

EDITORIAL

Hypocalcaemia Secondary to Iatrogenic Hypoparathyroidism as a Rare Cause of Dilated Cardiomyopathy

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Abstract:

Postoperative hypocalcaemia caused by hypoparathyroidism is one of the most common morbidities of total thyroidectomy. Hypoparathyroidism is associated with chronic hypocalcaemia which can have a variety of manifestations including cardiovascular changes. Hypocalcaemia is a very rare reversible cause of dilated cardiomyopathy (DCM) which can concern one or both ventricles. In this article, we present a case of iatrogenic hypoparathyroidism leading to hypocalcaemia, associated with systolic dysfunction of left ventricle presenting as congestive cardiac failure due to dilated cardiomyopathy in addition to other manifestations of hypocalcaemia. After treatment of heart failure and calcium-vitamin D supplementation, signs and symptoms of heart failure improved rapidly.

Keywords: Hypocalcaemia, hypoparathyroidism, dilated cardiomyopathy.

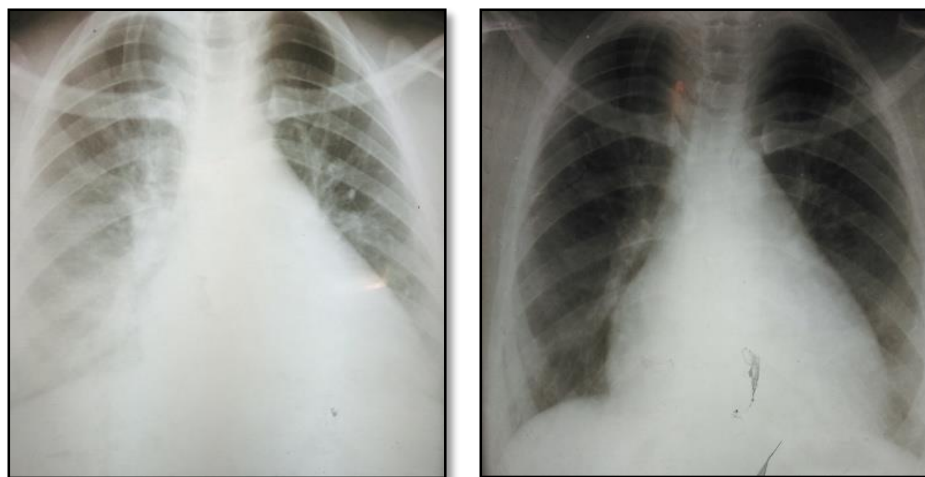
Case Report:

A 30- years old female admitted to hospital due to congestive heart failure, dyspnea (New York Heart Association class IV), generalized body swelling, for four months followed by seizures, hand feet spasm, facial numbness and peripheral numbness two days prior to admission. She had a past history of hyperthyroidism for which total thyroidectomy was done, one year ago. She was on thyroxine tablets and calcium supplementation but she was not compliant to medication. Investigations revealed, severe hypocalcaemia, hypomagnesaemia, and hyperphosphatemia (Fig. 1). Chest X-ray revealed prominent cardiomegaly with pulmonary congestion and mild bilateral pleural effusion, which were improved after correction of hypocalcaemia (Fig. 2). Electrocardiography showed prolonged QT interval (543 ms) with nonspecific ST-T changes (Fig. 3). Trans-thoracic echocardiography showed dilated global hyperkinesias systolic and diastolic dysfunction, (Dilated cardiomyopathy, DCM) with trivial mitral regurgitation. Systolic ejection fraction (EF) 33%. The patient was admitted to ICU received anti-failure medications, thyroxine and calcium supplement with vitamin D, then dramatic improvement was achieved; clinically chest was clear ,facial and lower limb swelling subsided, ECG was normal ,Trans-thoracic echocardiography showed mild dilatation of the left ventricle systolic ejection fraction 43% with mild trivial mitral regurgitation and she was discharged in a good condition.

EDITORIAL

	Normal value	Date	9/12/2014	20/1/2015	3/2	5/2	7/2	8/2	9/2	10/2	12/2	14/2	15/2	16/2	19/2	21/2	25/2	11/3
Ca +	8.1-10.4mg/dl		6	8	2.7	2.2	2	5.6	5.5	6.8	5.4	4.8	4.7	4.6	5.6	5.1	5.2	7.4
mg	1.9 - 2.5 mg/dl										1.3	3.6	2.9				1.47	
Ph	2.5 – 5 mg/dl										7.7				7.8	6.22		
K	3.2-5 mmol/L				2.5	2.9	3									2.0	3.4	3.4
Na	135-140 mmol/L				130	137	1									133		

Table 1: Electrolytes Results.



A

B

Figure 1 chest X-ray; (A) on admission, (B) after treatment,

EDITORIAL

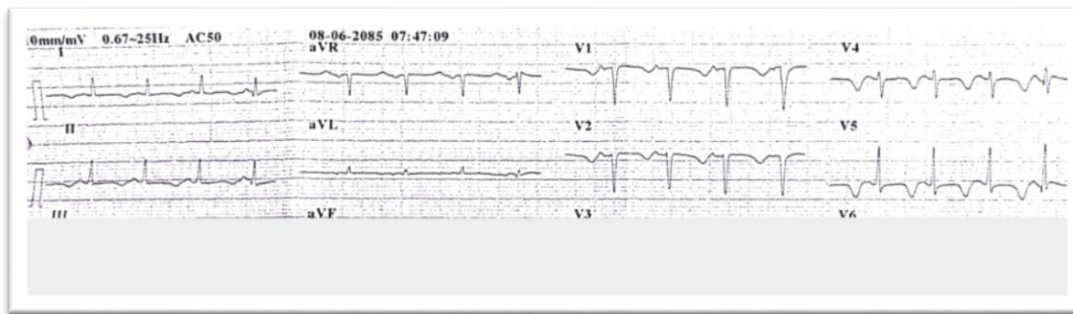
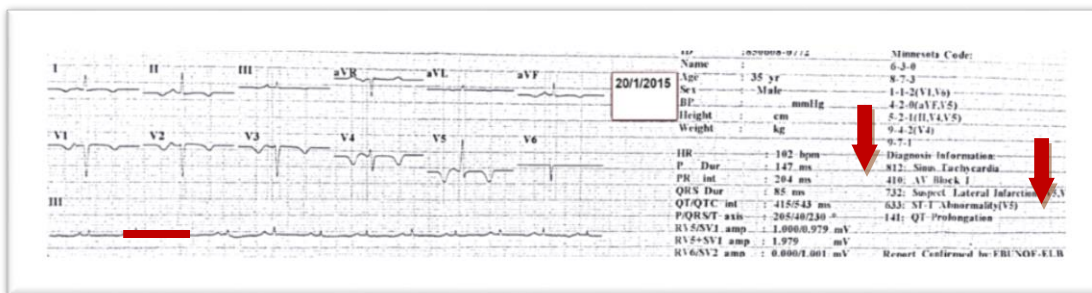


Figure 2:



(Fig.3) ECG Changes

Discussion:

Hypoparathyroidism is a well-recognized complication after thyroid and parathyroid surgery. Transient hypoparathyroidism occurs in 10% of patients who undergo total thyroidectomy, and less than half of these patients develop permanent hypoparathyroidism. (1) This usually, results from devascularization of the parathyroids, unintentional resection, or accidental coagulation of the parathyroids. (2)

Hypoparathyroidism is characterized by hypocalcaemia, hyperphosphatemia and low or inappropriately normal levels of parathyroid hormone (PTH). PTH is a key calcium regulating hormone essential for calcium homeostasis, vitamin D-dependant calcium absorption, renal calcium reabsorption and renal phosphate clearance. The most common cause of hypoparathyroidism is iatrogenic, following anterior neck surgery. Hypoparathyroidism may be due to congenital or acquired disorders. Hypocalcaemic patients commonly present with symptoms of neuromuscular irritability with perioral numbness, paresthesias, tingling, seizures and, bronchospasm; or may be asymptomatic. (3) Carpopedal spasm and tetany are typical manifestations and usually occur within weeks after surgery. The first signs can be less typical and include movement disorders such as chorea, as well as symptoms of increased intracranial pressure or epileptic seizures. (4) Dilated cardiomyopathy is usually an idiopathic disease of heart muscle with a poor prognosis. (5) Calcium has a central role in myocardial contraction coupling and hypocalcaemia decreases myocardial contractility. Calcium has a direct effect on the strength of myocardial contraction through excitation-contraction coupling. Hypocalcaemia reduces

EDITORIAL

myocardial contractility, but the incidence of CCF and cardiomyopathy due to hypocalcaemia is very rare. Hypocalcaemic cardiomyopathy is usually refractory to conventional treatment for cardiac failure, but responds favorably to restoration of normocalcaemia. ⁽⁶⁾

EDITORIAL

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