



# TOMOGRAPHIC DIAGNOSIS OF PRIMARY ADRENAL TUBERCULOSIS IN ADDISON'S DISEASE AT ALTITUDE. CASE REPORT

DIAGNÓSTICO TOMOGRAFICO DE TUBERCULOSIS ADRENAL PRIMARIA EN ENFERMEDAD DE ADDISON EN LA ALTITUD. REPORTE DE CASO.

Brayan Dávila-Aranda<sup>1,2,a</sup>, Valeria Córdova-Valenzuela<sup>1,2,a</sup>, Gonzalo Carrillo-Sanabria<sup>1,2,a</sup>,  
Francisco Meza-Legua<sup>1,3,b</sup>, Amilcar Tinoco-Solórzano<sup>1,2,4,c</sup>

## ABSTRACT

We report the case of a 23-year-old man, natural and high-altitude resident, with hyperpigmentation, asthenia, fatigue, nausea, vomiting, weight loss, abdominal pain, hyporexia, and hypotension, with decreased cortisol dosage and elevated ACTH. Normal chest X-ray, negative sputum and urine smear, negative TB LAM antigen. The contrast-enhanced computed tomography of the abdomen shows an increase in dimensions and small calcifications in both adrenal glands, suggesting a specific granulomatous infiltration type. In endemic tuberculosis areas such as Peru; In the absence of adrenal biopsy, it can be used early as a diagnostic alternative to tomography to rule out adrenal involvement. In conclusion, this report has described how tomography can be used as an alternative diagnostic method in hospitals where it is not feasible to perform a quick biopsy.

**Key words:** Addison's disease; Tuberculosis; Computed tomography; High altitude (source: MeSH NLM).

## RESUMEN

Reportamos el caso de un varón de 23 años, natural y residente de altitud, con hiperpigmentación, astenia, fatiga, náuseas, vómitos, pérdida de peso, dolor abdominal, hiporexia e hipotensión; con dosaje de cortisol disminuido y ACTH elevado. Radiografía de tórax normal, baciloscopia en esputo y en orina negativo, antígeno TB LAM negativo. En la tomografía computarizada de abdomen con contraste se visualiza incremento de dimensiones y pequeñas calcificaciones en ambas adrenales sugerentes de infiltración granulomatosa de tipo específico. En zonas endémicas de tuberculosis como en el Perú; ante la ausencia de la biopsia adrenal, se puede recurrir en forma precoz, como alternativa diagnóstica a la tomografía para descartar el compromiso adrenal. En conclusión, el presente reporte a descrito como la tomografía puede ser usado como un método diagnostico alternativo en hospitales donde no es factible realizar la biopsia en forma rápida.

**Palabras clave:** Enfermedad de addison; Tuberculosis; Tomografía Computarizada; Altitud. (fuente: DeCS BIREME).

<sup>1</sup> Universidad Peruana Los Andes. Facultad de Medicina Humana. Catedra de Medicina Interna II, Huancayo-Perú.

<sup>2</sup> Sociedad Científica de Estudiantes de Medicina Los Andes (SOCIEMLA), Huancayo-Perú.

<sup>3</sup> Ministerio de Salud (Minsa), Hospital Nacional Daniel Alcides Carrión, Servicio de Medicina Interna, Huancayo-Perú.

<sup>4</sup> Seguro Social de Salud (EsSalud), Hospital Nacional Ramiro Priale Priale. Servicio de Cuidados Intensivos e Intermedios, Huancayo-Perú.

<sup>a</sup> Student of Human Medicine.

<sup>b</sup> Endocrinology specialist.

<sup>c</sup> Medical specialist in Intensive Medicine.

**Cite as:** Brayan Dávila-Aranda, Valeria Córdova-Valenzuela, Gonzalo Carrillo-Sanabria, Francisco Meza-Legua, Amilcar Tinoco-Solórzano. Tomographic diagnosis of primary adrenal tuberculosis in addison's disease at altitude. Case report. Reporte de caso. Rev. Fac. Med. Hum. October 2020; 20(4):727-730. DOI 10.25176/RFMH.v20i4.2953

Journal home page: <http://revistas.urp.edu.pe/index.php/RFMH>

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## INTRODUCTION

Addison's disease (AD) is characterized by a decrease in steroidogenic hormones, mineralocorticoids, glucocorticoids, and androgens. The clinical manifestations in a chronic patient are asthenia, abdominal pain, nausea, vomiting, hypoglycemia, hypotension, among others, and it is accompanied by skin hyperpigmentation due to the increase in plasma ACTH. The diagnosis is made by clinical suspicion and demonstrating a low cortisol production ( $<3 \mu\text{g/dl}$ )<sup>(1)</sup>. It has an incidence of 0.83 per 100,000, a prevalence of 4-6 per 100,000 per year. It is 2 to 3 times more common in women. The most frequent etiology is idiopathic with 70%, tuberculosis (TB) represents 7-20% of cases<sup>(2,3)</sup>. In developing countries, TB has a higher prevalence, represented by 47% in India and 34% in South Africa<sup>(4,5)</sup>.

Adrenal tuberculosis is the affection of the adrenal glands caused by *Mycobacterium tuberculosis*. The aetiological diagnosis of certainty is confirmed with the biopsy of the gland. It is estimated that between 19 and 43% of the world's population is infected with TB. Tuberculous adrenalitis only develops in 0.3% to 5% of patients with TB<sup>(3)</sup>. There are no epidemiological studies in our country and less in altitude due to the lack of published series<sup>(6)</sup>.

Findings on computerized axial tomography (CT) can support the clinical-etiological diagnosis of AD. In infection by *Mycobacterium tuberculosis*, an increase in the size of the adrenal gland is evidenced; initially to a gland and then bilateral with the presence of microcalcifications and granulomatous infiltration<sup>(7,8)</sup>.

En-Sen Ma et al. in 2007 showed in 19 patients (38 glands) that tomography and laboratory and clinical tests have high specificity in the diagnosis of TB associated with AD<sup>(9)</sup>. García Romero M, et al. public in 2010, a clinical case where tomography was used as a diagnostic aid to detect adrenal tuberculosis, then confirmed with a biopsy of a patient with AD<sup>(10)</sup>. Alemparte Pardavila E, et al. public in 2005 a clinical case of adrenal tuberculosis that could not be confirmed with computed tomography<sup>(11)</sup>.

The early diagnosis of adrenal tuberculosis is important for initiating treatment and improving these patients' prognosis. We present a case where CT was used as a diagnostic support method for adrenal insufficiency due to primary tuberculosis.

Our objective is to describe how tomography can be used as an alternative diagnostic method in hospitals where it is not feasible to quickly perform a biopsy and detect if our patient has characteristics different from those described at sea level.

## CASE REPORT

A 23-year-old man, natural and resident of the altitude, is admitted by emergency to the hospital in Huancayo - Peru (3,250 meters of altitude, Barometric Pressure: 550 mmHg). He denies having contact with chronic coughs or patients with TB. For 6 months, he has had hyperpigmentation. Upon admission, he presented asthenia, fatigue, nausea, vomiting, weight loss, abdominal pain, and hyporexia. In the physical examination, generalized hyperpigmentation of the skin and mucosa of the oral cavity is visualized, hypotension (blood pressure 98/68 mmHg), heart rate 88 per minute, and respiratory rate of 20 are detected (Figure 1). Addison's disease is confirmed with a decreased cortisol dose ( $0.5 \mu\text{g} / \text{dl}$ ), elevated ACTH. Since TB is the main cause of adrenal insufficiency in developing countries, this possibility is studied, for which reason it is requested: chest x-ray without alterations. BK in sputum and urine negative and TB LAM antigen negative. Faced with negative tests for TB and there are tomographic characteristics that may bring us closer to the diagnosis of adrenal insufficiency due to TB, a CT scan of the abdomen with contrast is requested, which describes an increase in dimensions, small calcifications in both adrenal glands suggestive of granulomatous infiltration of a specific type (Figure 2).

As part of the differential diagnosis, infection by cryptococcus, syphilis, hepatitis B, and HIV are ruled out using cryptococcal antigen, rapid plasma reagin, surface antigen together with hepatitis B core and rapid negative HIV test respectively. Treatment for adrenal insufficiency with glucocorticoids is started; 40 mg prednisone in the morning and 20 mg in the afternoon. Antituberculous treatment was started (negative BK sensitive scheme) Isoniazid 5mg / kg, rifampicin 10mg / kg, ethambutol 20mg / kg, pyrazinamide 25mg / kg. The patient progressed favorably upon discharge.



**Figure 1.** a) Facial hyperpigmentation. b) Hyperpigmentation in the hands

## DISCUSSION

Addison's disease's main manifestations are hyperpigmentation in the palmar crease, knuckles, and oral mucosa. Gastrointestinal disorders associated with hyponatremia, and hypercalcemia. In our case, hyperpigmentation could be observed. The areas also described on the face, abdomen, and lower limbs are associated with gastrointestinal problems, without showing alterations in their electrolytes<sup>(5,12,13)</sup>.

Although autoimmune adrenalitis is described worldwide as the most common cause of adrenal insufficiency, TB is the main cause of an infectious type in developing countries, so it is mandatory to rule it out. The diagnosis of adrenal tuberculosis using tomography in association with other laboratory tests confirmed with the biopsy result has been described. However, in our report, the auxiliary tests cannot confirm the presence of primary pulmonary or adrenal tuberculosis, being the tomography the test that supported our diagnosis<sup>(10,119)</sup>. The main limitation in the present case was the inability to perform an early adrenal gland biopsy, so the tomography was performed.



**Figure 2.** Increase in the size of both adrenal glands with small calcifications.

CLINICAL CASE

In the absence of antecedents of a report on the altitude that associates adrenal insufficiency with TB, we wanted to compare our findings with those reported at sea level, finding no differences.

In TB endemic areas such as Peru, we recommend that an early tomography be used as a diagnostic alternative to rule out adrenal involvement in the absence of an adrenal biopsy. We also propose the execution of an analytical observational study to confirm our hypothesis of considering tomography as the first-line method for diagnosing adrenal tuberculosis in cases of adrenal insufficiency in the absence of a biopsy. In conclusion, this report has described how tomography can be used as an alternative diagnostic method in hospitals where it is not feasible to perform a quick biopsy.

## CONCLUSION

In conclusion, this report has described how tomography can be used as an alternative diagnostic method in hospitals where it is not feasible to perform a quick biopsy.

**Author's Contributions:** ATS, FML, BDA, VCV, and GCS, conceived the idea, wrote the initial version, carried out the critical revision of the manuscript, and approved the final version.

**Funding:** Self-financed.

**Conflicts of interest:** The authors declare that they have no conflict of interest.

**Received:** May 14, 2020

**Approved:** July 16, 2020

**Correspondence:** Amílcar Tinoco-Solórzano

**Address:** Av. Independencia 266, El tambo, Huancayo, Junín-Perú.

**Telephone number:** +51952991010

**E-mail:** amilcartinoco@gmail.com

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