2024 Coagulation (Communication)

Permission to print:	Yes
Category	Coagulation
Category 2	Communication
Severity	Good Catch No Harm Incident
Duration of incident:	minutes
Description:	Elective CABGx1/MVR on 80 year old patient in liver failure using S5 HLM and Liva Nova Inspire 8F oxygenator with dual reservoir. A cell saver was available. Due to the liver failure patient was bleeding more than normal before going on CPB. After IMA take down the surgeon packed the chest with 3-5 lap [swabs] and briefly left the OR. Upon returning to the OR heparin was given while the surgeon was gowning up. The cannulation process began and laps (Lap swabs) that were full of blood were removed from the chest and placed in a basin. Three minutes after heparin was given an ACT was drawn. When the ACT reached 400 seconds the pump suckers were turned on. The ACT result was 760 seconds. There was greater than 3L of volume [in the venous reservoir] upon initiation [of CPB] and the perfusionist ultrafiltrated to approximately the 2L of volume in the reservoir. The MVR and CABG proceeded without incident. The ACT remained over 525 seconds for the duration of the case. While terminating bypass it was noted that there was clot on the cardiotomy filter in the reservoir below the 2L mark that wasn't visible during the bypass run. The patient was weaned off of bypass without incident. The patient was transfused with enough blood from the pump to be hemodynamically stable. The remainder [of the pump blood] was sent to the cell saver to be washed and transfused. The team was notified and the circuit was discarded. Another HLM was brought into the OR and prepared. After discussion with the team the most likely cause of the incident were the laps that were full of unheparinised blood. The laps were removed from the chest before cannulation, but the scrub was busy assisting with the cannulation process and didn't immediately wring them out. After assisting with cannulation the scrub had time to wring the blood out of the laps (estimated at approximately 200-400 ml). The clot was contained in the cardiotomy filter. The venous sock was rinsed and examined and so was the integrated ALF in the inspire oxygenator. There was not any clot visible. That is how we were able to narrow the cause down to the pump suckers and the likely unheparized blood from the laps.and by this time the ACT was >400 and the pump suckers were on, so the blood got sent to the CPB circuit.
GOOD CATCH - what went well	The perfusionist was unaware of the problem until termination of CPB because the clot was beneath the blood in the reservoir the entire pump run. Upon realizing the problem CPB was terminated without incident and a new circuit was prepared.
What could we do better	Team education about the use of cell saver vs. pump sucker suction
Preventive actions	If a patient is bleeding pre-CPB the team at the field has be en instructed to have 2 basins for laps. One labelled heparin and one labelled no heparin. Laps are to be divided into those 2 categories. The scrubs have also been asked to verify with perfusion which suction to use (cell saver vs pump sucker).
Type of incident:	Management
Timing of incident:	CPBnormothermic
Hospital incident filed	No
Ext Authority Advised	No
Discussed with team:	Yes

Knowledge issue	No
Rule issue	Yes
Skill issue	Yes
Team Issue	Yes
Patient outcome variance	Nil
Commentary	This is an interestingly unusual report, where the good practice intention of blood salvage was impacted by a series of temporal distractions that conspired to result in coagulation within the CPB circuit. This is an example of Perrow's tightly coupled, highly complex system where accidents are likely to occur (1). Pre heparinised chest blood would routinely be discarded or sent to the "cell saver" but the time delay and subsequent distraction of the cannulation process took the thought processes into a post heparin timespan. The author's comment on "what went well" that "The perfusionist was unaware of the problem until termination of CPB because the clot was beneath the blood in the reservoir the entire pump run" could imply had this been seen during the case then an unnecessary intervention to change the reservoir may have been attempted. The preventive plan above deserves consideration. PIRS Ed. 1 Normal Accidents: Living with High-Risk Technologies: Charles Perrow; Basic Books1984