

Periorbital Oedema Associated with Hypothyroidism – A Case Report

Abstract

Introduction: Pituitary microadenomas are said to be common, with an incidence of 27%. Hypothyroidism causing periorbital oedema (PO) remains rare in the literature, but it is still within the etiological factors. **Patient Concerns:** This study presents a 53-year-old patient who presented with PO and visited the dental clinic to exclude dental infection. **Diagnosis:** Based on the evaluation of proper haematological and radiological investigations, pituitary microadenoma was identified with an abrupt increase in the thyroid stimulating hormone (TSH) level. **Follow-up:** The patient was followed with further studies to identify the primary cause of PO. It was concluded that the disruption in the drug regimen caused an increase in the TSH and led to PO rather than microadenoma.

Keywords: Hypothyroidism, periorbital oedema, pituitary microadenoma

Introduction

Pituitary adenomas are slow-growing masses that originate from the cells in the pituitary gland. Pituitary microadenoma (PM) accounts for almost 15% of all intracranial lesions and has a predicted occurrence rate of 1.5–27%.^[1,2] Secondary hypothyroidism is caused by disorders of the hypothalamus pituitary axis, differentiated from the primary, as it leads to decreased thyroxine and thyroid-stimulating hormone (TSH) levels.^[3] The present case report is rare since periorbital oedema (PO) could be a manifestation of PM, while it is a rare manifestation of hypothyroidism. The authors reported this case to reveal another reason for PO rather than PM, trauma, and allergy.

Case History

A 53-year-old woman attended the dental clinic complaining of PO of the left eye for 2 months. An approach to the case was started through a thorough medical history. The patient reveals left PO, pain, and blurred vision in the left orbit with no previous history of trauma. All the examinations and investigations were in accordance with the ethical standards of the responsible committee on human experimentation and with the Helsinki Declaration of 1975, As revised in 2000, and after consent have been obtained from

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the patient. Ethical committee clearance reference number (Decree No. 8 on November 30, 2021).

The patients tend to be hypertensive, diabetic (insulin nondependent), and have undergone total thyroidectomy surgery 4 years before. An excisional biopsy of the thyroid gland has been carried out, and the lesion was found to be benign. The patient has a daily drug regimen of Metformin 500 mg, one tablet taken twice a day (1x2), Simvastatin 10 mg, one tablet taken once a day (1x1), Vasoxen 5 mg taken once a day (1x1), Valsartan 160 mg, taken once a day (1x1), Vitamin D 300.000 IU/mL oral ampule, taken once per 15 days, Vitamin B1, B6, B12, 3 mL taken once per month, and Levothyroxine Sodium 100 mg taken once per day (1x1), for 4 days a week, and 100 mg (1x2), for the remaining 3 days of the week.

On examination, we found a pronounced, palpable left PO, which was tender to palpation. The ophthalmologist excluded the possibility of allergy and prescribed (sodium hyaluronate 0.30% eye drops), but the condition has not been relieved. For proper diagnosis, the patient was sent imaging, which is orthopantomography (OPG), to define any dental condition triggering the oedema. Intraoral examination and OPG revealed no defect associated with PO [Figure 1].

Before magnetic resonance imaging (MRI), the patient was sent for biochemical

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investigations to assess the kidney function for excretion of the contrast medium (Cyclolux 0.5 mmol/mL) used in MRI, multi-sequence multi-planar MRI including T1, T2, and T2 fluid-attenuated inversion recovery (FLAIR), T2 fat-saturated image (T2 fat-sat), susceptibility weighted imaging (SWI), Diffusion weighted imaging (DWI), and post-contrast T with and without Fat-Sat was used to rule out the local factors [Figure 2]. After studying the MRI for a further approach to the diagnosis, the patient was sent for a “Pituitary Hormonal Assay” because it showed a high T2 signal intensity (SI) lesion with contrast defect formation in the left lobe of the pituitary gland measured $9 \times 6 \text{ mm}^2$, which tend to be “Pituitary Microadenoma”. The pituitary hormone assay showed an abrupt increase in TSH; After thorough evaluation of the patients drug histroy, a disruption of the original drug regimen was identified as the patient’s drug regimen of levothyroxine was 50 mg instead of 100 mg, which indicated a wrong drug prescription by a pharmacologist. After a month, PO was subsided [Figure 3]. On the investigation of thyroid hormones after one month, TSH showed a pronounced drop with an approximation to its normal range.

Discussion

Functional microadenoma presents earlier symptoms due to excess hormones produced, which causes hormonal imbalance, leading to clinical marks. At the same time, some remain nonfunctional and tend to remain small without causing any complications.^[1,2] Based on this study, the findings reveal that an abrupt increase in TSH level could cause PO not necessarily to be bilateral. Many ophthalmologists believe that periorbital oedema has been caused by allergic reactions, while a unilateral allergic reaction remains in question.^[1] A high failure rate has been identified in detecting microadenomas in non-contrast CT.^[3] Microadenomas visualized on MRI are seen as areas of hypointensity on contrast and non-contrast enhanced T1-weighted MRI images.^[1,3,4]

On the other hand, hypothyroidism is a condition when the thyroid gland is deficient in producing enough thyroid hormone to meet body demands.^[5] Secondary hypothyroidism is caused by disorders of the hypothalamus-pituitary axis, differentiated from the primary, as it leads to decreased thyroxine and TSH levels. A variety of clinical features characterizes each primary and secondary hypothyroidism.^[6] The most clinical features of hypothyroidism are dry skin, cold sensitivity, fatigue, muscle cramps, voice changes, and constipation.^[7] In addition, Boddu *et al.*,^[8] (2017) presented a case of hypothyroidism associated with bilateral exophthalmos when the TSH level reached a peak level of 149 $\mu\text{IU/mL}$, whereas in the present case report, the patient manifested with unilateral PO under the TSH investigation level of 53.3 $\mu\text{IU/mL}$.

Moreover, periorbital oedema is defined as swelling, which can be felt as a result of an increase in the interstitial fluid

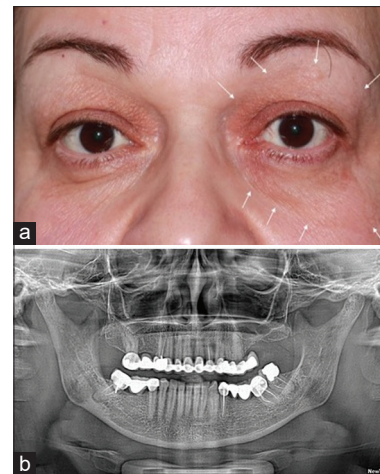


Figure 1: Pronounced palpable left periorbital oedema (arrow) and panoramic view of the upper and lower jaw revealing no defect associated with periorbital oedema

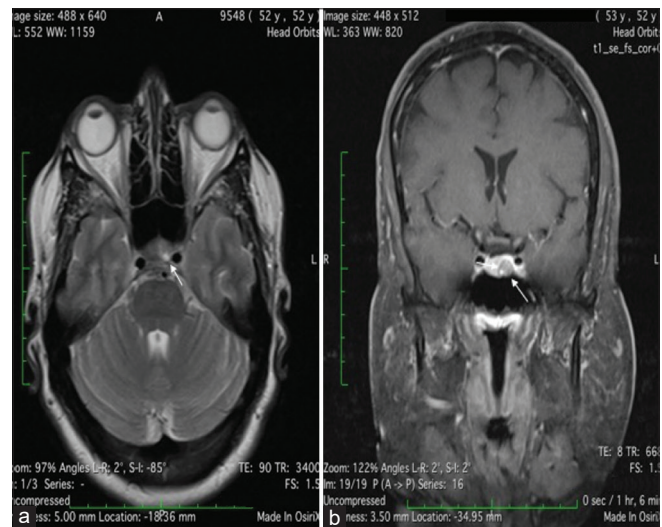


Figure 2: T2, TSE – Sag view High T2 SI lesion with contrast defect formation in the left lobe of the pituitary gland (arrow) and T1 – Post contrast fat-sat view High T2 SI lesion with contrast defect formation in the left lobe of the pituitary gland (arrow)



Figure 3: Patients follow-up after a month, periorbital oedema has subsided with the drop of TSH level

volume. Edema is caused by a change in capillary balance, which leads to a shift in the fluid from vascular space into

the interstitium. Such movement requires an alteration in components of Starling's law by either an increase in hydrostatic capillary pressure, a decrease in colloid osmotic pressure, or increased capillary permeability.^[7] Some oral infections can cause unilateral periorbital swelling, but in this case, the odontogenic infection was excluded. PM can be functional and possess indirect secondary orbital complications. The clinical presentation changes based on the enlargement of the tumour and hormonal irregularities secondary to the adenoma.^[2] The patient was diabetic and hypertensive; however, they were controlled by medications, which are metformin (500 mg 1*2) to control diabetes, vasoxen (5 mg 1*1), and valsartan (160 mg 1*1) to control hypertension.

Martin and Griffiths (2019)^[9] presented a lady with PO, thickened skin, brittle hair, and coarsened facial features with decreased tolerance to cold and a change in her voice. On proper investigation, it has been found that (TSH) has been elevated to 47.2 mIU/L while the normal ranges between (0.3–5.0 mIU/L) and T4 have been dropped down the normal range (<0.32 mIU/L). The condition has been managed with “Levothyroxine”. Similarly, the present study performed when the TSH level reached 53.3 µIU/ml has led to PO, blurred vision, and weakened hair.^[8] The condition of this study was managed successfully on the regular maintenance of a levothyroxine drug regimen in addition to the other symptoms the patient was suffering from due to hypothyroidism.

It was concluded that the disruption in the drug regimen caused the increase in the TSH and led to PO rather than microadenoma. PM tends to be nonfunctional, and it will remain under follow-up in case it enlarges and compresses the nearby structures. It is crucial to get into a detailed drug history, especially with the patients presenting a medical condition, since it is not only the trauma and allergy causing PO, additionally hormonal imbalance caused by disrupted drug regimen may also be presented as PO. A positive direct correlation was concluded between hypothyroidism and PO. Besides, the peak level of TSH was found to be caused by the unbalanced drug regimen rather than PM, which was found to be nonfunctional. The importance of the present case report was to roll out the common causative factors causing PO (trauma and allergy)

and to value drug history taking in the clinical examination, which was the leading cause of the hormonal imbalance causing PO.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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