

Infra-Hisian atrioventricular conduction disorder in a patient with treated acromegaly

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Abstract

Severe atrioventricular (AV) conduction disorder in acromegalic patients is limited to rare case reports with pacemaker implantation. This is a report of a 49-years-old female patient with cure criteria for acromegaly for 24 years and a history of syncope and lipothymia. The electrocardiogram showed a first-degree AV block. 24-hour Holter recorded Mobitz I second-degree AV block. The bundle of His electrogram showed prolongation of the HV interval (conduction time between the location where the His bundle potential is recorded and the beginning of ventricular activation). Thus, an artificial pacemaker was implanted with symptomatic improvement. The objective is to highlight atrioventricular conduction disorders in acromegalic patients and cardiological monitoring importance.

Keywords: Acromegaly; Artificial Pacemaker; Atrioventricular Block.

Introduction

Acromegaly is a progressive and chronic disease caused by a growth hormone (GH)-secreting pituitary adenoma, resulting in excess in GH and insulin-like growth factor (IGF)-I circulating levels. The clinical burden increases with facial and acral changes due to soft tissue overgrowth in

association with metabolic and oncologic complications [1].

Cardiovascular disease is the leading cause of death in acromegalic patients. High levels of these hormones lead to functional and structural changes in the heart, with potential for improvement with early diagnosis and treatment [2-4]. However, damage to the myocardium may be irreversible if the

disease remains active for a long period of time [2, 5].

Myocardial hypertrophy, fibrosis, ventricular dysfunction, among others, are factors that can contribute to the development of rhythm disorders in acromegalic patients [2-3,6-7]. However, there is no clear understanding of the potential severity of arrhythmias in heart disease associated with acromegaly [6].

What has been published so far are studies with a small number of patients and case reports. Supraventricular and ventricular arrhythmias are reported, without an indication of prognostic significance [6]. Electrical conduction disorders were registered including a few reports of pacemaker implantation due to AV conduction disorder [8-9].

Case report

The case reported here is of a 49-year-old female patient diagnosed with treated acromegaly. The condition started when she was 13 and was diagnosed at 24 years old. The magnetic resonance imaging was compatible with pituitary adenoma, requiring two surgeries and radiotherapy to control the disease.

At 25 years of age, she presented acromegaly cure criteria and developed panhypopituitarism. She had a long-standing complaint of lipothymia on

exertion and reported syncope in the past. The patient was using the following medications: Levothyroxine, prednisone, atorvastatin, somatropin, estradiol valerate, glucosamine sulfate, sodium chondroitin sulfate, vitamin D, and magnesium pidolate. On physical examination, her face, hand and feet presented acromegalic features, as well as lordosis and scoliosis, hoarse and nasal voice. Blood pressure of 100/80 mmHg, regular heart rate and no murmur.

Conventional electrocardiogram showed sinus rhythm, QRS complexes with regular duration, and first-degree AV block. Transthoracic echocardiogram showed cardiac chambers with normal dimensions and thickness, preserved left ventricular systolic function with ejection fraction (EF) estimated at 63%, aortic root ectasia, and mild mitral valve regurgitation.

The patient's evolution was marked by occasional episodes compatible with lipothymia, without syncope. Electrocardiograms showed first-degree AV block with significant PR interval prolongation and junctional and ventricular ectopic activity (Figure 1).

24-hour Holter examinations showed first-degree AV block, Mobitz I and 2:1, active junctional rhythm periods, premature supraventricular beats, and frequent ventricular ectopic

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activity, registering non-sustained and non-sustained idioventricular ventricular tachycardias with 3 beats and non-sustained idioventricular rhythms with 3 beats.



Figure 1. First-degree AV block and junctional ectopic beats. The AV block is represented by the lines (PR interval > 0,2s) and the ectopic beats by the arrows.

Cardiac magnetic resonance imaging showed ventricles with normal dimensions, global biventricular systolic function and analysis of segmental contractility preserved (left ventricular EF of 53%), mild left atrial dilatation, late mesocardial enhancement in the middle portion of the inferolateral wall. No ventricular hypertrophy.

An invasive electrophysiological study was performed, identifying HV interval = 110ms (normal HV interval varies from 35 to 55ms) characterizing infra-Hisian atrioventricular conduction disorder (Figure 2). A dual-chamber

pacemaker was indicated, considering the presence of symptoms and AV conduction disturbance below the atrioventricular node [10].

Lipothymia improved significantly without new episodes of syncope after implantation of the pacemaker device. The first intracavitary pacemaker recordings showed episodes of nonsustained ventricular tachycardia. 24h Holter monitoring, 8 months after implantation, showed artificial pacemaker DDD mode activity (multi programmable “physiological” dual-

chamber pacemaker) with ventricular capture 95% of the time, with no signs of device dysfunction. There were infrequent isolated supraventricular ectopic beats (400 beats). It also showed frequent ventricular ectopic beats (5% of analyzed beats), with one predominant morphology, isolated and in pairs, and 38 episodes of accelerated

idioventricular rhythm with 3 beats. Lastly, the patient is stable with an improvement of symptoms, with no report of new cases of lipothymia or syncope, using beta-blocker and panhypopituitarism drug control, and continues to be followed up at the outpatient clinic.



Figure 2: Electrophysiological study: HV interval = 110ms. I, II, AVF, V1, and V6 represent the surface electrocardiogram derivations. HISd indicates distal pole registry of the intracavitary catheter on the His bundle. The gap between the two vertical lines shows the time interval from the beginning of His bundle activation and the beginning of electrical activity in the ventricles.

Discussion and conclusion

The patient has heart disease with arrhythmic complications, with no other

clear etiology than acromegaly, despite disease cure criteria. In addition to the high density of ventricular arrhythmia

and non-sustained ventricular tachycardia, she presented atrioventricular conduction disorder. The occurrence of symptoms justified the investigation, including an invasive electrophysiological study.

A few reports of electrical conduction disorders with pacemaker implantation due to AV conduction disorder were registered in literature [8-9]. Tan et al. [8] described the case of a 52-year-old man with untreated acromegaly and syncope resulting from a third-degree atrioventricular block with wide QRS complexes. He underwent permanent pacemaker implantation and initiated the disease's treatment. Maffei et al. [9] described the case of an 82-year-old woman with treated acromegaly who underwent pacemaker implantation due to third-degree AV block evidenced by 24-hour Holter.

The occurrence of heart rhythm disorders is compatible with literature that indicates that cardiac arrhythmias can occur even after successful treatment of acromegaly and that the condition is associated with the duration of the disease [2, 7]. The case of Maffei et al. [9], presented control of acromegaly and hypopituitarism, but with more advanced age than the patient in this report.

Our report had no record of a third-degree AV block, unlike the reports by Tan and Maffei. The

electrophysiological study was the key to identify the severity of the conduction impairment. The presence of symptoms and evidence of infra-Hisian disorder were indicative of a pacemaker implant [10].

The lethal potential of heart disease in acromegaly is not clear in the literature, despite reports of sudden death and ICD (implantable cardioverter-defibrillator) implantation in patients with uncontrolled acromegaly [11-15]. Our patient has ventricular arrhythmia and heart disease with the potential of progression, but with controlled acromegaly and without indication for ICD at the moment [16]. The pacemaker implant provided a resource for recording any sustained ventricular tachyarrhythmia and allowed medication adequacy.

This report's objective was to contribute to the understanding of the potential of atrioventricular conduction disorders in acromegalic patients. Heart rhythm disorders occur in different ways and their prognosis is still not well understood. We consider that cardiological follow-up, whether acromegaly is active or not, has major importance.

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