

Case Report

Diabetes and infarcted papillary thyroid cancer

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ABSTRACT

A young black Jordanian lady who has type one diabetes, chronic diabetic complication and ischemic heart disease, presented with a picture of diabetic keto-acidosis, precipitated by an acute neck swelling. This was suggestive of acute suppurative thyroiditis with abscess formation causing compressive symptoms. This unfortunate patient had an eventful course despite aggressive treatment by antibiotics and surgery and then succumbed of an acute cardiac event. The operative tissue biopsy revealed an abscess in an infarcted papillary thyroid cancer. We believe this is a rare presentation of such an association with a fatal outcome.

Keywords: Diabetes, infarcted papillary thyroid cancer, abscess.

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Infections of the thyroid gland are rare due to its isolated anatomic location, abundant blood supply, generous lymphatic drainage and high iodine concentration.¹ Infections that might be either acute or chronic are more common among women with preexisting thyroid disease mainly adenomas.² Acute infections with abscess formation are caused by gram positive or negative organisms, which reach the gland either by hematogenous spread usually in an immune-compromised patient or via a fistula from the pyriform sinus adjacent to the larynx^{1,3} which, is the most common cause of suppurative thyroiditis now. Infections of the thyroid gland with mycobacterium,⁴ fungal⁵ and pneumocystic microorganisms are more chronic and nearly all occur in immune-compromised patients.³

This study reports a case of an unfortunate lady with type one diabetes and chronic diabetic complications admitted with acute suppurative thyroiditis and gas forming abscess in an infarcted papillary thyroid cancer.

Case Report A 39-year-old black lady was admitted in January 2001 with severe dehydration, shallow, rapid breathing, nausea and vomiting, recent left-sided neck swelling fever and stridor. She is known type one Diabetes Mellitus (DM) from 1993, on humulin insulin 25+15 units/day, and severe left ventricular impairment due to previous myocardial infarction managed medically. The neck lesion started 5 days prior to current admission with ill being and fever. She was seen in a district hospital and was given a course of oral antibiotics with no definite improvement. There was a history of shortness of breath, orthopnea, cough, palpitation and lower limb edema. The neck mass lesion was exerting compressive symptoms also. Her current medications include Digoxin 0.25mg once daily (OD), Frusemide 40 mg OD, Aspirin 175 mg OD, Enalapril 10 mg, Isosorbide Dinitrate 40 mg twice daily (BD), Humulin Insulin 25U am +15 U pm and Ranitidine 300 mg OD. She has no allergies.

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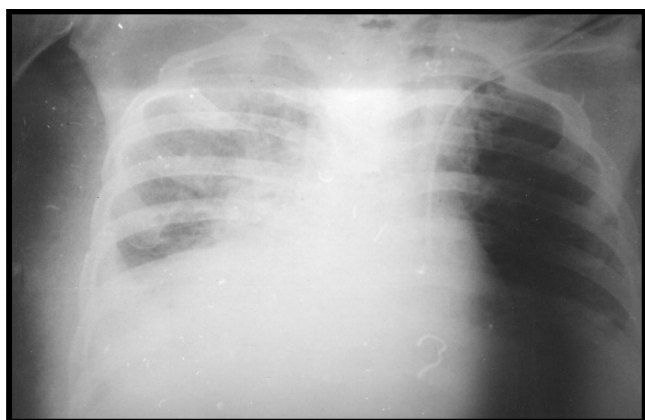


Figure 1 - Chest x-ray showing a shifted trachea to the right due to a mass in the left side of the neck with gas at the site of left thyroid lobe.

She lives with her brother in a refugee camp, separated from her husband 10 years ago, has no children and she quit smoking 5 years ago. Physical examination revealed an ill black lady who looks toxic with acidotic breathing and in pain. Blood pressure was <90 systolic, pulse >110 thready, temperature 37.9°C. There was a severely tender swelling 5x6 cm over the left side of the neck with multiple tiny lymph nodes enlargement. Jugular venous pressure was 6cm above sternum. Chest examination revealed signs of left pleural effusion and bilateral crepitations. Heart showed S3 gallop, there was moderate hepatomegaly, no ascitis and ++lower limb edema. The right big toe was amputated. Neurologically she was confused, lethargic with no lateralising signs.

Investigations. Full blood count: Neutrophilic Leukocytosis 35.5×10^9 , Packed Corpuscular Volume

(PCV) 38%, Platelets are normal, serum glucose 640 mg serum acetone positive, blood urea nitrogen (BUN) 48mg%, creatinine 2.4mg%, potassium 4.6, Sodium 133mmol/l. Thyroid function test was normal. Phosphor 6.96 sodium bicarbonate (HCO_3) 2.4 mmol/l, O_2 saturation 100%. Urine protein: creatinine ratio = 1.2. Electrocardiogram=sinus tachycardia. Echocardiogram: severe left ventricle impairment with mitral regurgitation. Chest x-ray showed a compressed, deviated trachea to the right with air shadow at the site of left thyroid lobe and left pleural effusion (**Figure 1**). The first impression was of severe diabetic ketoacidosis precipitated by acute suppurative thyroiditis. Thyroid ultrasound was unhelpful due to high gas content in the thyroid gland so a neck computerized tomography (CT) scan was performed which showed a large soft tissue mass lesion in the left side of the neck involving the left thyroid lobe with gas formation, extending to the upper mediastinum. The trachea was shifted to the right due to the mass. There was left pleural effusion. The appearances are suggestive of gas forming abscess involving the left thyroid gland. (**Figure 2a & 2b**). Pleural aspirate revealed transudate (protein=1.9 gr.) And no abnormal cells. Blood cultures grew *Escherichia coli*. Intravenous fluids, insulin, and HCO_3 infusion to correct keto-acidosis and triple antibiotics (Ceftriaxone, Metronidazole and Fluxacilline) to control infection, resuscitated the patient.

On the 2nd day the abscess extended in size to the anterior aspect of the neck causing more compressive symptoms. Fine needle thyroid aspirate was not helpful. She was operated upon under local anesthesia due to high risk surgery and left thyroid lobectomy performed, which revealed an abscess with bad smell chocolate like puss. Drainage and irrigation with Hydrogen peroxide (H_2O_2) and povidone and carrogate drain was inserted.

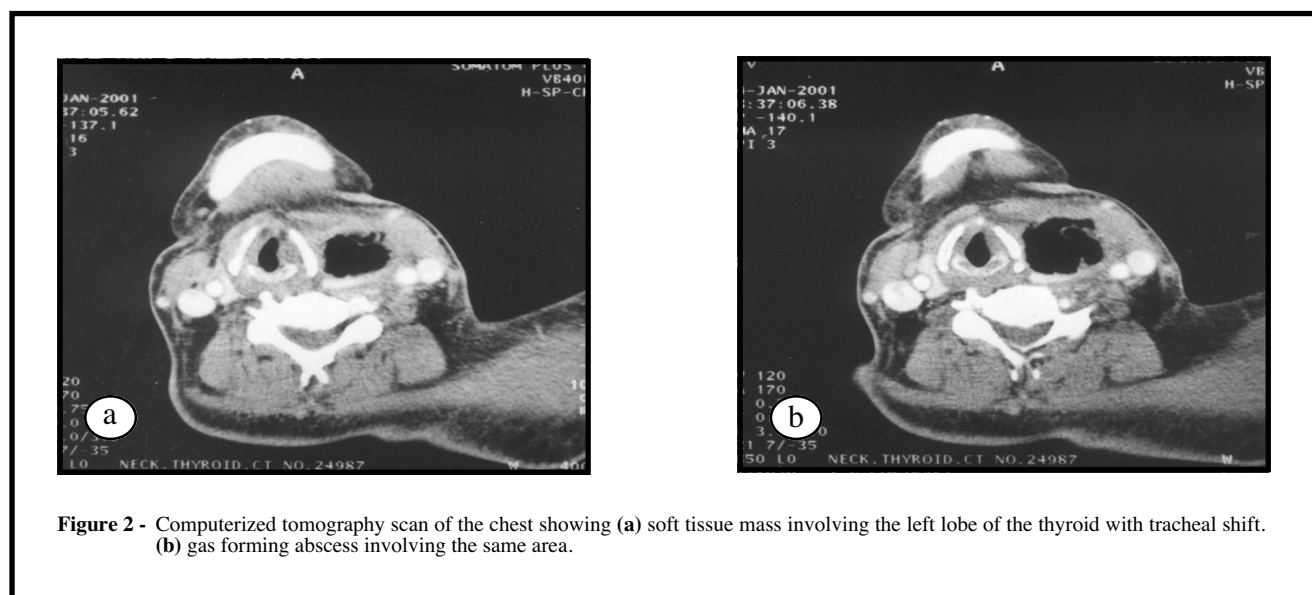


Figure 2 - Computerized tomography scan of the chest showing (a) soft tissue mass involving the left lobe of the thyroid with tracheal shift. (b) gas forming abscess involving the same area.

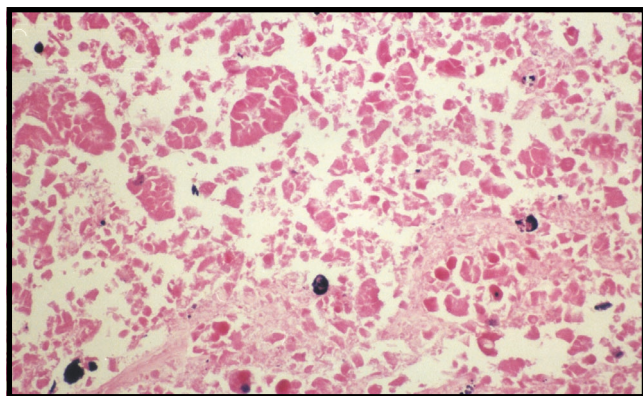


Figure 3 - Infarcted papillary carcinoma. Infarcted papillae with psammoma (Hematoxyline & Eosin stain, magnification x 100).

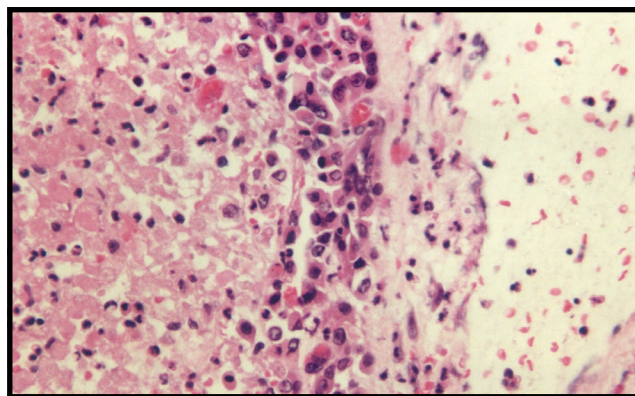


Figure 4 - Infarcted papillary carcinoma. Residual viable epithelial cells showing focal ground glass nuclear appearance and nuclear grooves. (Hematoxyline & Eosin stain, magnification x 200).

The patient had an uneventful immediate post-operative course but her condition did not improve as expected and she remained ill, confused and lethargic despite correction of acidosis, dehydration and normalization of blood glucose. On the 5th day of admission patient had a sudden cardiac arrest mostly due to acute myocardial infarction and succumbed. Family refused postmortem examination. The histological diagnosis of the excised thyroid lobe revealed an infarcted tissue in which epithelioid lined papillary forms with fibro-vascular cores, psammoma bodies and multilayered clumps of epithelial cells. Bacterial super infection and focal abscess formation were also present. The appearances are consisted with an infarcted papillary thyroid carcinoma with super-added infection (Figures 3 & 4).

Discussion. Purulent infections of the thyroid gland are rare, and may complicate an upper respiratory tract infection causing local compressive symptoms along with dysphagia, cough, stridor⁶ and accompanied by tenderness of the neck. Most patients do not show thyroid deficiencies and remain euthyroid.⁷ The early stages of acute suppurative thyroiditis may be difficult to diagnose, and may be mistaken for subacute thyroiditis into a pre-existing thyroid adenoma or cyst, rapidly growing anaplastic thyroid carcinoma, and rarely acute flare up of Hashimoto's disease.⁸ Infections are more common in diabetics than non diabetics due to impaired immunity for example impaired neutrophilic chemotaxis and phagocytosis.⁹ Microvascular complications of diabetes are a feature of uncontrolled long-standing diabetes.¹⁰ Papillary thyroid cancers constitute 81%-91% of the thyroid cancers.^{11,12} The annual incidence rate of well-differentiated thyroid cancer throughout the world ranges from 0.5-10 cases per 100,000 people. There is a 2 fold to 4 fold higher incidence of new thyroid cancer cases in women than men.¹³ We believe this case is quite unique in having a microvascular

complication involving the arteries supplying the thyroid gland and leading to infarction of a pre-existing papillary thyroid cancer. Along with infective process of the gland precipitated by poor glycemic control and the state of immune compression due to neutrophilic dysfunction of long standing diabetes. This lady had a complicated course of diabetic ketoacidosis, due to suppurative thyroiditis that histopathologically was an infarcted papillary cancer with super-added infection. A unique and rare association.

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