

When the cure became another challenge: A journey from Cushing disease to Nelson syndrome

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Abstract

Background: Nelson syndrome (NS) is an uncommon but serious consequence of bilateral adrenalectomy for Cushing disease (CD), characterized by marked ACTH elevation and progressive hyperpigmentation, with enlargement of the Sella turcica. We present an unusual case of persistent CD complicated by multiple electrolyte and mineral abnormalities, postsurgical hypopituitarism, and subsequent NS following bilateral adrenalectomy despite absence of radiological pituitary recurrence.

Case summary: A 26-year-old woman with longstanding menstrual irregularity and hirsutism presented with characteristic features of Cushing syndrome and generalized paresthesia. Investigations revealed ACTH-dependent Cushing disease with concurrent hypokalemia (2.3 mmol/L), hypocalcemia (6.4 mg/dL), and hypomagnesemia (1.4 mg/dL). Endoscopic transsphenoidal surgery for a pituitary microadenoma was performed on 8th August 2024, but hypercortisolism persisted. She subsequently developed postsurgical hypopituitarism and cranial diabetes insipidus, with persistent electrolyte disturbances. Chest and abdominal CT scans revealed no ectopic source of ACTH. Bilateral adrenalectomy was performed on 6th August 2025 for persistent hypercortisolism. Following surgery, the mineral abnormalities resolved, with calcium reaching 10.1 mg/dL and magnesium 2.1 mg/dL. Hormone replacement with Glucocorticoid, mineralocorticoid, and Androgen was needed. However, ACTH started progressively increasing from 392 pg/mL to 975 pg/mL, accompanied by marked diffuse hyperpigmentation, supporting the diagnosis of Nelson syndrome, though subsequent pituitary MRI showed no recurrent lesion. The patient eventually developed severe osteoporosis (L1-L4 DXA T-score and Z-score both -3) and received Intravenous Zoledronic acid.

Conclusion: The case illustrates a complex progression from persistent Cushing disease and refractory electrolyte/mineral disturbances to failed pituitary surgery, hypopituitarism, and adrenalectomy-associated Nelson syndrome. Resolution of hypokalemia, hypocalcemia, and hypomagnesemia after adrenalectomy highlights the systemic impact of severe hypercortisolism. This case emphasizes the need to recognize atypical biochemical features of CD and the long-term endocrine consequences of its treatment. [*J Assoc Clin Endocrinol Diabetol Bangladesh*, 2026;5(Suppl 1): S56]

Keywords: Cushing disease, Pituitary microadenoma, Hypokalemia, Hypocalcemia, Hypomagnesemia, Hypopituitarism, Bilateral adrenalectomy, Nelson syndrome

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