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MON-459

Background

In recent years, incidence and prevalence of thyroid and extrathyroid lesion is increasing in the worldwide due to increase awareness of medical check-up, and widespread use of imaging techniques. A Killian Jamieson diverticulum (KJD), a rare type of hypopharyngeal pulsion diverticulum outpouching from the lateral wall of the proximal cervical esophagus, was incidentally detected and likely to be misinterpreted as a thyroid nodule while performing thyroid sonography. Clearly differentiate between those lesions is essential to avoid unnecessary invasive procedure. Here we report a typical case of bilateral Killian Jamieson diverticulum mimicking thyroid nodules.

Clinical case

A 57-year-old Taiwanese man was referred to our endocrine outpatient department for further evaluation of thyroid nodules. The lesions were discovered while sonographic examination performed in the clinic for routine medical check-up. He denied having dysphagia, epigastric pain, odynophagia, halitosis, chronic cough or acid regurgitation, body weight loss, fever and dyspnea. He had no previous systemic disease and no prior radiation therapy. He lives in Nangang District, Taipei city. His body weight was 70 kg and BMI was 25. An examination of head and neck was unremarkable. Laboratory data revealed normal thyroid function (TSH: 0.67 uIU/ml; range 0.4~4.0, free T4: 0.83 ng/dl; range 0.9~1.8 and aTPO <1.0 IU/ml; range <5). Thyroid ultrasonography demonstrated oval, hypoechoic nodule-like lesions containing bright foci with acoustic shadow in the posterior aspect of the both lobes of thyroid gland. The rest of thyroid glands were normal appearance. An esophagography was performed and showed two contrast-filling anterior outpouching lesions at both sides of the cervical esophagus, around C7 level and both lesions were showing anterior outpouching appearance, consider Killian-Jamieson diverticulum. Taken together, he was diagnosed as KJD and clinical follow-up alone is suggested.

Clinical lessons

KJD is usually incidentally detected and misdiagnosed as a thyroid nodule containing punctuate microcalcification foci as found in papillary thyroid carcinoma. To differentiate these nodules, real time sonographic examination is important. Although rare, non-thyroid lesions originating from the esophagus should be considered in the differential diagnosis of the thyroid nodules to avoid unnecessary invasive fine needle aspiration of thyroid gland.

MON-689

Diabetes mellitus---hypoglycemic response---empyema

Case report

A 65-year-old woman was admitted to our department due to high blood glucose for two days on February 29, 2016. Fasting blood glucose was 12.53mmol/L on February 28 without polydipsia, polyuria, polyphagia and weight loss.

In the past medical history, she started to cough in January 2016. On February 2, the routine blood examination showed that white blood cells and neutrophils were higher than normal. Chest X-ray was normal. Moxifloxacin was given and symptoms were relieved slightly.

On examination, the temperature was 36.9℃. Auscultation of the chest was normal. On the evening of admission, body temperature rose to 37.8 C. On March 1st, white cell, neutrophil, erythrocyte sedimentation rate and C-reactive protein were increased. FBG was 10.5mmol/L, and HbA1c was 10.5%. Chest CT was normal. Piperacillin Tazobactam Sodium and Moxifloxacin were given, and insulin was used to lower blood glucose.

On March 2, body temperature was normal. And palpitation, tremor, sweating, fatigue and cold extremities appeared several times. Blood glucose test ruled out hypoglycemia. The above symptoms appeared again at around 4 pm, more serious than before. Gas analysis at 5:12pm showed PH 7.403 and lactic acid 19.27mmol/L. At 6:00pm, blood pressure started to drop. Vasoactive drug was given. In gas analysis at 6:27pm, PH was 7.237, lactic acid 21.05mmol/L. 5% $NaHCO_3$ solution was given to buffer acidosis. Cardiac and respiratory arrested during transferring to ICU. Undergoing cardiopulmonary resuscitation, vasoactive drugs and ventilator-assisted breathing were applied. Hemodialysis was used to counteract lactate acidosis. The bedside chest radiograph showed that the transmittance of left lung was decreased. On March 3, the transmittance of left lung was lower. Doctors prescribed Tylenol and Vancomycin. On March 4, left thoracic puncture and catheterization were performed. The pus was drained out and bacterial cultures were made. Klebsiella pneumoniae was cultured. Sensitive antibiotics therapy was chosen according to pleural cultures. On March 9, left empyema was removed and pericardial fenestration was performed by thoracoscope under general anesthesia. Nutritional support had been given. The patient gradually recovered and was discharged on April 9.

Discussion

Palpitation, tremor, sweating and fatigue were the first manifestations of the condition change in this diabetic patient. The condition rapidly developed into septic shock and empyema. After active treatment, she was cured and discharged from hospital. Besides hypoglycemia, other diseases such as septic shock also may cause the symptoms of sympathetic excitation, which should be considered in order to avoid delaying the time of treatment. Furthermore, diabetic patients complicating with infection should be actively treated with effective antibiotics.

Diabetes Mellitus and Glucose Metabolism

DIABETES COMPLICATIONS II

Diabetes Mellitus—Hypoglycemic Response—Empyema

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Thyroid

THYROID CANCER CASE REPORTS II

Dramatic Clinical Response to Lenvatinib in a Pediatric Patient with Advanced Metastatic Papillary Thyroid Carcinoma

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MON-453

Introduction: Papillary thyroid cancer (PTC) is the most common thyroid tumor in childhood. Most patients are referred with locally advanced and/or distant disease at the time of diagnosis. Whenever possible, these patients should be offered total thyroidectomy and radioiodine remnant ablation; however, this approach is not always feasible, rendering these tumors unresectable. These critical cases could benefit from neoadjuvant treatment with multikinase inhibitors (MKI) so that standard treatment can be performed. Lenvatinib is an MKI recently approved in many countries throughout the world for the treatment of radioiodine refractory adult differentiated thyroid cancer. Only few pediatric cases have been reported. Case report: A 10-year-old female patient with locally advanced PTC and metastasis to the lungs, who required 3 liters of oxygen due to respiratory failure caused by bilateral miliary lung disease, mistakenly treated as tuberculosis two months previously and referred to our Hospital. A large thyroid mass adhered to deep tissues was confirmed on CT scan, showing a large heterogeneous neck mass with multiple microcalcifications associated with multiple lymph nodes. Both lungs had multiple micro-nodular disease with interstitial involvement. Total thyroidectomy together with lymph-node dissection was planned, but extensive local infiltration made the lesion unresectable and surgery was limited to a thyroid biopsy. The patient required respiratory assistance. Histopathology confirmed the presence of a PTC (diffuse sclerosing variant) with a *RET-PTC3* oncogene rearrangement. Eight days after surgery the patient was critical and we decided to indicate the compassionate use of Lenvatinib. The patient was started on oral lenvatinib at a dose of 14 mg daily (14 mg/m/day). Three days later, she clinically improved and nine days post-lenvatinib initiation, the patient was discharged from hospital without need for oxygen therapy. Lab studies showed a rise in thyroglobulin levels in the first month of treatment followed by a significant drop. All Lung Function Test parameters significantly improved. The patient initially had severe restrictive breathing and due to the resting dyspnea with hypoxemia she could not perform the walking test. Two months after treatment onset she could walk 360 meters in six minutes with 96% oxygen saturation. After 4 months on Lenvatinib, imaging studies showed a stable thyroid mass while the pulmonary nodules appeared stable to slightly smaller without evidence of new or progressive disease. Conclusion: On lenvatinib treatment, our patient showed significant clinical improvement, arrest of disease progression, and stable disease on imaging studies. This case shows that lenvatinib may be a beneficial option for children with advanced PTC not amenable to surgery/RAI treatment and may be used as a bridge to these first-line therapies.

Pediatric Endocrinology

PEDIATRIC GROWTH AND ADRENAL DISORDERS

Identifying Distinct Facial Dysmorphology in Youth with Congenital Adrenal Hyperplasia Using Deep Learning Techniques

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SAT-087

Purpose: Classical Congenital Adrenal Hyperplasia (CAH) due to 21-hydroxylase deficiency affects 1:15,000 newborns and involves adrenal insufficiency and androgen excess. These hormone abnormalities are evident as early as 7 weeks' gestation and persist throughout pregnancy. Structural brain abnormalities are also known to occur in CAH, with abnormalities of brain and facial structure occurring together in conditions such as fetal alcohol spectrum disorder and holoprosencephaly. As well, sex differences in facial morphology are well described in healthy individuals. Thus, we aimed to study facial features using artificial intelligence in CAH youth. **Methods:** We studied frontal images of the face in 57 youth with severe salt-wasting CAH (60% female; 9.4±5.5y), and 38 controls (47% female, 9.7±5.1y), acquired with an iPad v12.1. We included 32 additional controls (43% female; 4-19y) from a publicly available face image dataset (1). Applying deep learning techniques, we converted 2-D facial photos to mathematical descriptors in order to differentiate features between groups. For a given test image, our pipeline output was a predicted "CAH score" between [0,1]. Due to our small dataset, we employed K-fold cross validation to train and test our deep neural network. At each of the K-9 folds, 88% of data (468 control and 531 CAH images) were used to train the network, with the remaining data (55 control and 63 CAH images) used to test the trained network. Test results were validated in terms of area under the curve (AUC) of receiver operating characteristic curves (generated from predicted CAH scores of test subjects), to analyze true and false positive rates. Our pipeline automatically detected face-bounding boxes and 68 facial landmarks (dlib toolkit) which were then used to compute 27 Euclidean (linear) facial features (2,3). We performed between group analyses of features with t-tests. **Results:** The averaged AUC of nine folds was 0.83±0.14, representing strong predictive power as a proxy to correlating facial dysmorphology with CAH. Predicted CAH scores were different between control (0.24±0.33) and CAH (0.69±0.37; $p<0.0001$) youth. Thirteen of 27 facial features were different between controls and CAH ($p<0.05$ for all) including 3 of 6 features related to sexual dimorphism. We also produced heat (i.e., saliency) maps showing the effect of CAH on facial features, and 2D t-SNE plot visualization of features showing well-defined separation between CAH and control group clusters. **Conclusions:** Utilizing deep learning, we have shown that CAH youth have facial features that can reliably distinguish them from controls. Further study is merited in regard to the etiology of affected facial morphology in CAH, and associations with