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Severe Early-Onset Preeclampsia in the Setting of Pituitary Apoplexy-Induced Hypopituitarism and IgA Nephropathy: A Case Report

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Case Report

Keywords: pituitary apoplexy, hypopituitarism, pregnancy, IgA nephropathy, preeclampsia, macroprolactinoma

Posted Date: May 26th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9795326/v1

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Additional Declarations: The authors declare no competing interests.

Abstract

Background:

Pituitary apoplexy during pregnancy is an uncommon endocrine emergency that may result in permanent hypopituitarism and complex maternal-fetal complications. Data describing the coexistence of pituitary apoplexy, multiaxis hypopituitarism, renal disease, and early-onset preeclampsia remain limited.

Case Report:

A 38-year-old primigravida with recurrent macroprolactinoma developed pituitary apoplexy at 9 weeks' gestation shortly after cabergoline discontinuation and underwent emergent transsphenoidal decompression. She subsequently developed secondary adrenal insufficiency, central diabetes insipidus, and evolving central hypothyroidism requiring ongoing hormone replacement adjustment. Early pregnancy was notable for proteinuria preceding hypertension, and renal biopsy later confirmed IgA nephropathy. Even with close multidisciplinary management and escalation of antihypertensive therapy, she progressed to severe early-onset preeclampsia requiring emergency cesarean delivery at 25 weeks' gestation. The neonate required prolonged neonatal intensive care due to extreme prematurity and was clinically stable at follow-up.

Discussion:

In this patient, early proteinuria and worsening endocrine abnormalities could not be explained by pituitary disease alone, prompting repeated reassessment as additional complications emerged.

Conclusion:

Multiple independently managed high-risk conditions may converge during pregnancy and produce a clinical course more severe than expected from any single diagnosis alone. Ongoing endocrine reassessment and careful evaluation of early proteinuria are essential in pregnant patients with pituitary disease.

INTRODUCTION

Pituitary apoplexy during pregnancy is uncommon but clinically significant because delayed recognition may result in visual compromise, adrenal insufficiency, and maternal-fetal morbidity.[1–4] Management of pituitary adenomas in pregnancy requires individualized assessment based on tumor size, hormonal activity, and visual symptoms. Dopamine agonists are commonly discontinued after pregnancy confirmation, although selected patients with large or invasive macroprolactinomas may require continued therapy or close surveillance.[5,6]

Pregnancy in women with hypopituitarism remains rare and requires careful endocrine monitoring throughout gestation.[8,9] In patients with underlying renal disease, distinguishing chronic proteinuria from evolving preeclampsia may be particularly challenging.[10–12] We present a case of macroprolactinoma complicated by pituitary apoplexy, evolving multiaxis hypopituitarism, IgA nephropathy, and severe early-onset preeclampsia requiring delivery at 25 weeks' gestation.

CASE PRESENTATION

A 38-year-old G1P0 woman with a history of prolactinoma diagnosed in 2022 underwent prior transsphenoidal surgery overseas and was subsequently treated with cabergoline. Even with treatment, serial imaging demonstrated progressive tumor enlargement, and by July 2025 MRI showed a 1.9 × 1.3 cm pituitary macroadenoma with cavernous sinus extension and mild optic apparatus mass effect. Prolactin level was 101.8 ng/mL. Baseline blood pressure and renal function before pregnancy were normal.

At approximately 9 weeks' gestation, cabergoline was discontinued after pregnancy confirmation in accordance with standard clinical practice to allow physiologic prolactin rise and minimize fetal exposure. However, because of the size and invasive features of the macroadenoma, the patient remained at elevated risk for tumor progression. Within days, she developed acute headache and visual symptoms, and imaging confirmed pituitary apoplexy. Emergent transsphenoidal decompression was performed.

Postoperatively, she developed multiaxis pituitary dysfunction. Morning cortisol ranged from 2.21–2.26 µg/dL with inappropriately low ACTH of 5 pg/mL, consistent with secondary adrenal insufficiency, and hydrocortisone replacement was initiated. She also developed central diabetes insipidus requiring desmopressin titration according to urine output and serum sodium trends. Urine osmolality fluctuated between 59–567 mOsm/kg. Serum sodium during pregnancy ranged from 132–144 mmol/L with intermittent mild hyponatremia; a postpartum nadir of 126 mmol/L occurred during desmopressin adjustment and perioperative fluid shifts.

Thyroid function was initially preserved after surgery, with free T4 levels ranging from 1.01–1.69 ng/dL in November 2025 and 1.09–1.4 ng/dL in December 2025. Pituitary dysfunction can evolve following apoplexy, so we performed serial endocrine reassessment throughout pregnancy. By mid-pregnancy, thyroid studies demonstrated evolving central hypothyroidism with low free T4 of 0.76 ng/dL, low free T3 of 1.5 pg/mL, and low TSH ranging from 0.018–0.479 mIU/L. Levothyroxine was subsequently initiated by the obstetric team and titrated to 200 mcg daily during the peripartum period, followed by a dose reduction postpartum.

At 21 weeks' gestation, she developed new hypertension with blood pressures up to 162/100 mmHg and significant proteinuria, including 24-hour urine protein of 1485 mg and protein-creatinine ratio of 1350. Importantly, proteinuria had preceded the onset of hypertension earlier in pregnancy, raising concern for underlying renal disease rather than isolated preeclampsia. Because of the early gestational age and the severity of proteinuria, a renal biopsy was performed, which confirmed IgA nephropathy. Serum creatinine increased from baseline values of approximately 0.64 mg/dL to a peak of 1.14 mg/dL during disease progression. Angiogenic markers such as sFlt-1 and PlGF were not obtained during evaluation, limiting biochemical distinction between superimposed preeclampsia and progressive renal disease.

Antihypertensive therapy included nifedipine with escalation to labetalol and hydralazine during hospitalization. Despite treatment, she progressed to severe early-onset preeclampsia with severe-range hypertension and hepatic involvement. Liver enzymes increased with AST ranging from 66–129 U/L and ALT from 116–190 U/L. At 25 weeks' gestation, worsening maternal and fetal status necessitated emergency cesarean delivery. Because of known secondary adrenal insufficiency, perioperative stress-dose glucocorticoids were administered, followed by tapering to maintenance dosing postoperatively. The neonate

weighed 645 g and required prolonged neonatal intensive care for extreme prematurity, including ventilatory support and management of suspected intestinal complications.

Postpartum, central diabetes insipidus persisted and desmopressin replacement remained necessary. She also developed a rectus femoris hematoma requiring conservative management and analgesia. At early postpartum follow-up, she had no recurrent headaches or visual symptoms. The patient had not initiated breastfeeding because of ongoing neonatal intensive care hospitalization and extreme prematurity. Cabergoline was therefore temporarily withheld pending further breastfeeding decisions and follow-up tumor surveillance imaging in the absence of acute compressive symptoms. Hydrocortisone was tapered toward physiologic replacement and the levothyroxine dose was reduced. The neonate remained in the NICU for ongoing respiratory and feeding support related to extreme prematurity but is clinically stable and progressing appropriately for corrected gestational age.

DISCUSSION

This case is best understood as a sequence of interacting clinical problems that evolved during a closely monitored pregnancy: recurrent macroprolactinoma, pituitary apoplexy, progressive hypopituitarism, previously unrecognized renal disease, and severe early-onset preeclampsia. Management at each stage followed contemporary practice, but the combination of these high-risk conditions made the clinical course unusually complex.

One of the earliest key decision points was discontinuation of cabergoline after pregnancy confirmation. This approach aligns with common management strategies intended to allow physiologic prolactin rise and reduce fetal drug exposure.[5–7] However, the patient had a large macroadenoma with cavernous sinus extension, and current guidelines acknowledge that selected patients with invasive macroprolactinomas may require continuation or re-initiation of dopamine agonist therapy during pregnancy.[5] In this case, pituitary apoplexy developed shortly after withdrawal, illustrating that guideline-consistent management may not fully mitigate the risk of acute tumor-related complications in patients with substantial residual disease.

Following emergent decompression, the patient developed secondary adrenal insufficiency and central diabetes insipidus requiring hormone replacement. Thyroid function was initially preserved but later deteriorated, with central hypothyroidism emerging during mid-pregnancy despite earlier normal studies. This progression shows us that pituitary dysfunction after apoplexy can evolve, so endocrine function should be reassessed throughout pregnancy even when early postoperative findings appear stable.[1,3,8]

Another important finding was the presence of proteinuria before the hypertension developed. Rather than attributing this finding solely to evolving preeclampsia, further renal evaluation was pursued, and biopsy confirmed IgA nephropathy. Chronic kidney disease is a recognized risk factor for severe and early-onset preeclampsia because of underlying endothelial dysfunction and impaired renal adaptation during pregnancy.[10–12] In this patient, underlying renal disease was likely the main driver of the hypertensive complications, while endocrine dysfunction may have further limited normal vascular and volume adaptation during pregnancy.

The patient progressed rapidly to severe preeclampsia, even with escalation of pregnancy-compatible antihypertensive therapy, requiring delivery at 25 weeks' gestation. Angiogenic markers such as sFlt-1 and PlGF were not obtained, limiting biochemical distinction between superimposed preeclampsia and worsening renal disease. However, severe hypertension, hepatic involvement, and maternal-fetal deterioration supported the diagnosis of severe early-onset preeclampsia. This part of the case shows how coexisting endocrine and renal pathology made the clinical picture hard to interpret and may have contributed to rapid deterioration.

Existing literature on pituitary apoplexy in pregnancy has primarily focused on acute presentation, neurosurgical management, and endocrine outcomes rather than hypertensive complications.[3,4] Similarly, studies of hypopituitarism in pregnancy emphasize hormone replacement and obstetric monitoring without clearly defining effects on vascular adaptation or preeclampsia risk.[8,9] Although these conditions have each been reported individually, we did not identify prior reports describing this combination of pituitary apoplexy with multiaxis hypopituitarism, central diabetes insipidus, biopsy-confirmed IgA nephropathy, and severe early-onset preeclampsia in a single pregnancy.

This report has several limitations. As a single case, causal relationships between endocrine dysfunction and preeclampsia severity cannot be established. Angiogenic markers were not measured, and the relative contributions of renal disease, endocrine dysfunction, and advanced maternal age to disease progression cannot be fully separated.

CONCLUSION

This case emphasises the importance of close monitoring of pituitary function during pregnancy, as hormonal deficiencies may evolve despite initially stable findings. Even with timely management, the combination of multiaxis hypopituitarism and underlying renal disease may disrupt normal adaptation to pregnancy and contribute to a highly unpredictable clinical course.

Declarations

Informed Consent

Patient consent for publication of this case report and accompanying clinical details was obtained by the treating physician.

Ethics Statement

This report was conducted in accordance with the ethical standards of the institutional and national research committees and with the principles of the Declaration of Helsinki.

Conflict of Interest

The authors declare no conflicts of interest related to this work.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work, the author Y.N used ChatGPT (OpenAI) for language editing and formatting assistance. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Author Contributions

L.M. managed the patient's endocrine care and performed all laboratory tests of the patient. Y.N performed the literature review and drafted the manuscript. Both authors reviewed and approved the final manuscript.

References

1. Briet C, Salenave S, Bonneville JF, Laws ER, Chanson P. Pituitary apoplexy. *Endocr Rev.* 2015;36(6):622-645. doi:10.1210/er.2015-1042
2. Rajasekaran S, Vanderpump M, Baldeweg SE, et al. UK guidelines for the management of pituitary apoplexy. *Clin Endocrinol (Oxf).* 2011;74(1):9-20. doi:10.1111/j.1365-2265.2010.03913.x
3. Grand'Maison S, Weber F, Bédard MJ, et al. Pituitary apoplexy in pregnancy: a case series and literature review. *Obstet Med.* 2015;8(4):177-183.
4. Gheorghe G, Fica S, et al. Challenges of pituitary apoplexy in pregnancy. *J Clin Med.* 2023;12(10):3416. doi:10.3390/jcm12103416
5. Luger A, Broersen LHA, Biermasz NR, Biller BMK, Buchfelder M, Chanson P, et al. ESE Clinical Practice Guideline on functioning and nonfunctioning pituitary adenomas in pregnancy. Eur J Endocrinol. 2021;185(3):G1-G33. doi:10.1530/EJE-21-0462.
6. Glezer A, Bronstein MD. Prolactinomas, cabergoline, and pregnancy. *Endocrine.* 2015;48(1):64-69. doi:10.1007/s12020-014-0377-9
7. Ananthakrishnan S. Diabetes insipidus in pregnancy. *Best Pract Res Clin Endocrinol Metab.* 2016;30(2):305-315. doi:10.1016/j.beem.2016.02.002
8. Aulinas A, et al. Pregnancy outcomes in women with hypopituitarism: experience from a tertiary center. *Pituitary.* 2022;25(6):882-890. doi:10.1007/s11102-022-01220-5
9. Feferkorn I, et al. Pregnancy outcomes in women with hypopituitarism: a retrospective cohort study. *J Matern Fetal Neonatal Med.* 2022;35(25):9562-9568. doi:10.1080/14767058.2021.1893853
10. Piccoli GB, Cabiddu G, Attini R, et al. Pregnancy in CKD: clinical practice guideline. *J Nephrol.* 2018;31(3):341-352. doi:10.1007/s40620-018-0472-9
11. Wiles K, Chappell LC, Clark K, et al. Clinical practice guideline on pregnancy and renal disease. *BMC Nephrol.* 2019;20:401. doi:10.1186/s12882-019-1560-2
12. Wyatt RJ, Julian BA. IgA nephropathy. *N Engl J Med.* 2013;368:2402-2414. doi:10.1056/NEJMra1206793
13. Charmandari E, Nicolaides NC, Chrousos GP. Adrenal insufficiency. *Lancet.* 2014;383(9935):2152-2167. doi:10.1016/S0140-6736(13)61684-0
14. De Groot L, Abalovich M, Alexander EK, et al. Management of thyroid dysfunction during pregnancy and postpartum. *Thyroid.* 2012;22(10):1081-1125. doi:10.1089/thy.2012.0205

15. Lindheimer MD, Taler SJ, Cunningham FG. Hypertension in pregnancy. *J Am Soc Hypertens.* 2008;2(6):484-494. doi:10.1016/j.jash.2008.10.001
16. Redman CW, Sargent IL. Placental stress and preeclampsia: a revised view. *Placenta.* 2009;30(Suppl A):S38-S42. doi:10.1016/j.placenta.2008.11.021

Tables

Table 1. Endocrine, renal, and biochemical laboratory trends across the clinical course.

Category	Parameter	Value	Reference Range	Interpretation	Clinical Context
Pituitary	Prolactin (Jul 2025)	101.8 ng/mL	4-23	Elevated	Residual macroprolactinoma
	Prolactin (Dec 2025)	12.1 ng/mL	4-23	Reduced postoperatively	Post-surgery
Adrenal	Cortisol	2.21-2.26 µg/dL	3.44-22.45	Low	Secondary Adrenal Insufficiency
	ACTH	5 pg/mL	6-50	Low	Central pattern
Thyroid	Free T4	0.76 (Mar 2026); 1.09-1.4 (Dec 2025); 1.01-1.69 (Nov 2025)	0.89-1.76	Low	Central hypothyroidism
	Free T3 (Feb 2026)	1.5 pg/mL	2.3-4.2	Low	Reduced thyroid hormone
	TSH	0.018-0.479 mIU/L	0.40-4.50	Low	Central hypothyroidism
Diabetes insipidus	Urine Osmolality	59-567 mOsm/kg	50-1200	Variable	DI with DDAVP response
	Sodium	Sodium: 132-144 mmol/L during pregnancy; Postpartum nadir 126 mmol/L	136-145	Stabilized	Treatment response
Renal	UA Protein (Nov 2025)	2+	Negative	Early proteinuria	Suggests CKD
	24h Protein	1485 mg	<150	Elevated	Unusually early at 21 weeks
	Creatinine	0.64-1.14 mg/dL	0.55-1.02	Mild elevation	Disease progression
Liver	AST (March 2026)	66-129 U/L	8-40	Elevated	Severe disease
	ALT	116-190 U/L	7-40	Elevated	Hepatic involvement

Serial laboratory findings demonstrated evolving hypopituitarism, diabetes insipidus, renal involvement, and progression to severe preeclampsia. Creatinine values were interpreted using pregnancy-adjusted reference ranges (0.4 -0.8 mg/dL). Cortisol, prolactin, and thyroid function tests should be interpreted in the context of physiologic hormonal changes during pregnancy.

Abbreviations: ACTH = adrenocorticotropic hormone; ALT = alanine aminotransferase; AST = aspartate aminotransferase; DDAVP = desmopressin; DI = diabetes insipidus; HTN = hypertension; TSH = thyroid stimulating hormone.

Table 2. Chronological endocrine management and hormone replacement during pregnancy and postpartum follow-up.

Time Point	Endocrine Event	Hydrocortisone	Desmopressin (DDAVP)	Thyroid Hormone	Clinical Impact
Pre-pregnancy (2022-2025)	Prolactinoma on cabergoline	Not required	Not required	Not required	Stable endocrine function
9 weeks gestation (Nov 2025)	Pituitary apoplexy → surgery	Initiated (20 mg AM / 10 mg PM)	Initiated	Normal thyroid function	Acute endocrine failure (AI + DI) + early proteinuria (2+) suggesting underlying renal disease
Post-op (Nov-Dec 2025)	Confirmed hypopituitarism	Continued replacement	Active titration	Normal → evolving dysfunction	Stabilization phase
15 weeks gestation (Jan 2026)	Temporary endocrine stability	10 mg BID	0.1 mg daily	Not yet started	Stable on hormone replacement
21 weeks gestation (Feb 2026)	HTN + proteinuria onset	Continued	Continued	Evolving central hypothyroidism	Early hypertensive disease
Late pregnancy (Mar 2026)	Severe preeclampsia	Stress-dose steroids	Continued	Levothyroxine initiated and titrated (up to 200 mcg daily)	Endocrine + vascular instability
Delivery (25 weeks)	Emergency cesarean delivery	Stress-dose steroids	Continued	Continued	Critical phase
Early postpartum 2 weeks follow-up (Apr 2026)	Persistent DI	Tapered to physiologic dosing	Continued	Dose reduced	Persistent hypopituitarism

Summary of evolving pituitary dysfunction, hormone replacement adjustments, and major clinical events throughout pregnancy and the early postpartum period.

Abbreviations: AI = adrenal insufficiency; DI = diabetes insipidus; DDAVP = desmopressin.

Figures

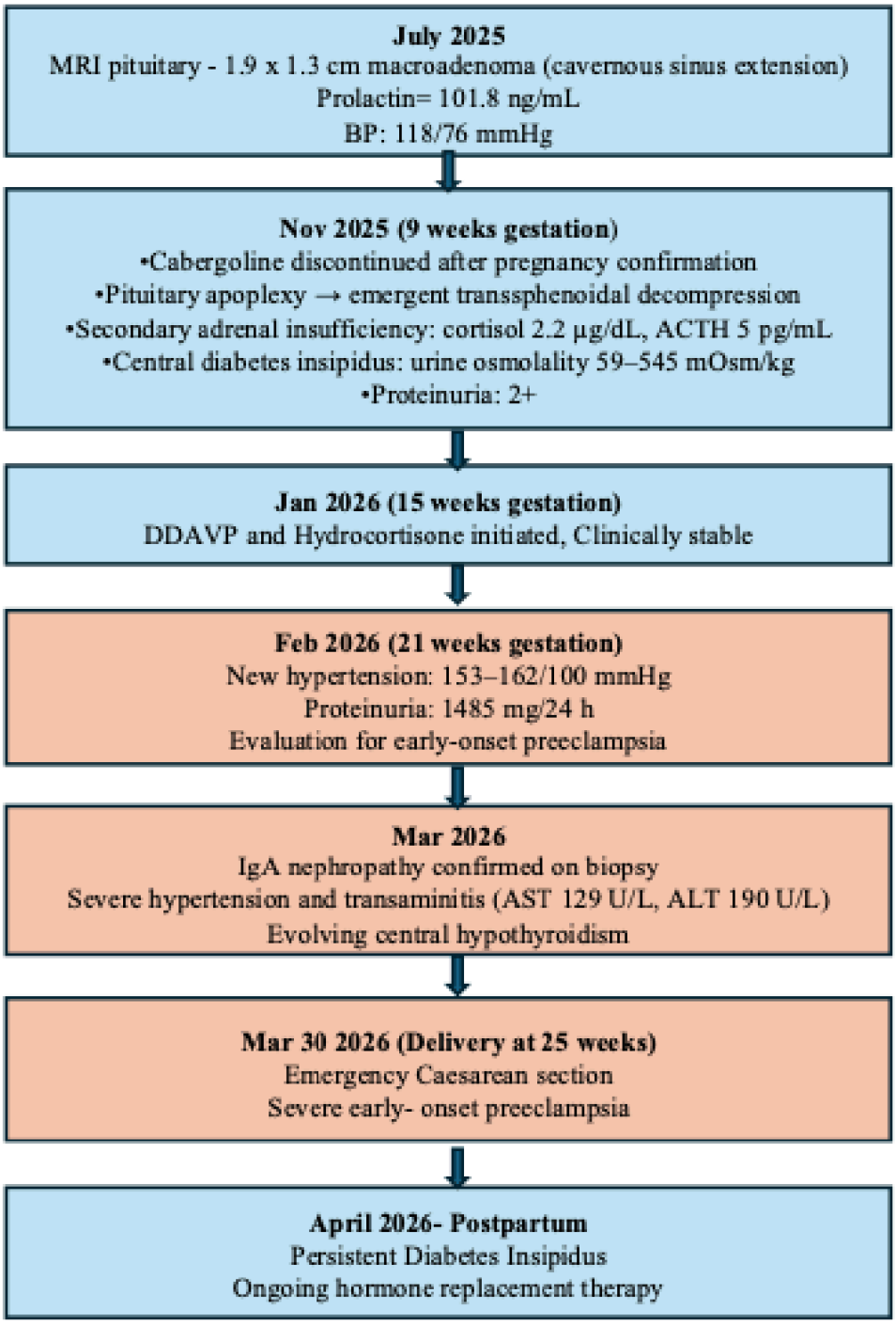


Figure 1

Multiple independently managed endocrine, renal, and obstetric complications converged during pregnancy despite guideline-consistent management, resulting in severe early-onset preeclampsia and extreme preterm delivery.