

Facilitating emergency caesarean delivery using continuous positive airway pressure in a Covid-19 positive patient [P76]

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Introduction

We describe the successful emergency caesarean delivery of a 37 weeks gestation primigravida patient with worsening respiratory failure due to SARS-CoV-2 (Covid-19) pneumonia. The patient was escalated to intensive care and established on continuous positive airway pressure (CPAP). Following consideration of multiple factors and discussion with the patient, a lower-segment caesarean section was performed under spinal anaesthetic using CPAP to support ventilation. To our knowledge this is the first time this approach has been described.

Case Report

A 37-year-old patient attended the Emergency Department at a sister hospital with an eight-day history of shortness of breath, fatigue, anorexia, central chest discomfort, fevers and a productive cough. She had a positive Covid PCR test six days prior. As she was 37 weeks pregnant, she was transferred to our hospital with a collocated maternity unit. She had a background of asthma but was otherwise fit and healthy and a non-smoker. She had not received any Covid-19 vaccinations by choice. A plain chest film demonstrated extensive bilateral opacities (Fig.) and foetal ultrasound scans were reassuring. A CTPA was performed that did not demonstrate evidence of pulmonary embolism but did reveal extensive bilateral ground-glass densities in keep with Covid infection.

Respiratory failure worsened requiring escalating oxygen and she was transferred to the Intensive Care Unit (ICU). She was tachypnoeic, pyrexial and tiring. High-flow nasal oxygen (HFNO) was started (Fisher & Paykel Airvo™ 2) but requirements rapidly escalated over 24hrs to maximal support yielding SpO2 82% and PaO2 7kPa. She was started on CPAP (Dräger Evita® V800) initially with zero pressure support (PS) and positive end-expiratory pressure (PEEP) 10cm H2O using a full-face mask. Given the likely trajectory of her respiratory failure and following discussions between obstetrics, neonatology, anaesthetics and intensive care, the decision was made for an emergency caesarean section. General or spinal anaesthesia with HFNO/CPAP were discussed as potential options with the patient and obstetric team. If intubated, she would return to ICU as such, as difficulties weaning quickly from the ventilator were anticipated in the context of Covid-19 pneumonia respiratory failure. She therefore opted for spinal anaesthesia.

The patient was transferred from ICU to an adjacent theatre on CPAP. An aseptic awake sitting spinal was performed using a 25G pencil point needle with success on the first pass at L3/4 without complications. 2.5mls 0.5% heavy bupivacaine and 300mcg diamorphine were used giving a rapid motor block and sensory block to T6 bilaterally using ethyl chloride spray at 2mins. Block was checked prior to skin incision and was to T4 bilaterally. A phenylephrine infusion was established following the spinal to maintain mean arterial blood pressure above 70mmHg monitored by a radial arterial line. Antibiotics (1.5g Cefuroxime) and antiemetics (6.6mg dexamethasone and 4mg ondansetron) were given as standard. Ventilatory parameters were unaltered throughout at PS/PEEP 5/10 cm H2O and O2 70% yielding SpO2 100% and the patient remained comfortable.

Caesarean section was uneventful and a healthy 2565g baby was delivered in five minutes following knife-to-skin and transferred to the special care baby unit purely for isolation. The patient spent nine days in ICU during which time she was weaned from CPAP/HFNO to humidified Oxygen and thereafter stepped down to a respiratory ward. She acquired a pulmonary embolism on the ward but recovered well. She is now vaccinated against Covid-19.

We describe the successful emergency **caesarean delivery** of a **SARS-CoV-2** pneumonia primigravida using **CPAP** and **spinal anaesthesia.**



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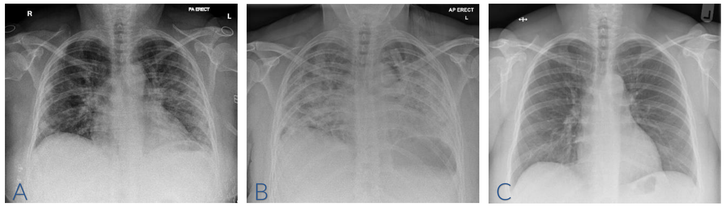


Figure: Plain film radiograph of patient at admission (A) and on stepping down from ICU two weeks later (B) demonstrating progressive patchy consolidation throughout mid-lower zones bilaterally. Plain film radiograph (C) two months following discharge demonstrates significant resolution.

Discussion

The global Covid-19 pandemic has had a significant impact on maternal health and infected parturients requiring hospitalisation have overall worse maternal outcomes. Although pregnant women with no comorbidities do not appear any more or less likely to contract Covid-19 than the general population. Indeed, they are at a significantly increased risk of becoming severely unwell, requiring ICU admission, invasive ventilation and extracorporeal membrane oxygenation (ECMO). Those who do require hospitalisation have overall worse maternal outcomes, including an increased (albeit still small) risk of death.

The cause of this increased susceptibility is still being elucidated but the numerous physiological changes that occur during pregnancy undoubtedly increase vulnerability to infections. Furthermore, anatomical changes are also likely to play a part with a reduced functional residual capacity, diaphragmatic splinting and concomitant reduction in chest volume likely impacting reserves against Covid-19.

In this case, it is likely that further deterioration necessitating invasive ventilation was avoided by a timely delivery. Similarly, using CPAP to facilitate emergency caesarean also avoided intubation and hence the risk of the persistent need for ventilation. The patient was also able to be conscious for her delivery which was a significant priority for her and helped support her mental wellbeing.

There is significant discordance in the literature on whether invasive ventilation, and the optimal timing thereof, contributes to morbidity and mortality of Covid-19 patients. It is therefore not known how the clinical course of this patient would have altered if she were invasively ventilated.

References

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