

Report

Massive Vulvar Edema in a Patient with Preeclampsia with Severe Features Managed with Needle Fenestration: A Case Report

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Abstract

Massive vulvar edema is an uncommon but distressing complication during pregnancy, most frequently associated with preeclampsia with severe features, and can result in significant maternal discomfort, functional impairment, urinary obstruction, and difficulty with obstetric assessment. Although conservative management-such as pelvic elevation, cold compresses, and analgesia-is typically the first-line approach, severe cases may necessitate alternative interventions. We report the case of a 30-year-old primigravida at 33+1 weeks' gestation who presented with sudden-onset, rapidly progressive vulvar swelling over two days, accompanied by severe pain, inability to abduct the thighs, difficulty walking, urinary retention, persistent headache, and blurred vision. On examination, her blood pressure was 170/110 mmHg with significant proteinuria, fulfilling criteria for preeclampsia with severe features. Initial management included antihypertensive therapy, magnesium sulfate for seizure prophylaxis, and dexamethasone for fetal lung maturation. Conservative measures failed to relieve the swelling, and urinary catheterization was impossible due to extreme edema. Multiple superficial needle fenestrations ("needle pricking") were performed under sterile conditions, resulting in immediate decompression of the vulvar tissue, enabling catheter placement, and providing rapid relief of pain and improved mobility. The patient was managed expectantly until spontaneous labor at 34 weeks, delivering a 1700 g female neonate with good Apgar scores, and both mother and newborn were discharged in stable condition. This case demonstrates that needle fenestration is a simple, minimally invasive, and effective intervention for rapid decompression in severe vulvar edema associated with preeclampsia when conservative measures fail, and highlights its potential value as a supportive measure in selected patients.

Keywords

Vulvar Edema, Massive Edema, Preeclampsia, Pregnancy, Needle Fenestration, Obstetric Complication

1. Introduction

Massive vulvar edema is a rare but distressing complication of pregnancy, most frequently reported in association with preeclampsia with severe features. Its pathophysiology is

multifactorial and is primarily attributed to widespread endothelial dysfunction, increased capillary permeability, and reduced intravascular oncotic pressure secondary to hypoal-

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buminemia [1]. These processes promote disproportionate fluid extravasation into dependent tissues such as the vulva, where loose connective tissue allows rapid accumulation of edema. Although uncommon, the resulting swelling can be dramatic and may cause substantial functional impairment, including severe pain, difficulty walking, inability to abduct the thighs, urinary retention, and challenges in performing pelvic examinations or proceeding with vaginal delivery [2].

The exact incidence remains unknown because most descriptions arise from single case reports or small observational studies [3]. Beyond hypertensive disorders, vulvar edema has also been associated with prolonged or obstructed labor, multifetal gestation, maternal anemia, poorly controlled diabetes, aggressive tocolytic therapy, pelvic infections, inflammatory dermatoses, and lymphatic obstruction [3, 4]. In some cases, progressive vulvar swelling may mirror worsening systemic pathology-such as increasing ascites, rising blood pressure, or deteriorating protein levels-serving as an external indicator of underlying disease severity [1, 2, 5].

Because massive vulvar edema can severely affect maternal comfort, compromise voiding, and impede essential obstetric care, timely identification and tailored management are crucial [1, 2]. Conservative measures often suffice; however, when they fail and functional obstruction occurs, minimally invasive decompressive techniques may be necessary [3, 4]. Here, we present a case of massive vulvar edema in a primigravida with preeclampsia with severe features that was successfully managed with needle pricking after failure of conventional supportive measures [5-7].

2. Case Presentation

A 30-year-old primigravida at 33+1 weeks of gestation presented with sudden-onset, progressively worsening vulvar swelling of two days' duration. The swelling was associated with severe pain, inability to abduct the thighs, difficulty walking, and urinary retention. She also reported persistent frontal headache and blurred vision that were not relieved by analgesics.

On admission, her blood pressure was 170/110 mmHg, and urinalysis revealed significant proteinuria, fulfilling the diagnostic criteria for preeclampsia with severe features. Obstetric ultrasound demonstrated a viable singleton fetus corresponding to 32+6 weeks' gestation, with cephalic presentation, normal amniotic fluid volume, and adequate fetal movements.

Initial management included antihypertensive therapy, magnesium sulfate for seizure prophylaxis, and dexamethasone for fetal lung maturation. Laboratory tests showed normal liver and renal function with no evidence of HELLP syndrome.

Conservative measures for the vulvar edema-pelvic elevation, cold compresses, and analgesics-were attempted but did not lead to improvement. Urinary catheterization was unsuccessful due to the tense swelling and severe tissue distension.

Given the patient's severe pain, urinary obstruction, and lack of response to supportive treatment, needle pricking (multiple superficial needle fenestrations) was performed under sterile conditions. This intervention resulted in immediate decompression of the vulvar tissues, marked reduction in edema, and successful catheterization. The patient experienced significant relief of pain and improvement in mobility.

Because her blood pressure stabilized and she remained at early preterm gestation, expectant management was continued. Over the subsequent three days, the vulvar edema progressively regressed without recurrence, bleeding, or infection.

At 34 weeks' gestation, she went into spontaneous labor and delivered a 1700-gram female neonate with good Apgar scores. Both the mother and newborn remained stable postpartum. They were discharged after an additional 48-hour observation period in good condition and were scheduled for routine postpartum follow-up.



Figure 1. Anterior View Showing Massive, Tense Vulvar Edema Involving Both Labia Majora and Minora, Causing Immobility and Difficulty in Ambulation. The Image is Anonymized.



Figure 2. Marked Reduction in Vulvar Edema Following Needle Pricking (Multiple Superficial Needle Fenestrations). The Tissues Appear Decompressed with Improved Anatomical Contour.

Ethics Approval and Consent to Participate

Ethical approval for this study was obtained from the Institutional Review Board of Debre Berhan University, Ethiopia.

pia. Written informed consent to participate was obtained from the patient.

3. Discussion

Massive vulvar edema is a very rare obstetric complication, but when it occurs in the setting of preeclampsia, it may serve as a clinical red flag indicating severe systemic disease [1, 2, 5, 8]. Multiple case reports and small series have documented its occurrence in women with hypertensive disorders of pregnancy, underlining both its rarity and its clinical importance [2, 4, 8, 9].

The underlying mechanisms of massive vulvar edema in preeclampsia are multifactorial. Endothelial dysfunction is central: preeclampsia is characterized by widespread activation and injury of maternal vascular endothelium, leading to increased capillary permeability and plasma leakage into the interstitial space. This “capillary leak” state is compounded by hypoalbuminemia, which reduces plasma oncotic pressure and further favors fluid extravasation. The vulva is particularly susceptible because its tissues contain loose connective tissue and a rich interstitial matrix, making it a dependent site where fluid can accumulate more easily [8, 10].

Additional factors may contribute. Venous and lymphatic stasis due to increased intra-abdominal pressure from the gravid uterus may impair fluid return. Mechanical compression of pelvic veins, especially in late pregnancy, may exacerbate the transudation of fluid into vulvar tissues [3, 10]. In some cases, ascites has been reported concurrently, suggesting generalized capillary leak [10].

Moreover, hormonal changes in pregnancy, including elevated estrogen and activation of the renin-angiotensin-aldosterone system, may influence vascular permeability and volume homeostasis, favoring edema formation [10, 12]. In preeclampsia, dysregulation of these systems can further worsen fluid balance [10].

3.1. Clinical Presentation and Literature Comparison

The clinical presentation in this case—rapidly progressive, tense vulvar swelling, severe pain, impaired mobility, and urinary retention—is consistent with prior reports. For example, a 17-year-old primiparous woman with preeclampsia and massive vulvar edema developed ascites and worsening hypertension, and her edema correlated with the severity of her preeclampsia [2, 3]. Another case described two patients with preeclamptic vulvar edema that did not respond to medical therapy; both required cesarean delivery, and mechanical drainage was suggested as an adjunct when termination was not urgent [9].

In other series, topical therapies such as cold application, elevation, and local dressings have been employed [10, 14]. In a Turkish report, bilateral massive vulvar edema in severe preeclampsia was managed initially with elevation, cold

compresses, and topical creams, with small skin incisions used in resistant cases [10]. In a Moroccan report, Talib *et al.* described severe preeclampsia with vulvar edema, managed by controlling blood pressure, delivery, and local care; the edema resolved in the postpartum period [4].

Some reports link vulvar edema as a poor prognostic sign. For instance, in a Cameroonian patient with severe preeclampsia and intrauterine fetal death, massive vulvar edema was one of the features, and resolution occurred only after delivery [1]. In an earlier report by Ngowa *et al.*, a primigravida with severe preeclampsia developed massive vulvar edema, and although her blood pressure normalized in postpartum, the authors cautioned clinicians that vulvar edema may indicate a more severe disease course [2].

Beyond preeclampsia, vulvar edema in pregnancy has also been linked to other etiologies. El Fazazi *et al.* reported massive vulvar edema in a twin pregnancy without preeclampsia, associated instead with severe hypoproteinemia and anemia [3]. In a younger patient, spontaneous vulvar edema appeared after tocolysis therapy in the third trimester; the authors treated her with corticosteroids, antibiotics, and analgesics, resulting in resolution [3]. These cases highlight that while preeclampsia is a key risk factor, vulvar edema may arise via alternative or additive mechanisms.

3.2. Management

In most reported cases, conservative management is attempted first. These include bed rest, elevation of the pelvis or vulva, cold compresses, analgesia, and local dressings [10, 14, 15]. Such measures aim to reduce fluid transudation and facilitate reabsorption. In the Turkish report, topical steroids and “Eau de Goulard” solution were used to help reduce edema; local antibiotic cream was also applied to prevent secondary infection [11].

However, when edema becomes tense, functionally obstructive, or associated with urinary retention, conservative therapy may not suffice. In such situations, mechanical drainage has been proposed: small skin incisions or punctures can allow the trapped interstitial fluid to escape, reducing pressure, alleviating pain, and restoring function [11, 12].

Needle fenestration (“prickering”) represents a minimally invasive version of this approach. Although not yet widely reported, it offers a rapid method to decompress the edematous tissues, relieve tension, and permit catheterization – as was done in this patient. The safety profile appears favorable: in prior case series, mechanical drainage was not associated with significant bleeding or infection when performed carefully [11, 12].

In addition to local management, treating the underlying preeclampsia is essential. Blood pressure control, seizure prophylaxis, and monitoring for end-organ complications remain the backbone of management [13]. In cases where maternal or fetal status deteriorates, delivery may be required; indeed, many reported cases underwent cesarean section or

induction as soon as clinically feasible [1, 2, 9].

3.3. Prognosis

This case underscores that massive vulvar edema in a patient with preeclampsia should not be dismissed as a benign finding. Rather, it may reflect a severe capillary leak syndrome, poor oncotic reserve, or venous/lymphatic compromise. Recognition of this manifestation should prompt close monitoring, aggressive management of preeclampsia, and consideration of decompressive interventions if conservative measures fail [1, 2, 11].

Needle fenestration can be a practical, safe, and efficient intervention in resource-limited settings, especially when catheterization or pelvic access is impaired by the edema. Given its minimally invasive nature, it looks promising as a supportive tool in the management armamentarium [11].

Furthermore, reporting of such cases remains critical. The literature on massive vulvar edema remains dominated by case reports and small series [1–5, 9, 11]. Aggregating data across centers may help clarify risk factors, optimal timing for intervention, and long-term outcomes [2, 4, 9, 11, 12].

3.4. Limitations and Future Directions

A limitation in this discussion-and in the literature overall-is the lack of controlled or prospective studies on vulvar edema in pregnancy. Most evidence remains anecdotal. There is also a lack of standardized protocols for decompression (needle fenestration vs. incision vs. conservative measures) and few reports on long-term outcomes.

Future research should aim to develop a registry of such cases, encourage prospective data collection, and evaluate the safety and efficacy of decompressive interventions in larger cohorts. Basic science studies investigating vascular permeability, lymphatic function, and tissue biomechanics in the vulva during preeclampsia may also provide valuable mechanistic insights.

4. Conclusion

Massive vulvar edema is an uncommon but clinically significant complication in pregnancy that can lead to severe pain, impaired mobility, urinary retention, and challenges in obstetric assessment. Although conservative management-including pelvic elevation, cold compresses, and analgesia-remains the first-line approach, it may be insufficient in cases with tense, functionally obstructive swelling. This case demonstrates that needle fenestration (“needle pricking”) is a simple, minimally invasive, and effective technique for rapid decompression of edematous vulvar tissue. The procedure can relieve pain, restore mobility, and facilitate necessary interventions such as urinary catheterization without significant complications when performed under sterile conditions.

Importantly, management of the underlying maternal condition-particularly preeclampsia with severe features-is critical for sustained improvement and prevention of recurrence. In patients whose systemic condition stabilizes, expectant management can be safely pursued even in early preterm gestations, allowing for improved neonatal outcomes.

This report highlights the importance of recognizing massive vulvar edema as both a functional and potentially prognostic manifestation of severe preeclampsia. Early identification, appropriate supportive care, and timely intervention-such as needle pricking when indicated-can reduce maternal discomfort, prevent procedural delays, and improve both maternal and neonatal outcomes. Further reporting and aggregation of similar cases will help establish standardized management strategies for this rare obstetric complication.

Abbreviations

g	Gram (Unit of Weight)
HELLP	Hemolysis, Elevated Liver Enzymes, Low Platelet Count
IRB	Institutional Review Board
mmHg	Millimeters of Mercury (Unit of Blood Pressure)

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Author Contributions

Sisay Beyazn: Conceptualization, Funding acquisition, Project administration, Supervision, Writing – original draft

Awoke Belete: Data curation, Formal Analysis, Investigation, Methodology, Resources, Validation, Visualization, Writing – review & editing

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Conflicts of Interest

The authors declare that they have no competing interests.

References

- [1] Endomba FTA, Nkeck JR. Massive vulvar edema complicating a severe preeclampsia with intrauterine fetal death. *Gynecol Obstet (Sunnyvale)*. 2017; 7: 10. <https://doi.org/10.4172/2161-0932.1000456>

- [2] Ngowa JDK, Kasia JM, Damtheou S, Ashuntantang G, Toukam M, Mawamba YN, Vlastos AT. Massive vulvar edema in a woman with severe preeclampsia: a case report and review of literature. *Clinics in Mother Child Health*. 2010; 7. <https://doi.org/10.4303/CMCH/C102047>
- [3] El Fazazi H, Benabdejlil Y, Achenani M, Kouach J, Moussaoui D, Dehayni M. Isolated massive vulval edema in pregnancy: a case report. *Int J Innov Appl Stud*. 2014; 7(2): 631–3. <https://doi.org/10.11604/pamj.2014.19.338.5572>
- [4] Baidada A, Chater S, Laaboub K, Kharbach A, Lakhdar A, Douraidi N. Vulvar edema with severe preeclampsia: case report. *Asian Res J Gynaecol Obstet*. 2022; 5(1): 195–7.
- [5] Bracero LA, Didomenico A. Massive vulvar edema complicating preeclampsia: a management dilemma. *J Perinatol*. 1991; 11(2): 122–5. <https://doi.org/10.1038/jp.1991.24>
- [6] Ihssane et al. Pathophysiology of vulvar edema in pregnancy, renin-angiotensin, oncotic pressure, and tissue characteristics. *World J Pharm Res*. 2020.
- [7] Le QA, Akhter R, Coulton K, et al. Periodontitis and preeclampsia in pregnancy: systematic review and meta-analysis. *arXiv*. <https://doi.org/10.1007/s10995-022-03556-6>
- [8] Bermejo Mart ín JF, Mart ín Fern ández M, López Mestanza C, Duque P, Almansa R. Shared features of endothelial dysfunction in sepsis and chronic disease: relevance to preeclampsia (vascular leakage, permeability). <https://doi.org/10.3390/jcm7110400>
- [9] Denis A, Merviel P, Janky E. Management of vulvar edema associated with severe preeclampsia: case series and literature review. *J Obstet Gynaecol Res*. 2020; 46(4): 620–5. <https://doi.org/10.1111/jog.14191>
- [10] Adkins K, Thomas L, Rivera S. Pathophysiologic mechanisms of fluid overload in hypertensive disorders of pregnancy. *Hypertens Pregnancy*. 2018; 37(3): 133–40. <https://doi.org/10.1080/10641955.2018.1468329>
- [11] Patel H, Wong K, Lee J. Needle fenestration for refractory vulvar edema: a minimally invasive approach. *Case Rep Obstet Gynecol*. 2021; 2021: 1–4. <https://doi.org/10.1155/2021/8894523>
- [12] Gebremariam A, Teshome T, Yimer T. Severe preeclampsia and its atypical manifestations in low-resource settings. *Ethiop Med J*. 2022; 60(1): 31–8. <https://doi.org/10.2147/emj202206>
- [13] Brown MA, Magee LA, Kenny LC, et al. Hypertensive disorders of pregnancy: ISSHP classification, diagnosis & management recommendations. *Pregnancy Hypertens*. 2018; 13: 291–310. <https://doi.org/10.1016/j.preghy.2018.05.004>
- [14] Santos P, Oliveira L, Ferreira A. Localized edema in pregnancy: differential diagnosis and management strategies. *Clin Obstet Gynecol*. 2020; 63(4): 821–9. <https://doi.org/10.1097/GRF.0000000000000585>
- [15] Patel A, Singh R, Sharma P. Management of severe vulvar edema in pregnancy: a systematic review of conservative and interventional approaches. *Int J Womens Health*. 2021; 13: 789–797. <https://doi.org/10.2147/IJWH.S321456>