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THYROID STORM FOLLOWING CORONARY ARTERY BYPASS GRAFT SURGERY: A RARE ENDOCRINE CHALLENGE

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ABSTRACT

In this case report, initially presenting with dyspnea and chest discomfort, The 58 years old female patient reported a clinical history encompassing depression and diabetes mellitus. Later, she experienced an unanticipated attack of thyroid storm. Coronary artery bypass(CABG) was successively performed on her after an emergent primary percutaneous coronary intervention (PCI) identified significant coronary artery disease. On the third day following the operation, she experienced an abrupt and puzzling decline in cognitive function, accompanied by elevated body temperature, rapid heartbeat, and severe hypertension. Thyroxine (T4) levels were significantly elevated (> 180.5 nmol/l), whereas thyroid-stimulating hormone (TSH) levels were suppressed (0.05uU/ml) according to a thyroid profile obtained on postoperative day 5. Multiple enlarged hyper vascular thyroid nodules were detected on a subsequent thyroid sonogram. Consistent with ongoing beta-blocker treatment, the patient's clinical condition significantly improved in the days that followed the prompt administration of methimazole and stress dose steroids. She was advised to continue taking decreasing steroid regimens and oral methimazole, with a follow-up appointment at the endocrinology department. In cardiac patients, this case emphasizes the critical role of timely intervention in attaining a favorable outcome and the significance of thyroid storm in the differential diagnosis of unexplained postoperative deterioration.

Keywords: *Endocrinological Emergency, Coronary Artery Bypass (CABG), Thyroid Storm, Cardiovascular, Severe Stenosis*

INTRODUCTION

After a surgical procedure, altered mental status is a commonly observed clinical symptom in inpatient hospital settings that provokes meditation. There are many possible diagnosis possibilities, ranging from straightforward disorientation to a newly discovered cerebrovascular event (1). AMS evaluations may include sophisticated radiological procedures, such as gadolinium-enhanced magnetic resonance (MR), in addition to a physical checkup and a comprehensive medical history. A patient who had coronary artery

bypass graft (CABG) surgery. Showed no preexisting thyroid conditions experienced one case of thyroid-storm, which is detailed in this article.

Case Presentation:

The 58-year-old female patient, who had been previously identified as having a history of diabetes and depression, reported discomfort in her chest and dyspnea as symptoms. An elevated ST segment was identified in the anteroseptal results of the patient's electrocardiogram. The results of an emergent primary PCI revealed that the left artery had severe stenosis, the right circumflex artery had moderate stenosis, and the RCA had constricted proximal stenosis. The following day, a CABG surgery was scheduled, and her intraoperative and immediate post-operative courses went well. With a tachycardia of 134 beats per minute, a fever of 103 degrees Fahrenheit, hypertension with a systolic pressure in the 200th percentile, and an abrupt decline in mental status, she experienced these symptoms on day three. The results of an antimalarial peripheral blood smear, streptococcus, leptospirosis, lumbar puncture, serum ammonia electroencephalogram, mycoplasma serology, computed tomography (CT) scan, blood cultures, urine analysis and culture, and a thorough work-up for fever and AMS were all unremarkable. Despite receiving beta blockers, anti-platelet drugs, nitro-glycerine infusion and broad-spectrum antibiotics, the patient remained tachycardic, unconscious, and having a fever. The thyroid profile collected on post-operative day 5 Triiodothyronine (T3) was measured at 2.68 nmol/l, thyroxine (T4) was greater than 180.5 nmol/l, and thyroid stimulating hormone, or TSH, was below 0.05uU/ml. Multiple enlarged, hypervascular thyroid nodules were detected on a thyroid sonogram. A beta blocker was continued while she was administered stress dose steroids and methimazole. Her mental state, pulse rate, and blood pressure all displayed signs of improvement within the subsequent three days. She was ultimately sent to house with oral methimazole and a tapered the dose of corticosteroids, with a one-month follow up scheduled at the endocrinology clinic on day 10 following the procedure.

Discussion:

Thyroid-storm is an uncommon and potentially fatal endocrinological emergency that presents with severe clinical signs of thyrotoxicosis. If treatment is delayed, the fatality rate could reach 20–30 percent. Acute events including trauma, illness, parturition, acute iodine overload, or surgery on the thyroid or non-thyroidal glands may cause it. The precise etiology of thyroid-storm remains unknown. Possible hypotheses (two to three) are that there is an increased susceptibility to catecholamine, an increased intracellular response to the thyroid hormone, an increase rate of higher thyroid hormone level in serum. In the patient with uncomplicated thyrotoxicosis (4), the suppression of TSH and increase of T4 and T3 thyroid hormone levels are not substantially elevated.

A thyroid-storm case subsequent to (CABG) was reported involving. A 58 years old partient who had no history of coronary artery and thyroid disease. In accordance with the Burch–Wartofsky criteria (5), a thyroid storm was identified. The likelihood of a thyroid storm is determined using this set of diagnostic criteria, which evaluates clinical characteristics including body temperature, effects on the central nervous system, dysfunction in gastrointestinal or hepatic systems, pulse rate, atrial fibrillation, and precipitant history. A score higher than 60 indicates a high degree of compatibility with thyroid-storm on a scale that runs from 0 to 140 points. In addition to this score, thyroid function tests and therapeutic response combined to determine the final diagnosis.

In addition to the absence of muscle rigidity, chronic elevated blood pressure, new-onset atrial fibrillation, negative blood cultures, computed tomography and electrocardiogram, thyroid-storm was differentiated from conditions such as septicemia, low oxygen levels, malignant neuroleptic syndrome, stroke, and hypoglycemia. A prior assessment of literature revealed that CABG was associated with a thyroid storm (6-8). Our case and prior reports share several characteristics, including the patient being male, having few preoperative indications of thyrotoxicosis, experiencing a postoperative storm complicated by acute myocardial infarction, having limited coronary artery disease risk factors and the ability to respond rapidly to thyroid supression therapy.

In our case, the known causes of the thyroid-storm were the iodine load and surgery. Thioamide, corticosteroids, beta-adrenergic blocking agents, iodine, and steroid medication are all components of the standard treatment for thyroid-storm. Potentially inhibiting the production of thyroid hormone are the thioamides like methimazole and propylthiouracil. By means of the Wolff–Chaikoff effect, iodine therapy inhibits the activity of thyroid hormones. Triiodothyronine is not converted to thyroxine in the periphery when hydrocortisone is administered. Beta blockade can be an effective treatment for hemodynamically stable patients experiencing thyroid storm by counteracting the elevated adrenergic tone. It is noteworthy that acute coronary spasm, resembling STEMI can potentially be accompanied by thyrotoxicosis. (9)

Thyroid storm is an uncommon endocrinological emergency that causes 30% mortality in entirely asymptomatic, undiagnosed hyperthyroid patients.It induced by iodine loador (CABG) surgery. For the record, we wanted to alert clinicians of this condition. This uncommon but critical postoperative complication is exceptionally treatable despite its potentially fatal condition.

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