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Laryngeal myxedema, an uncommon complication of severe hypothyroidism: A case report

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Abstract

Laryngeal myxedema is a rare complication of severe hypothyroidism. It may be responsible for upper airway obstruction and has to be taken into account as an emergency situation. A 65 years old male presented with difficulty in breathing, hoarseness, facial and cervical edema at a Tertiary Center. Clinical suspission led to appropriate blood examinations and the diagnosis of laryngeal myxedema was made. The patient was treated with intravenous levothyroxine and hydrocortisone. Symptoms were alleviated completely and endotracheal intubation or tracheostomy were not necessary. This case indicates that early suspicion, and diagnosis of laryngeal myxedema, a lethal condition, may be challenging, and with prompt medical treatment, intubation may be prevented.

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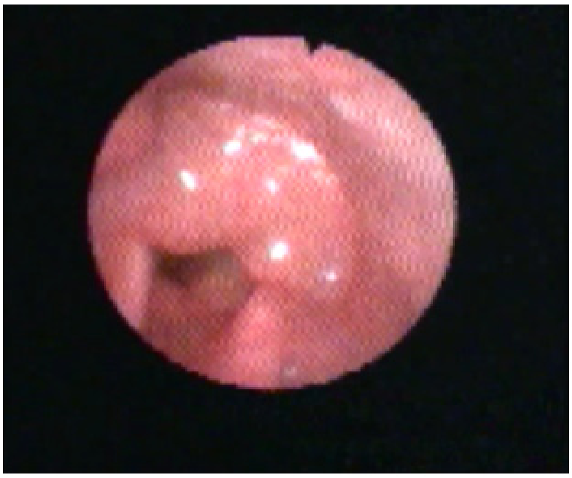
Introduction

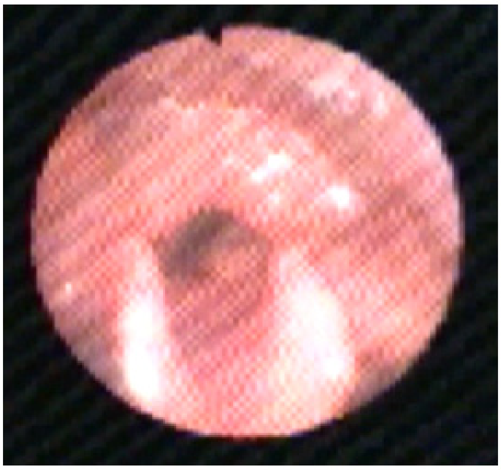
Laryngeal myxoedema is a complication of severe hypothyroidism, may imitate other crucial for patient life clinical entities and therefore high clinical suspicion is needed. In this article we are going to discuss the effects of laryngeal myxoedema to the larynx and upper respiratory tract, a condition that can cause obstructive phenomena to the airway and lethal outcomes in patient's life and highlight the need for urgent diagnosis.

Case report

A 65 years old male with history of adenocarcinoma of the right lung, first diagnosed six years earlier. The patient underwent chemotherapy (8 cycles) and radical radiation therapy. At follow up, relapse of the disease was noted with mediastinal lymph nodes block and the patient underwent a new course of radiotherapy and chemotherapy. The patient dropped out of follow up three years later. He presented again after three years, with further advance of his disease on the right lung and lesions on the left lung. He took 6 cycles of cerbotaxol and pembro and after that once monthly course of immunotherapy with carbotexim and cemcitabine.

The patient visited the Oncology Department of a Teretiary Hospital in order to receive his monthly scheduled immunotherapy. During the course of immunotherapy, he developed bilateral edema of his upper eyelids which progressively extended to the whole face. Apart from the facial edema, the patient reported hoarseness without shortness of breath or swallowing disorders. ENT evaluation was performed with flexible endoscopy, which revealed supraglottic laryngeal edema, specifically on the arytenoid folds with normal true vocal cord movement and without significant obstruction of the airway (Figures 1 and 2). Criteria of anaphylactic shock were not fulfilled and further investigation was made with blood samples; WBC 27300 K/μL, Neutrophils 97.9%, Lymphocytes 1%, CRP 0,79. Cardiologic evaluation was made with electrocardiogram and heart ultrasound which excluded heart failure, inferior vena cava syndrome and any other heart related pathology. Endocrinologic evaluation revealed severe hypothyroidism with TSH 37, 6μ UI/ml, FT3<0,95 pg/ml, FT4<0,42 ng/ml and due the clinical findings, a diagnosis of myxedema with laryngeal participation was made. The patient was admitted to the oncologic department and received intravenous levothryroxine 400 mcg in the acute face, followed by subsequent dose of 1,6 mcg/kg/d





Figures 1 and 2: ENT evaluation was performed with flexible endoscopy, which revealed supraglottic laryngeal edema, specifically on the arytenoid folds with normal true vocal cord movement and without significant obstruction of the airway.

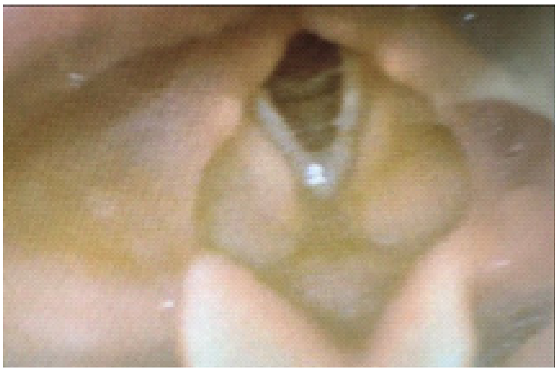


Figure 3: The second day of medical treatment laryngeal and face edema improved and on the fifth day full resolution was observed.

with a decrease of 75% of the initial dose until treatment resolution. At the same time hydrocortisone was administered with initial dose of 250 mg the first day of symptoms, followed by i.v. methylprednisolone 40 mg 3 times per day for five days. During hospitalization otorhinolaryngologic evaluation with flexible endoscopy was made on a daily basis. The second day of medical treatment laryngeal and face edema improved and on the fifth day full resolution was observed (Figure 3. The patient was discharged from the hospital with TSH 0,5 μUI/ml on the tenth day of hospitalization.

Discussion

Hypothyroidism is a common condition characterized by insufficient levels of thyroid hormones, which may potentially lead to serious health implications, and even fatal conditions such as myxedema. Its prevalence ranges between 0,2% and 5,3% in Europe and 0,3% and 3,7% in the USA [1]. Clinical manifestations of hypothyroidism may differ according to age and sex and may vary in the adult from weight gain, dry skin, fatigue, infertility, hair loss, and cold intolerance, to rarer but life-threatening conditions, which affect the respiratory system, such as laryngeal myxedema [2,3].

Hypothyroidism may affect the respiratory tract in many ways. Alveolar hypoventilation, depression in hypoxic and hypercapnic ventilator drive, respiratory muscle weakness, decrease in forced vital capacity, forced expiratory flow and carbon monoxide diffusion capacity may be observed [3-7]. The pathophysiological mechanism of laryngeal myxedema is not fully understood, but it may lead to upper airway obstruction. Histologically, it is characterized by the deposition of mucopolysaccharide in the supraglottic region and more specifically in the arytenopiglottic fold, false vocal folds, and true vocal cords leading to local edema and airway obstruction [8,9]. Thyroid Hormone receptors TR-alpha and TR-beta and TR-beta have been found within the fibrous connective tissue of the lamina propria, the laryngeal cartilage and the grandular element. This condition suggests a potential but unknown role of the thyroid hormones in the human larynx [8,9].

Laryngeal myxedema should be treated as an airway emergency. Laryngeal endoscopy is required in order to assess the upper airway and if needed to proceed to intubation or even tracheostomy in order to secure the airway. Laboratory assessement with thyroid hormone levels is essential for diagnosis of severe hypothyroidism and exclusion from differential diagnosis of other entities with similar clinical manifestation, such as anaphylactic shock, inferior vena cava syndrome etc. The administration of levothyroxin either i.v or orally is of vital capacity [3]. Intravenous levothyroxin is preferred for more rapid effect, as possible bowel edema caused by hypothyroidism may lead to increased difficulty of medication absorption [10,11]. Intravenous levothyroxin has been associated with shorter time of ventilation discontinuation [10,11]. Even though the role of steroid therapy in the treatment of laryngeal myxedema remains unclear, dexamethasone, methylprednisolone and nebulised budesonide are used to prevent further upper airway edema and in cases with intubation to prevent postextubation laryngeal edema [10].

Diagnosis of laryngeal myxedema may be challenging. High clinical suspicion along with medical history, hormonological tests and endoscopic findings may lead to early correct diagnosis. Consideration of the presence of laryngeal myxedema without an established diagnosis of hypothyroidism must be taken into account. Early medical treatment is of paramount importance in order to prevent completely airway obstruction.

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