

# About one of my favorite patients



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## Sacha

Well-developed 14 y old boy

- < General Hospital
- Abdominal pain - Possible appendicitis
  - Echographic diagnosis
  - Second episode (1 year!)
- Medical history
  - Hypoplastic right ventricle with tricuspid and pulmonary atresia
  - Fontan
  - Sintrom - Acenocoumarol



## Sacha

Well-developed 14 y old boy

- Abdominal pain - Possible appendicitis
  - Echographic diagnosis
  - Second episode (1 year!)
- Surgical advice
- Laparoscopic Appendectomy



## Sacha

- Hypoplastic right ventricle with tricuspid and pulmonary atresia
  - 3-stages palliation
    - RMBTS
      - PDA Ligation
    - Glenn Anastomosis
    - Fontan
  - Neonatal period
    - NEC - colostomy
    - Intestinal continuity



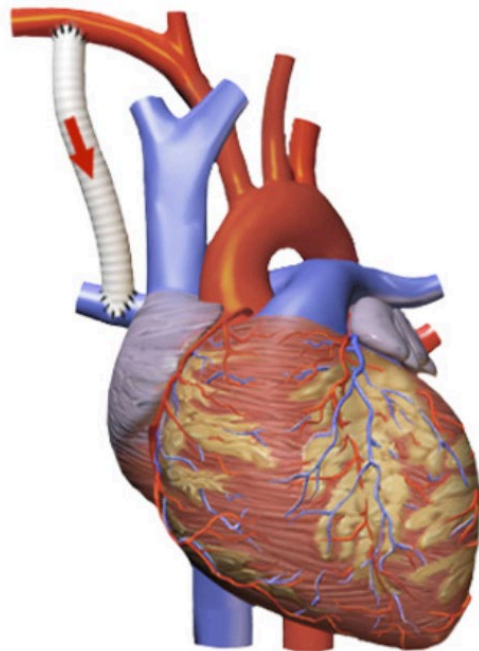
## First thoughts?



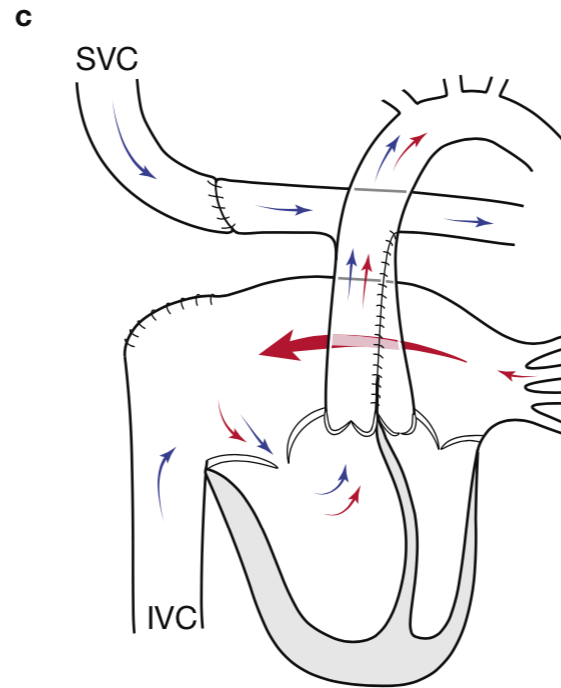


# Physiological situation of the patient - « Single ventricle circulation »

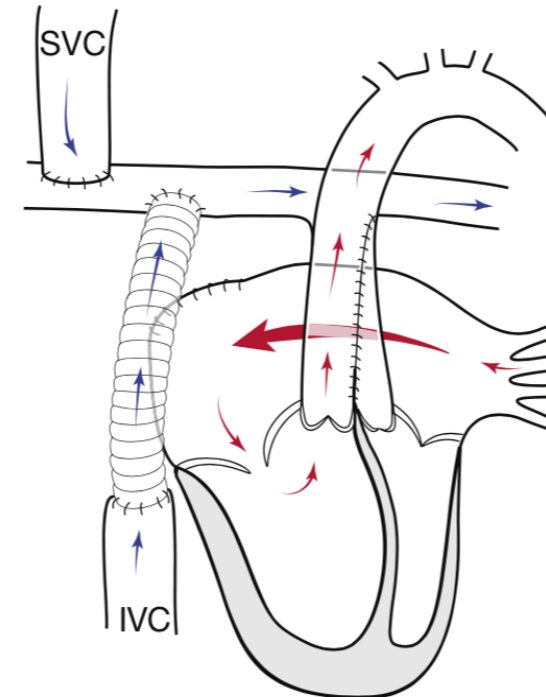
RMBTS



Glenn shunt



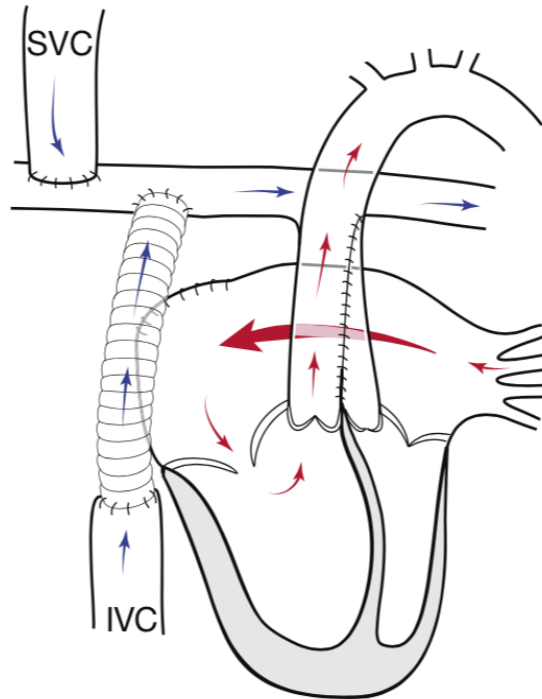
Fontan



Smith.2018: Anaesth & Intens Care med

## Physiology - « Single ventricle circulation »

Fontan



- Passive venous return to pulmonary bed
- Ventilation
  - Spontaneous ventilation
  - If controlled ventilation
    - Minimizing peak time & pressure
    - Minimizing PEEP

Smith.2018: Anaesth & Intens Care med

## Do we need preoperative investigations?





## Preoperative evaluation

- Careful physical evaluation
  - Medications
  - Medical summaries
- Extracardiac associated anomalies
- Recent investigations
  - Echocardiography - MRI - CTscan
- Blood tests



## Preoperative evaluation

- Careful physical evaluation
  - Medications
  - Medical summaries
- Extracardiac associated anomalies
- Recent investigations
  - Echocardiography - MRI - CTscan
- Blood tests
  - 47 kg - 160 cm -
  - BP 119/63 - Sp O2 100%
  - Echo: Very good flow in the conduit & in the Glenn shunt. No aortic or mitral insufficiency. Pulmonary arteries well developed. Very good function
  - MRI: Function good. No pulmonary, pericardial or abdominal liquid
  - INR : 1,65



## Preoperative evaluation

- Expected difficulties
  - Vascular accesses
  - Laryngeal anomalies and possible tracheal stenosis
  - Anxiety and maladaptive behavior
- Psychological challenge (Child and parents)



## Anesthesia technique - Monitoring



# Anesthesia technique and monitoring

- Premedication
- Anesthesia induction and maintenance
  - Inhalational
  - IV
- Post-operative analgesia





# Anesthesia technique and monitoring

## *Pay attention*

- Dehydration & Short preop fasting
- Perioperative complications
  - Related to heart function
  - Sudden
    - Hypoxia: Pulmonary Hypertension, ↓SVR, ↑PVR
- Bleeding for patients on anticoagulant therapy

Vasoactive & Inotropic drugs readily available

# Surgery

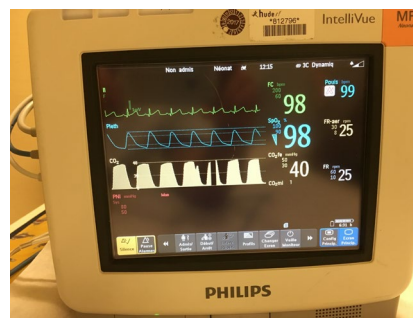
## *Laparoscopic - Thoracoscopic procedures*

- Preoperative assessment
- Invasive monitoring
- Insufflation pressure limitation: 10 mmHg (if thoracoscopic surgery 4 mmHg)
- Cardiopulmonary function
  - Patient position
  - Increased IAP: venous congestion and cephalad shift of diaphragm (FRC ↓)
  - CO<sub>2</sub> absorption
- Less tolerance for complications: gas embolism...

Chu et al.,2018: J Pediatr

# Monitoring

- Standard monitoring
  - Capnography
- NIRS
- Invasive monitoring
  - Arterial line
  - Central venous line
  - Cardiac Output measurement
  - Blood gas analysis & Acid-base status



## WHY SACHA?



H.U.B



THANK YOU FOR YOUR ATTENTION

H.U.B

