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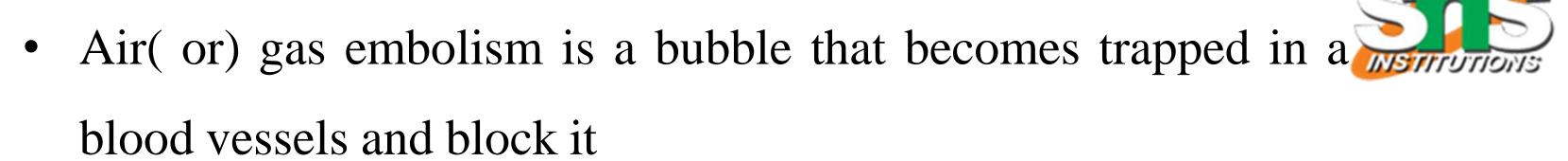
DEPARTMENT OF OPERATION THEATRE AND ANAESTHESIA TECHNOLOGY

3rd YEAR

SUBJECT:Principles of Anaesthesia II

TOPIC:AIR EMBOLISM





- Any gas can result in the embolization if present in vasculature so air embolism can be
- Venous air embolism
- Arterial air embolism
- Paradoxical sir embolism



RISK FACTORS



VENOUS EMBOLISM:

Surgical factors:

- sitting craniotomy
- posterior fossa surgery
- spinal surgery
- shoulder surgery
- laproscopic surgery (CO2)
- ceasarean section





Anaesthetic factors:

- central venous access
- pressurized infusions
- non primed giving sets
- unrecognized epidural vein cannulation



Patient factors:



Trauma blent and penetrating hypovolemia

ARTERIAL EMBOLISM

Surgical factors:

- CPB (cardiopulmonary bypass)
- ECMO (Extra carporial membrane oxygenation)
- Cardiac ablation
- laproscopic surgery



Anaesthetic factors:



Error priming transducer set

PEEP

Patient factors:

PFO

ASD/VSD



A volume of 5ml/kg is considered large enough cause cardiovascular collapse due to reduction is cardiac output



Some of the clinical manifestations which can been are as follows:

- Chest pain
- Arrythmiasis
- Right ventricular failure
- Cardiac output
- Shortness of breath
- May cause seizure, confusion in awake patient



- Posterior fossa surgeries are performed in sitting position dural sinuses are above the level of heart therefore have subatmospheric pressure. Once the dura is opened
- ,air from atmosphere can be sucked in causing venous air embolism
- The incidence of venous air embolism can be high as 20 to 40% in posterior fossa craniotomes however clinically significant venous air embolism is very less
- The major portion of air gets absorbed through pulmonary circulation
- Paradoxical embolism can cause coronary block causing cardiac arrest (or) cerebral block causing massive infarcts





- The most sensitive tool to detect venous air embolism is trans esophageal echocardiography. It can detect low as 0.25ml of air. Other advantages of TEE is can measure quantity of air.
- Predordial Doppler: Less sensitive than TEE
- ETCO2 : Sudden drop in ETCO2 values after the opening of dura strongly suggests venous air embolism





Signs and Symptoms:

- Hypotension
- Tachycardia
- Cyanosis
- Cardiovascular collapse



Treatment:



- Ask the surgeon to pack & flood the area with saline
- Stop nitrous oxide & start 100% O2, Nitrous oxide can expand size of air embolism
- Cardiopulmonary resuscitation: If cardiac arrest occurred
- Aspirate air through CVP Catheter
- Hyperbaric oxygen to reduce size of air bubble .It is helpful if transfer to Hyperbaric chamber is done within 8 hours





THANK YOU