HIGH-FREQUENCY JET VENTILATION IN THE MANAGEMENT OF NEONATAL PNEUMOPERICARDIUM AND CARDIAC TAMPOONADE. – A CASE STUDY

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INTRODUCTION: We present a patient who developed pneumopericardium (PPC) and subsequent cardiac tamponade post-delivery. High-frequency jet ventilation (HFJV) was used in effort to maintain gas exchange with the goal of minimizing further air leak. CASE: The patient was a 2.5 kg, 34 WGA infant born via cesarean section secondary to maternal placental abruption. He required cardiopulmonary resuscitation and intubation at birth. Upon arrival to our facility his first CXR revealed PPC. He was briefly placed on PC-IMV, in preparation for pericardiocentesis and decompensated with oxygen saturation (SpO₂) of 70% and mean arterial pressures as low as 20 mmHg. He was then transitioned to HFJV with initial settings of: HFJV PIP 40 cm H₂O, rate 420 breaths/minute (bpm), Ti of 0.02 seconds, and conventional settings of: PIP 22 cm H₂O, PEEP 10 cm H₂O, 4 bpm and F₁O₂ of 1. At this time an emergent pericardiocentesis was performed in the setting of continued decompensation, which was most likely a product of cardiac tamponade. The pericardial drain (angiocath) was left in place for ongoing intermittent air removal. Initial arterial blood gas (ABG) results were 7.09/86/116/25. HFJV PIP was increased to 50 cm H₂O and HFJV rate was decreased to 360 bpm. The conventional ventilator was minimized to CPAP of 7cm H₂O in an effort to minimize further air leak with follow up ABG results of 7.30/45/71/22. The angiocath was removed the following day and there was no further evidence of air accumulation. Our patient remained on HFJV for seven days and was extubated to CPAP on day 9.

DISCUSSION: PPC is a rare complication in the neonatal period, which is typically associated with both RDS and other air leaks. Small amounts of air may be tolerated without intervention; however severe cases can result in hemodynamic instability and cardiac tamponade physiology. After pericardiocentesis, it was a priority to minimize ventilator pressures and prevent further air accumulation. This case demonstrates that HFJV along with optimization of frequency and PEEP have potential to provide adequate gas exchange and reduce air leak in neonates with PPC.