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## Swift Reversal of Hypercortisolism-Related Dermatological Features Following Treatment in a Patient with Cushing's Disease

### Reversão Rápida das Manifestações Cutâneas Associadas ao Hipercortisolismo após Tratamento da Doença de Cushing

**Keywords:** Alopecia/etiology; Cushing Syndrome/complications; Skin Diseases/etiology; Skin Manifestations/drug therapy**Palavras-chave:** Alopecia/etiologia; Doenças da Pele/etiologia; Manifestações Cutâneas/tratamento farmacológico; Síndrome de Cushing/complicações

Cushing's syndrome (CS) is a rare disorder caused by exposure to high levels of glucocorticoids. Dermatological manifestations are common and often discriminatory of this condition.<sup>1</sup> We report the case of a female with an adrenocorticotrophic hormone (ACTH)-dependent CS who had prominent dermatological features at presentation, which remarkably improved after treatment of the hypercortisolism.

A 74-year-old female presented with prominent and troublesome hair loss and easy bruising of the skin for nine months. She also complained about proximal muscular weakness and had recently been diagnosed with hypertension and diabetes. She denied exposure to exogenous corticosteroids. On clinical examination, she had severe frontovertical alopecia, with the scalp crown practically devoid of hair, suggestive of type III female pattern alopecia (Ludwig classification) (Fig. 1A). She also had reduced skin-fold thickness and exuberant ecchymosis in her upper limbs (Fig. 1B). Facial plethora, hirsutism, purple striae and skin

hyperpigmentation were absent. Her laboratory work-up confirmed endogenous hypercortisolism, with an elevated 24h-urinary free cortisol at 2300 µg/24h (reference range: 124 - 581; urinary volume of 2 liters) and an unsuppressed cortisol level of 35.4 µg/dL (normal < 1.8 µg/dL) following a 1 mg-overnight dexamethasone suppression test. ACTH was elevated at 377 pg/mL (reference range: 7.2 - 63.3) and her serum potassium level was normal at 4.3 mmol/L (reference range: 3.5 - 5.1). The diagnosis of an ACTH-dependent CS was established and a magnetic resonance imaging (MRI) test revealed a large 3 cm-pituitary macroadenoma invading the right cavernous sinus, the sphenoidal sinus and the skull base with significant clival destruction, but with no optic chiasm compression.

The patient started on metyrapone achieving eucortisolemia within a month, after which she underwent bilateral adrenalectomy, as curative pituitary surgery had been deemed unfeasible at our multidisciplinary team meeting. Within three months, her CS-related dermatologic manifestations improved remarkably (Figs. 1C and D).

Skin manifestations in CS patients are frequent and reflect the hypercatabolic effects of cortisol excess on collagenous subcutaneous fibers.<sup>2,3</sup> Excessive levels of cortisol also reduce the synthesis of proteins, such as hyaluronan and proteoglycans. These proteins are important skin components, but also elements of the hair follicles and are essential for a normal hair follicle cycling and growth.<sup>4</sup> High levels of ACTH can also lead to overproduction of adrenal androgens, which in turn may further contribute to the CS-related alopecia. Thus, hypercortisolism may impact the fine-tuned mechanisms of hair follicles resulting in hair growth disruption and hair loss.<sup>4</sup>



Figure 1 – Female patient with ACTH-dependent Cushing's syndrome (A) with alopecia (B) and skin ecchymosis, (C, D) which improved remarkably within three months after the treatment of hypercortisolism

Patients with CS may first present to dermatologists with a wide and heterogeneous spectrum of dermatological features, which should be recognized and lead to a prompt referral to an endocrinologist. A timely diagnosis and treatment of CS is essential, not only to prevent the metabolic and cardiovascular complications, but also to improve the patient's quality of life. As illustrated here, CS-related dermatologic manifestations may significantly and rapidly improve after prompt therapy targeting the cortisol overproduction.

#### AUTHORS CONTRIBUTION

MIA: Conception of the manuscript.  
PMG, PM: Critical review of the manuscript.

#### PROTECTION OF HUMANS AND ANIMALS

The authors have followed the protocols of their work center on the publication of data. The data was anonymized

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and none of the authors had access to patient identification. The study was conducted in accordance with the Helsinki Declaration updated in 2013.

#### DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

#### INFORMED CONSENT OF THE PATIENT

Obtained.

#### COMPETING INTERESTS

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#### Ethics in Authorship: Considerations and Concerns

#### Reflexão sobre Ética em Autoria Científica

**Keywords:** Authorship; Ethics; Retraction of Publication as Topic; Scientific Misconduct

**Palavras-chave:** Autoria; Ética; Má Conduta Científica; Retratação de Publicação como Assunto

Dear Editor,

The exponential proliferation of scientific publications in recent decades was accompanied by emerging issues related to ethics in research and publication. In the last five years, Retraction Watch identified 485 retracted papers involving concerns related to authorship,<sup>1</sup> with the more frequent issues being disputes concerning right of authorship, fake authorship, forged authorship, bought authorship, ghost authorship and honorary authorship.<sup>2</sup>

Local ideological concepts of authorship criteria in many clinical and research departments are outdated and do not

comply with current international recommendations. Many authors fail to adhere to ethical principles or may not be aware of the definitions of authorship and its criteria. The same issues apply to conference presentations<sup>3</sup> which in Portugal may be decisive for medical career progression.

Ethical transgressions related to authorship discredit scientific publications and jeopardize the reputation of authors. We are aware of several widespread misconceptions and unethical historical practices in clinical departments: 1) bestowing authorship to an individual who performed diagnostic tests (e.g. radiology, histology) in the setting of everyday clinical care of patients; 2) the widespread practice of including the head of the department as the senior author in conference papers but also in research publications; 3) bestowing authorship to physicians responsible for the clinical care of patients included in research, despite not participating in the study conception, interpretation of data and draft of the manuscript; 4) extensive reciprocal authorship sharing among residents when submitting conference papers.