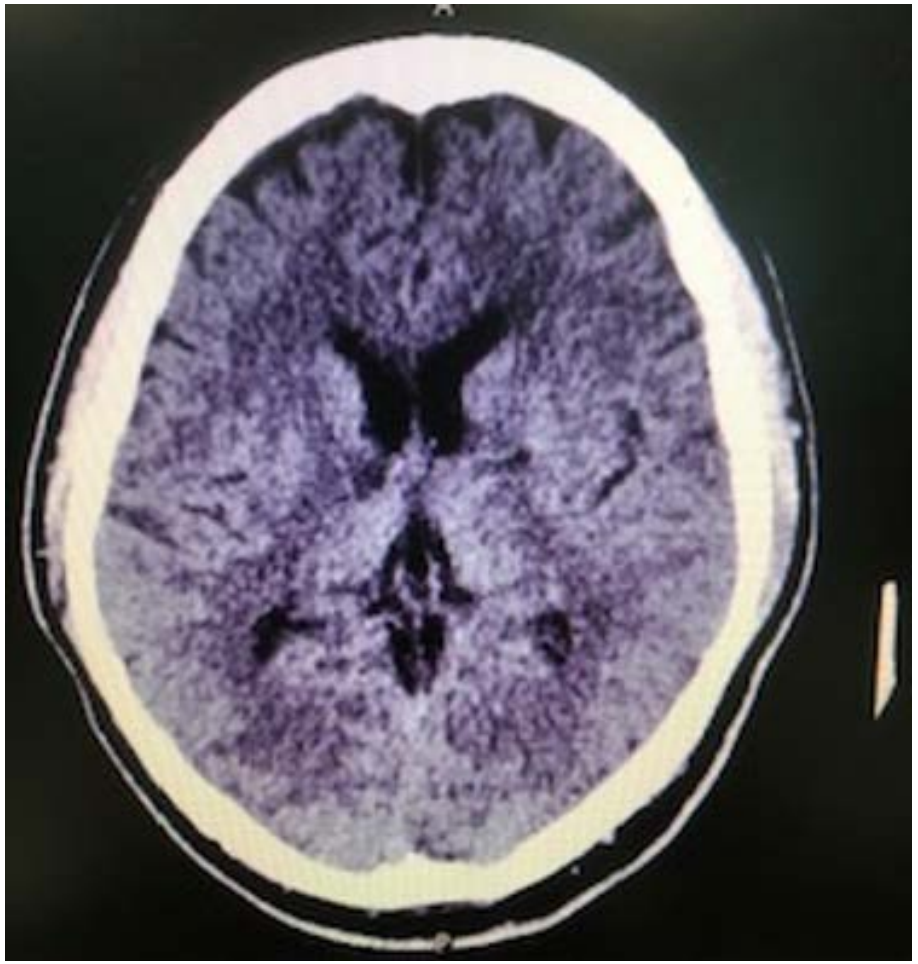
- No infiltration
- No cardiomegaly

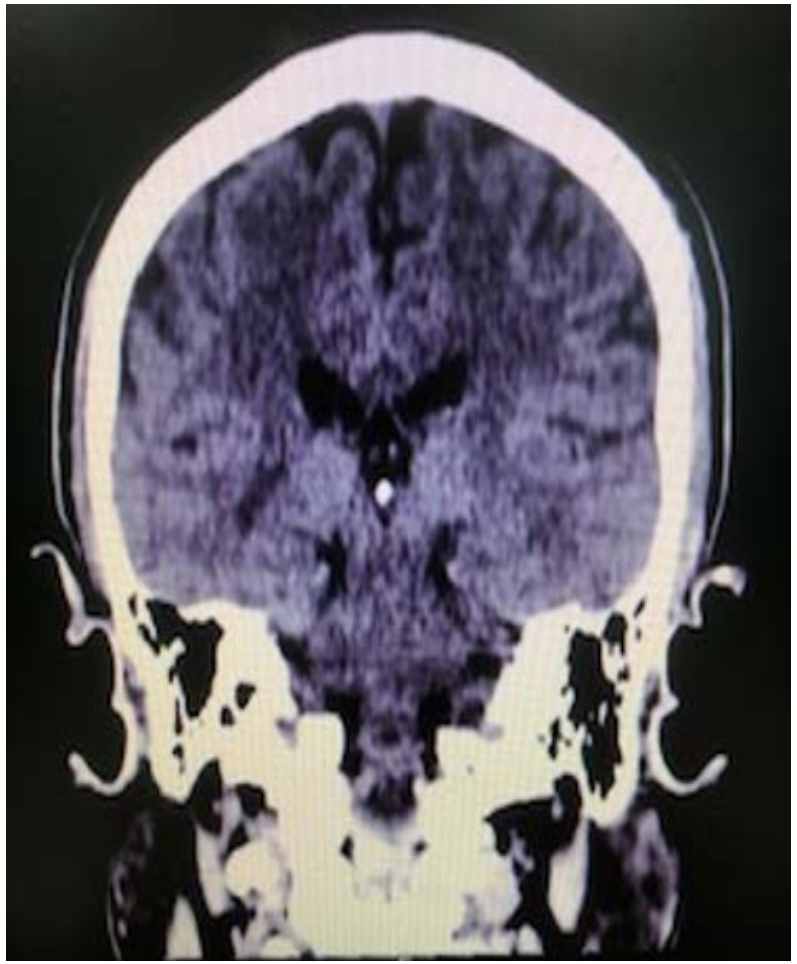


EKG : NSR, RATE 65 BPM



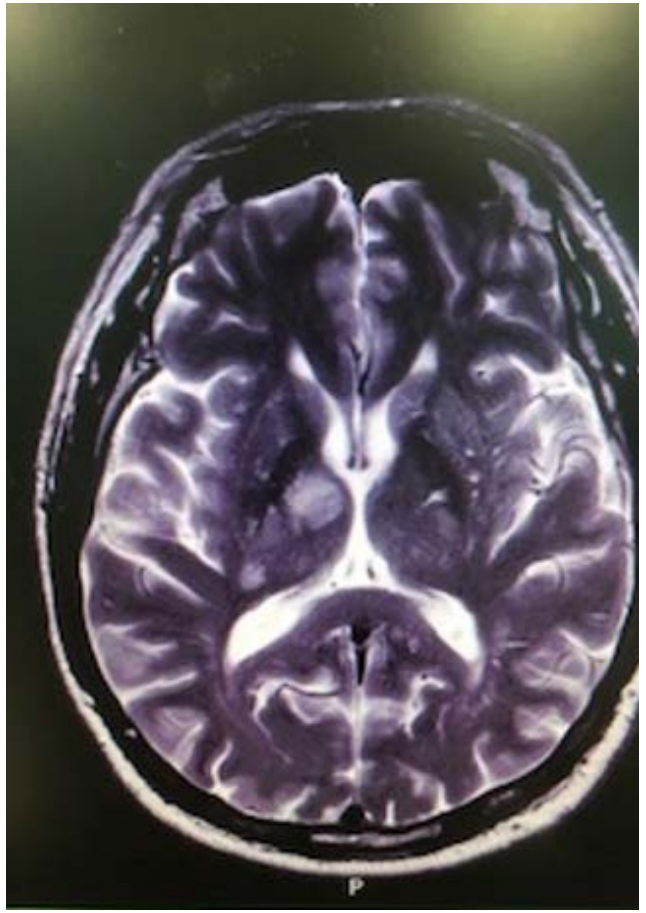
CT BRAIN

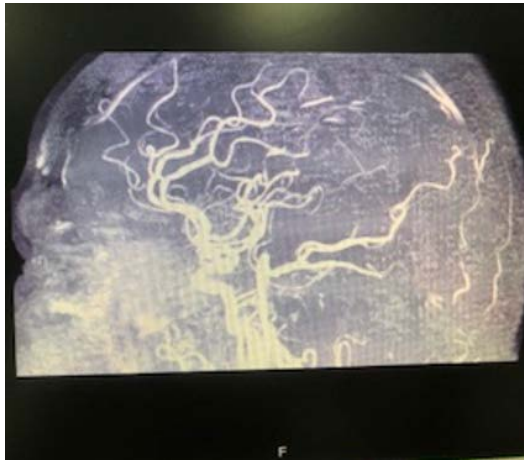




MRI MRA BRAIN

- Subacute lacunar infraction at right thalamus with involved right cerebra peduncle
- Severe stenosis at proximal right ICA along ICA with artherosclerotic stenosis along right ICA from cervical segment to supraclinoid segment
- Relative decrease flow in right MCA and its branches
- Relative decrease flow in distal left PCA
- Arterosclorotic change with moderate stenosis at proximal basilar artery and mild stenosis along V4 segment of left vertebral artery





R1

PROBLEM LIST & ASA CLASSIFICATION

PROBLEM LIST AND ASA CLASSIFICATION

- 1. 66 years-old male problem with stenosis right ICA
- 2. History of ischemic stroke 2 weeks PTA
- 3. HT
- 4. DLP
- 5. Aging

- ASA Class III

R2

PREOPERATIVE EVALUATION AND PREPARATION

PREOPERATIVE EVALUATION

- **Cardiovascular system**
  - Sought evidence of heart disease (30% to 50% have coronary artery disease)
  - Coronary artery disease, hypertension ,and renal disease
  - Medical condition associated with arteriosclerosis : Obesity, diabetes mellitus, pulmonary disease secondary to cigarette smoking
  - Hypertension ; sensible target is that SBP $\leq$ 180, DBP $\leq$ 100
- **Neurological system**
  - Evaluate the patient regarding his readiness of carotid lesion from imaging for surgery and the patient's neurologic status

PREOPERATIVE EVALUATION

- **Airway assessment** : assessed for ease of ventilation and intubation
  - **Prevent hypercarbia(increase in PaCO2 :** adverse effect on regional CBF)
  - **ROM of neck** : extreme extension and rotation neck can occlude the vertebral artery and contribute to postoperative neurological deficits

RCRI , CARDIAC RISK UNDERGOING NON CARDIAC SURGERY

TABLE 38-3 REVISED CARDIAC RISK INDEX COMPONENTS AND EXPECTED CARDIAC RISK

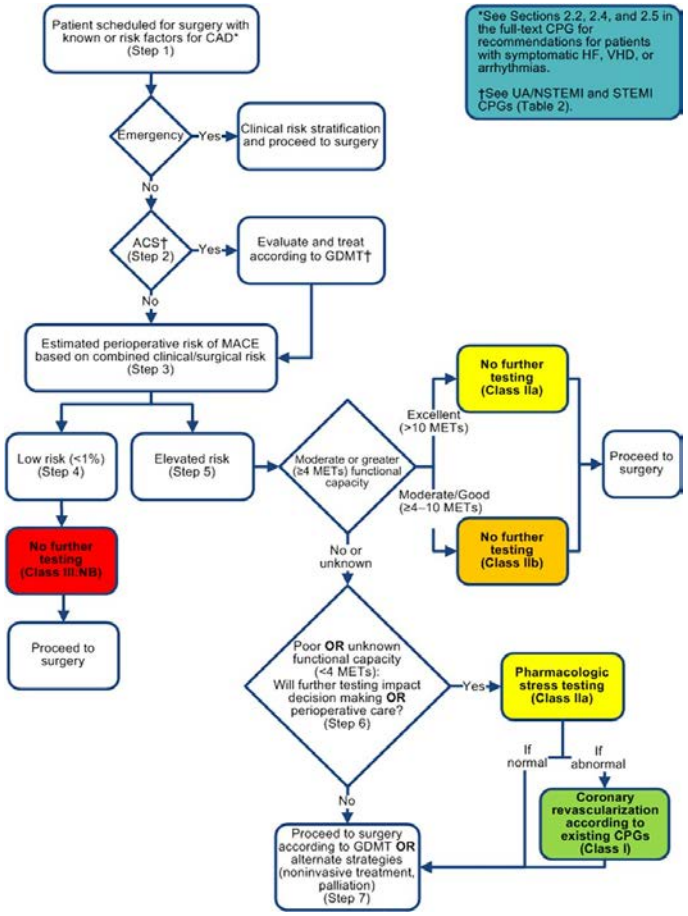
Components of Revised Cardiac Risk Index*	Points Assigned
High-risk surgery (intraperitoneal, intrathoracic, or suprainguinal vascular procedure)	1 √
Ischemic heart disease (by any diagnostic criteria)	1
History of congestive heart failure	1
History of cerebrovascular disease	1 √
Diabetes mellitus requiring insulin	1
Creatinine >2.0 mg/dL (176 μmol/L)	1
Revised Cardiac Risk Index Score	Risk of Major Cardiac Events†‡
0	0.4%
1	1.0%
2	2.4% √
≥3	5.4%

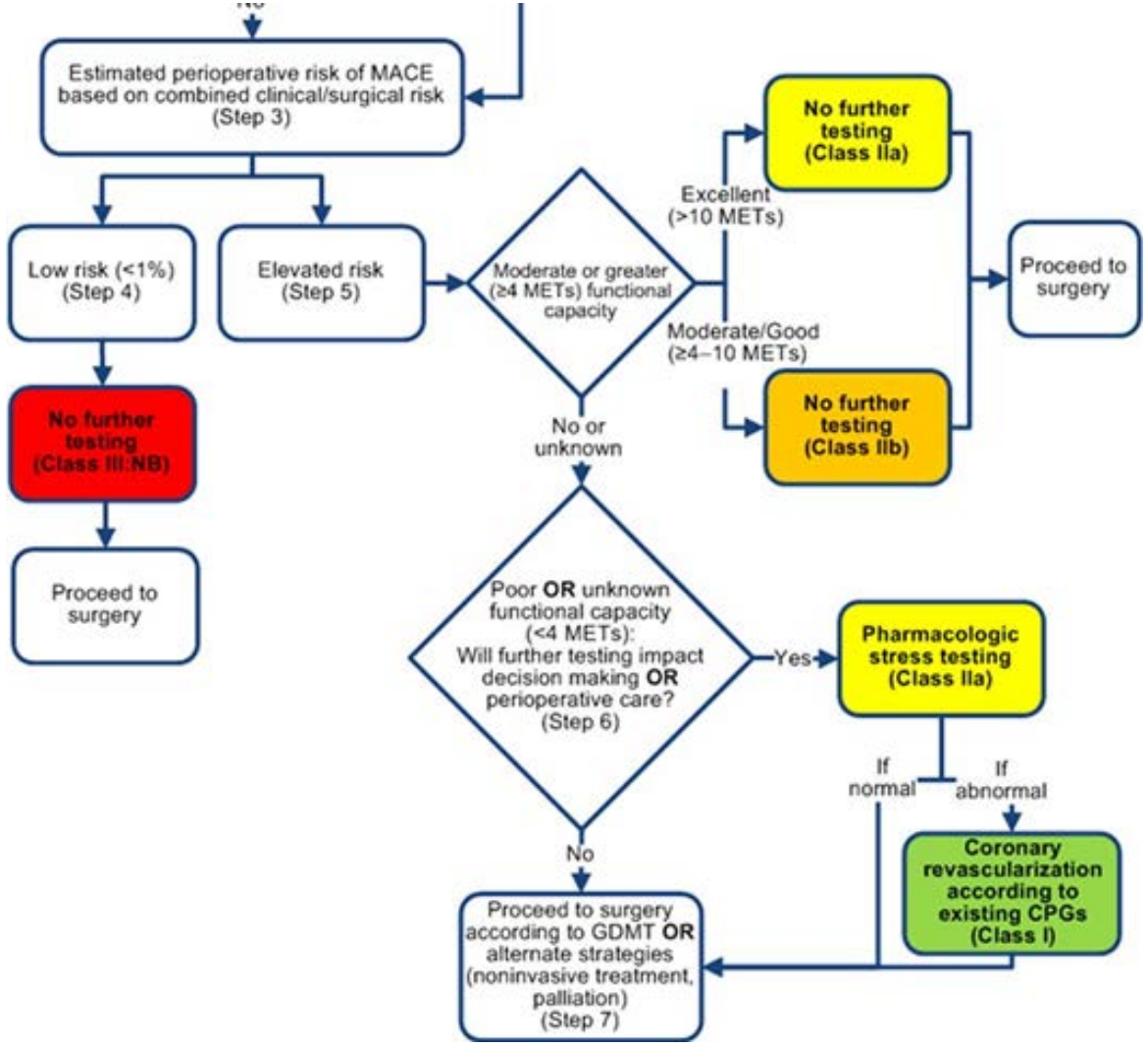
TABLE 38-4 STRATIFICATION OF PERIOPERATIVE CARDIAC RISK FOR NONCARDIAC SURGICAL PROCEDURES

Risk Stratification	Estimated Risk of Cardiac Death or Nonfatal MI	Examples of Procedures
Vascular	>5%	Aortic and other major vascular surgery Peripheral vascular surgery
Intermediate	1-5%	Intraperitoneal and intrathoracic surgery Carotid endarterectomy Head and neck surgery Orthopedic surgery Prostate surgery
Low*	<1%	Endoscopic procedures Superficial procedure Cataract surgery Breast surgery Ambulatory surgery

Risk for cardiac death, nonfatal MI ,and nonfatal cardiac arrest

RCRI , CARDIAC RISK UNDERGOING NON CARDIAC SURGERY





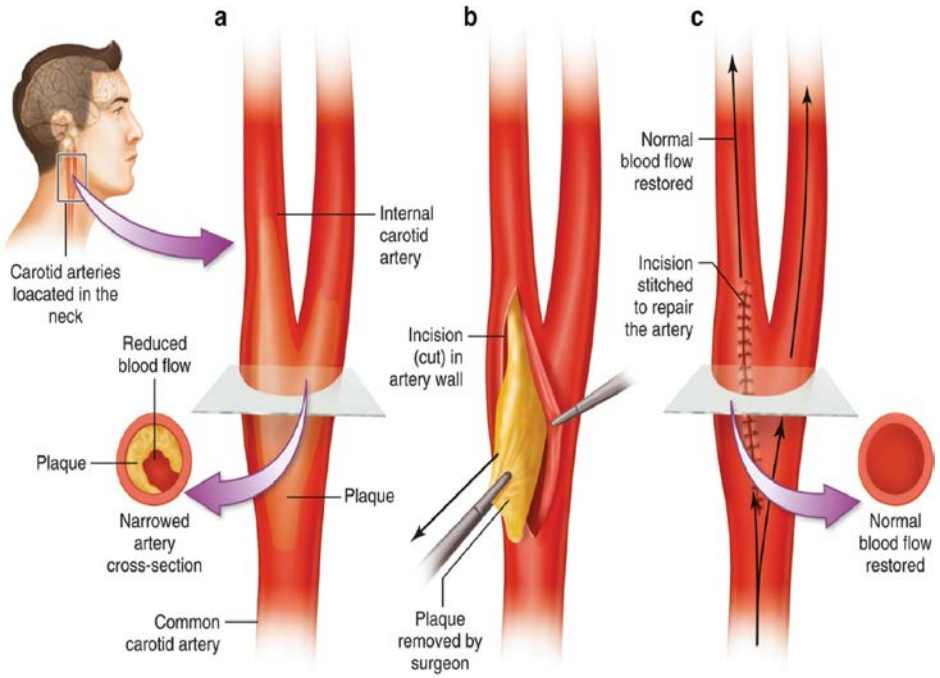
2014 ACC/AHA Guideline on Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Noncardiac Surgery

PREEXISTING MEDICAL CONDITION

- **Hypertension** :
  - Find out end organ damage : HX, PE, investigation
  - BP baseline : Baseline BP < 140-150/80-90 mmHg
  - Uncontrolled or inadequate control BP(>150-170/100 mmHg) increase risk of postop hypertension and poor neurologic outcome after CEA
  - Premed : Manidipine(10) 1 tab เช้าก่อนมา OR
- Suggest off Plavix 5 day before surgery
- Off Cilostazol should be stop at lease 3 days before the procedure
- Aspirin continued till the day of surgery

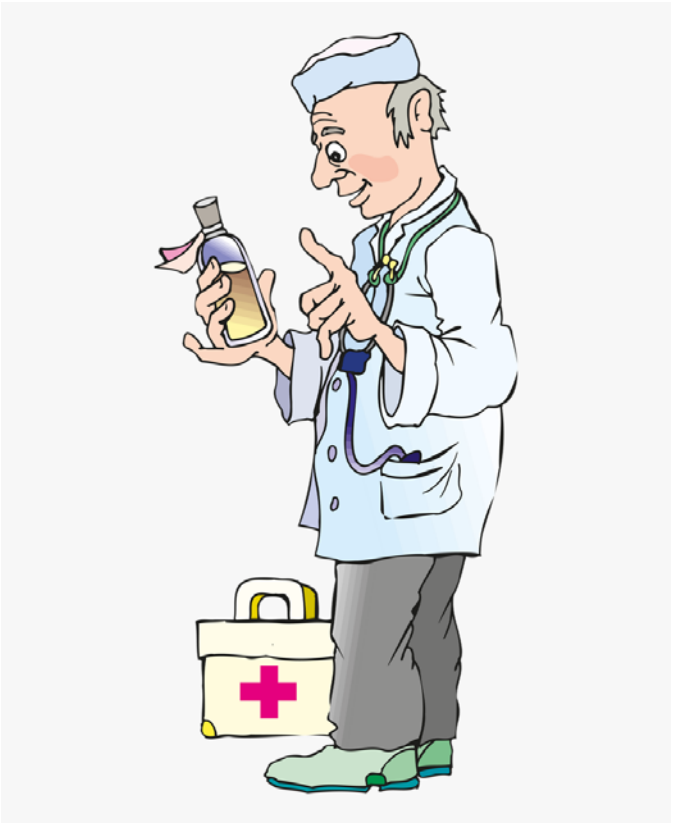
SURGICAL CONDITION

- CEA is “Gold Standard” in symptomatic patients with stenosis >70%
- Useful in symptomatic patients if the operation with 2 weeks
- Severe carotid stenosis (greater then 70%)
- CEA is superior to medical therapy in symptomatic patient with > 70% stenosis
- Carotid revascularization is recommended before CABG in patient with
  - Symptomatic carotid disease
  - Bilateral severe asymptomatic carotid stenosis



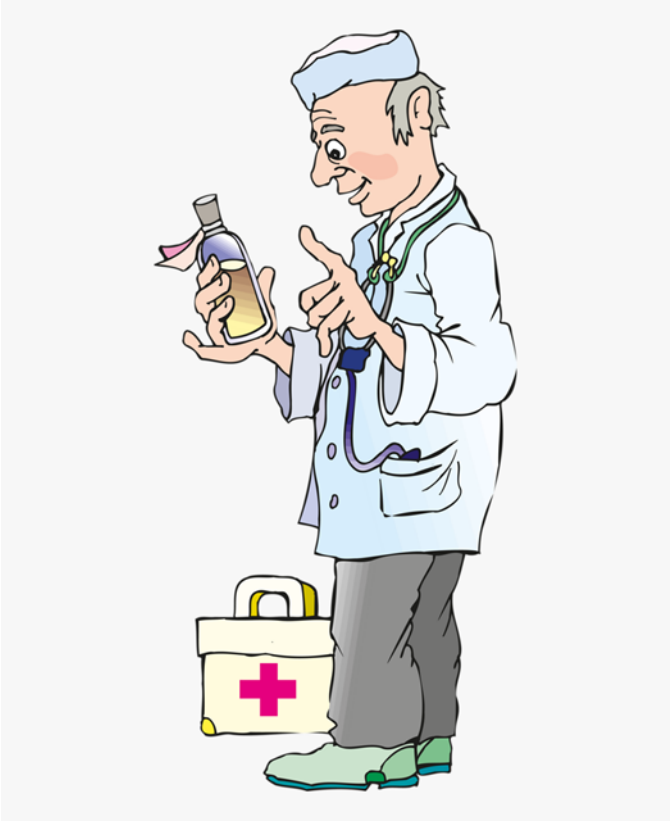
PREOPERATIVE PREPARATION

- NPO
- Inform consent
- Anesthetic machine
- Intubation equipment
- Force air warmer
- Warm IV fluids
- Antibiotic
- IV anesthetic drugs



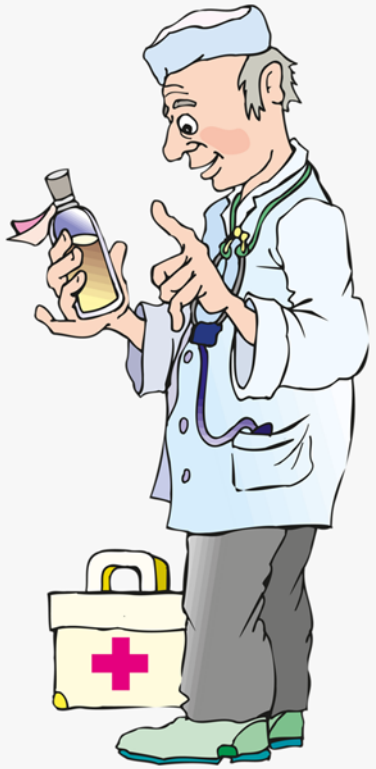
PREOPERATIVE PREPARATION

- Blood component
- Large bore IV fluids
- Pressure bag , Rapid infusion device
- A-line
- ICU post-op
- Set spinal block
- Local anesthetic drug
- Ultrasound
- Cerebral oximetry



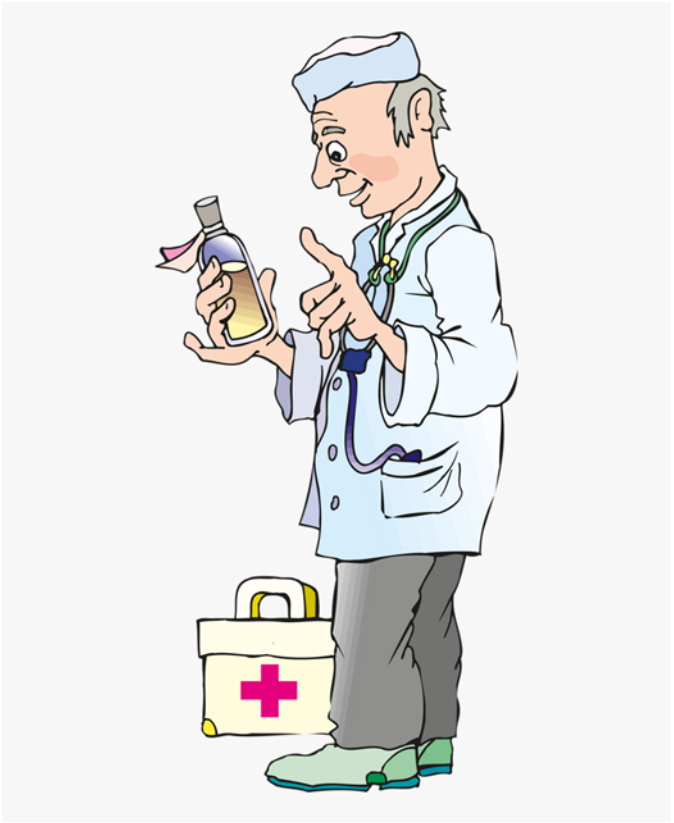
PREOPERATIVE PREPARATION

- Communication with surgeon for Positioning & Special monitoring requirements
- Medications
  - Drug for blunt hemodynamic response to intubation : Lidocaine, Esmolol, Labeteral , NTG
  - Inotropes : Dopamine
  - Vasopressor : Levophed , Ephedrine
  - Emergency drugs



PREOPERATIVE PREPARATION

- If premed required
  - BZD (diazepam 5 mg oral 1hr preoperative or midazolam 1-2 mg IV) anxiolysis and minimal respiratory depression
  - Avoid anxiety, ventilatory depression , prompt emerge neurologic evaluation



R3

ANESTHETIC CONSIDERATION AND MANAGEMENT

PREOPERATIVE CONSIDERATION

- Cardiac risk undergoing non cardiac surgery
- Perioperative stroke risk
- Preexisting medical condition
- Current medical treatments
- Timing of surgery
- premedication

PERIOPERATIVE STROKE RISK

Table 1. Incidence of Stroke after Various Surgical Procedures.

Procedure	Risk of Stroke (%)
General surgery[2]	0.08–0.7
Peripheral vascular surgery[3]	0.8–3.0
Resection of head and neck tumors[4]	4.8
Carotid endarterectomy[5]	5.5–6.1
Isolated CABG[1,7]	1.4–3.8
Combined CABG and valve surgery[1,7]	7.4
Isolated valve surgery[1]	4.8–8.8
Double- or triple-valve surgery[1]	9.7
Aortic repair[7]	8.7

nejm

TIMING OF SURGERY

- North American symptomatic carotid endarterectomy trial (NASCET) and European Carotid Surgery Trial(ECST)
- Symtomatic stenosis ≥ 50% benefit highest (greatest risk reduction perioperative stroke and death) when procedure perform within 2 weeks of cerebral ischemic event
- NNT 5 if therapy within 2 week ,NNT 125 if > 12 weeks
- Asymtomatic stenosis ≥ 60%

INTRAOPERATIVE MONITORING

Non-invasive

- Five lead EKG
- NIBP
- Pulse Oxymetry
- ETCO2
- Core temperature

Invasive

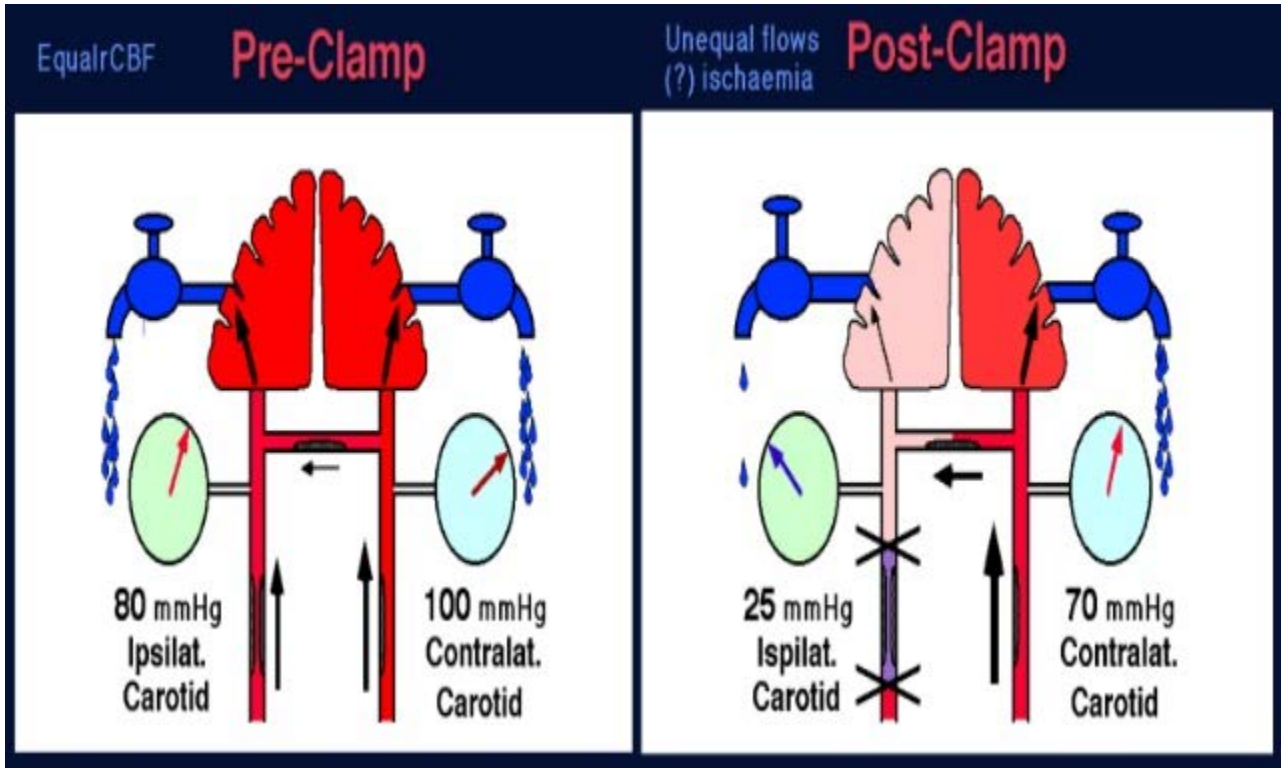
- A-line
- Other : urine output, DTX
- Specials : Cerebral oximetry

SPECIAL MONITORING

- **Neurologic monitoring**
  - **Gold standard cerebral function monitoring :** Awake patient
  - Electroencephalography(EEG)
  - Carotid artery stump pressure
  - Region cerebral blood flow
  - Somatosensory evoke potential(SSEP)
  - Transcranial doppler ultrasonography
  - Cerebral oxtgenation

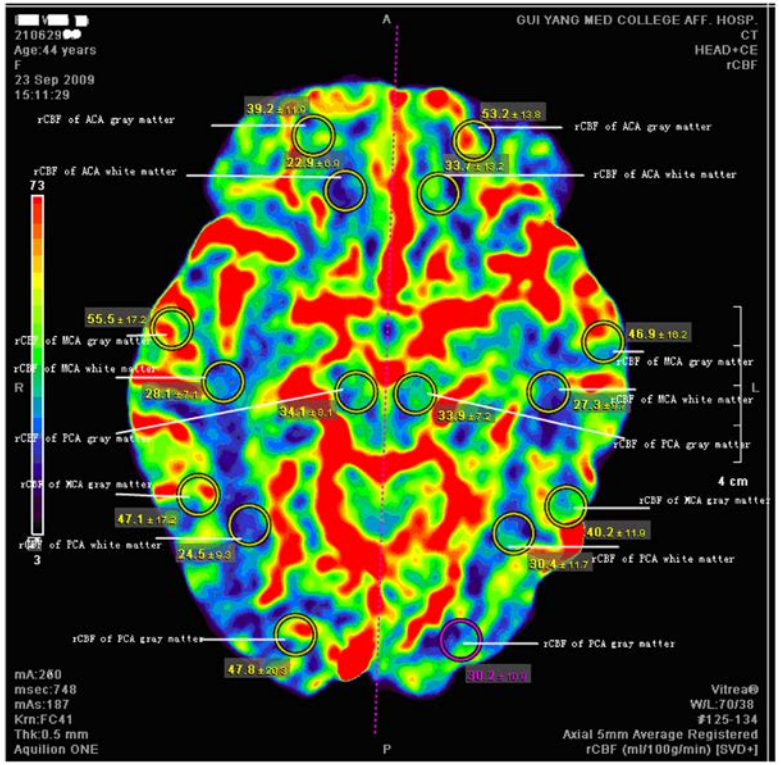
CAROTID ARTERY STUMP PRESSURE

- Represents the back pressure resulting from collateral flow through the circle of Willis via the contralateral carotid artery and the vertebrobasilar system



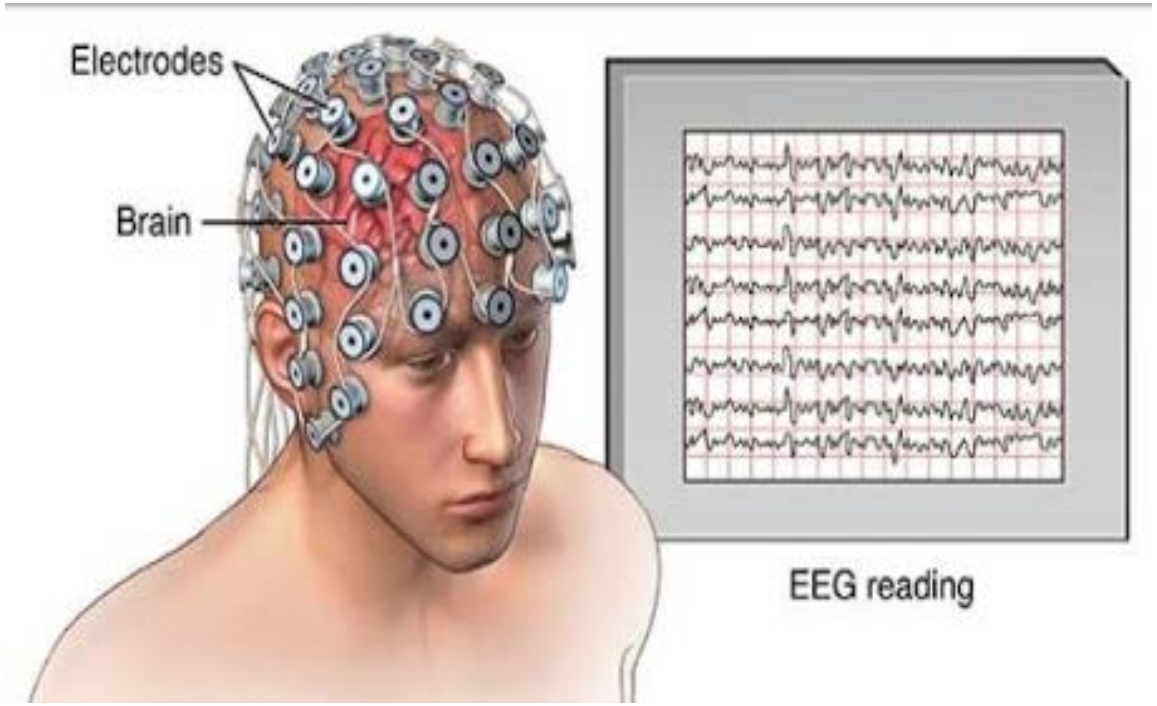
REGIONAL CEREBRAL BLOOD FLOW

- rCBF measurements during CEA are obtained by IV or ipsilateral carotid artery injection of radioactive xenon and analysis of decay curve obtained from detector placed over the area of the ipsilateral cortex supplied by the middle cerebral artery



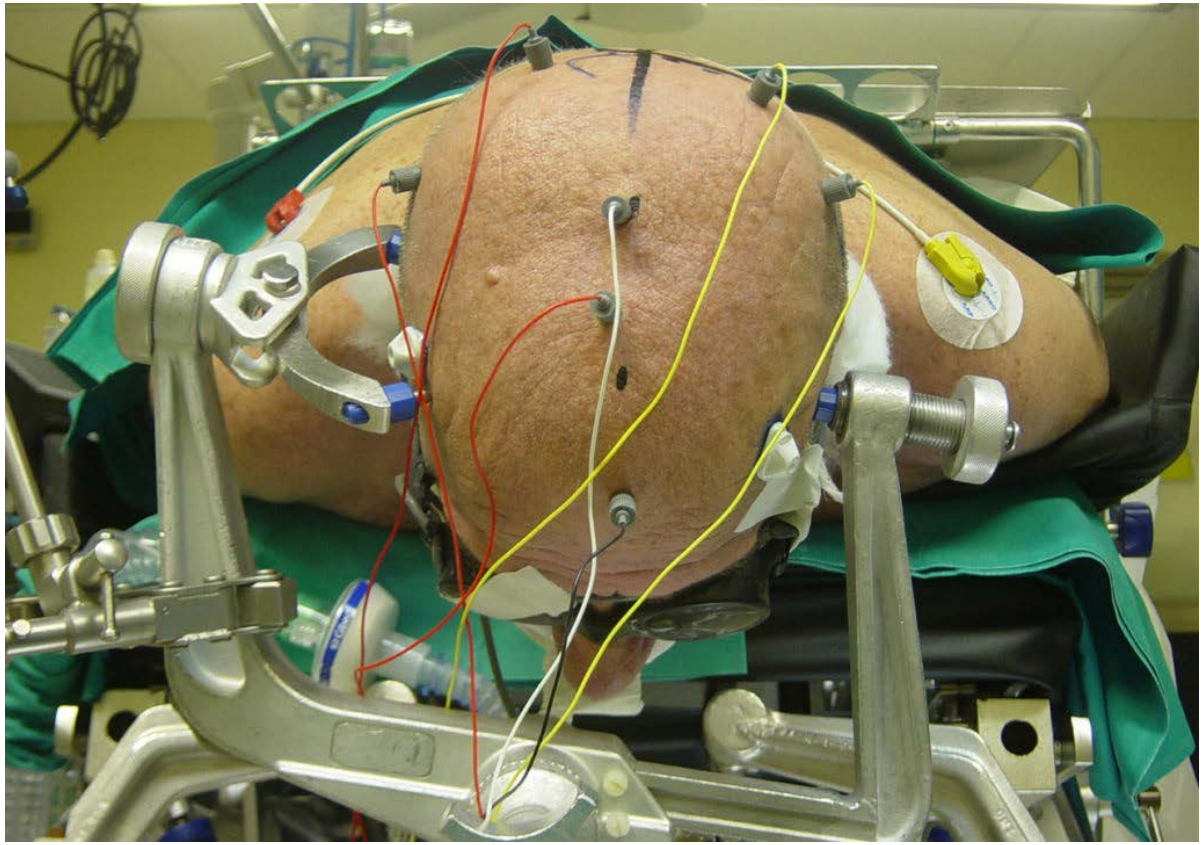
ELECTROENCEPHALOGRAPHY : EEG

- Isoflurane, desflurane, and sevoflurane produce similar ECG changes at equipotent levels and , when used at 0.5 MAC ,allow for reliable ECG cerebral ischemia monitoring



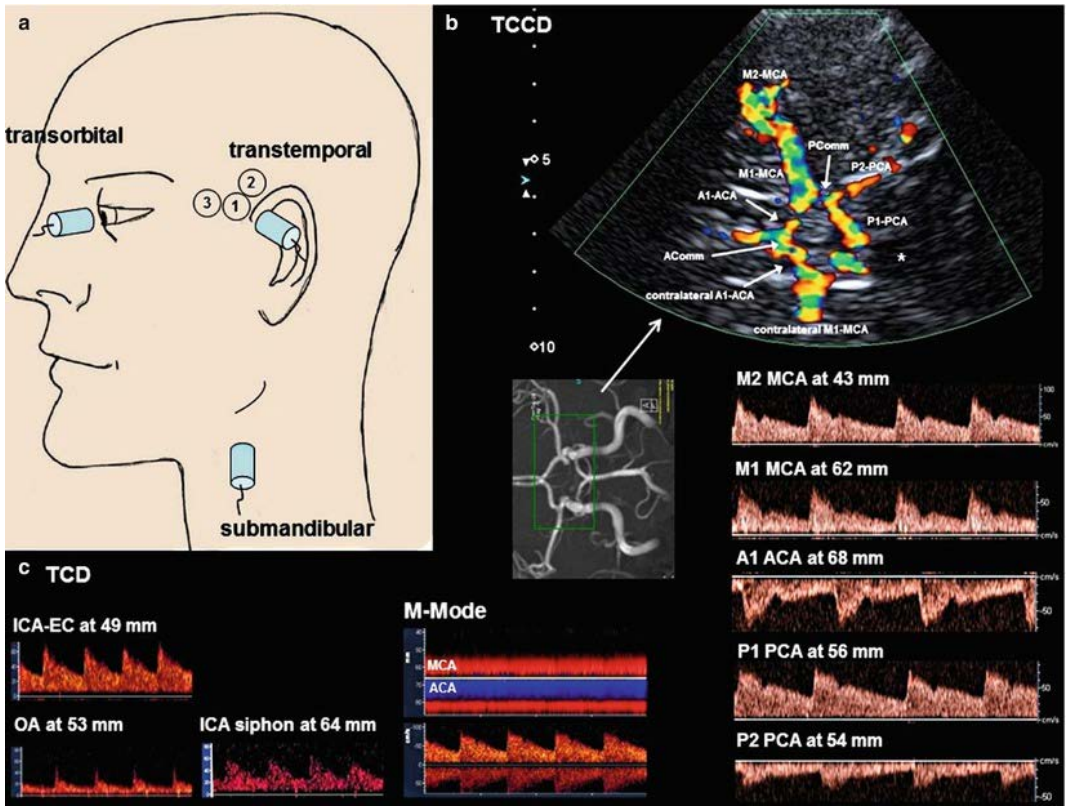
SOMATOSENSORY EVOKED POTENTIALS : SSEP

- Response of the sensory cortex to electrical impulses from peripheral sensory nerve stimulation and detect subcortical sensory pathway ischemia
- Decreased CBF : decrease amplitude, increase latency or both)
- False negative ; Anesthetics , hypothermia



TRANSCRANIAL DOPPLER ULTRASONOGRAPHY

- Continuous measurement of mean blood flow velocity
- Detection of microembolic events in the MCA
- Most TCD detected emboli occur in the first 2-3 hours after surgery



CEREBRAL OXYGENATION

- Jugular bulb venous monitoring : detected global ischemia
- NIRS ; Near-infrared spectrophotometry
- rSO2 above 75% reduced the number of strokes
- rSO2 above 50% may be corrected with poorer neurologic outcomes

CHOICE OF ANESTHESIA

GA VS RA

CHOICE OF ANESTHESIA

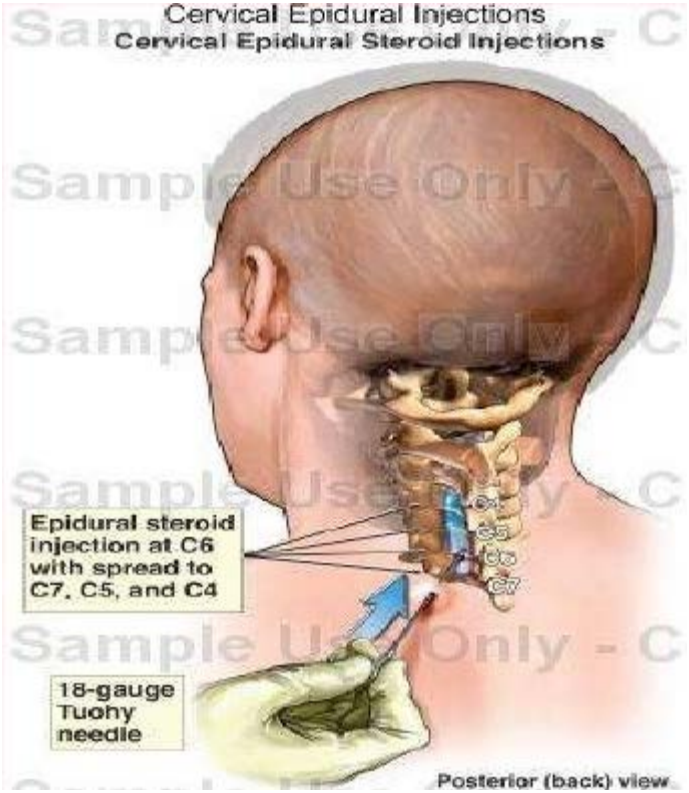
Choice	Advantage	Disadvantage
GA	- Control ventilation (PaCO2) - Cerebral protection afforded by volatile - Airway security - Control BP easier comfortable operation conditions - Less stressful - Prevent patient from coughing and straining	- Shunt insertion more commonly than RA - Required brain monitoring - Circulatory depression in associated with labile BP and necessitates greater vasopressor support - Higher incidence in postoperative neurocognitive dysfunction

CHOICE OF ANESTHESIA

Choice	Advantage	Disadvantage
RA	- Awake patient is the gold standard cerebral function monitoring - Preserve cerebral autoregulation - Hemodynamic stability - Reduce vasopressor requirement - Reduce cardiac and respiratory related morbidity - Lower shunt insertion rate - Reduces operative time - Shorten hospital stay - Lower cost - Improves outcomes after surgery (better postop analgesia, reduce blood loss ,lower risk of thromboembolic event)	- Patient discomfort, anxiety during operation - Need patient collaboration - Procedural complication(Diaphragmatic and vocal cord paralysis, neural injury , epidural, subarachnoid or intravascular injection of LA) - Urgent conversion of RA into GA

ANESTHESIA METHODS FOR CAROTID ENDARTERECTOMY

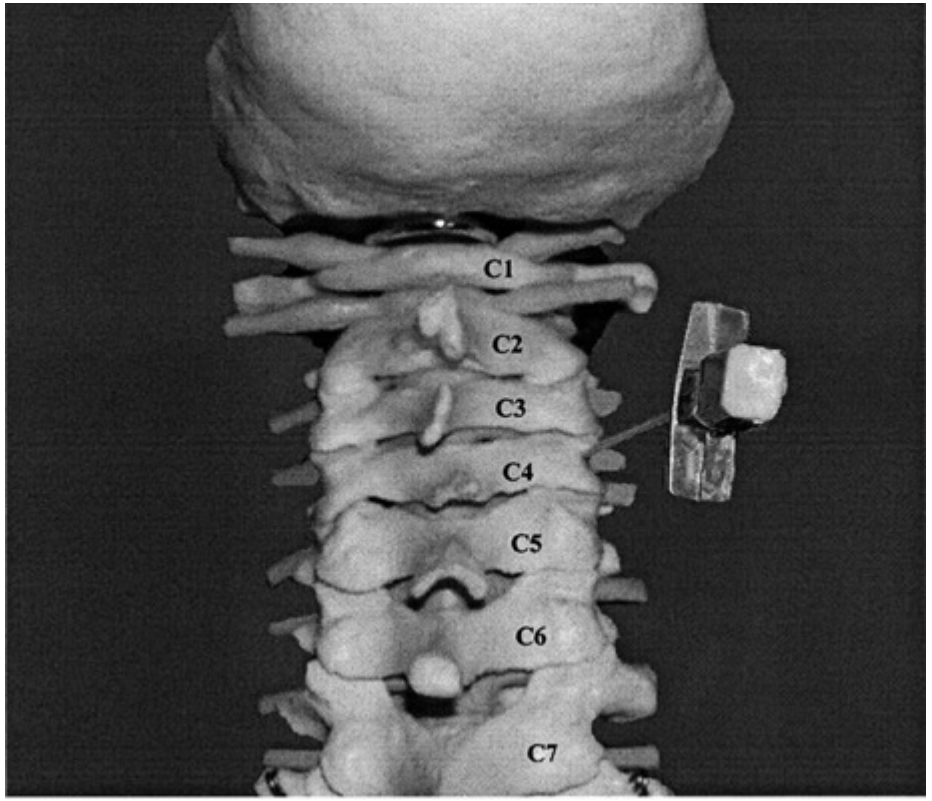
- **1. Cervical epidural block**
  - Site at C6-C7 level
  - Complication : dural tap, epidural hematoma, direct spinal cord damage, hypotension, bradycardia, and respiratory impairment, conversion to GA, dural tap, epidural haematoma, and direct spinal cord damage.



British Journal of Anaesthesia 114 (3): 372–83 (2015)
Advance Access publication 30 August 2014

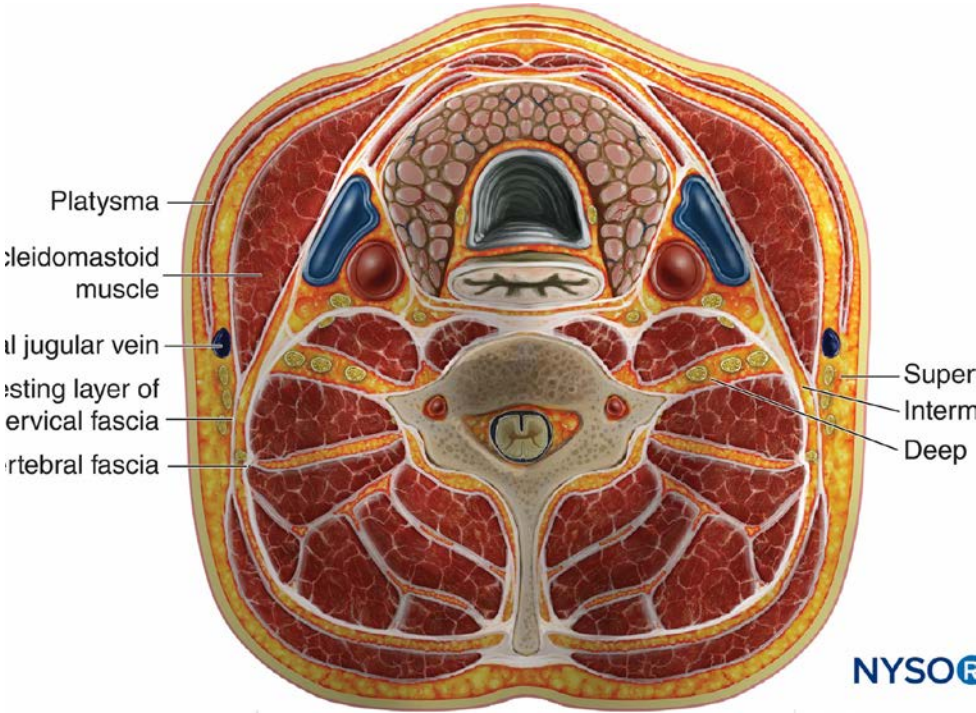
ANESTHESIA METHODS FOR CAROTID ENDARTERECTOMY

- **2. Posterior cervical paravertebral block**
  - Single injection at C4 level
  - blocking C2-C4 dermatomes
  - risk of injury to the vertebral vascular structures



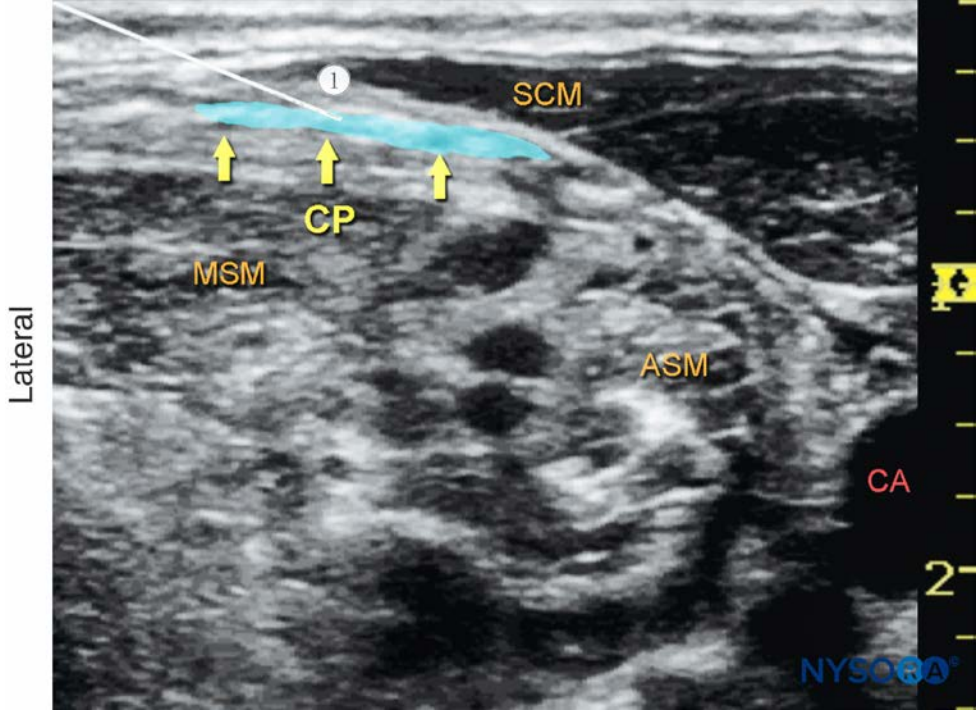
ANESTHESIA METHODS FOR CAROTID ENDARTERECTOMY

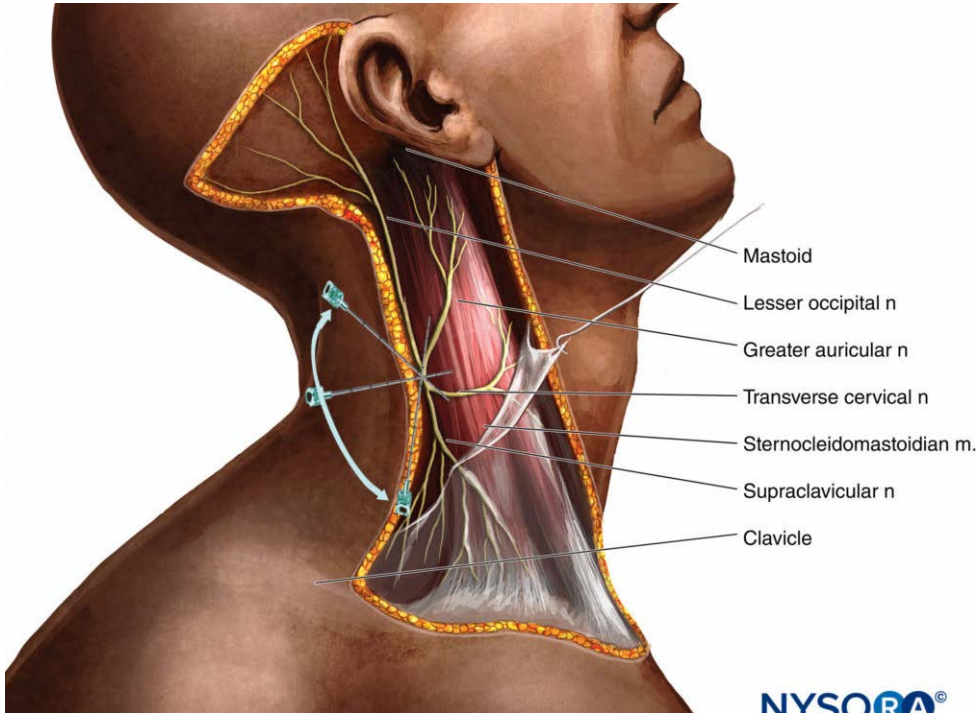
- **3. Cervical plexus block (CPB)** : Commonly
  - Superficial branches : provides cutaneous innervatios to the head and anterolateral neck
  - Deep branches : innervation muscles of the anterior neck , the anterior and middle scalene and the diaphragm
    - **3.1) Superficial CPB**
    - **3.2) Intermediate CPB**
    - **3.2) Deep CPB**



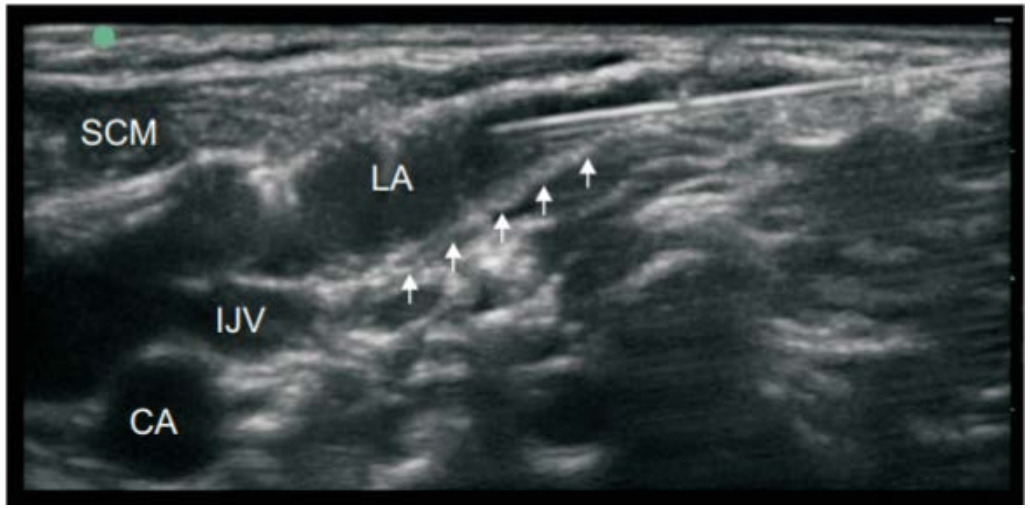
ANESTHESIA METHODS FOR CAROTID ENDARTERECTOMY

- **3.1) Superficial CPB**
  - LA into middle third of the posterior border of SCM ,superficial to the investing layer of deep cervical fascia
  - Targeting superficial branches of the cervical plexus
  - Not provide neck muscle relaxation
  - Reduced postoperative opioid requirements
  - Increase patient satisfaction with analgesia
  - Low risk of complications and is easy to master



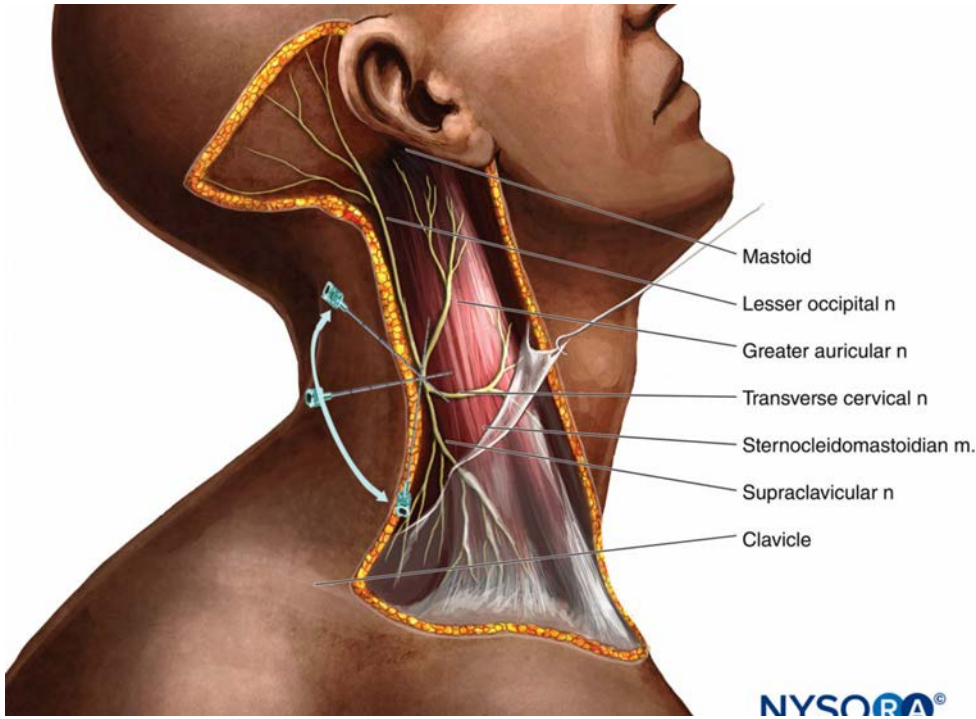


ANESTHESIA METHODS FOR CAROTID ENDARTERECTOMY

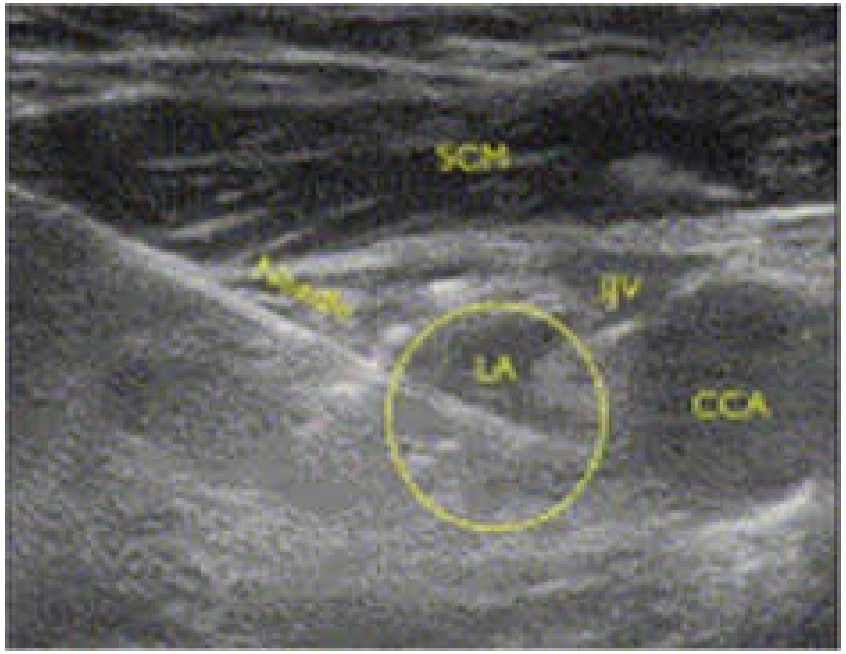


- **3.2) Intermediate CPB**
  - LA injected between the superficial and deep cervical fascia
  - Target the posterior cervical space (PCS) at the C4 level.
  - Fascia between the SCM and trapezius muscles is formed of areolar tissue

ANESTHESIA METHODS FOR CAROTID ENDARTERECTOMY



- **3.3) Deep CPB**
  - LA under deep cervical fascia to cervical transverse process
  - Performed with three injections along a line drawn from Chassaignac's tubercle(C6) to the mastoid process.
  - Targeting the C2–C4 spinal nerves
  - Relaxation of neck muscles
  - Rate of converse to GA is more superficial CPB
  - Major complications such as intravascular injection, epidural or subarachnoid injection, and phrenic nerve palsy, due to its deep



CHOICE OF ANESTHESIA

- GA with ETT with controlled ventilation combine Superficial cervical plexus block

INTRAOPERATIVE MANAGEMENT

- **Anesthetic management GOALs for CEA**
  - Protection of the heart and brain from ischemic injury
  - Control of the heart rate and arterial blood pressure
  - Control ablation of the surgical pain and stress response
  - Awake patient at the end of surgery for the purpose of neurologic examination

Yao & Artusio anesthesiology

ANESTHETIC MANAGEMENT

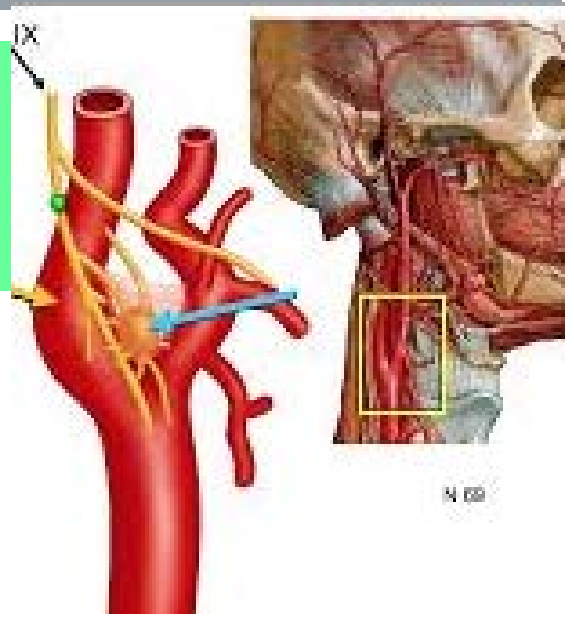
- **Dual antiplatelet drug**
  - - Reduce the rate of micro-embolization after operation (MI, transient ischemic events)
  - - Aspirin should be continued through the perioperative period
  - - Clopidogrel should be stop at lease 5 days before the procedure
  - - Cilostazol should be stop at lease 3 days before the procedure

ANESTHETIC MANAGEMENT

- **Blood pressure management**
  - **ABP** : maintain in the high–normal during the period of carotid clamping to increase collateral flow and prevent cerebral ischemia
  - Induced hypertension(10%-20% above baseline) to increase contralateral flow and prevent ischemia

Yao & Artusio anesthesiology

ANESTHETIC MANAGEMENT



- **Surgical manipulation of the carotid sinus**
  - Activation of the baroreceptor reflexes can cause : Abrupt Bradycardia and Hypotension
  - Mx : - Cessation of surgical manipulation promptly restores the hemodynamic
  - - Infiltration of the carotid bifurcation with 1%Lidocaine usually prevent further episode

Yao & Artusio anesthesiology

ANESTHETIC MANAGEMENT

- **Carbon dioxide management**
  - Control of ventilation ann ETCO2 during GA
  - **Hypercapnia : “Steal phenomenon”(**shunting of blood away from hypoperfused territories with dilated vasculature) >> Avoided
  - **Hypocapnia : “Reversal steal phenomenon”** with its associated cerebral vasoconstriction>> increase risk ischemia
  - Keep Normocapnia or mild hypocarbia

Yao & Artusio anesthesiology

ANESTHETIC MANAGEMENT

- **Glucose management**
  - Glucose greater than 200 mg/dl : Increased risk for perioperative stroke or TIA , MI and death

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ANESTHETIC MANAGEMENT

- **Emergence period**
  - The period of emergence and extubation may be associated with marked hypertension and tachycardia, with may require aggressive pharmacologic intervention

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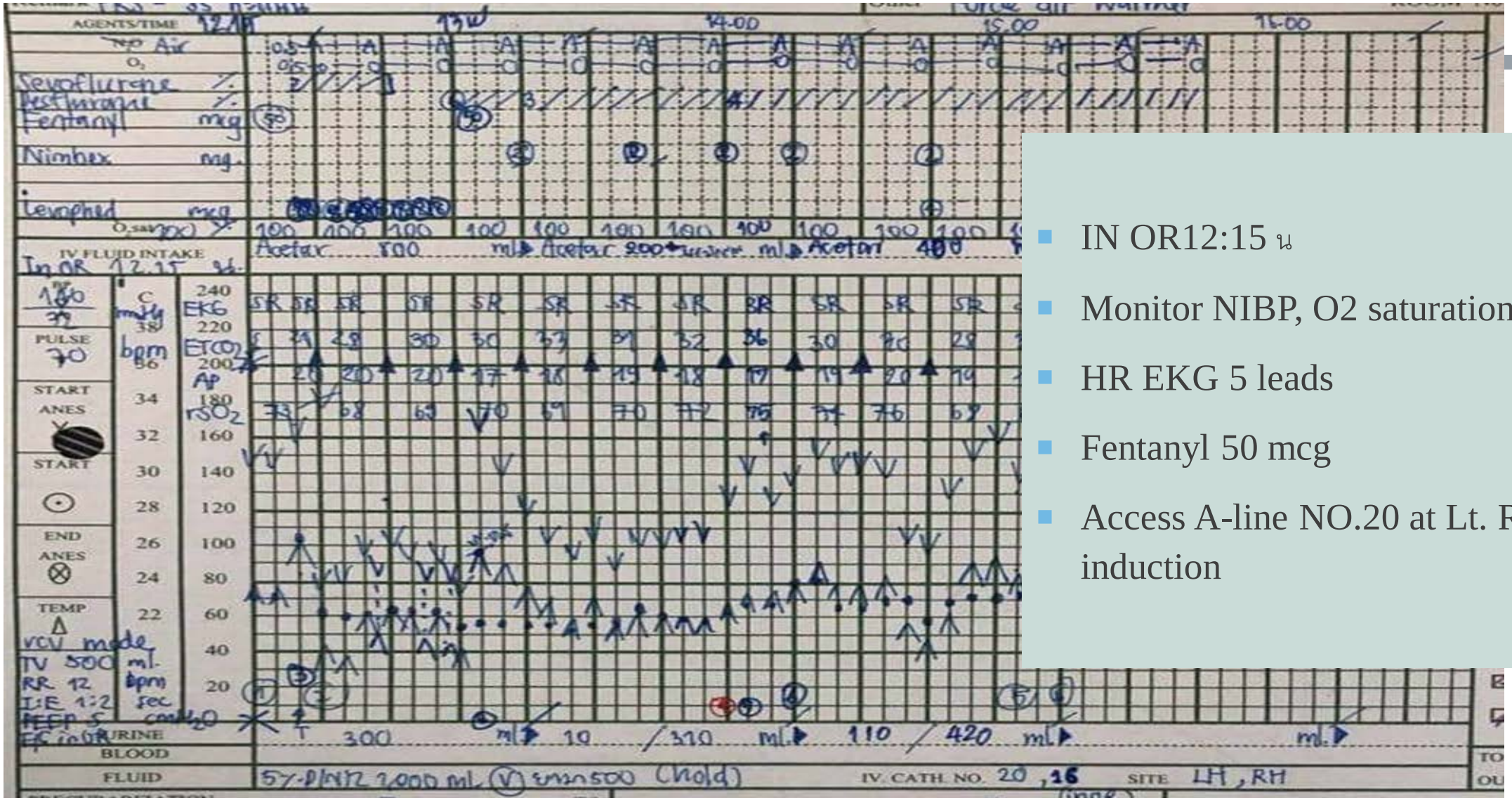
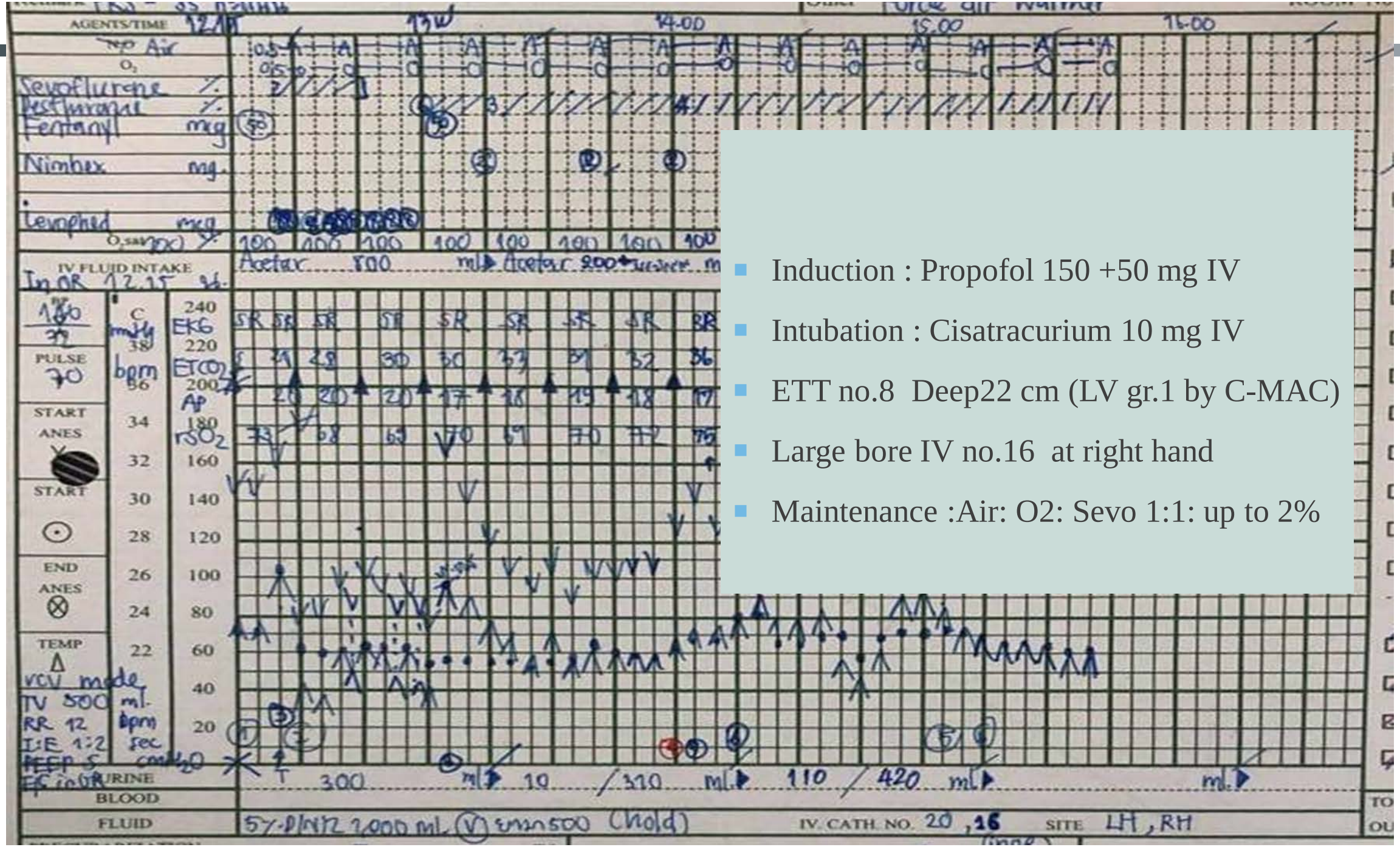
OPERATION



- IN OR12:15 น
- Monitor NIBP, O2 saturation
- HR EKG 5 leads
- Fentanyl 50 mcg
- Access A-line NO.20 at Lt. RA before induction

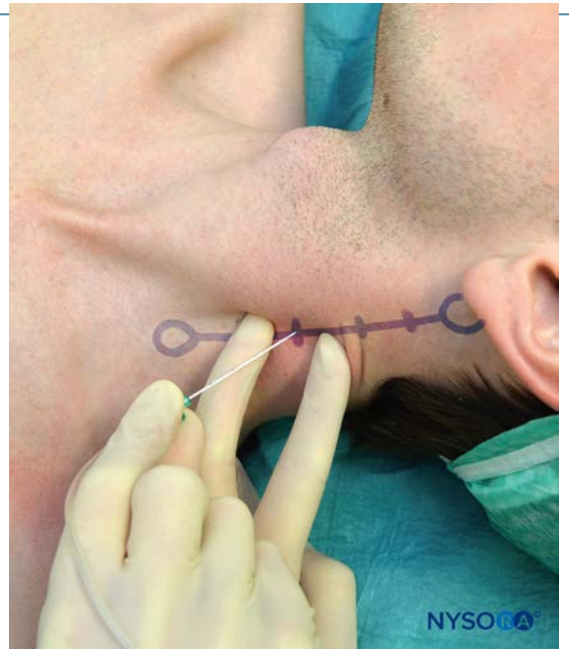
เวลา	C	Hb/Hct	pH	pCO2	pO2	HCO3	BE	Na	K	Ca	ACT	DTX
12:45	36.6	14.7/44.3	7.447	38.3	279.6	25.9	1.9	136.9	3.85	1.16	-	100

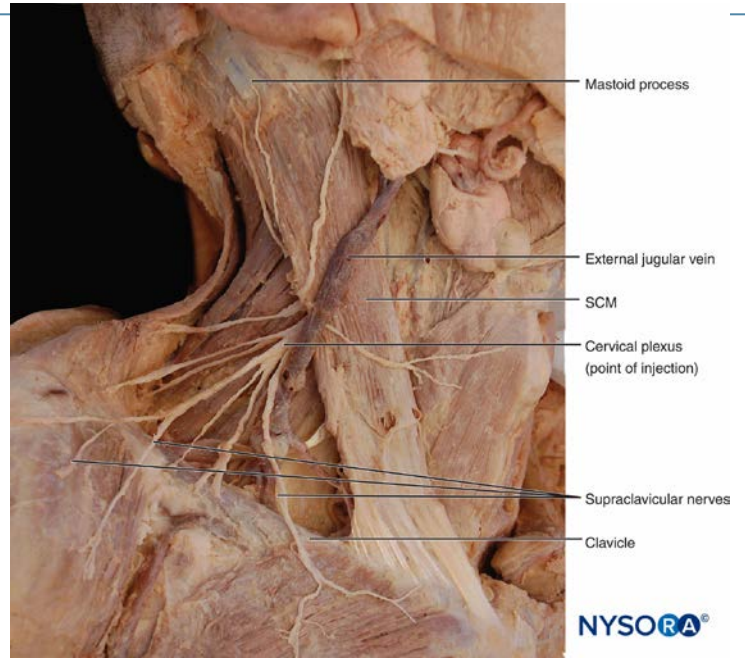


- Induction : Propofol 150 +50 mg IV
- Intubation : Cisatracurium 10 mg IV
- ETT no.8 Deep22 cm (LV gr.1 by C-MAC)
- Large bore IV no.16 at right hand
- Maintenance :Air: O2: Sevo 1:1: up to 2%

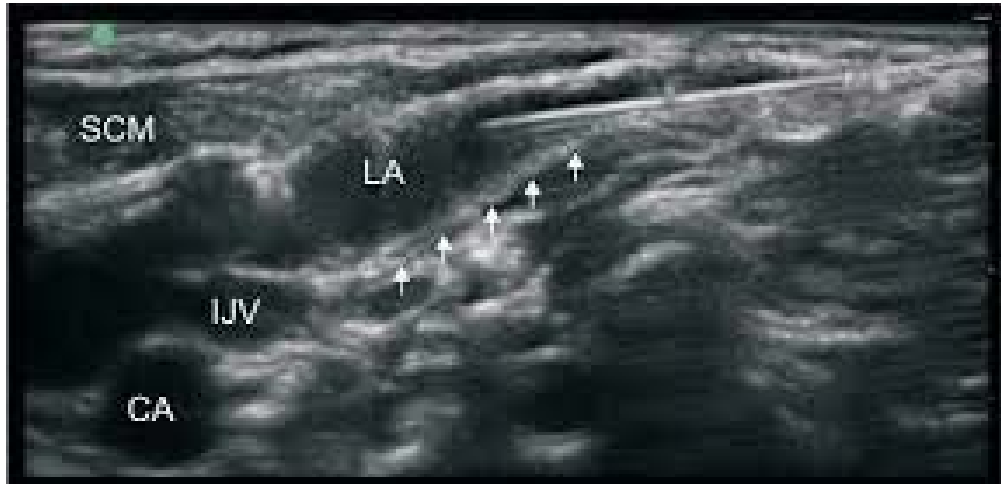
- Monitor Cerebral Oxygenation right
- NIRS ; Near-infrared spectrophotometry
- rSO2 baseline 73


NYSORA


NYSORA


Mastoid process
External jugular vein
SCM
Cervical plexus
(point of injection)
Supraclavicular nerves
Clavicle
NYSORA


MSM
LS
LsCa
NYSORA

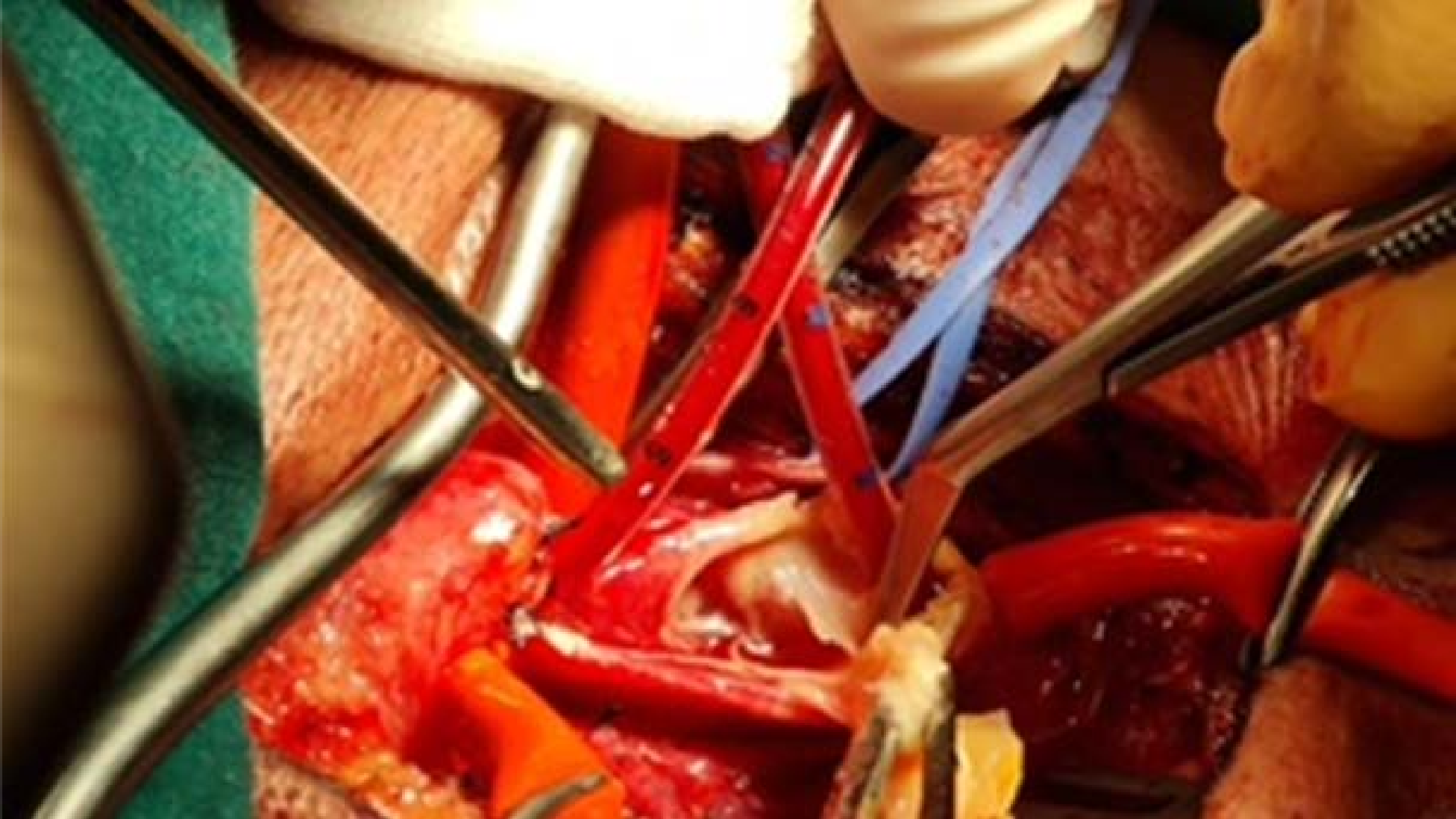

SCM
LA
IJV
CA

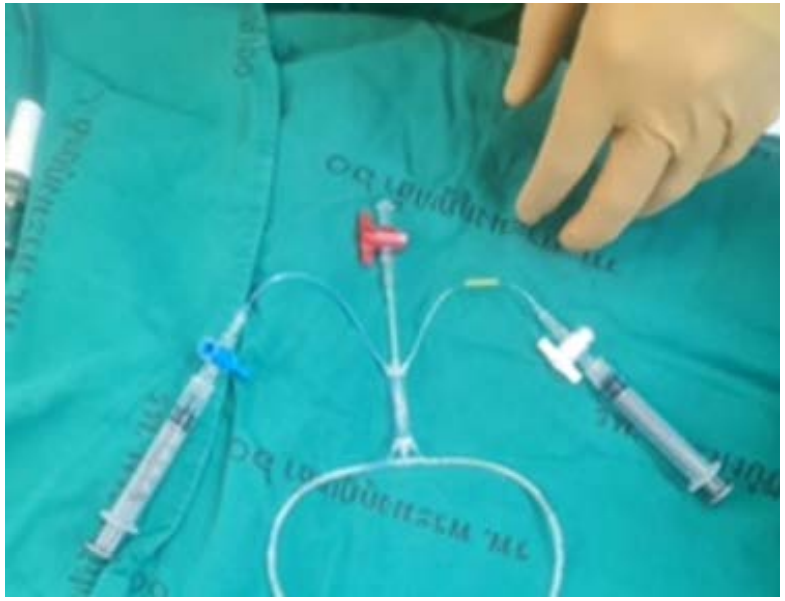
- **Superficial cervical plexus block**

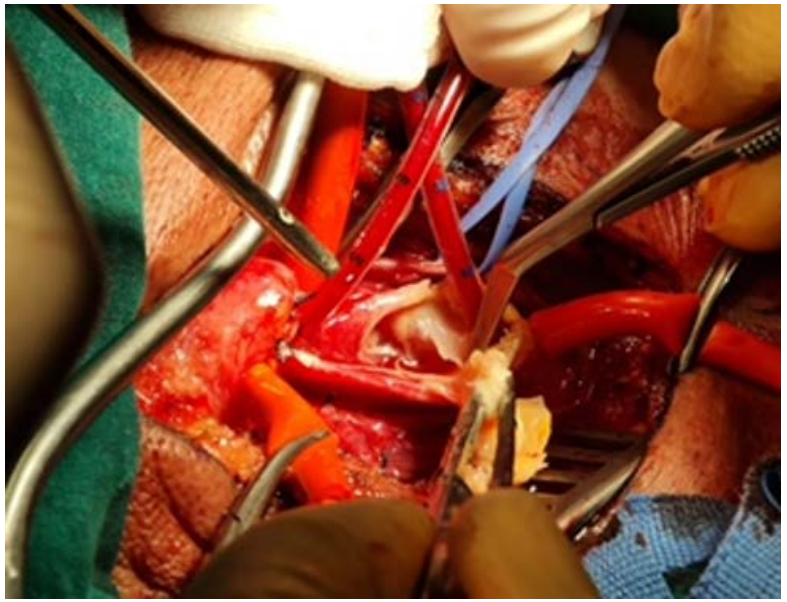
  by U/S guilde

- 0.25% Marcaine 10 ml

- Before clamp : BP 140/75 mmHg, HR 75
- Heparin 3000 u IV 13:59 น
- Carotid Cross Clamping on at 14:04-14:07น Insert Shunting 3 mins
- 1%Xylocaine w/o ADR injected to carotid body
- Total shunt time 55 min







INTRAOPERATIVE

- **Carotid cross clamp**
  - Before carotid clamp Heparin 75-100 u/kg
  - BP maintain at baseline to 20% above preop level
  - CAD maintain BP unless evidence cerebral ischemia
- **Surgical**
  - **Shunt** : Place to maintain CBF during carotid artery cross clamping

    Place before clamping

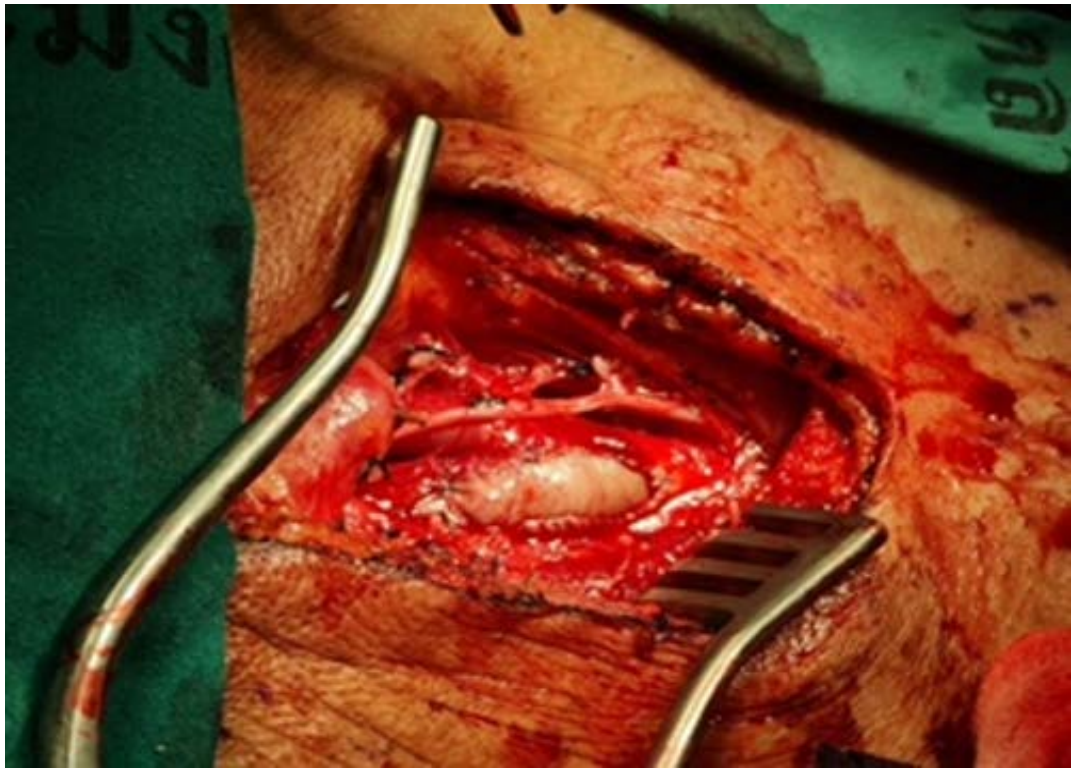
    Place if neuro exam change while under RA
  - Routine in case without neurologic monitor
  - Risk of embolization and carotid intimal dissection, limit surgical exposure
  - Discontinue NO2 before shunt

INTRAOPERATIVE

- **Traction on carotid sinus**
  - Hypotension, bradycardia : traction carotid during dissection “ misinterpreted”>> LA carotid sinus nerve, reduction depth anesthesia, IV fluid, vasopressor e.g. Phrenylphrine, ephedrine
- **Traction on carotid artery**
  - Hypertension : Visceral pain , traction, distort carotid >> LA infiltration carotid sheat or deepen anesthesia antiHT e.g. Esmolol, Labetalol

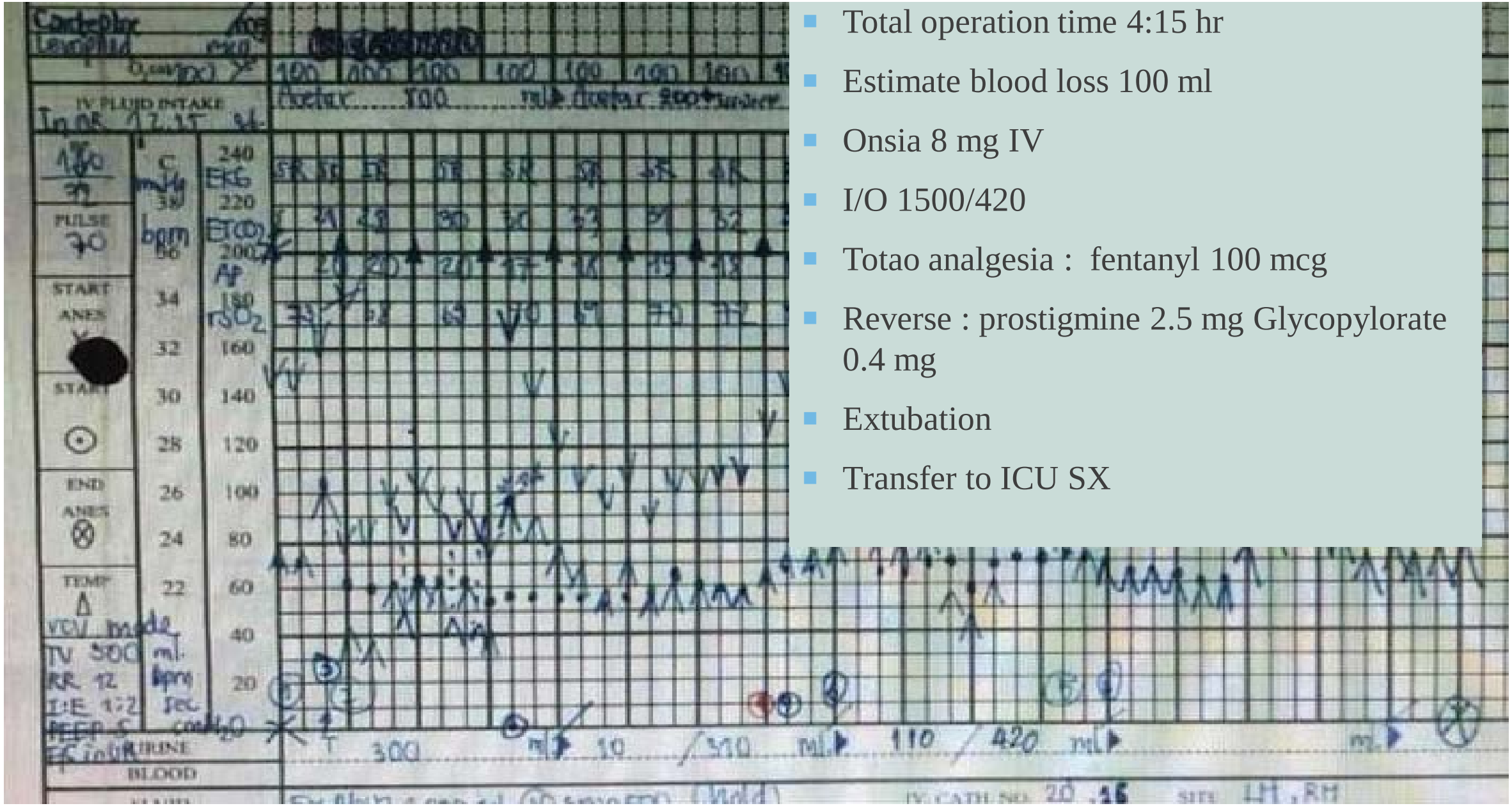
INTRAOPERATIVE

- **Unclamping**
  - Reflex vasodilation ,Bradycardia and Hypotension
  - Reperfusion injury : ICH , Cerebral edema
  - Vasopressor may be required
  - BP keep low normal range
  - Decrease myocardial oxygen consumption
  - Decrease the amount of stress on the suture line
  - Minimizes the possibility off reperfusion memorrhage



LAB ABG

เวลา	C	Hb/Hct	pH	pCO2	pO2	HCO3	BE	Na	K	Ca	ACT	DTX
12:45	36.6	14.7/44.3	7.447	38.3	279.6	25.9	1.9	136.9	3.85	1.16	-	100
14:05	36.3	14.4/43.2	7.452	37.5	275.8	25.6	1.8	139.5	3.54	1.10	-	108



- Total operation time 4:15 hr
- Estimate blood loss 100 ml
- Onsia 8 mg IV
- I/O 1500/420
- Totao analgesia : fentanyl 100 mcg
- Reverse : prostigmine 2.5 mg Glycopylorate 0.4 mg
- Extubation
- Transfer to ICU SX

POST OPERATIVE

- Postop monitor : A line
- Supplement oxygen
- Carotid sinus baroreceptor function

POSTOPERATIVE CONSIDERATION

- **Postoperative complication**
  - 60% Hypertension
  - 3.3% Carotid artery thrombosis : asso with high rate of Major stroke or death despite immediate operative intervention
  - 1-3% Cerebral hyperperfusion syndrome (ipsilateral headache: improves on upright posture ,seizure, focal neurologic signs, brain edema and possibly ICH)
  - 0.4-2% Intracranial hemorrhage
  - 0-2% MI

POSTOPERATIVE CONSIDERATION

- **Postoperative complication**
  - Cranial and cervical nerve dysfunction
    - Recurrent laryngeal nerve(vocal cord paralysis) , superior laryngeal nerve, hypoglossal nerve, marginal mandibular nerve
  - Carotid body denervation : Unilateral loss(impaired ventilatory response to mild hypoxemia), Bilateral loss(loss normal ventilation and arterial pressure)
  - Wound hematoma : airway obstruction
  - Tension pneumothorax
  - Post operative hypotension
    - DDX : Hypovolemia, residual anesthetic, prolong effect antiHT drug, MI, Dysrhythmia, sensitivity of carotid sinus
    - Mx : Fluid and vasopressor

POSTOPERATIVE DAY 0

- S : ผู้ป่วยตื่นดี พูดคุยรู้เรื่อง ไม่มีneuro deficit ไม่มีอาการเจ็บแน่นหน้าอก หรือหอบเหนื่อย เจ็บแผลเล็กน้อย เสียงไม่แหบ แผลไม่ซึม ไม่มีไข้ ไม่ปวดหัว
- O : Vital sign BP 140/80 ,Pulse 70 bpm ,RR 16 /min O2 sat 100%(face mask 10 LPM)

  HEENT : not pale conjunctivae, no neck hematoma

  CVS : normal S1S2 ,no murmur

  Lung : clear ,equal breath sound

  Neuro : E4V5M6 full EOM ,no facial palsy, motor grade V all extremity

POSTOPERATIVE DAY 0

- A : Right carotid stenosis S/P CEA day 0
- P : Pain control :fentanyl 50 mcg IV q 6 hr, fentanyl 25 mcg iv prn q 4 hr
  - Control BP <130-150/80-90 mmHG
    - Hypotension : Levophed(1:25) IV 3ml/hr (0.023 mcg/kg/min)
  - Off foley
  - Plasil 10 mg IV prn q 8 hr
  - Observe neuro signs
  - Start current medication : continuous ASA(81) 1*1 po pc, Manidipine(10) 1*1 po pc
  - Lab at ICU : Hb/Hct 14.3/41 Plt 220,000 Na132 K3.6 Cl107.2 HCO3 23.9 Ca6.46 Mg1.74 Po4 3.41 DTX135

POSTOPERATIVE DAY1

- S : ผู้ป่วยตื่นดี พูดคุยรู้เรื่อง ไม่มีneuro deficit ไม่มีอาการเจ็บแน่นหน้าอก หรือหอบเหนื่อย เจ็บแผลเล็กน้อย เสียงไม่แหบ แผลไม่ซึม ไม่มีไข้ ไม่ปวดหัว
- O : Vital sign BP 132/64 ,Pulse 68 bpm ,RR 16 /min O2 sat 100%(RA)

  HEENT : not pale conjunctivae, no neck hematoma

  CVS : normal S1S2 ,no murmur

  Lung : clear ,equal breath sound

  Neuro : E4V5M6 full EOM ,no facial palsy, motor grade V all extremity
- A : Right carotid stenosis S/P CEA day 1
- P : Pain control :fentanyl 50 mcg IV
  - Control BP <130-150/80-90 mmHG (Off Levophedได้)
  - Off foley, off IV, off A-line
  - Plasil 10 mg IV prn q 8 hr
  - Observe neuro signs
  - ย้ายward13/1

POSTOPERATIVE DAY 2

- S : ผู้ป่วยตื่นดี พูดคุยรู้เรื่อง ไม่มีneuro deficit ไม่มีอาการเจ็บแน่นหน้าอก หรือหอบเหนื่อย เจ็บแผลเล็กน้อย PS3/10 แผลไม่ซึม drainออกย้อยมาก5cc ไม่มีไข้ ไม่ปวดหัว
- O : Vital sign BP 132/64 ,Pulse 68 bpm ,RR 16 /min O2 sat 100%(RA)

  HEENT : not pale conjunctivae, no neck hematoma

  CVS : normal S1S2 ,no murmur

  Lung : clear ,equal breath sound

  Neuro : E4V5M6 full EOM ,no facial palsy, motor grade V all extremity
- A : Right carotid stenosis S/P CEA day 2
- P : Pain control : Para(500) 1tab prn q 6hr, tramol(50) 1*2 po pc
  - Observe neuro signs
  - Plan D/C พรุ่งนี้
  - HM : ASA(81) 1*1 PO PC, Atorvas(40) 1*hs, Ultracet1*2 po pc

THANK YOU