

Case Report

The Girl with Protruded Left Eye: A Case Report

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Abstract

Unilateral proptosis means forward protrusion of one eyeball caused by various pathology. An abnormal protrusion of the eyeball, beyond the boundaries of the bony orbit, is termed 'proptosis'. A similar appearance, seen in endocrine dysfunction, especially thyroid disorders, is called 'exophthalmos'. Protrusion of eyeball is commonly seen in Graves' ophthalmopathy, also known as thyroid eye disease which is mostly bilateral. Unilateral proptosis is rare in this condition. Graves' Ophthalmopathy is an immune mediated inflammation in orbital and retroorbital tissues, occurs mainly with Thyrotoxicosis, more frequently in female. Natural history of unilateral Graves' Ophthalmopathy is unknown and the diagnosis remains challenging. In this article, a 19-year-old female presented to the outpatient department of Pabna Medical College with the complaints of protrusion of left eye and palpitation for 2 months.

Introduction

The most common extrathyroidal manifestation of Graves' disease is Thyroid Eye disease observed in 25- 50% of the Graves' patients. A total of 75% of the patients with thyrotoxicosis develop Graves' Ophthalmopathy within a year of diagnosis¹. In majority of patients, both eyes are equally affected. Unlike bilateral proptosis, which is mostly seen in thyroid disease, unilateral proptosis has a great variety of differentials including orbital pseudotumor, orbital cellulitis, cavernous sinus thrombosis, intra-orbital neoplasms, vascular lesions which may delay the appropriate diagnosis and management². Unilateral Ophthalmopathy mostly progresses to bilateral disease, while only 5- 11% of cases are pure unilateral³. This case report details an instance of unilateral Graves' Ophthalmopathy in a 19- year- old female presenting with unilateral proptosis and occasional palpitation for 2 months highlighting the clinical features, diagnostic approaches, treatment strategies. The rarity of the unilateral presentation emphasizes the importance of considering Graves'

Ophthalmopathy in the differential diagnosis of unilateral orbital processes, in patients with no history of thyroid dysfunction⁴.

Case Description

A 19-year-old female presented to the outpatient department with the complaints of protrusion of left eye and palpitation for 2 months. Bulging of her left eye was insidious in onset and was increasing gradually without visual impairment. Palpitation was occasional without any aggravating factor. She had no history of weight loss, fever, night sweat, chest pain, cough, breathlessness, menstrual irregularities. No remarkable prior medical history, family history or drug history. She was normotensive, nonsmoker, non-diabetic, non- alcoholic.

On examination, she was anxious, co-operative with body weight 54 kgs, blood pressure 110/70 mmHg, Pulse 120 b/m, respiratory rate 16 breaths/min, axillary temperature 97p F. Thyroid gland was not palpable. On ocular examination, eye movements were normal, there was retraction of left upper eyelid,

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visual acuity was 6/6 in both eyes. There was no color change of surrounding skin, lid swelling, conjunctival congestion, watering or tenderness.



Figure 1: *Protrusion of left eyeball*



Figure 2: *No thyroid gland enlargement*

Laboratory investigation revealed a hemoglobin level of 12.8 g/dL and a white blood cell count of 8600 /mm³ with 55% neutrophil. The free T3 level was 9.86 pmol/ml (reference 3.50-8.56 pmol/ml), free T4 level was 26.70 pg/ml (reference 8.9- 17.20 pg/ml), TSH was 0.005 μ IU/ml (reference 0.35-4.50 μ IU/ml), TSH receptor antibody was 7.39 IU/L (reference 0.82-40 IU/L), anti- thyroglobulin level was 1087.53 IU/ml (reference < 75 IU/ml), anti- thyroid peroxidase level was 552 IU/ml (reference < 30 IU/ml), blood glucose, liver and renal function tests were within normal limit, Sinus tachycardia on Electrocardiogram. Thyroid scan revealed normal position of the gland with diffusely increased uptake. CT scan of both eyeballs was normal. She was diagnosed as Graves' Disease with Graves' Ophthalmopathy and started Carbimazole and Beta blocker. She has been advised for regular follow up also.

Discussion

The patient presented with unilateral proptosis, palpitations without visual disturbance. This is a rare presentation of Graves' Disease.

Graves' Disease is an autoimmune disorder that is more frequent between 20 and 50 years of age and occurs in 2% of women¹. The annual incidence of Graves' Ophthalmopathy is 16 per 100,000 women. The symptoms of GO include a dry, gritty feeling in the eyes, photophobia, excessive tearing, double vision, and pressure feeling behind the eyes, as reported by nearly half of the patients of Graves' hyperthyroidism^{1,5}. The most typical symptoms of GO are proptosis, ophthalmoplegia, orbital congestion, eyelid edema, eyelid erythema, conjunctival chemosis, difficulty moving eyes, eyelid retraction, and less frequently, compression of the optic nerve. Proptosis can cause corneal exposure and injury in severe cases^{2,6}.

The most widely accepted cause of Graves' orbitopathy is the formation of autoantibodies against thyrotropin receptors located in both the thyroid gland and the orbit¹. This activates T cells, resulting in the release of inflammatory mediators. Inflammatory cells and hyaluronans infiltrate the muscle, causing enlargement of the EOMs, an increase in the orbital fat volume, and ultimately, collagen deposition leading to fibrosis. The disease often progresses via two distinct phases: an active, inflammatory phase followed by a static, non-inflammatory phase with fibrosis^{3,4,7}.

The risk factors for Thyroid eye disease as smoking, older age, extreme physical or psychological stress, prior treatment with radioactive iodine, and increased titers of antithyroid-stimulating hormone receptor antibodies are well described in published literature. However, unilateral proptosis can be attributed to several factors, such as an asymmetrical distribution of antigens, anatomical variations in blood flow or lymphatic drainage, the elasticity of orbital septa, or other localized conditions. Infections or differences in the ability to generate adipose tissue can be a potential trigger for unilateral proptosis^{4,5,8}.

This patient had positive anti thyroglobulin and anti-thyroid peroxidase antibody with a rise in free T3, T4, undetectable TSH with a negative TRAB and normal orbital CT scan, diffusely increased uptake on thyroid scan. Different studies have shown that unilateral Graves' may be present in hyperthyroid, euthyroid, TRAB negative patients^{8,9}.

Treatment strategy varies with patient's symptoms. Management of Hyperthyroidism by Carbimazole or Methimazole or Propylthiouracil, treatment of eye symptoms with pulse methylprednisolone, artificial tear supplements are primarily started. Radiotherapy, Surgery, Immune therapy are different treatment modalities according to different patient's overall condition. This patient started anti thyroid drugs only as she didn't have ocular symptoms or visual disturbance and was advised for regular follow up

Conclusion

This clinical case is a diagnostic challenge because the true unilateral disease is rare, and bilateral asymmetric eye involvement is seen in GO. Besides, patient did not have adequate symptoms. Numerous differential diagnoses should be considered and studied before diagnosing this uncommon entity. Prompt treatment, patient's education, regular follow up, ultimately a tailored approach is crucial for this.

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