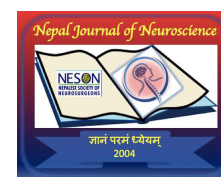


Pituitary Apoplexy During Cabergoline Therapy for Prolactinoma: A Rare but Serious Clinical Complication

Sandeep Bohara¹, Ijan Dhamala², Alok Chandra Thakur³, Dipendra Kumar Shrestha⁴,
Gopal Sedain⁵



^{1,4} Assistant Professor, Department of neurosurgery, Maharajgunj Medical Campus, Kathmandu, Nepal

^{2,3} MCh resident, Department of neurosurgery, Maharajgunj Medical Campus, Kathmandu, Nepal

⁵ Professor and Head of Department Department of neurosurgery, Maharajgunj Medical Campus, Kathmandu, Nepal

Date of Submission: 28th August 2026

Date of Acceptance: 5th September 2026

Date of Publication: 15th September 2026

Abstract

Pituitary apoplexy is an uncommon yet potentially life threatening endocrine and neurosurgical emergency characterized by hemorrhage or infarction within the pituitary gland, most frequently occurring in a pre-existing pituitary adenoma. Although prolactinomas are commonly managed conservatively with dopamine agonists, pituitary apoplexy has occasionally been reported during treatment with these medications. Cabergoline associated pituitary apoplexy remains particularly rare. We report the case of an 18-year-old male with macroprolactinoma who developed acute pituitary apoplexy during treatment with cabergoline. The patient initially presented with progressive visual impairment and was diagnosed with a pituitary macroadenoma associated with markedly elevated serum prolactin levels exceeding 2000 ng/mL. Medical therapy with cabergoline was initiated and gradually escalated over six months with serial hormonal monitoring. Although serum prolactin levels significantly decreased, the patient subsequently developed acute bifrontal headache and worsening visual disturbance one week after dose escalation. Computed tomography of the head demonstrated a hyperdense sellar and suprasellar lesion consistent with hemorrhagic transformation. Emergency endoscopic transnasal transsphenoidal decompression was performed. Intraoperatively, the tumor demonstrated hemorrhagic and necrotic components. Near-total tumor resection was achieved, and postoperative recovery was favorable with significant improvement in visual function. Histopathological examination confirmed pituitary adenoma. This case underscores the rare occurrence of pituitary apoplexy during cabergoline therapy and highlights the importance of close clinical and radiological surveillance in patients receiving dopamine agonists for macroprolactinomas. Early recognition and prompt surgical intervention may result in favorable neurological and visual outcomes.

Keywords: pituitary apoplexy, prolactinoma, cabergoline, pituitary macroadenoma, dopamine agonist

Introduction

Acute bleeding or infarction within the pituitary gland can cause pituitary apoplexy, a rare endocrine emergency that typically occurs in conjunction with a pituitary adenoma¹. The condition is clinically significant because of its abrupt onset and

potential to cause severe neurological, ophthalmological, and endocrinological complications. Patients typically present with sudden severe headache, visual deterioration, ophthalmoplegia, altered sensorium, nausea, vomiting, or acute pituitary hormonal dysfunction. In severe cases, delayed diagnosis may result in permanent neurological deficits or death².

Although pituitary apoplexy may occur spontaneously, several precipitating factors have been identified. These include hypertension, diabetes mellitus, major surgery, head trauma, anticoagulant use, pituitary dynamic testing, pregnancy, radiotherapy, and medications such as dopamine agonists³. Dopamine agonists remain the cornerstone of treatment for prolactin secreting pituitary adenomas because of their efficacy in reducing prolactin secretion and inducing tumor shrinkage. Historically, bromocriptine was the most commonly used medication. But, because of its greater effectiveness, longer half-life, and fewer side effects, cabergoline has essentially taken its position⁴.

Despite the benefits of dopamine agonist therapy, pituitary apoplexy has occasionally been associated with their use. Most reported cases involve bromocriptine therapy, whereas

Access this article online

Website: <https://www.nepjol.info/index.php/NJN>

DOI: <https://doi.org/10.3126/njn.v23i3.94904>



HOW TO CITE

Bohara, S., Dhamala, I., Thakur, A. C., Shrestha, D. K., & Sedain, G. (n.d.). Pituitary Apoplexy during Cabergoline Therapy for Prolactinoma: A Rare but Serious Clinical Complication. *NJNS*. 2026;23(3):73-76

Address for correspondence:

Dr. Ijan Dhamala, MBBS, MS, MCh resident
Department of neurosurgery, Maharajgunj Medical Campus
E-mail: ijan111333000999@gmail.com

Copyright © 2023 Nepalese Society of Neurosurgeons (NESON)

ISSN: 1813-1948 (Print), 1813-1956 (Online)



This work is licensed under a Creative Commons
Attribution-Non Commercial 4.0 International License.

cabergoline associated pituitary apoplexy is considerably less common. The proposed mechanism involves rapid tumor shrinkage, ischemic necrosis, and intratumoral hemorrhage induced by degenerative changes within adenomatous tissue^{5,6}. We report a rare instance of a young patient with macroprolactinoma developing a pituitary apoplexy while on cabergoline medication who underwent successful endoscopic transnasal transsphenoidal surgery with favorable postoperative recovery.

Case Presentation

An 18-year-old male presented to the emergency department with complaints of severe bifrontal headache and progressive blurring of vision for three days. The headache was sudden in onset, more pronounced during the morning hours, and associated with worsening visual disturbance predominantly involving the left eye. There was no history of fever, seizures, loss of consciousness, trauma, or vomiting.

The patient had been diagnosed with prolactinoma six months earlier after initially presenting with gradual visual impairment. Ophthalmological examination at that time demonstrated visual acuity of 6/60 in the left eye with bilateral temporal visual field defects on perimetry. Magnetic resonance imaging of the brain revealed a large sellar and suprasellar mass measuring approximately $3.2 \times 2.8 \times 2.4$ cm, consistent with pituitary macroadenoma. The lesion appeared isointense on T1-weighted and fluid attenuated inversion recovery sequences and hyperintense on T2-weighted imaging. An incidental extra axial lipoma posterior to the midbrain was also noted.

Endocrinological evaluation demonstrated markedly elevated serum prolactin levels exceeding 2000 ng/mL, low thyroxine levels, and reduced testosterone levels, supporting the diagnosis of macroprolactinoma with associated hypopituitarism. Because the patient had relatively mild symptoms without significant neurological compromise, conservative management with dopamine agonist therapy was initiated.

Cabergoline was started at a dose of 0.25 mg twice weekly for one week and subsequently increased to 0.5 mg twice weekly. Levothyroxine replacement therapy and intramuscular testosterone isocaproate injections were also initiated. Serial follow up demonstrated progressive reduction in prolactin levels and partial visual improvement. However, because prolactin levels remained elevated, the cabergoline dose was gradually escalated over several months.

One week after escalation of cabergoline to a cumulative weekly dose of 3 mg, the patient developed severe headache and worsening visual symptoms, prompting emergency evaluation. On examination, the patient was conscious, alert, and oriented. Visual acuity was 6/6 in the right eye and 6/60 in the left eye. Bilateral bitemporal hemianopia was present on visual field assessment. Fundoscopic examination did not demonstrate papilledema. Laboratory investigations were largely unremarkable except for elevated serum prolactin levels measuring 92.2 ng/mL. Non-contrast computed tomography of the head demonstrated a hyperdense sellar lesion with suprasellar extension measuring approximately $3 \times 3 \times 2.5$ cm, suggestive of hemorrhage within the pituitary adenoma (Figure 1).



Figure 1: Non-contrast Computed Tomography Scan Demonstrating Hyperdense Sellar Lesion With Suprasellar Extension

Based on the acute clinical deterioration and imaging findings, a diagnosis of pituitary apoplexy was established. The patient underwent urgent endoscopic transnasal transsphenoidal decompression. Intraoperatively, the lesion appeared soft, friable, and hemorrhagic with extensive blood clots within the tumor cavity (Figure 2). Near-total tumor excision was achieved while preserving the surrounding structures.

Table 1: Timeline of Serum Prolactin Levels and Cabergoline Dose Escalation

Timeline	Serum Prolactin Level (ng/mL)	Cabergoline Dose
Initial presentation	>2000	0.25 mg twice weekly for one week, then 0.5 mg twice weekly
One month follow up	116.3	1 mg and 0.5 mg twice weekly
Two month follow up	114.5	1 mg twice weekly
Subsequent follow up	127.9	2 mg and 1 mg twice weekly
One week later	Symptomatic deterioration	Emergency presentation

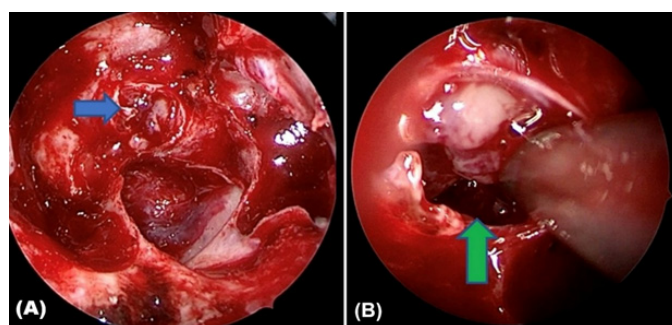


Figure 2: Intraoperative Endoscopic Views. (A) Intraoperative endoscopic trans-nasal transsphenoidal picture of sella showing soft, suckable tumor with areas of hemorrhage (blue arrow). (B) Intraoperative endoscopic transnasal transsphenoidal picture of sella showing hemorrhage within tumor cavity (green arrow).

Postoperative computed tomography imaging demonstrated satisfactory decompression of the sellar and suprasellar regions with near-total excision of the hemorrhagic pituitary adenoma. Significant reduction in tumor volume and relief of mass effect on adjacent structures were observed following surgical intervention (Figure 3).

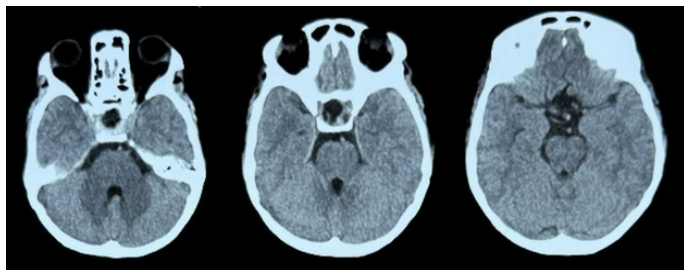


Figure 3: Postoperative Computed Tomography Scan Showing Near-total Resection of the Tumor

Postoperatively, the patient demonstrated immediate improvement in visual fields. The postoperative period was uneventful without evidence of diabetes insipidus or cerebrospinal fluid leakage. On the second postoperative day, the nasal packing was removed, and on the tenth postoperative day, the patient was discharged. Histopathological examination confirmed pituitary adenoma with areas of hemorrhage and necrosis. At two-month follow-up, visual acuity had improved to 6/6 bilaterally, and visual field testing demonstrated marked recovery (Figure 4).

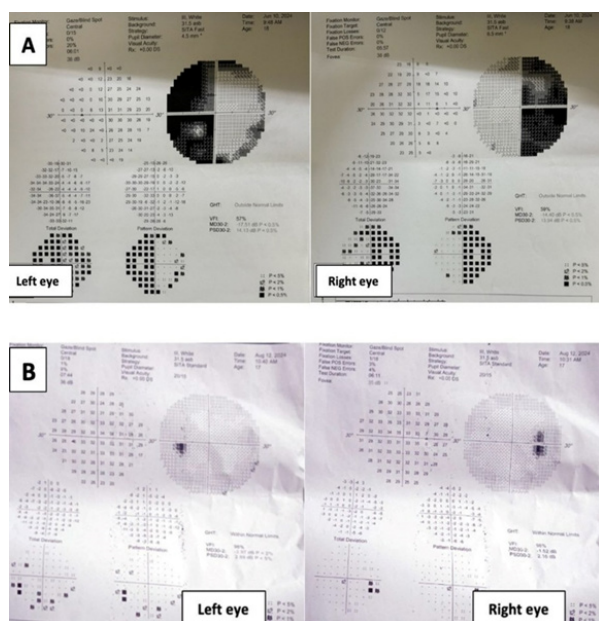


Figure 4: Preoperative and Postoperative Visual Field Assessment. (A) Pre-operative visual field examination of bilateral eyes. (B) Visual field examination of bilateral eyes at 2 months post-operative period.

Discussion

Pituitary apoplexy represents a neurological and endocrine emergency arising from acute ischemia or hemorrhage within the pituitary gland. The pathophysiology is believed to involve

a mismatch between the metabolic demands of the adenoma and its limited vascular supply⁷. Pituitary adenomas often possess fragile vascular networks with inadequate angiogenesis, rendering them vulnerable to ischemia and hemorrhage, particularly during periods of rapid tumor expansion or vascular compromise.

Several precipitating factors have been implicated in the development of pituitary apoplexy, including hypertension, diabetes mellitus, pregnancy, trauma, anticoagulation therapy, endocrine stimulation testing, and sudden alterations in intracranial pressure⁸⁻¹⁰. Dopamine agonists have also emerged as a recognized but uncommon risk factor.

Dopamine agonists act primarily by stimulating dopamine D2 receptors on lactotroph cells, thereby suppressing prolactin secretion and inducing tumor shrinkage through apoptosis and degenerative cellular changes¹¹. Although these effects are therapeutically beneficial, rapid cellular degeneration may predispose tumors to necrosis and hemorrhage. Intratumoral fibrosis and vascular compromise may further contribute to infarction and apoplexy.

Most reported cases of dopamine agonist associated pituitary apoplexy involve bromocriptine therapy. Cabergoline associated apoplexy is significantly rarer despite the widespread use of this medication. Carija and Vucina performed a systematic review demonstrating that pituitary apoplexy associated with dopamine agonists most commonly occurred in patients with macroprolactinomas and generally developed within the first year of therapy⁶. Our patient closely matched this profile, developing apoplexy within six months of initiation of treatment. The relationship between cabergoline dosage and risk of apoplexy remains poorly understood. Previous reports have described pituitary apoplexy occurring at doses ranging from 0.5 mg to 3 mg per week^{2,3}. In the present case, the event occurred shortly after escalation to 3 mg weekly, suggesting that rapid dose escalation may potentially contribute to ischemic changes within large adenomas.

Lima et al. described cases of cystic macroprolactinomas developing apoplexy during cabergoline treatment, suggesting that cystic degeneration may predict increased susceptibility to hemorrhage⁵. Interestingly, our patient did not demonstrate cystic characteristics on imaging, indicating that apoplexy may also occur in predominantly solid adenomas.

Yousem et al. reported a high prevalence of intratumoral hemorrhage in prolactinomas treated with dopamine agonists, supporting the hypothesis that hemorrhage represents the principal mechanism underlying apoplexy in this setting¹². The intraoperative findings in our patient, including hemorrhagic and necrotic tumor tissue, strongly support this mechanism.

Management of pituitary apoplexy depends on the severity of neurological deficits and visual compromise. Patients with mild symptoms may occasionally be managed conservatively with corticosteroids and close observation. However, urgent surgical decompression remains the preferred treatment in patients with significant visual deterioration, cranial neuropathies, or altered mental status. Early surgery has been associated with improved visual and neurological outcomes⁸.

Our patient demonstrated substantial visual recovery following urgent endoscopic transnasal transsphenoidal surgery. This favorable outcome emphasizes the importance of prompt diagnosis and timely neurosurgical intervention in symptomatic pituitary apoplexy.

Conclusions

Pituitary apoplexy is a rare but potentially devastating complication of prolactinoma treatment with dopamine agonists. Although cabergoline is generally considered safe and highly effective, clinicians should remain aware of the possibility of acute hemorrhagic or ischemic transformation, particularly in patients with large macroprolactinomas undergoing dose escalation. Careful clinical monitoring and regular ophthalmological and radiological follow up are essential during therapy. Early recognition and prompt surgical decompression can result in excellent neurological and visual recovery.

Financial Support

No funding was obtained for this study.

Conflict Of Interest

The author(s) declare that they do not have any conflict of interest regarding the publication of this article.

References

1. Jahangiri A, Clark AJ, Han SJ, et al.: Socioeconomic factors associated with pituitary apoplexy. *J Neurosurg.* 2013;119(6):1432-1436. <https://doi.org/10.3171/2013.6.JNS122323>.
2. Knoepfelmacher M, Gomes MC, Melo ME, et al.: Pituitary apoplexy during therapy with cabergoline in an adolescent male with prolactin-secreting macroadenoma. *Pituitary.* 2004;7(2):83-87. <https://doi.org/10.1007/s11102-005-5349-x>.
3. Chng E, Dalan R. Pituitary apoplexy associated with cabergoline therapy. *J Clin Neurosci.* 2013;20(12):1637-1643. <https://doi.org/10.1016/j.jocn.2013.02.027>.
4. Singh P, Singh M, Cugati G, et al.: Bromocriptine or cabergoline induced pituitary apoplexy: Rare but life-threatening catastrophe. *J Hum Reprod Sci.* 2011;4(1):59. <https://doi.org/10.4103/0974-1208.82367>.
5. Balarini Lima GA, Machado EO, Dos Santos Silva CM, et al.: Pituitary apoplexy during treatment of cystic macroprolactinomas with cabergoline. *Pituitary.* 2008;11(3):287-292. <https://doi.org/10.1007/s11102-007-0046-6>.
6. Carija R, Vucina D. Frequency of pituitary tumor apoplexy during treatment of prolactinomas with dopamine agonists: A systematic review. *CNS Neurol Disord Drug Targets.* 2012;11(8):1012-1014. <https://doi.org/10.2174/1871527311211080011>.
7. Bi WL, Dunn IF, Laws ER. Pituitary apoplexy. *Endocrine.* 2015;48(1):69-75. <https://doi.org/10.1007/s12020-014-0359-y>.
8. Albani A, Ferraù F, Angileri FF, et al.: Multidisciplinary management of pituitary apoplexy. *Int J Endocrinol.* 2016;2016:7951536. <https://doi.org/10.1155/2016/7951536>.
9. Cardoso ER, Peterson EW. Pituitary apoplexy: A review. *Neurosurgery.* 1984;14(3):363-373. <https://doi.org/10.1227/00006123-198403000-00021>.
10. Chapman AJ, Williams G, Hockley AD, et al.: Pituitary apoplexy after combined test of anterior pituitary function. *Br Med J (Clin Res Ed).* 1985;291(6487):26. <https://doi.org/10.1136/bmj.291.6487.26>.
11. Ghadirian H, Shirani M, Ghazi-Mirsaeed S, et al.: Pituitary apoplexy during treatment of prolactinoma with cabergoline. *Asian J Neurosurg.* 2018;13(1):93-95. <https://doi.org/10.4103/1793-5482.181130>.
12. Yousem DM, Arrington JA, Zinreich SJ, et al.: Pituitary adenomas: Possible role of bromocriptine in intratumoral hemorrhage. *Radiology.* 1989;170(1 Pt 1):239-243. <https://doi.org/10.1148/radiology.170.1.2909102>.