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(CASE REPORT)

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Pituitary adenoma consecrating GH and ACTH: A rare case report

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Abstract

Plurihormonal Pituitary adenoma is defined as an adenoma that expresses more than one hormone on immunohistochemistry. The most common combination in these adenomas includes growth hormone (GH) and prolactin (PRL). We describe an interesting case of plurihormonal pituitary adenoma with double hormonal staining for adrenocorticotrophic hormone (ACTH) and GH in a patient who presented with acromegaly and subtle signs of Cushing disease due to a large pituitary macroadenoma

Keywords: Pituitary adenoma; Growth hormone (GH); Corticotrophin (ACTH); Cushing disease; Acromegaly

1. Introduction

Pituitary adenomas are common benign tumors that arise from the pituitary gland. They are classified based on their secretory characteristics into hormone-secreting and non-secreting adenomas. Plurihormonal pituitary adenomas are rare forms of pituitary adenomas that express more than one hormone. They represent approximately 10 to 15% of pituitary adenomas [1]. The most common association is with growth hormone (GH) and prolactin. Consecration of GH and adrenocorticotrophic hormone (ACTH) is rare with only 25 reported cases in literature. Most presented with features of GH excess, and only four presented with Cushing's disease[6]. We report a case of a pituitary macroadenoma producing both GH and ACTH resulting in acromegaly and Cushing's disease.

2. Case report

A 35 year female patient, consulted for the first time for secondary amenorrhea. The clinical examination noted a dysmorphic syndrome (prominent nose, thickened lips, bulging fingers and toes), homogeneous obesity, facial, back and neck acne, severe hirsutism rated at 22 according to the Ferriman and Gallwey score and bilateral galactorrhea induced by breast pressure. There was no faciotruncular obesity, no slender limbs, no buffalo hump, no purple stretch marks.

The Endocrine assessment revealed hypogonadotropic hypogonadism, hyperprolactinemia at 37.6 ng/ml, thyroid insufficiency with TSH at 0.9mUI/L and T4l at 10.7pmol/L. the rest of the hypophysiogram was normal, in particular morning cortisolemia at 21µg / dl. IGF-1 was 3 times normal(1408 ng/l)and ACTH was not performed. A complement of pituitary MRI objectified a sellar and supra-sellar process realizing an hourglass aspect in favor of a macro-adenoma measuring 20.8 x 17 x 28.8 mm, filling the opto-chiasmatic cistern and pushing back the optic chiasm. (Figures 1 and 2). Acromegaly was mentioned, a MEN1 (multiple endocrine neoplasia type 1) assessment was performed without specificity, the patient was quickly operated on by the transphenoidal way.

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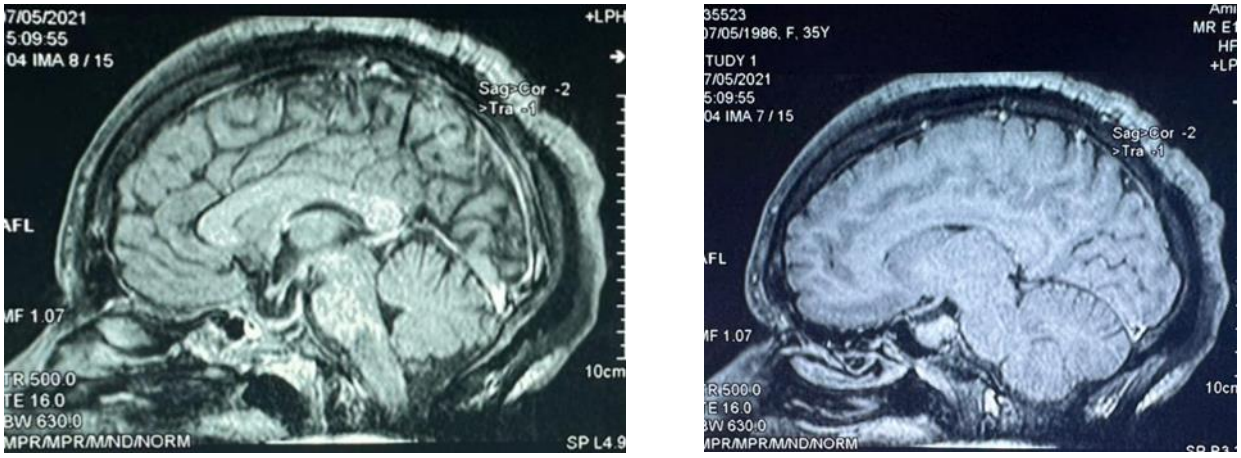

Figure 1 and 2 Pituitary MRI revealing the tumor in the sella and along the stalk measuring 20.8 x 17 x 28.8 mm

The anatomopathological study noted a morphological aspect of a pituitary adenoma and the complement of immunohistochemistry noted the expression anti GH(85%) and anti ACTH antibodies(15%). The postoperative check-up showed that IGF1 was still elevated at 788 ng/l(2 times the normal range), and on pituitary MRI a tumor residue measuring 11 mm .The patient was then put on somatostatin analogues.

3. Discussion

Pituitary adenomas (PA) are usually benign, monoclonal tumors arising from adenohypophyseal cells. [2]. They represent about 15% of all intracranial tumors[3]. Functioning pituitary adenomas are the most frequent and produce clinical syndromes due to pituitary hormonal oversecretion and/or a mass effect[4]. The large majority of functioning pituitary adenomas have single-hormone production. Histologically, plurihormonal pituitary adenomas represent 10 to 15% of all pituitary, but only a small number clinically secrete multiple hormones. The most common association is represented by prolactin (PRL) and growth hormone (GH), and other molecular combinations are rare. The majority of plurihormonal pituitary adenomas produce GH, PRL, and TSH because somatotroph, lactotroph, and thyrotroph cells all arise from the same progenitor [5]. The expression of pituitary hormones is regulated by several transcription factors: PIT-1 regulates the functional differentiation of GH, PRL, and TSH; STF-1 and GATA-2 regulate the expression of FSH and LH, while ACTH expression is controlled by T-PIT [5,6], which might explain the higher association with GH and PRL cosecretion. A common feature for GH-ACTH plurihormonal pituitary adenomas is the clinical dominance related to GH overproduction, what we also found in our patient. This phenomenon has been defined as subclinical Cushing's disease. Subclinical Cushing's disease may be caused by an insufficiency of autonomic ACTH production or by a biologically inactive ACTH. Some authors have reported the presence of high molecular weight ACTH, a biologically inactive form in patients with acromegalic features, but no Cushingoid features.

A review of the literature based on a meta- analysis, reported only 25 patients with a single pituitary adenoma simultaneously expressing GH and ACTH, of whom 4 had both clinical signs of acromegaly and Cushing's disease, 16 had only clinical signs of acromegaly and 2 presented only clinical signs of Cushing's disease, the 3 remaining presented pituitary apoplexy [6]. Our patient is therefore one of the very rare cases of plurihormonal GH-ACTH pituitary adenoma having presented clinical signs of acromegaly and Cushing's disease although in which signs of the second condition were subtle, but present.

4. Conclusion

Pituitary adenomas cosecreting ACTH and GH are rare, and cases with clinical signs of hypersecretion of both hormones are extremely rare. our case is an addition to the 25 cases in the literature.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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