To Do or Not to Do: The Anesthetic Dilemma of a High Risk Renal Transplant Candidate

Presented by
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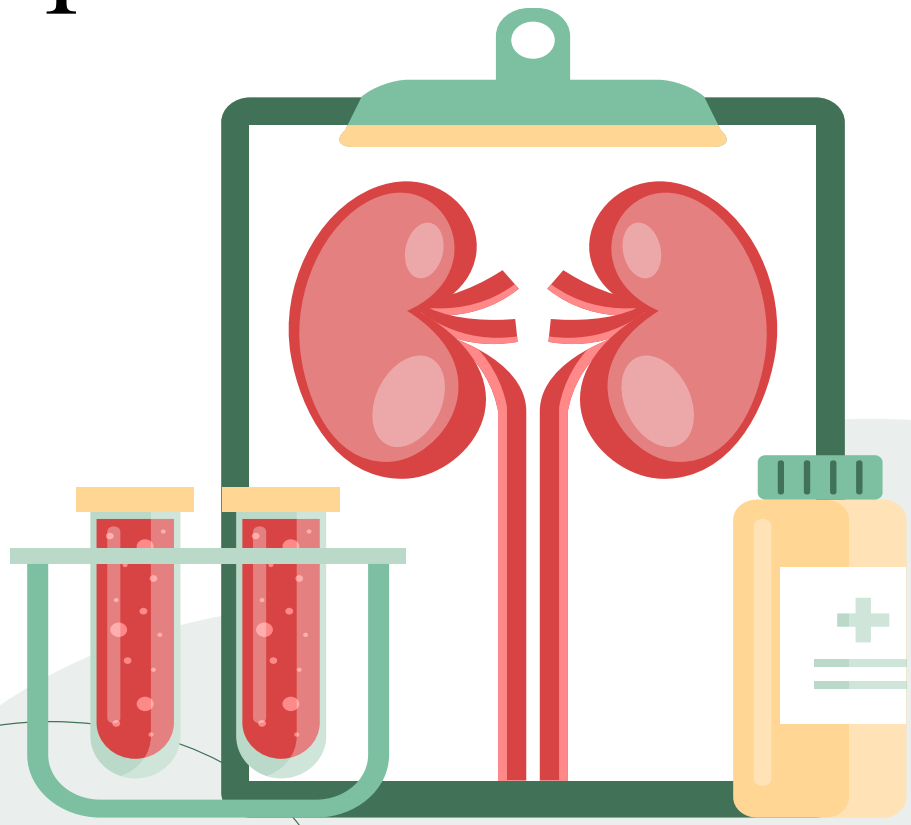

Introduction

Renal Transplantation:

- A highly demanding surgery that presents significant anesthetic challenges, especially in patients with multiple systemic comorbidities.

Anesthetic Challenges:

- Complex medical histories, including SLE, CKD, heart failure, and other conditions, heighten the risks during anesthesia and surgery.
- The objective of this presentation is to outline the anesthetic strategies used to optimize care for this high-risk patient, focusing on comprehensive preoperative assessment and multidisciplinary optimization.
- Intraoperative vigilance with effective coordination and smooth post operative transition.

Chief Complaints

- A 34-year-old female, weighing 43 kg and measuring 157 cm in height, with a body mass index (BMI) of 17.4 kg/m²
- Patient is a known case of Systemic Lupus Erythematosus (SLE) since 5 years and has multiple co morbidities.
- Presented to us with Stage IV Chronic Kidney Disease- secondary to Lupus Nephritis
- Posted for elective live related renal transplantation – mother to daughter

History of Presenting Illness

- Patient was apparently normal 5 years ago, when she developed **sudden-onset bilious vomiting**.

She was diagnosed with **Systemic Lupus Erythematosus (SLE)** based on clinical features and serology. Patient was found to have **significant proteinuria** – suggestive of **Class IV lupus nephritis** and was referred for live related renal transplant

- Diagnosed with **SLE** 5 years ago; developed **progressive renal dysfunction** leading to **ESRD on dialysis**
- History of **multiple ICU admissions** for breathlessness; likely **lupus pneumonitis or pulmonary edema**
- **H/o bronchial asthma**, managed with inhalers
- Diagnosed with **heart failure (EF 15-20%)**, attributed to **lupus myocarditis/hypertension**
- H/o **recurrent abdominal distension**; required **ascitic tapping**
- H/o **fatigue and proximal muscle weakness** suggestive of musculoskeletal involvement
- **H/o hypothyroidism** on **thyroxine supplementation**
- Due to progressive multi-system disease, patient is **referred for renal transplantation**

Previous Surgical History

- History cystectomy done under Spinal anaesthesia
- History of failed AV fistula creation on the left hand
- History of bilateral cataract surgery under local anaesthesia

Dilemma

- **The Dilemma:**
  At the heart of this case lies a profound clinical conundrum.
- Should we pursue a life-saving transplant to improve quality of life, knowing that the patient's current condition could make surgery and anesthesia themselves life-threatening?
- Or do we accept the progression of her illness and avoid doing any more harm.

- **The Anesthesiologist's Crucial Role:**
  Far beyond administering drugs, the anesthesiologist becomes a key decision-maker—carefully weighing the razor-thin margin between benefit and harm.
- With patient safety as the compass, we must evaluate whether the anesthetic risk is ethically defensible considering her prognosis, comorbidities, and the broader principle of "do no harm."

General Physical Examination

Patient is conscious, oriented, and cooperative.

No s/o pallor, icterus, cyanosis, clubbing, lymphadenopathy, or pedal edema.

Vital Signs:

- Heart Rate:76 bpm
- Blood Pressure:130/80mmHg
- Respiratory Rate: 18 breaths/min
- Temperature:37.2°C (Afebrile)
- SpO_2: 97% on room air
- JVP Normal

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Systemic Examination

Cardiovascular System: S1 and S2 +no murmurs

Respiratory System: B/L air entry present.
No added sounds

Abdomen: Soft, non-tender, no organomegaly

Neurological Examination: Patient alert and oriented

Spine and Joints: No obvious deformities

Cervical spine mobility normal

Airway examination :

2.5 Finger mouth opening

Mallampati Score- 3

No loose teeth

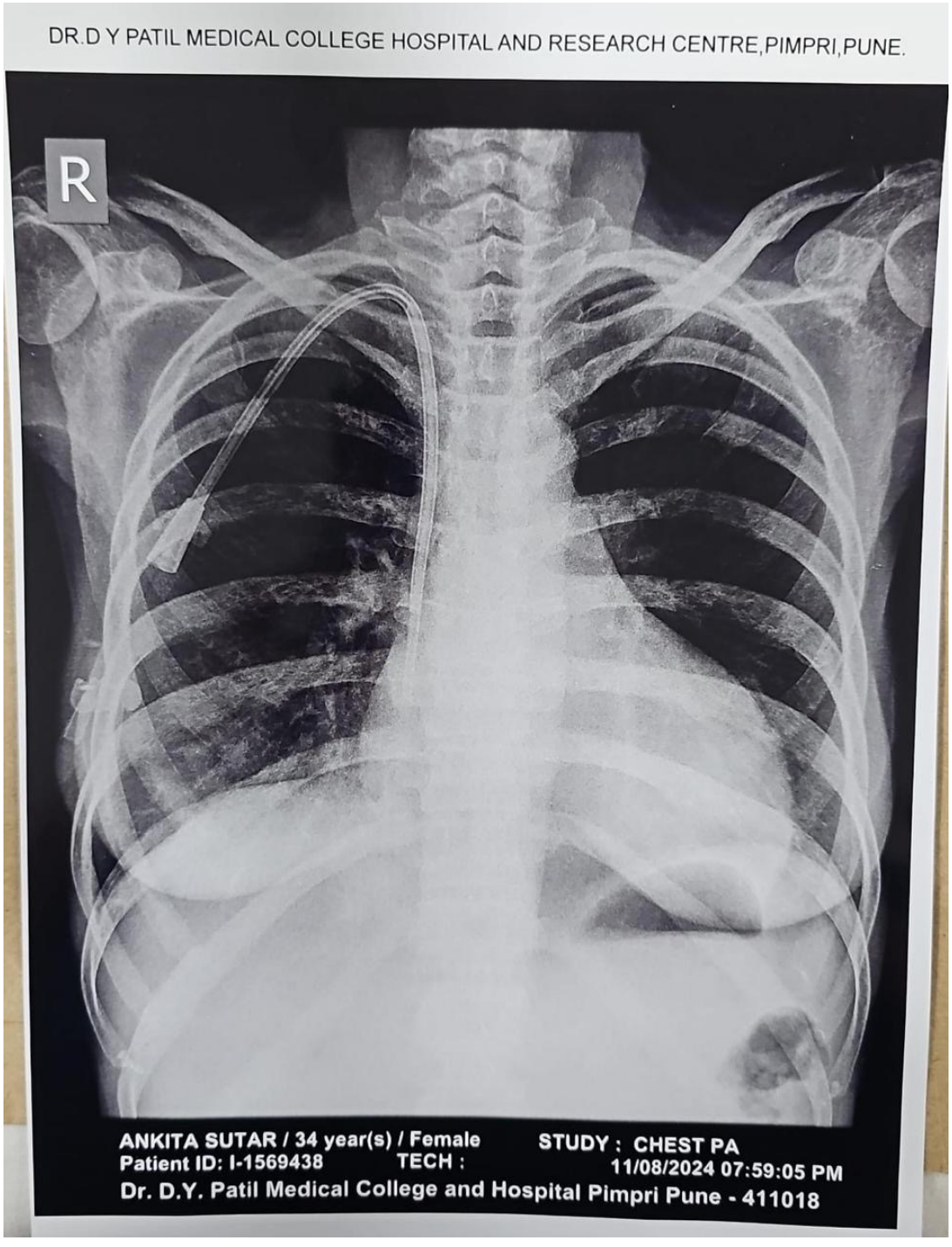
Thyromental distance > 6.5cms

Neck movement: Not restricted

TMJ no restriction noted

Lab Investigation	Value
Hemoglobin	10.10 gm/dl
TLC	3,300/mm^3
Platelet Count	1.08 lakhs/mm³
Urea	**63mg/dl**
Creatinine	**3.84mg/dl**
Serum Electrolytes (Na/K/Cl)	143/3.97/105
PT/INR	12.50/1.05
TSH	**11.24*(raised)**
T3	0.66
T4	6.53
RBS	110 mg/dl
Serology	Non-reactive
Blood Group	O Positive
LFTs	WNL

CXR


DR.D Y PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE,PIMPRI,PUNE.
R
ANKITA SUTAR / 34 year(s) / Female
Patient ID: I-1569438
TECH :
STUDY : CHEST PA
11/08/2024 07:59:05 PM
Dr. D.Y. Patil Medical College and Hospital Pimpri Pune - 411018

Room Air – Arterial Blood Gas

- **pH**: 7.46
- **$PaCO_2$**: 39
- **PaO_2**: 67
- **HCO_3^-**: 27.7
- **Base Excess (BE)**: 3.6
- **SpO_2**: 99%
- **Lactate**: 0.8
- **Time of Sample**: Arterial

2D Echocardiography

- **EF 15-20%**
- Global LV hypokinesia
- **Severe LV dysfunction**
- Mild concentric LV hypertrophy
- All 4 chambers dilated
- Grade 3 Diastolic dysfunction
- Grade 2 Mitral Regurgitation
- Moderate Tricuspid Regurgitation
- **Severe Pulmonary Artery Hypertension**
- RVSP = 47mmHg
- No clot/vegetation/pericardial effusion

D'PU Dr. D.Y. Patil Medical College, Hospital & Research Centre, Pimpri, Pune-411018	PRN-[redacted] Patient's Name-[redacted] Ward No/Room No –FCW Doctor In charge- DR.C SRIDEVI Technician –SAGAR Anesthetist – DR RAJ PEDGOANKAR
	Date-05/08/2024 Age/Sex: 34 Y/F Asst: DR.PRAKASH Nurse –POONAM X

CORONARY ANGIOGRAPHY

Preoperative Diagnosis: CKD/ HTN/ON MHD

Access –Right Femoral Artery

Hardware – 6F Femoral Sheath, Diagnostic Catheter-6F JL(3.5), JR (3.5)

Heparin-1000-unit, CONTRAST -OMNIPAQUE -50 ml

Fluro Time –06:35 min, DAP –48695 mGycm^2

Findings: - Right Dominant System

LMCA: - Normal

LAD: - Type III Vessel, TIMI III Flow
Proximal-Normal
Mid- Normal
Distal- Normal
Diagonals- Normal

LCX: - TIMI III Flow
Proximal- Normal
Mid & Distal- Normal
OMS- Normal

RCA: - Dominant, TIMI III Flow
Proximal- Normal
Mid- Normal
Distal- Normal
PDA/PLV-Normal

IMP: NORMAL CORONARIES
ADV: MEDICAL MANAGEMENT

DR C SRIDEVI
INTERVENTIONAL CARDIOLOGIST

DPU Dr. D.Y. Patil Medical College, Hospital & Research Centre, Pimpri, Pune-411018	PRN [redacted] Patient's Name- [redacted] Ward No/Room No –FCW Doctor In charge- DR.C SRIDEVI Technician –SAGAR Anesthetist – DR RAJ PEDGOANKAR
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RIGHT & LEFT HEART CATHETERIZATION WITH OXYMETRY, PRESSURE STUDY

DIAGNOSIS – CKD/ HTN/ON MHD
INDICATION – PREOPERATIVE ASSESMENT
WEIGHT-43 Kg, HEIGHT-157cm,
BSA-1.39 m^2 (MOSTELLAR) BMI –17.4 kg/m^2, HAEMOGLOBIN- 10.10 gms%
Pressure NIBP- 104/70/ mmHg, HR-125 /min, SPO^2- 94 % ON ROOM AIR
CATHETER USED- 6F Pigtail Catheter & JR 3.5, APPROACH – Right Femoral Artery & Vein

PRESSURE STUDY

CARDIAC CHAMBERS	PRESSURE (mm of Hg)
PA	51/29 (37)
RVSP	46
RVEDP	25
RA(MEAN)	15
LVEDP	25
AORTA	

OXYMETRY

CHAMBER	SATURATION
PA	
AO	108/94 (99)

CALCULATED VALUES (AT RESTING)	
Cardiac Output FICK'S METHOD	2 lit/min
Cardiac Index FICK'S METHOD	1.43 lit/min/m2
SV	16 ml/beat
PVR	6 wood units
SVR	42 wood units
PVRI	4.3 wood's m^2
SVRI	30.21 wood's m^2
PVR/SVR	0.142

IMPRESSION – HFrEF with Reduced Cardiac Output with RV Dysfunction with Mixed Pulmonary HTN

DR C SRIDEVI
INTERVENTIONAL CARDIOLOGIST

Cardiac Output : 2 lit/ min (Normal : 4-8 lit/min)

RVSP(Right Vetricular systolic pressure) : 46 (Normal :<40)

Pulmonary Vascular Resistance : 6 wood units (Normal: 0.25-2)

Specialist Consultations

- **Nephrology:** for dialysis timing, immunosuppressive plan
- **Cardiology:** for perioperative risk and optimization
- **Rheumatology:** for SLE activity, perioperative steroid protocol
- Pulmonology
- Medicine
- ENT
- OBGY
- Dermatology
- Urology
- Ophthalmology

Current medications

- **T. Prednisolone 2.5 mg OD**
  → Maintenance immunosuppression for SLE
- **T. Hydroxychloroquine 300 mg OD**
  → Disease-modifying agent for SLE flares
- **T. Isosorbide dinitrate + Hydralazine (20/37.5 mg TID)**
  → Afterload/preload reduction in heart failure (EF 15-20%)
- **T. Torsemide 10 mg OD**
  → Volume control in CHF and ESRD
- **T. Febuxostat 40 mg OD**
  → Management of hyperuricemia due to CKD
- **T. Rifaximin 400 mg BD**
  → GI decontamination/prevention of uremic/hepatic encephalopathy
- **T. Empagliflozin 10 mg BD**
  → Cardio-renal protection in heart failure/CKD
- **T. Thyronorm 100 mcg BD**
  → Replacement therapy for hypothyroidism

Preoperative – Advice

- Patient evaluated by senior anaesthesiologists and specialists from other departments
- **Multidisciplinary meeting** held 1 week prior to surgery
- Patient and family – counselling

- **Anaesthesia plan explained**: GA with invasive lines, intubation, prolonged ICU stay
- **High-risk consent** taken for:
- ***EF 15–20%, severe PAH***
- Risk of arrhythmias, cardiac failure, cardiopulmonary arrest
- **Pre-op instructions:**
- Repeat labs post-dialysis: CBC, SE, LFT, RFT, PT/INR
- Repeat CXR and 2D Echo on day of surgery
- Continue regular meds (Empagliflozin, Thyronorm, Prednisolone)
- NPO for >6 hours

Anaesthesia Plan

Anaesthetic Technique:

- General anesthesia with invasive monitoring and invasive lines
- Goal: Stable hemodynamics - maintain stable BP, CO, SVR
  Adequate ventilation
  Goal directed fluid therapy

Monitoring:

- Standard ASA monitors: ECG, SpO_2, NIBP, $EtCO_2$, temperature
- **Arterial line** for beat-to-beat BP & ABG sampling
- **Cardiac output monitor** connected to arterial line (e.g., FloTrac) for real-time CO, SVV, SVR
- **CVP measured** through Central Venous Catheter
- Foley catheter with hourly urine output

Anaesthesia Plan

Induction Plan:

- Etomidate for cardiac stability
- Fentanyl for blunting response
- Cisatracurium for neuromuscular blockade
- Video laryngoscope & bougie ready for airway access

Maintenance:

- Sevoflurane-based balanced GA
- Fentanyl infusion for analgesia
- TOF monitoring to guide relaxant use
- Milrinone and Noradrenaline infusions titrated according to cardiac output trends
- Normothermia and normocapnia maintained
- Restrictive fluids pre-reperfusion (CVP ~8–10 mmHg)
- Liberal fluids post-reperfusion (CVP ~12–14 mmHg)

WHAT IF !?!?!?!
Live Donation- Mother to Daughter

- **Standard Approach**:
  - Donor nephrectomy surgery starts first, followed by recipient surgery

- **In this case :**
  - **What if the recipient does not tolerate anaesthetic induction** (e.g., cardiac arrest, hypotension, arrhythmias)
  - This could have happened in a high-risk recipient (e.g., heart failure, multiple comorbidities)

- **What we have done….**

  - A multidisciplinary approach
  - Timely and coordinated recipient surgery to avoid complications.
  - Contrary to the routine approach of preparing the donor first followed by the recipient
  - We initiated management of the recipient
  - optimized condition of the recipient (daughter) and then we started donor(mother) surgery, giving them the best possible chance at a successful outcome..

Arterial Line

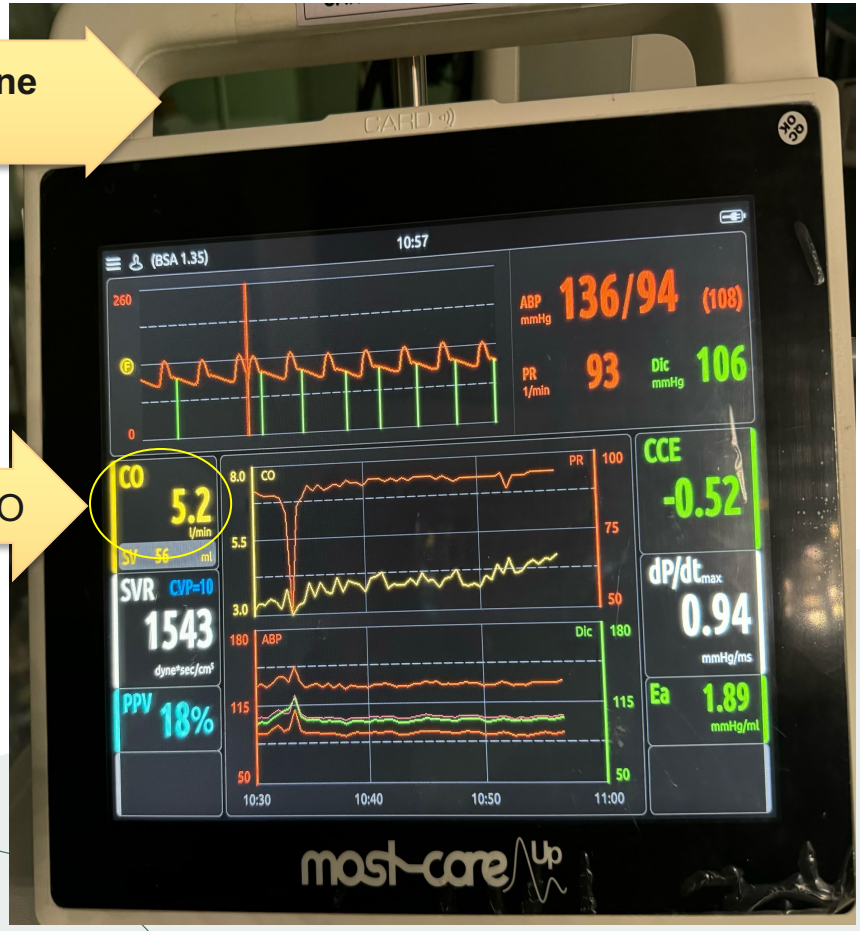
- As the radial pulses in both hands were feeble decision was taken to cannulate the femoral artery.
- On scanning the femoral artery, it was noted to be calcified
- In individuals with suspected connective tissue disease, particularly SLE, all invasive interventions warrant heightened vigilance, given the potential for dissection during cannulation leading to hematoma formation.

Pre-induction

- Cardiac Output was noted to be LOW and Inj. Milrinone infusion 0.3 mcg/kg/min and was started prior to induction.

Infusion Inj. Milrinone 0.3 mcg/kg/min

Note the CO



Induction

On Going Infusions

- Infusion Inj. Milrinone 0.3 mcg/kg/min
- Infusion Inj. Antithymocyte Globulin (ATG)
- Infusion Inj. Noradrenaline 0.05 mcg/kg/min

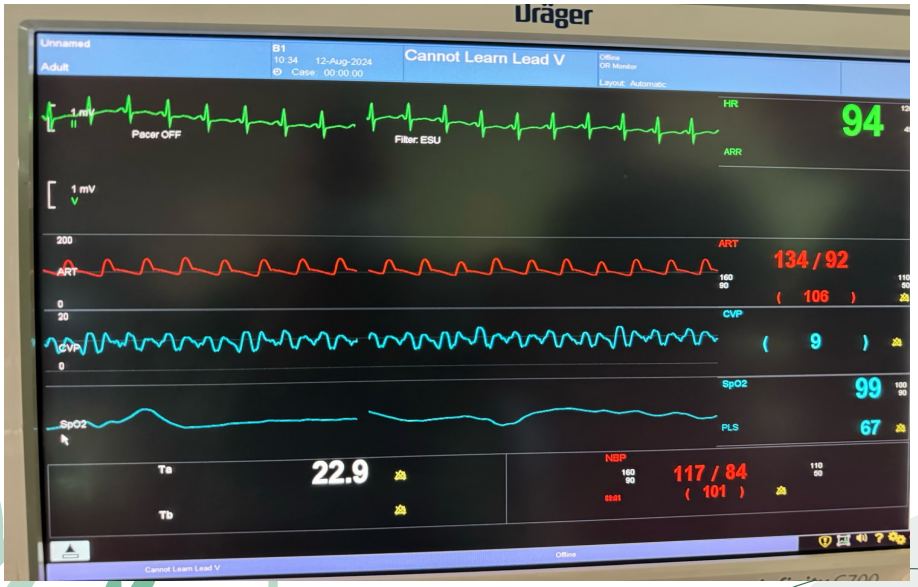
Induction Agents

- Inj. Midazolam 0.02mg/kg
- Inj. Hydrocortisone 2mg/kg
  Inj. Ondansetron 0.1mg/kg
- Inj. Fentanyl 2mcg/kg
- Inj. Etomidate 0.3mg/kg
- Inj. Rocuronium 1mg/kg
- Inj. Methyl Prednisolone 1gm

The Intraoperative Course

Initial Phase:

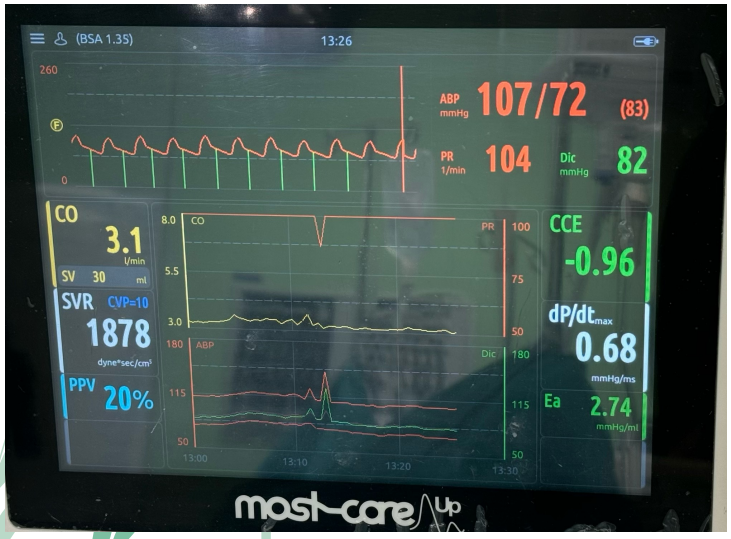
- Uneventful induction and intubation
- Stable hemodynamics during surgical incision
- Restricted fluids pre-reperfusion (CVP ~8–10 mmHg)
- ABG and electrolytes checked at 1 hour — within acceptable range

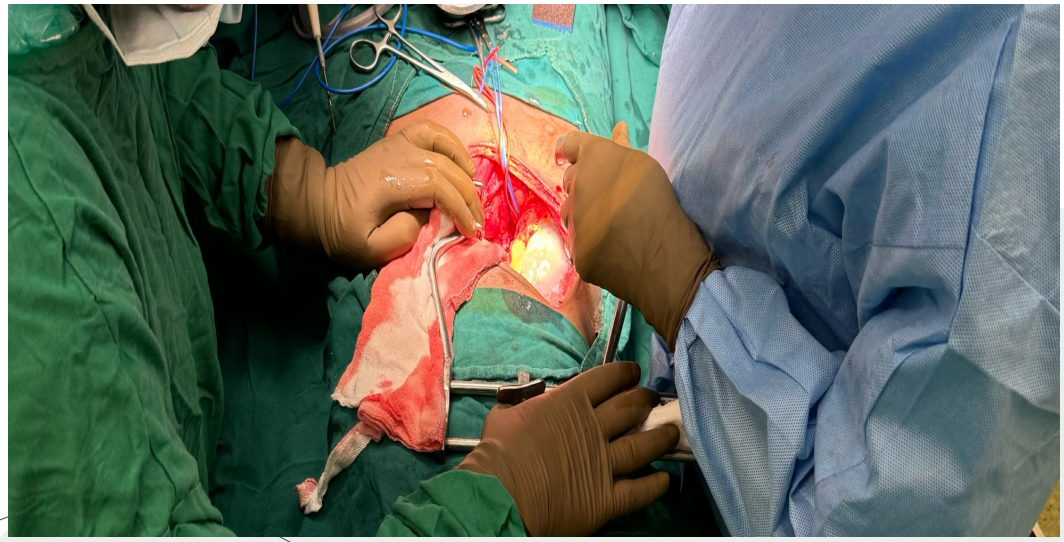


The Intraoperative Course

Graft Reperfusion Phase:

- Transient hypotension post unclamping noted
- Managed with fluid bolus + noradrenaline titration
- Mannitol and furosemide given according to protocol
- Adequate urine output observed from graft

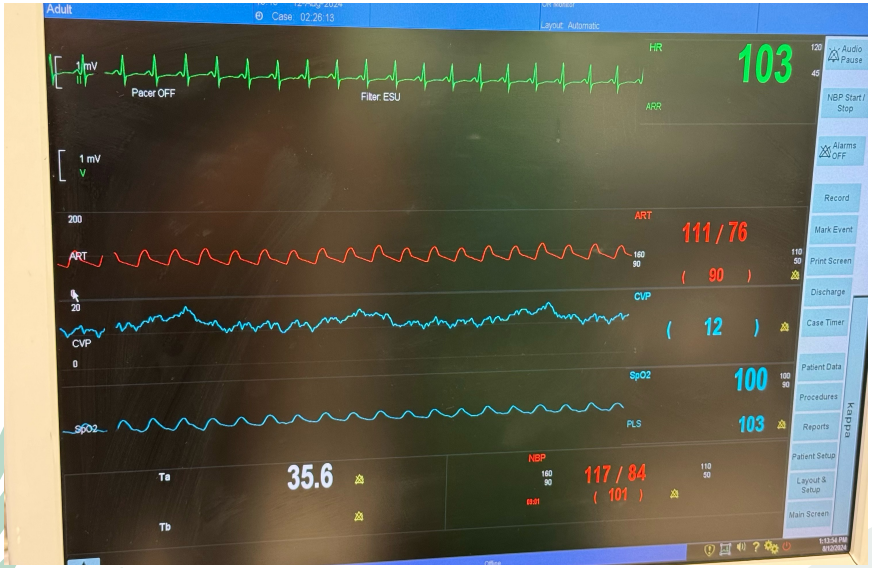


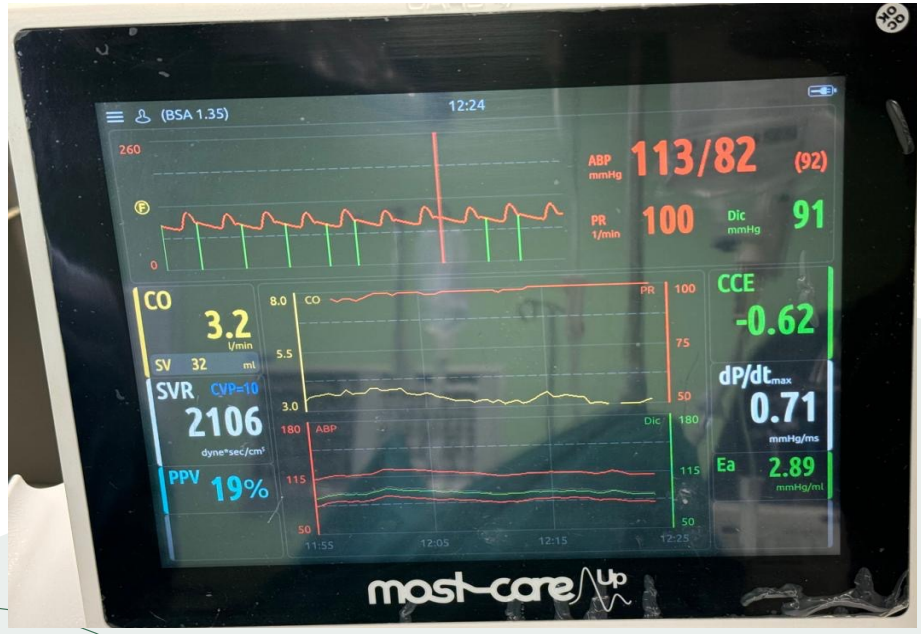


The Intraoperative Course

Post-Reperfusion and Closure:

- CVP increased to ~12–14 mmHg
- Hemodynamics stabilized with noradrenaline support
- Surgery completed without major complications





Post Operative Course

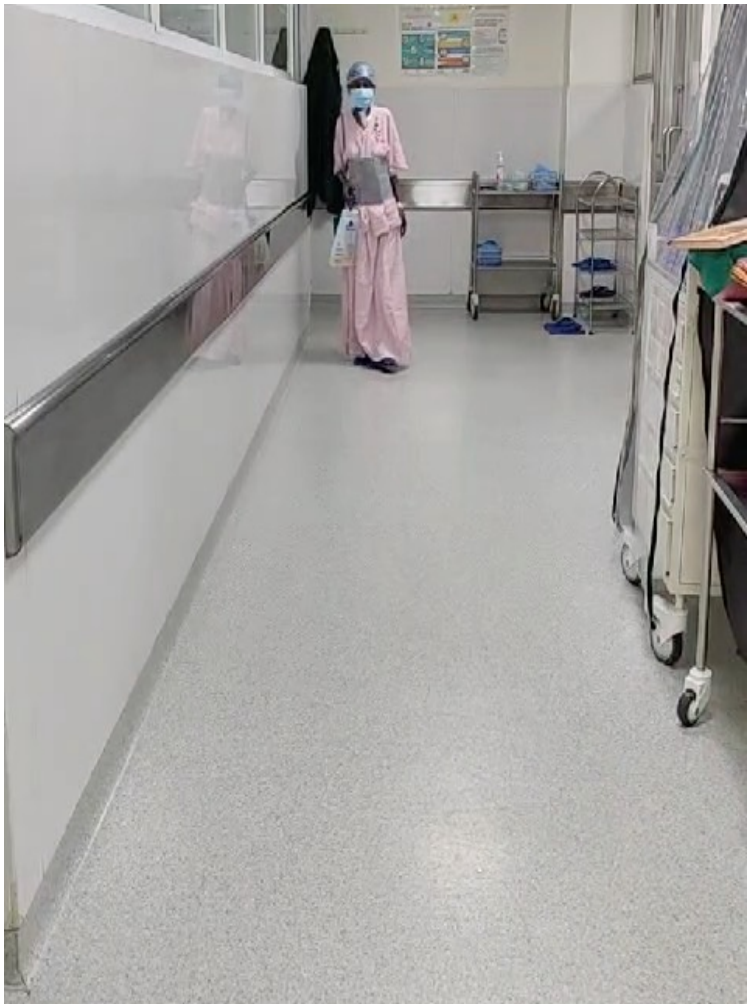
- Patient was shifted Intubated to Kidney Transplant ICU with ionotrope support.

- Patient was extubated on POD – 1.

-Nor-adrenaline infusion was tapered according to BP on POD-1 prior to extubation

- -Milrinone infusion stopped on POD-2 and patient was vitally stable.

- Patient was in KT-ICU for 16 days post operatively being continuously monitored



Discussion

- This case underscores the complex anaesthetic considerations in a patient with multi-system involvement, including ESRD, SLE, and heart failure (EF 15-20%).
- Preoperative optimization required a careful balance of fluid status, electrolyte correction, steroid coverage, and cardiac risk stratification.
- Anaesthetic induction and maintenance focused on agents with minimal myocardial and renal impact.
- Postoperative priorities included vigilant hemodynamic monitoring, immunosuppressant continuation, and early detection of graft-related complications.
- This case highlights the anesthesiologist's central role in anticipating complications, preserving organ perfusion, and coordinating multidisciplinary care to ensure optimal graft and patient outcomes.

Challenges we faced

- Each comorbidity brought its own perioperative implications:
- **Hypertension and heart failure** posed major haemodynamic risks
- **ESRD** complicated fluid and electrolyte management
- **SLE** introduced autoimmune and steroid-related considerations
- **Asthma** increased the risk of intraoperative bronchospasm
- **Hypothyroidism** impacted metabolism, drug handling, and cardiovascular responsiveness

Take-Home Messages

- Preoperative optimization is crucial.
- Anticipating intraoperative events enables timely intervention with the **anesthesiologist playing a crucial role** in maintaining hemodynamic stability and ensuring graft perfusion.
- **Tailored anesthetic optimization and management** in this case with multiple comorbidities was essential for a successful outcome.

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THANK YOU