

# Acromegaly and testicular seminoma: a rare association

## Abstract

**Context:** Acromegaly is a chronic disease characterized by sustained elevation of circulating growth hormone and insulin-like growth factor-1 (IGF-1). Epidemiological studies reported higher incidence of neoplasms in acromegalic patients especially colorectal and thyroid neoplasms. We report the case of a rare association of acromegaly to a testicular seminoma that deserves to be discussed.

**Case description:** A 49-year-old male, who was treated for testicular seminoma, during the follow-up, acromegaly, was suspected because of typical acromegalic features, diagnosis was confirmed by elevated IGF-1 and presence of pituitary adenoma showed by MRI.

**Conclusion:** acromegalic patients are at an increased risk of developing neoplasms. Therefore, the clinician must have the reflex to think to look for features of acromegaly in patients with cancer as the case of our patient.

**Keywords:** acromegaly, testicular seminoma, IGF1

Volume 8 Issue 5 - 2020

Abainou L,<sup>1</sup> Eljadi H,<sup>1</sup> Idrissi A,<sup>1</sup> Meftah A,<sup>1</sup> Essadi,<sup>1,2</sup> Akhaddar A,<sup>3</sup> Baizri H<sup>1</sup>

<sup>1</sup>Endocrinology Diabetes and Metabolic Diseases Department, Avicenna Military Hospital, Marrakesh, Morocco

<sup>2</sup>Medical Oncology Department, Avicenna Military Hospital, Marrakesh, Morocco

<sup>3</sup>Department of Neurosurgery, Avicenna Military Hospital, Marrakech, Morocco

**Correspondence:** Abainou L, Endocrinology Diabetes and Metabolic Diseases Department, Avicenna Military Hospital, Marrakesh, Morocco, Tel +212678747303, Email abainoulhossaine@gmail.com

**Received:** October 10, 2020 | **Published:** October 30, 2020

## Introduction

Acromegaly is an endocrine disorder caused predominantly by pituitary adenoma leading to autonomic oversecretion of growth hormone and secondary elevation of insulin-like growth factor 1 (IGF-1). Epidemiology studies have provided increasingly debated evidence that acromegaly may enhance the neoplastic risk, and that cancers constitute the third leading cause of mortality in this condition.<sup>1</sup> Here, we report a very rare association between acromegaly and seminoma of the testicle. Thus, we are wondering about the strength of this association.

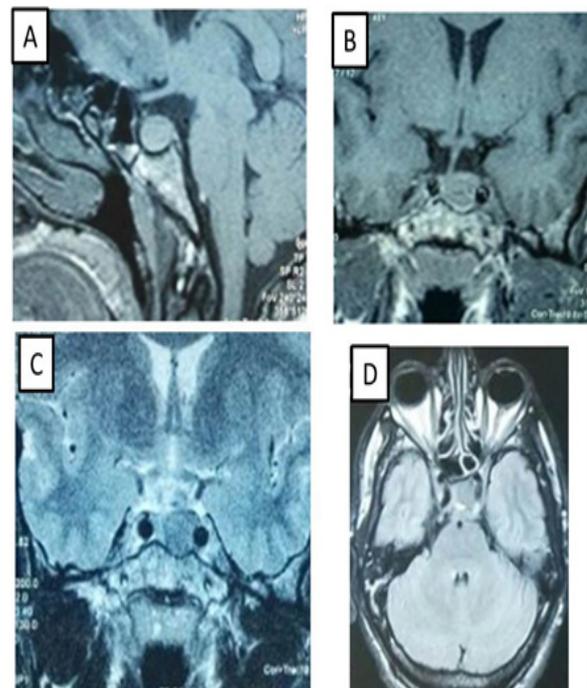
## Clinical observation

In February 2017, a 49-year-old male, without medical history, developed a right testicular mass; levels of serum beta-human chorionic gonadotropin and alpha-fetoprotein were within the reference range, and the metastatic workup findings were negative. Histopathology showed a pure seminoma. Metastatic workup showed no nodal or distant spread, T1N0M0 stage I. After radical orchiectomy, the patient underwent adjuvant cobalt radiation with a good evolution during the follow-up.

In March 2017, the patient was admitted and on the physical examination acromegaly was suspected because of typical acromegalic features (including acral overgrowth, excessive sweating, headaches and deep voice). Acromegaly was confirmed by elevated IGF-1 : 679,9ng/mL (normal: 72-225ng/mL), basal levels of GH was not suppressed during the oral glucose tolerance test (OGTT test) and the complement by MRI showed the presence of a 12mm pituitary adenoma intensely intensifying after injection of Gadolinium (Figure 1). Other pituitary, thyroid hormone levels, and biochemical tests were within normal ranges except for hyperprolactinemia: 30, 42ng/mL (normal: 4,04 – 15,2ng/mL).

The electrocardiography and the echocardiography were without abnormalities and the colonoscopy was normal. A thyroid nodule was

detected by ultrasonography, biopsy was performed, and histological features were benign. In colonoscopy, multiple hyperplastic polyps which biopsy and histology revealed typical hyperplastic polyps with superficial serrated architecture and absence of atypia. Polysomnography did not show sleep apnea syndrome.



**Figure 1** MRI images of pituitary macroadenoma.

- (A) Sagittal T1-weighted image,
- (B) Coronal T1-weighted image,
- (C) Coronal T2-weighted image,
- (D) Axial T2-weighted image.

The patient underwent transsphenoidal surgical (TSS) resection in July 2017; the histological examination revealed diffuse growth of an eosinophilic, chromophobic mixed adenoma. Immunohistochemistry detected many adenoma cells positive for GH and prolactin but negative for the other adenohypophysial hormones. Endocrinological reevaluation 3 months after surgery demonstrated biochemical cure: IGF1 level is 167.9ng/ml (normal: 72-225ng/mL).

The patient did well postoperatively. Biochemical cure has persisted despite the residual mass without further treatment. His IGF-1 levels have never reelevated during the follow-up for two years.

## Discussion

Acromegaly is a rare chronic disease caused by excessive secretion of GH and consequently of IGF-I. The excess of GH induces insulin-like growth factor-binding protein 3 (IGFBP-3) and IGF-I levels and promotes dysregulated cell growth balance. The symptoms usually appear insidiously, with changes that often go unnoticed. Therefore, more than 10 years can pass from the beginning of the disease until diagnosis.<sup>2</sup> In recent years, it has become recognized that acromegaly is associated with an increased risk of cancer, both in general and with thyroid and colorectal cancer in particular.<sup>2</sup> Moreover, circulating IGF-1 levels within the upper normal range have been associated with elevated risk of breast, prostate, colorectal, thyroid and lung cancers in the general population.<sup>3</sup>

Series of studies have shown that acromegaly is clearly associated with thyroid pathology. Long-lasting stimulation of the follicular epithelium by GH and IGF-1 can alter thyroid function and morphology, such as increased mass and the development of goiter. Acromegalic patients develop more often non-toxic multinodular goiter and nodules.<sup>4</sup>

In a meta-analysis that included 9 controlled studies of 701 patients with acromegaly and 1573 controls, there was a higher risk of colon cancer in patients with acromegaly (14/304 [4.6%]) than in control patients (8/627 [1.2%]).<sup>5</sup>

American Association of Clinical Endocrinologists (AACE) and the Endocrine Society suggest screening for colon neoplasia with colonoscopy at the time of diagnosis of acromegaly. Furthermore, AACE guidelines suggest that follow-up colonoscopy be performed at time intervals “appropriate for patients at higher-than-average risk for colon cancer” whereas the Endocrine Society guidelines suggest screening every 5 years for patients with elevated IGF-1 levels or polyps and every 10 years for patients with normalized IGF-1 levels and no polyps.<sup>6,7</sup>

In contrast to colorectal neoplasms, there is some evidence that GH/IGF-I axis is engaged in the pathogenesis of breast cancer in general population. Therefore, it is advisable to offer female acromegalic patients a regular mammography screening, even before the age of 50.<sup>8</sup>

As observed in breast cancer studies, both in vitro studies and studies on general population have confirmed the involvement of GH/IGF-I axis in prostate cancer. Nevertheless, men with acromegaly should be screened for prostate cancer and provided regular serum PSA measurement, rectal examination, and/or prostatic ultrasound annually.<sup>9</sup>

Numerous case reports describe various benign and malignant tumors including bone tumors, skin epidermoid tumors, dermatosis and melanomas, parathyroid and adrenal tumors. The mechanism for

developing cancers is likely to be multifactorial. The most frequently discussed factor is the role of IGF-I. IGF-I is a known mitogen that stimulates proliferation of cells and their migration, but the exact contribution to organs carcinogenesis still remains unclear.<sup>9</sup>

Abraham and al, described a case of bilateral testicular enlargement and seminoma in a patient with acromegaly. After resection of the pituitary tumor, GH levels fell below 0.5ng/ml with acromegaly resolution. Following acromegaly resolution, the enlarged remaining testicle decreased in size. But the implications of the testicular enlargement and seminoma in the presence of a GH-secreting tumor were discussed.<sup>10</sup>

In conclusion, monitoring patients with acromegaly for prevention and early detection of potential neoplasms remains a vital part of the treatment. And logically, to have acromegaly in mind when receiving patient with cancer especially because the typical features are insidious.

## Acknowledgments

None.

## Conflicts of interest

The author declares that there are no conflicts of interest.

## Funding

None.

## References

- Colao A, Ferone D, Marzullo P, et al. Systemic complications of acromegaly: epidemiology, pathogenesis, and management. *Endocr Rev*. 2004;25(1):102–152.
- López-Macia AA, Picó-Alfonso A. Clínica de la acromegalia: pre-sentación, cuadro clínico y comorbilidades. *Endocrinol Nutr*. 2005;52(3):18–22.
- Jakob Dal, Michelle Z, Leisner Kasper Hermansen, et al. Cancer Incidence in Patients With Acromegaly: A Cohort Study and Meta-Analysis of the Literature. *The Journal of Clinical Endocrinology & Metabolism*. 2018;103(6):2182–2188.
- Dabrowska AM, Tarach JS, Kurowska M, et al. Thyroid diseases in patients with acromegaly. *Arch Med Sci*. 2014;10(4):837–845.
- Rokkas T, Pistiolas D, Sechopoulos P, et al. Risk of colorectal neoplasm in patients with acromegaly: a meta-analysis. *World J Gastroenterol*. 2008;14(22):3484–3489.
- Katznelson L, Atkinson JL, Cook DM, et al. American Association of Clinical Endocrinologists Medical Guidelines for Clinical Practice for the Diagnosis and Treatment of Acromegaly—2011 update: executive summary. AACE Acromegaly Task Force. *Endocr Pract*. 2011;17(4):636–646.
- Katznelson L, Laws ER Jr, Melmed S, et al. Acromegaly: an endocrine society clinical practice guideline. *Endocrine Society. J Clin Endocrinol Metab*. 2014;99(11):3933–3951.
- Ruchala M, Szczepanek-Parulska E, Fularz M, et al. Risk of neoplasms in acromegaly. *Contemp Oncol (Pozn)*. 2012;16(2):111–117.
- Maja Radman, Tanja Miličević. Acromegaly and cancer. *Endocrine Oncology and Metabolism*. 2016.
- Abraham D1, Couldwell WT. Bilateral testicular enlargement and seminoma in a patient with acromegaly. *Br J Neurosurg*. 2004;18(6):629–631.