

Syncope Caused by a Head and Neck Cancer Controlled by a Permanent Pacemaker

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ABSTRACT

Syncope caused by carotid sinus syndrome due to head and neck cancer is rare. We report a case of recurrent syncope as a result of extreme bradycardia requiring pacemaker implantation. The patient began chemotherapy and radiation therapy to treat the underlying cause. When diagnosed early, a positive outcome is expected in these situations.

LEARNING POINTS

- The differential diagnosis of transient loss of consciousness is frequently evident at clinical examination but may prove to be a challenge.
- The invasion and direct compression of the carotid sinus is a rare cause of carotid sinus syndrome and presents clinically as syncope.

KEYWORDS

Carotid sinus syndrome, paraneoplastic, syncope

INTRODUCTION

Syncope is a transient loss of consciousness (TLOC) due to cerebral hypoperfusion, characterized by a rapid onset, short duration and spontaneous complete recovery^[1]. The main causes of syncope are cardiac syncope, orthostatic hypotension and reflex syncope, which includes carotid sinus syndrome. The carotid sinus serves as a regulatory mechanism in maintaining normal arterial blood pressure and heart rate^[1].

Carotid sinus syndrome results from excitation of a hyperactive carotid sinus reflex. It can be classified into 3 categories, according to the type of response: cardioinhibitory (which results in sinus bradycardia, atrioventricular block or asystole due to vagal action on the sinus and atrioventricular nodes); vasodepressor (in which the predominant manifestation is a vasomotor tone decrease without a decreased heart rate) and mixed (in which there is a decrease in heart rate and vasomotor tone)^[2]. A fourth type was previously described in the literature as the “cerebral response”, in which direct compression of the carotid artery causes ipsilateral cerebral ischaemia leading to convulsions and unconsciousness; this occurs due to an abnormality in the circulation of the ipsilateral cerebral hemisphere, and therefore, is not a true reflex^[3]. Although still used today, the above definitions have been widely contested and proposed for review. Some experts consider that a cardioinhibitory mechanism cannot occur without a decrease in arterial pressure^[2].

CASE DESCRIPTION

The patient was a 45-year-old male, a smoker and former drug addict, with a medical history of human immunodeficiency virus (HIV) type 1 infection under antiretroviral therapy (ART) along with a recent diagnosis of locally advanced right tonsillar squamous cell carcinoma. He was admitted to the emergency department (ED) after recurrent episodes of TLOC, involuntary movements, sphincter incontinence and

dysaesthesia in his right hemiface. On physical examination, the patient had a palpable 5 cm mass in the right submandibular region that was firm, fixed and non-tender.

The blood chemistry, including sodium, potassium, calcium and magnesium levels, was unremarkable and the ECG showed a sinus bradycardia with 30 bpm. Cranial computerized tomography showed no endocranial lesions and cervical computerized tomography showed the tumoral mass directly in contact and compressing the right carotid space. Lumbar puncture revealed no significant findings. Initially, the episode was interpreted as a seizure; however, after a magnetic resonance imaging of the brain, we excluded the hypothesis of a metastatic endocranial lesion. Under observation, the patient experienced another episode similar to that previously described. Cardiac rhythm strips recorded during this event showed marked sinus bradycardia of 30–35 beats per minute. Given these findings, a diagnosis of carotid sinus syndrome caused by the neoplastic lesion was considered. The altered state of mind was considered to be due to low cardiac output with low cerebral perfusion as a consequence of bradycardia. No further studies were performed. An isoprenaline infusion was initiated and the patient was transferred to the intermediate care unit for close monitoring. A pacemaker was implanted several days later, and the patient remained free of symptoms. The patient was discharged. He underwent chemo- and radiotherapy with regression of the disease. He is being closely followed for surveillance.

DISCUSSION

The case presents a rare situation, and therefore, there is little experience in diagnosing and treating it.

There are some clinical entities that, although frequent, often prove to be a diagnostic challenge – TLOC being 1 of these. We found that using a normalized diagnostic diagram can be useful, as this simplifies and exposes all the diagnosis options, including some that may not be evident on a first approach. The first step is to determine whether the episode is of syncopal or non-syncopal origin (which includes seizures and others). A detailed clinical history is sufficient to differentiate syncope from other forms of TLOC in approximately 60% of cases^[4]. In the clinical case here, the presenting episode was at first interpreted as a seizure as some of its characteristics were typical of this entity (namely, the presence of involuntary movements, sphincter incontinence and altered sensitivity), and due to the history of malignancy with unknown staging. The diagnosis of syncope due to carotid sinus syndrome was only considered after an ECG was rapidly performed during a second episode.

Neoplastic invasion and compression of the carotid sinus as a cause of syncope is a rare situation: a series of 2 cases was described in 2000^[5] and another case was published in 2014^[3]. The exact mechanism is not clear – probably invasion of the sinus by neoplastic cells causes its dysfunction and the presence of the tumour mass causes direct compression and syncope.

The symptoms were sufficiently severe and persistent to warrant pacemaker implantation so that the patient could undergo treatment for the malignant condition.

The teamwork between Internists, Cardiologists, Oncologists and the Head and Neck Cancer specialists was crucial for a correct diagnosis and management of this situation, resulting in a positive outcome.

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