Submitted: 31.01.2024
Accepted: 07.04.2024
Early publication date: 26.06.2024

Endokrynologia Polska
DOI: 10.5603/ep.99199
ISSN 0423–104X, e-ISSN 2299–8306
Volume/Tom 75; Number/Numer 3/2024

A remission of Cushing's disease after pituitary tumour apoplexy

Arnika Wydra[1], *Jakub Wydra*[2], *Joanna Gątarek*[2], *Wojciech Zgliczyński*[1], *Izabella Czajka-Oraniec*[1]

[1]*Department of Endocrinology, Centre of Postgraduate Medical Education, Bielanski Hospital, Warsaw, Poland*
[2]*I Department of Internal Medicine, Bielanski Hospital, Warsaw, Poland*

Key words: *Cushing's disease; pituitary apoplexy; remission*

Pituitary apoplexy (PA) is a rare complication of pituitary adenomas occurring mostly in large non-functioning tumours (NFPA) or prolactinomas. PA in Cushing's disease (CD) is exceptionally rare, and less than 30 case reports have been published [1].

A 24-year-old woman was admitted to the Department of Endocrinology (DE) with suspicion of CD. She presented with a one-year history of unexplained weight gain of 19 kg with a centripetal distribution of fat and moon-like face, severe acne, purple skin striae on her thighs, easy bruising, muscles weakness, and amenorrhoea. Her recent laboratory evaluation revealed elevated morning serum cortisol, adrenocorticotropic hormone (ACTH), and 24-h urinary free cortisol (UFC). There was no suppression of the serum cortisol in the overnight 1 mg dexamethasone suppression test (DST). Other laboratory tests showed supressed gonadotropic axis, insulin resistance, and impaired glucose tolerance. Magnetic resonance imaging (MRI) showed a moderately enlarged pituitary gland with an 8 mm focal lesion on the right side (Fig. 1AB). A diagnosis of CD was suggested based on the patient's signs and symptoms, laboratory and imaging results.

However, at admission to the DE, repeated hormonal tests showed normal morning levels of ACTH and serum cortisol and preserved diurnal rhythm of their secretion. Baseline UFCs were in the lower range of the norm and total inhibition of cortisol secretion was seen in the 1 mg DST (Tab. 1). The patient revealed that approximately 2 weeks prior to hospitalisation, she experienced an episode of a severe headache which resolved spontaneously. A pituitary MRI was performed, and it showed hyperintense signal in the focal lesion in pre-contrast T1-weighted images and heterogeneous hyperintense signal in T2-weighted images, which may have indicated recent bleeding into the adenoma (Fig. 1CD). Other anterior pituitary functions remained intact, and the patient did not require glucocorticosteroid substitution. During a 12-month follow-up she continued to be in remission. She experienced a significant weight loss of 20 kg, recurrence of regular menses, and an improvement in her skin condition. The levels of ACTH, serum cortisol, and 24-h UFC remained within the normal range (Tab. 1). MRI showed significant shrinkage of the pituitary lesion during 12 months of follow-up, and only a scar remained in the location of the previously visible adenoma, resulting in a partially empty sella on the right side (Fig. 1EF).

CD is a rare condition characterised by the hypersecretion of ACTH due to a pituitary adenoma that ultimately causes endogenous hypercortisolism by stimulating the adrenal glands. Corticotroph tumours represent about 10–12% of all pituitary adenomas [3], and most of them are microadenomas. Because PA usually occur in large tumours, it is very rarely observed in corticotroph adenomas [2, 4]. PA might manifest as a severe headache with abrupt onset, nausea, vomiting, visual impairment, ophthalmoplegia, and decreased level of consciousness. Neurologic and endocrinologic deteriorations are mainly caused by a rapid expansion of an intrasellar mass as a result of haemorrhage within the pituitary tumour. However, the degree of disturbances might depend on both tumour size and bleeding intensity. Not all patients present with classic signs and symptoms. Subclinical course might be present, and quite commonly pituitary apoplexy could be an incidental radiological finding. PA was reported in between 0.6% and 10% of operated pituitary adenomas [2, 4].

In our patient the symptoms of PA were very subtle, but it resulted in the complete remission of hypercorti-

Arnika Wydra, Department of Endocrinology, Centre of Postgraduate Medical Education, Bielanski Hospital, Warsaw, Poland; e-mail: arnika.wydra@gmail.com

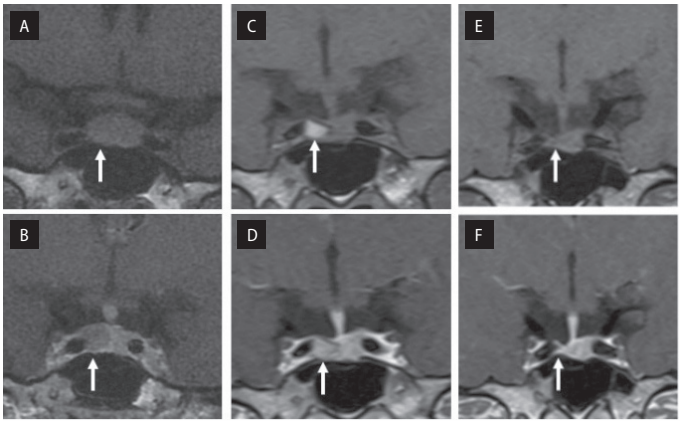

Figure 2. *Magnetic resonance images (MRI). Coronal T1-weighted pre-contrast (***A***, ***C***, ***E***) and (***B***, ***D***, ***F***) post-contrast.* **A, B.** *An initial picture of the microadenoma — an isointense, homogeneous 8 mm focal lesion located on the right side of the enlarged pituitary gland (14 × 11.3 × 10.4 mm) with delayed contrast enhancement (white arrows) and the pituitary stalk slightly deviated to the left;* **C, D.** *At admission to the Department of Endocrinology (DE) — haemorrhage region in the microadenoma (size 6 × 5 mm) with hyperintense pre-contrast and post-contrast signals within the focal lesion (white arrows);* **E, F.** *Twelve months after pituitary apoplexy (PA) — complete regression of the microadenoma, resulting in a partially empty sella on the right side, in the location of the previously described lesion (white arrows)*

Table 1. *Patient's laboratory results — initial and during a 12-month follow-up.*

Parameters	Laboratory results				Normal range
	Initial	During first hospitalisation in DE	6 months after PA	12 months after PA	
ACTH [pg/mL]	54.7	41.1	14.2	16.4	5–46.0
Cortisol 8 a.m. [μg/dL]	23.44	9.8	12.6	14.4	5–22.0
Cortisol [μg/dL] midnight	19.5	0.5	3.7	4.7	< 7.5
Cortisol 1 mg DST [μg/dL]	23.46	< 0.5	< 0.5	< 0.5	< 1.8
I baseline UFC [μg/24 h]	1476.0	30.3	52.5	38.2	20–130.9
II baseline UFC [ug/24 h]	1375.0	21.8			20–130.9

DE — Department of Endocrinology; PA — pituitary apoplexy; ACTH — adrenocorticotropin; cortisol 1 mg DST — cortisol after 1 mg of dexamethasone; UFC — 24-h urinary free cortisol

solaemia. Furthermore, PA did not cause any other hormonal deficiencies or neurological symptoms, probably due to a small size of adenoma. In the literature there are only a few described cases of subclinical PA of microadenoma leading to spontaneous resolution of CD without the need for surgical intervention. The presented case is exceptional because the full MRI documentation showing initial tumour and its evolution following PA, together with the changing clinical picture and hormonal results, were available. Prolonged remissions of CD are possible, even in patients managed conservatively [5], but recurrence of hypercortisolaemia has also been reported [1]; therefore, long-term follow-up is necessary.

Author contributions

A.W. — medical practices, concept, data collection and processing, analysis or interpretation, literature search, writing; J.W. — data collection and processing, analysis or interpretation, literature search, writing; J.G. — medical practices, data collection and processing, literature search, writing; W.Z. — medical practices, analysis or interpretation; I.C.O. — medical practices, concept, data collection and processing, analysis or interpretation, literature search, writing.

Acknowledgments

None declared.

Conflict of interest

The authors report no conflict of interest.

References

1. Popa Ilie IR, Herdean AM, Herdean AI, et al. Spontaneous remission of Cushing's disease: A systematic review. Ann Endocrinol (Paris). 2021; 82(6): 613–621, doi: 10.1016/j.ando.2021.10.002, indexed in Pubmed: 34687655.
2. Fernandez A, Karavitaki N, Wass JAH. Prevalence of pituitary adenomas: a community-based, cross-sectional study in Banbury (Oxfordshire, UK). Clin Endocrinol (Oxf). 2010; 72(3): 377–382, doi: 10.1111/j.1365-2265.2009.03667.x, indexed in Pubmed: 19650784.
3. Buliman A, Tataranu LG, Paun DL, et al. Cushing's disease: a multidisciplinary overview of the clinical features, diagnosis, and treatment. J Med Life. 2016; 9(1): 12–18, indexed in Pubmed: 27974908.
4. Capatina C, Inder W, Karavitaki N, et al. Management of endocrine disease: pituitary tumour apoplexy. Eur J Endocrinol. 2015; 172(5): R179–R190, doi: 10.1530/EJE-14-0794, indexed in Pubmed: 25452466.
5. Siwakoti K, Omay SB, Inzucchi SE. Spontaneous resolution of primary hypercortisolism of cushing disease after pituitary hemorrhage. AACE Clin Case Rep. 2020; 6(1): e23–e29, doi: 10.4158/ACCR-2019-0292, indexed in Pubmed: 32984518.