



Preterm Delivery in a Patient with Chronic Hypercarbia Secondary to Severe Kyphoscoliosis

Cortney Barbica, M.D., Katelyn Scharf, M.D., Shobana Bharadwaj, M.D., Jessica Galey, M.D.

Introduction:

31yo G1P0 at 20w4d gestation with a history of HTN and severe kyphoscoliosis s/p Harrington rod placement (Figure 1) was admitted for hypoxic and hypercarbic respiratory failure.

Admission labs and imaging:

ABG: respiratory acidosis with metabolic compensation

CT Chest: atelectasis in the right basal segments and severe thoracic scoliosis with rightward convexity

TTE: normal EF, moderate pulmonary hypertension, and a small patent foramen ovale with right to left shunt

V/Q scan: decreased size/activity of the entire right lung

PFTs: severe restrictive lung disease

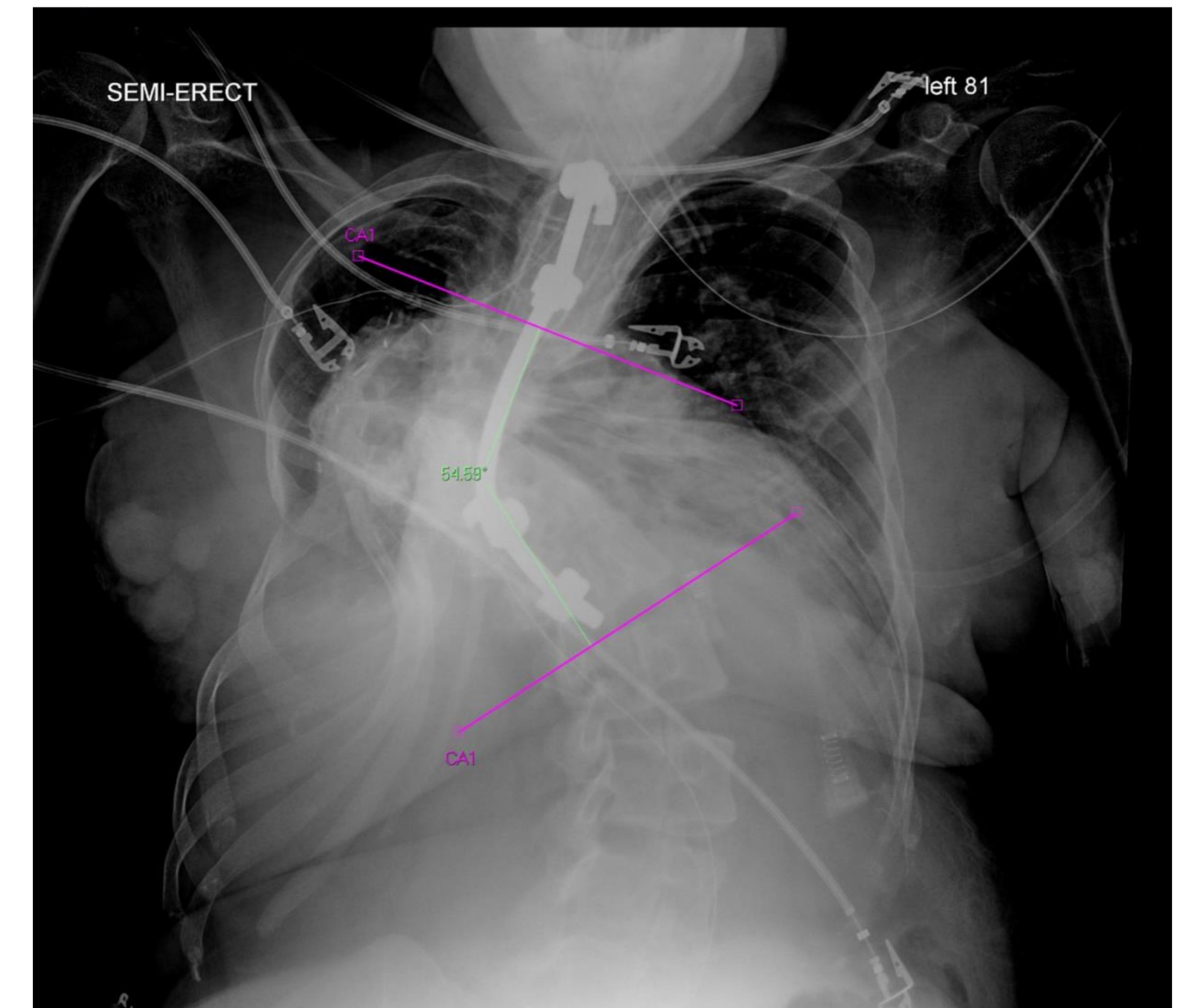


Figure 1. Chest radiography of kyphoscoliotic spine post hardware implantation. Cobb angle 54.59

Management:

- Initially: nocturnal bilevel positive airway pressure (BiPAP) and daytime high flow nasal canula (HFNC). However, BiPAP was poorly tolerated, so patient was transitioned to continuous HFNC.
- Daily venous blood gases showed an average $\pm$ SD pH of 7.3 ± 0.012 , pCO₂ of 54.22 ± 5.66 , PO₂ of 68.5 ± 34.1 , and HCO₃ of 28.5 ± 1.8 .
- At 25w4d, ultrasound showed absent end diastolic flow and a large retroplacental clot and the patient was diagnosed with HELLP syndrome based on worsening labs (platelets 86, AST/ALT 214/196, LDH 437).
- Betamethasone and magnesium infusion initiated, and the multidisciplinary team decision was to deliver via c-section.

Concerns:

Risks of neuraxial anesthesia with the precipitous drop in platelets, suspected difficulty with placement and unpredictable local anesthetic spread and of risk of prolonged mechanical ventilation with general anesthesia (GA) was discussed with the patient. The decision was made to proceed with GA.

Outcome:

Preoxygenation was achieved in an upright position and following rapid sequence induction, she was intubated using video laryngoscopy in a supported supine position.

End tidal CO₂ was maintained at the patient's baseline without any ventilation/oxygenation problems.

Following Pfannenstiel incision and classical uterine hysterotomy, the neonate weighing 645g was delivered with Apgar scores of 1, 3, 3, at 1, 5, and 10 minutes.

The patient returned to the MICU intubated for recovery and was extubated the following day.

Discussion:

Women with restrictive lung disease from severe kyphoscoliosis are at risk of hypoxic or hypercarbic respiratory failure during pregnancy when lung volumes are further reduced by the gravid uterus and there is increased ventilation¹. Furthermore, the effects of chronic hypercarbia in pregnancy on fetal development are unclear¹, but elevated CO₂ levels may cause an increased respiratory effort in the fetus, increasing fetal oxygen utilization¹. While this patient's complex condition was complicated by HELLP syndrome and placental abruption necessitating preterm delivery, it is possible her longstanding hypercarbia also contributed to the poor neonatal outcome.

Literature

1. Lapinsky S, et al. Restrictive lung disease in pregnancy. Chest. 2014;145(2):394-398.