

Severe Preeclampsia, Class III Obesity, and Prophylactic Postoperative Negative Pressure Wound Therapy After Cesarean Delivery: A Case Report

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Background

Preeclampsia is a major hypertensive disorder of pregnancy and an important cause of maternal and perinatal morbidity and mortality worldwide. The diagnostic criteria for preeclampsia and severe preeclampsia are included in the tables below (1). These diagnoses require prompt recognition and management to reduce maternal and fetal complications.

Preeclampsia Diagnostic Criteria
20 weeks' gestation or postpartum AND
New onset hypertension: systolic bp ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg and proteinuria (≥ 300 mg/24 hours)
OR
New onset hypertension: systolic bp ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg and significant end-organ dysfunction with or without proteinuria

Preeclampsia with Severe Features Diagnostic Criteria (includes one or more of the following)
Systolic bp ≥160 mmHg and/or diastolic blood pressure ≥110 mmHg on 2 occasions at least 4 hours apart
CNS dysfunction: new-onset cerebral or visual disturbances such as photopsia, scotomata, cortical blindness, retinal vasospasm and/or severe headache
Hepatic abnormality: impaired liver function characterized by serum transaminase concentration > 2 times the upper limit of the normal range and/or severe RUQ pain unresponsive to medication
Thrombocytopenia: platelet count < 100,000 platelets/microL
Kidney function impairment: serum creatinine >1.1 mg/dL and/or doubling of serum creatinine concentration

Maternal obesity is associated with an increased risk of hypertensive disorders of pregnancy and cesarean delivery. Obesity also increases the risk of postoperative wound complications following cesarean delivery, including surgical-site infection, seroma, hematoma, and wound separation. Negative-pressure wound therapy (NPWT) has been studied as a strategy to reduce postoperative wound complications in patients with obesity; however, evidence regarding its routine prophylactic use remains mixed (2,3,4,5,6). This case highlights the multidisciplinary management of severe preeclampsia in a patient with class III obesity and the postoperative considerations involved in cesarean delivery and wound management.

Objective

To describe the clinical management of a patient with severe preeclampsia, class III obesity, and significant preoperative edema undergoing cesarean delivery, with emphasis on the individual decision to use prophylactic closed-incision NPWT and the considerations involved in postoperative wound management.

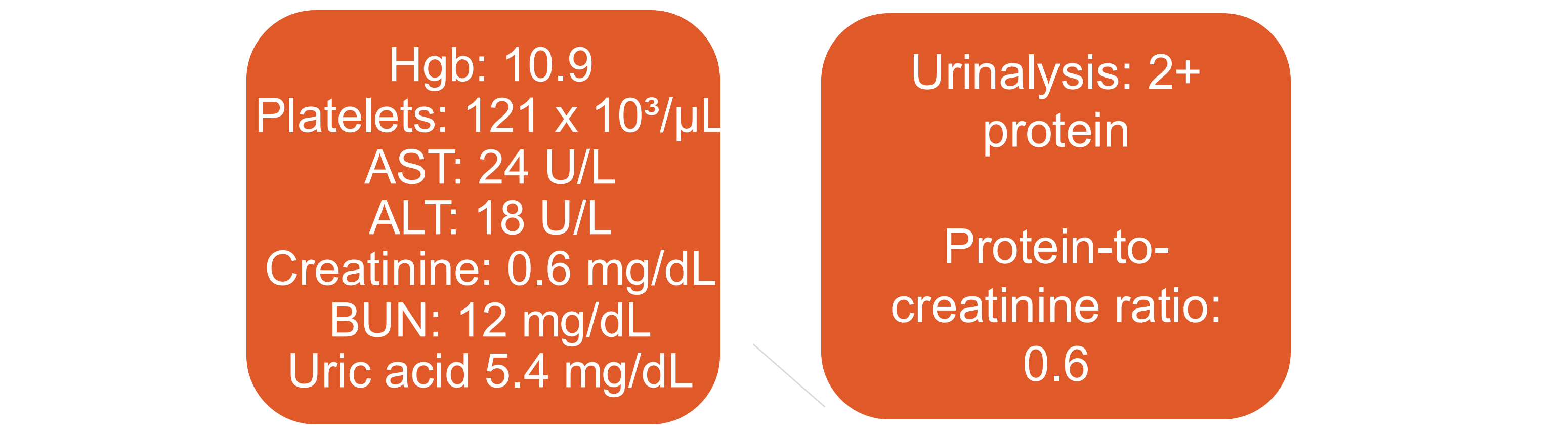
Methods

A retrospective review of the clinical course of a 33-year-old G1P0 patient at 37 weeks' gestation with severe preeclampsia and class III obesity (BMI 40) was performed. Maternal presentation, laboratory findings, blood pressure management, fluid balance, delivery approach, and postoperative course were reviewed. The decision to proceed with cesarean delivery and prophylactic closed-incision NPWT was evaluated in the context of the patient's severe preeclampsia, unfavorable cervix, obesity, and significant preoperative tissue edema. Relevant literature regarding prophylactic NPWT following cesarean delivery was also reviewed to provide clinical context for the case.

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Case Description

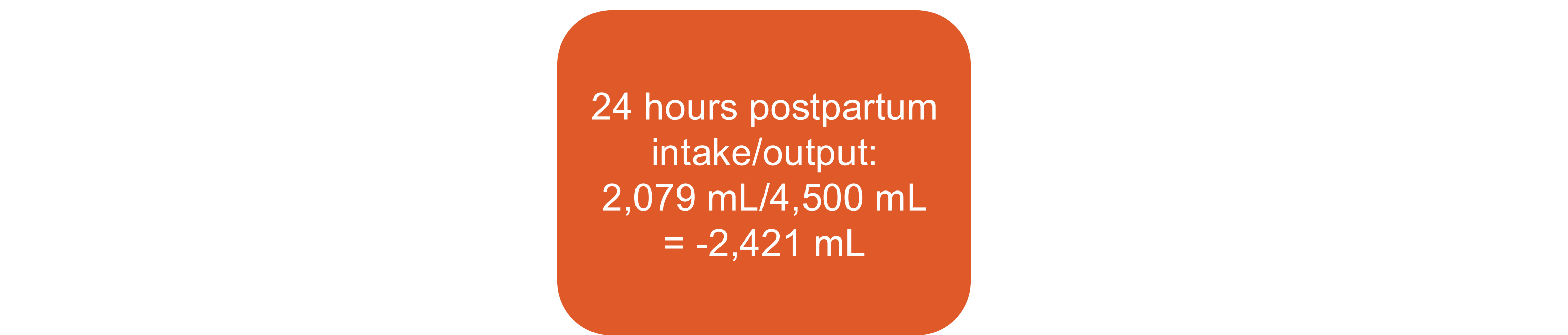
A 33-year-old G1P0 at 37 weeks' gestation presented to labor and delivery for induction of labor due to elevated blood pressures and urine protein-creatinine ratio of 0.4. She reported headaches, visual disturbances with scotomata, and generalized swelling. She denied right upper quadrant pain, cramping, vaginal bleeding, or leakage of fluid and reported good fetal movement. Her pregnancy was complicated by group B Streptococcus positivity, class III obesity (BMI 40), and preeclampsia. On examination, she had 4+ pitting edema and 4+ deep tendon reflexes with one-beat clonus. Her initial blood pressure was 173/98 mmHg. Magnesium sulfate was initiated for seizure prophylaxis. Fetal heart tracing was category I, with a baseline fetal heart rate of 150 beats per minute and no contractions. Cervical examination was 1/40/-3. The labs are shown below.



Labetalol 20 mg IV followed by 40 mg IV was administered for severe-range blood pressure. Twenty-five minutes after administration, blood pressure remained elevated at 195/122 mmHg, and an additional 80 mg IV labetalol was administered, resulting in improvement to 136/86 mmHg. Magnesium sulfate was continued at 2 g/hr. Blood pressure subsequently increased again to 168/88 mmHg. Given severe preeclampsia and an unfavorable cervix, shared decision-making was undertaken, and the patient proceeded with primary cesarean delivery.

A primary low- transverse cesarean delivery was performed with an estimated blood loss of 1,500 mL. Given the patient's severe preeclampsia, class III obesity, and marked preoperative wound tissue edema, she was considered at increased risk of postoperative wound complications. Prophylactic closed-incision negative-pressure wound therapy (NPWT) was applied over the intact surgical incision following closure to support the postoperative wound environment and reduce the risk of wound complications, including seroma, wound separation, impaired healing, and infection.

Seven hours postpartum, blood pressures remained elevated at 150-172/67-81 mmHg. She received an additional 20 mg IV labetalol and was started on oral labetalol 200 mg three times daily. On postoperative day 2, blood pressure remained elevated at 162/74 but subsequently improved with oral antihypertensive therapy. During the first 24 hours postpartum, the patient had a net negative fluid balance of 2,421 mL; however, lower-extremity edema persisted.



Magnesium sulfate was discontinued 24 hours after delivery. Her postpartum course was additionally notable for persistent lower-extremity edema. She was discharged on labetalol 200 mg three times daily, acetaminophen-hydrocodone, and ibuprofen for pain control. At discharge, she was ambulating, tolerating oral intake, voiding, passing flatus, and had minimal lochia with adequate pain control. The cesarean incision remained well approximated without drainage or other signs of wound complication. The NPWT dressing was planned for removal on postoperative day 7.

Discussion

The decision to proceed with delivery was based on the patient's severe preeclampsia, including severe-range blood pressures, headache, visual disturbances, marked edema, hyperreflexia with clonus, and proteinuria at 37 weeks' gestation. Magnesium sulfate was initiated for seizure prophylaxis, and intravenous and oral antihypertensive therapy was used to achieve blood pressure control. Given the unfavorable cervix and ongoing severe preeclampsia, cesarean delivery was chosen after shared decision-making rather than continuing an induction. Following cesarean delivery, prophylactic closed-incision NPWT was selected because the patient had combined class III obesity and marked preoperative tissue edema, which were considered additional risk factors for postoperative wound complications. Although routine prophylactic NPWT is not universally recommended for obese patients undergoing cesarean delivery, this case highlights the role of individualized clinical judgement when multiple wound-risk factors are present. An important lesson from this case is the value of recognizing and documenting significant tissue edema before delivery and considering the patient's overall risk profile when developing a postoperative wound-management plan. The patient's persistent edema despite a net negative fluid balance of 2,421 mL during the first 24 hours postpartum further demonstrates that marked tissue edema may persist despite substantial postpartum fluid loss. The incision remained well-approximated without drainage or other documented wound complications, although this favorable outcome should be interpreted as an observation rather than as evidence that NPWT alone prevented complications.

Conclusion

In future cases with patients with severe preeclampsia, class III obesity, and significant edema undergoing cesarean delivery, early identification and documentation of wound-risk factors may help guide individualized postoperative management. Optimization of fluid status while avoiding unnecessary fluid administration, careful monitoring of edema and urine output, meticulous cesarean wound closure, and consideration of prophylactic NPWT in selected high-risk patients may be appropriate. Because evidence supporting routine NPWT in obese cesarean patients remains mixed, its use should be individualized based on the patient's overall risk profile rather than obesity alone. Further studies are needed to determine whether patients with severe preeclampsia and significant edema may represent a subgroup that could benefit from prophylactic NPWT.

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