

2019 air entrainment

Permission to print:	Yes
Region	ANZ
Description:	<p>Perfusing for a routine cardiac operation for a dilated Ascending Aorta, Patient was put on CPB with femoral cannulation. Towards the [completion of the] re warming the phase of the operation (nasal temp 36.4), the femoral line pressure started to [go] higher than 400mmHg. Surgeon was advised and plan was undertaken to cannulate the patient centrally. The pump was stopped and central aortic cannulation was undertaken. When the connection was made at the operating table between central aortic cannula and the arterial line there was some air in the aortic side of the cannula. The pump was slowly turned on to refill the aortic cannula, however this did not completely remove the air. A 50ml syringe was connected to the one-way tap of the aortic cannula with a clamp on the pump side of the tubing to aspirate the air. This however did not remove the air and created lots of micro emboli. The clamps were removed and replaced multiple times in the ensuing process to remove air and communication was not ideal with multiple inputs from the assistant the surgeon and the anaesthetist; at some point, accidentally aspirating the arterial line without positive pressure in the system. This resulted in negative pressure of -181mmHg in the arterial line. So before turning the pump on, I saw first noticed air in the arterial pump boot and then air in the arterial filter, oxygenator and inflow tubing of the oxygenator. Communicated to team that I can't turn forward [flow] and recirculated to eliminate the air by opening the recirc-line [1/4" wye] from arterial line distal to 20micron filter to a cardiomy reservoir port], sampling manifold [sourced from inflow luer of the arterial filter and the Inspire 6 oxygenator de-airing line (inspire shunt)]. The bubble alarm (S5) activated during this process. Making sure the circuit was totally de-aired before continuing CPB, I also pumped forward to the 50ml syringe a couple of times before starting the perfusion. This process took 4 minutes [from electronic record] where patient had a total circulatory arrest. The patient's postoperative course was uneventful.</p>
GOOD CATCH - what went well	Observation of the air in the cannula prior to recommencing CPB and systematic deairing of the CPB circuit and complete check of the circuit undertaken before recommencing the perfusion.
What could we do better	More precise closed loop communication [during deairing of the cannula] and taking a pause as the air was noticed in the arterial line to confirm actions before continuing further to de-air the circuit.
Preventive actions	Perfusion team discussion on management of the incident and a planned multidisciplinary review of technical management and communication for this type of situation.
Category	Air in circuit
Incident type	Good Catch Near Miss
Commentary	<p>This good catch/near miss illustrates the potential for arterial air embolism during CPB despite the multilevel safety technology and design in current day heart lung machines and oxygenators. An important component identified by the reporter is the importance of the pause - or mini timeout - and precise closed loop communication. An operating field camera with screens for OR staff is an important safety adjunct. The systematic approach to removal of circuit air in this account is integral to the Good Catch. PIRS-II Ed</p>