Cardiac arrest as a major complication of bilateral cervico-dorsal sympathectomy

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Abstract

Severe palmar and/or axillary hyperhidrosis can be socially and psychologically very disturbing. We present a case of a patient who suffered from a 43 s asystolic cardiac arrest the night following a second contralateral thoracoscopic T₃–T₁ sympathectomy for severe axillary and truncal hyperhidrosis. The cardiovascular effects of cervico-dorsal sympathectomy will be reviewed. Evaluation required to prevent such a serious cardiac complication will also be discussed.

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1. Introduction

Severe hyperhidrosis can be socially and psychologically very disturbing. Among various indications of cervico-dorsal sympathectomy, severe primary hyperhidrosis has gained growing acceptance due to its feasibility through minimally invasive techniques, especially thoracoscopy [1].

Cervico-dorsal sympathectomy consists of removing part of the sympathetic chain, along the antero-lateral surface of the spine, usually at a single or multiple levels from T₂ to T₄ [2]. It is usually an easily performed procedure on an outpatient basis. The risk of complication is low. The most commonly reported complications/side effects are Claude-Bernard-Horner syndrome (0.5–1%), asymptomatic brady-cardia and compensatory hyperhidrosis, the latter remains the most significant for the patient [3].

We present a case of a patient who suffered from a 43 s asystolic cardiac arrest the night following a second contralateral thoracoscopic T₃–T₁ sympathectomy for severe axillary and truncal hyperhidrosis. The cardiovascular impacts of cervico-dorsal sympathectomy are reviewed. Evaluation required to prevent such a serious cardiac complication will also be discussed.

2. Case study

A 54-year-old man was followed by the respirologist service for five years because of asthma. He was sent to our thoracic surgery service because his asthma was not considered as severe as it was initially supposed. His symptoms of dyspnea were more related to a symptomatic right post-traumatic diaphragmatic eventration. His medical history also consisted of high blood pressure. His current medication was hydrochlorothiazide (25 mg/day), losartan (50 mg/day) and salbutamol.

During preoperative evaluation, he described a severe primary facial, axillary and truncal hyperhidrosis that affected him since his teenage years. The patient was a human resources consultant and was exposed to meet clients and give conferences. He was very embarrassed by his perspiration problem, changing clothes many times per day and taking a shower just before meetings. He tried multiple medical treatments without success. Because an open right diaphragmatic plication by thoracotomy was planned and future thoracoscopic procedures could be compromised, a surgical right sympathectomy was offered at the same time of the procedure. Also, because this patient was one of the oldest patients in our service to have a sympathectomy for hyperhidrosis (true oldest patients are those with refractory angina), it was decided to do only the right side, which was the dominant side of the patient. He had no cardiovascular contraindication for the procedure having a normal ECG. Maximal stress test was normal. The surgical procedure went uneventfully and the patient was extremely satisfied with the result. He urged his surgeon to do a left sympathectomy as soon as possible but, because of the age of the patient, a left sympathectomy was planned only for the next year.

The morning of the surgery, the patient was stable with his blood pressure (BP) at 156/92 mmHg and heart rate at 85 beat per min (bpm). During this surgery, as the left sympathetic chain was cut, there was a significant drop in heart rate from 85 to 58 bpm. At the recovery room, after
extubation, his heart rate was 45 bpm and BP 125/75 mmHg. Thereafter, patient’s monitoring with telemetry on the surgical ward was decided. The patient received 30 mg of codeine at the recovery room. On the surgical ward, the patient had a restful evening and his vital signs were stable with BP 105/65 mmHg and HR 60 bpm.

At 04:35 h, the patient went to the bathroom. He suffered from syncope due to a 43 s cardiac asystole requiring reanimation maneuvers. Following successful reanimation, the patient showed extreme sinus bradycardia (30 bpm) with drowsiness. Intravenous dopamine was started and a temporary pacemaker insertion was performed at the coronary care unit. The following morning, a DDDR pacemaker was implanted. Retrospectively, the patient recalled twice vagal-type syncope in the past.

At six months follow-up, heart rate being often pacemaker-dependent, it was reprogrammed in a DDIR mode. Since then, the patient remained very satisfied of his dry chest, independently of this major cardiovascular complication. At follow-up, he presented a recurrent episode of syncope during a celebration. Most recent evaluation showed 26% atrial pacing and no ventricular pacing.

3. Discussion

We described a major asystolic cardiac arrest, occurring shortly after cervico-dorsal sympathectomy and requiring implantation of a permanent pacemaker. This major complication occurred under a particular combination of circumstances: uncompensated increased vagal tonus during micturition possibly associated with mild postoperative dehydration. Also, vagal syncope in the past was unmasked. The patient had no medication for slowing his heart rate but he was taking hydrochlorothiazide before surgery which could have exacerbated his relative hypovolemia. Also after surgery, the patient received one dose of codeine for pain relief which can give of dizziness and vagal symptoms.

4. Physiology

Perspiration maintains body temperature and balances hydration and electrolytes. Palmar and plantar sudation is more related to stress and axillary perspiration is considered secondary to mixed stimulations of stress and hot environment. It seems that eccrine glands are involved in the pathophysiology of hyperhidrosis through acetylcholine [4]. Hyperhidrosis would result from abnormal or excessive central sympathetic stimulation.

Sympathetic and parasympathetic innervations of the heart come from the external autonomous nervous system. The vagal nerve, from the 10th pair of cranial nerves, brings constant parasympathetic innervation, reducing heart rate as well as contractility. Sympathetic innervation originates from cervical and/or superior thoracic sympathetic ganglion cells. It is not constant and is stimulated by stress or exercise accelerating heart rate and increasing contractility.

5. Hemodynamic consequences of cervico-dorsal sympathectomy

Thoracic sympathectomy has usually minimal consequences if unilateral, especially on the right side. For bilateral procedures, a mean 12% reduction of heart rate was reported [5]. Around 50% of patients have bradycardia in the following minutes of a bilateral surgery with mean and diastolic blood pressure significant reduction. Since the sympathectomy will block the chronotropic response, a significant increase of the ejection volume is observed when the patient moves in the erect position from dorsal decubitus [6].

Two cardiovascular complications were reported in the literature. First, an asystolic cardiac arrest in an 18-year-old woman during the second side (left) of bilateral sympathectomy for severe hyperhidrosis, requiring resuscitation maneuvers, with no chronic sequelae [7]. The second case was reported in a 23-year-old woman in whom a bilateral T2 sympathectomy was performed for facial hyperhidrosis. Two years later, following electrophysiologic studies confirming unopposed vagotonic stimulation, she underwent permanent pacemaker insertion for symptomatic bradycardia [8].

6. Recommendations

From this experience, we suggest that a meticulous questionnaire on possible vagal symptoms should be ascertained and one may seriously reconsider performing a bilateral cervico-dorsal sympathectomy on patients with a positive history of vagal syncope. If surgery is still performed, considering only one side would probably decrease the risk of cardiac complications and a cardiac monitoring is useful for at least 24 h with IV access, postoperatively. Patients should be instructed of possible cardiovascular complications following this intervention.

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References