International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

A Case of Graves' Orbitopathy-Euthyroid State

Steffy Francis Lonth[1], Reshma K Pillai[2], Rajitha[3]

[1]Junior Resident, Department of General Medicine, Azeezia Institute of Medical Sciences and Research, Kollam

[2]Assistant Professor, Department of General Medicine, Azeezia Institute of Medical Sciences and Research, Kollam

[3]Assistant Professor, Department of Ophthalmology, Azeezia Institute of Medical Sciences and Research, Kollam

Abstract: ***Graves' orbitopathy (Graves' eye disease or Graves' ophthalmopathy) is a constellation of signs and symptoms related to the orbit and surrounding tissues in patients with Graves' disease. It is an autoimmune process affecting retroocular tissues. It can also sporadically occur in euthyroid or hypothyroid patients due to chronic thyroiditis. In its severe form, it can be sight-threatening; thus, prompt evaluation and timely management are crucial. Here, we present a case of a 48-year-old male who presented with bilateral proptosis.***

Keywords: Graves' orbitopathy, autoimmune eye disease, proptosis, thyroid-related eye disorder

1. Case Report

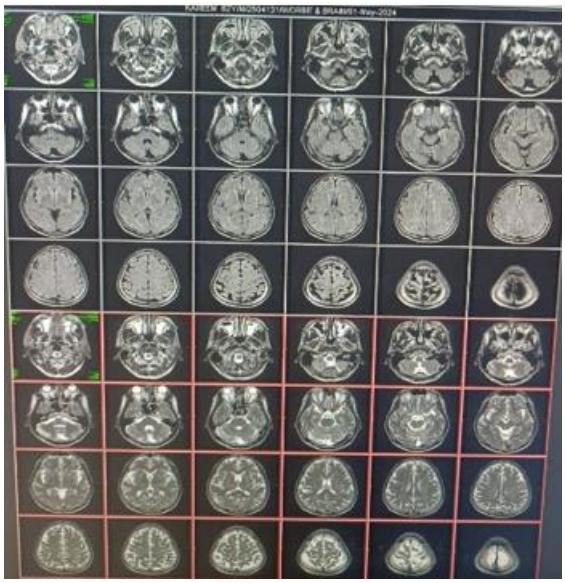
A 48-year-old male manual labourer, smoker, and with a history of alcohol consumption, with a known case of systemic hypertension for three years (on T. Amlodipine 5mg OD), presented with complaints of transient diminution of vision on bending forward, lasting for two minutes over the past 2–3 months.

The patient was conscious and oriented on examination, with no pallor, icterus, cyanosis, clubbing, lymphadenopathy, or pedal edema. His vital signs were: BP-140/90 mmHg, PR-82 bpm, RR-18/min, SpO2-99% on room air. No thyroid swelling was noted on palpation. Systemic examination was within normal limits. Exophthalmos was noted bilaterally (left eye > right eye).
Ophthalmologic evaluation revealed lid retraction in the right eye, proptosis in the left eye, restriction of elevation and abduction bilaterally (left eye > right eye), with no congestion or chemosis. Convergence insufficiency and the Kocher sign were positive in the right eye. The corneas were clear, visual acuity and color vision were normal, and pupils were brisk without relative afferent pupillary defect (RAPD). Grade I hypertensive retinopathy was noted in both eyes.

Proptometry findings: Anterior-posterior diameter: 19mm (RE), 21mm (LE), horizontal diameter: 27mm (BE) and vertical diameter: 18mm (BE). A provisional diagnosis of axial proptosis was considered, and an MRI Brain and orbit with contrast was advised.

2. Investigations

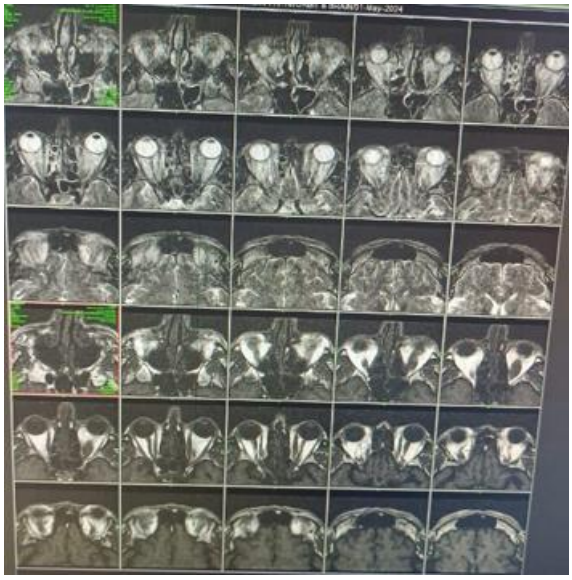
MRI Brain and Orbit:



- Minimal bilateral proptosis
- Retrocerebellar arachnoid cyst
- Marked enlargement of bilateral extraocular muscles (L > R) with sparing of tendinous insertions
- Increased intraocular and extraocular orbital fat
- No evidence of optic neuropathy

Thyroid Function Tests (TFTs):

- TSH: 1.48
- T3: 1.01
- T4: 5.36
- Free T3: 2.45
- Free T4: 1.31
- *(All within normal limits)*



- **Clinical Activity Score (CAS)**: 3/7
- **Thyroid Eye Disease Severity Assessment**: Mild category
- **Anti-TPO Antibody**: 41.7 (within normal limits)
- **TSH Receptor Antibody**: Elevated at 1.73
- **USG Neck**: TIRADS 3 nodules in the left lobe of the thyroid in the background of early thyroiditis.

Given the euthyroid state and absence of optic nerve compression, systemic steroids were not initiated following ophthalmology consultation.

Outcome and Follow-up

The patient's proptosis and conjunctival congestion have not worsened. As there was no optic nerve compression, regular thyroid function tests, and no features of hypo- or hyperthyroidism, the patient was advised to undergo regular follow-up and monitoring of thyroid function tests.

3. Discussion

Thyroid-associated orbitopathy (TAO) is an orbital autoimmune disease that typically affects individuals aged 30 to 50 years[1]. Orbital fibroblasts play a central role by differentiating into adipocytes and producing glycosaminoglycans, resulting in tissue expansion and fibrosis. The insulin-like growth factor-1 receptor (IGF-1R) has been identified as a key player in this process, interacting with the thyrotropin receptor to amplify the autoimmune response. Additionally, T helper 17 (Th17) cells contribute significantly to the pro-inflammatory environment in TAO[4]. Risk factors include female gender, genetic predisposition, and exposure to radioiodine therapy. Smoking is the most significant modifiable risk factor. Studies indicate that at diagnosis, 90% of patients with clinical orbitopathy are hyperthyroid, while 3% have Hashimoto's thyroiditis, 1% are hypothyroid, and 6% have normal thyroid function tests[1].

The key pathogenic factor is the thyroid-stimulating hormone (TSH) receptor antibody[3]. Symptoms may include periorbital swelling, redness, foreign body sensation, tearing, pain, pressure, and pain with eye movement. Visual disturbances such as diplopia, blurring, color desaturation, or vision loss may occur in severe cases[4].

Orbital imaging aids in diagnosis and disease monitoring. Thyroid function tests, including anti-thyroglobulin, anti-microsomal, and anti-TSH receptor antibodies, confirm the diagnosis.

Electrophysiological tests can detect subclinical optic neuropathy, while somatostatin-receptor scintigraphy may aid in evaluating disease activity and guiding immunomodulatory therapy decisions.

Management

The first step in treatment is regulating thyroid hormone levels. While some patients experience spontaneous remission within a year, others require treatment, which may include:

- **Topical lubricants** to prevent corneal damage
- **Corticosteroids** to reduce orbital inflammation[1]
- **Radiotherapy** in selected cases

Recent therapeutic strategies have focused on targeted biological agents:

- **Teprotumumab**: An IGF-1R antagonist that has shown efficacy in reducing proptosis and improving overall outcomes in active TAO cases[1].
- **Tocilizumab**: An interleukin-6 receptor antagonist used in refractory cases to mitigate inflammation.
- **Rituximab**: A monoclonal antibody targeting CD20-positive B cells, offering benefits in select patients with active disease.

Supportive measures include Ocular surface management, which is essential in addressing dry eye symptoms associated with thyroid-associated orbitopathy (TAO) through the use of lubricants and protective strategies. Smoking cessation is another critical aspect, as quitting smoking can significantly reduce disease severity and progression, given that smoking is a modifiable risk factor that exacerbates TAO. Additionally, psychological support plays a vital role in patient care, offering counselling and emotional support to help individuals cope with the psychosocial impact of the disease, ultimately improving their quality of life.

Mild cases often resolve with symptomatic management, such as artificial tears and smoking cessation. Severe cases are a medical emergency requiring glucocorticoids and sometimes cyclosporine. Emerging treatments include biological agents like infliximab, etanercept, and anakinra. Surgery may be considered for orbital decompression, strabismus correction, or eyelid retraction repair[3]. Advancements in surgical techniques, such as endoscopic and minimally invasive approaches, have improved both functional and aesthetic outcomes[5].

4. Conclusion

Any patient presenting with blurred vision and proptosis should be evaluated for Graves' disease with thyroid orbitopathy. In contrast, most cases occur in a hyperthyroid state, and 20% of patients present in a euthyroid state. If there is no optic nerve compression, regular follow-up and

monitoring are advised. Systemic steroids and antithyroid drugs remain the mainstay of treatment.

References

[1] Fox TJ, Anastasopoulou C. Graves Orbitopathy. [Updated 2023 Aug 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan.
[2] Takamura Y, Nakano K, Uruno T, et al. Changes in serum TSH receptor antibody (TRAb) values in patients with Graves' disease after total or subtotal thyroidectomy. Endocrine Journal. 2003;50(5):595–601. doi:10.1507/endocrj.50.595.
[3] Bhargav PR, Sabaretnam M, Kumar SC, et al. Regression of Ophthalmopathic Exophthalmos in Graves' Disease After Total Thyroidectomy: A Prospective Study. Indian J Surg. 2017;79(6):521–526. doi:10.1007/s12262-016-1516-8.
[4] Kulbay M, Tanya SM, Tuli N, Dahoud J, Dahoud A, Alsaleh F, Arthurs B, El-Hadad C. A Comprehensive Review of Thyroid Eye Disease Pathogenesis: From Immune Dysregulations to Novel Diagnostic and Therapeutic Approaches. Int J Mol Sci. 2024 Oct 29;25(21):11628. doi: 10.3390/ijms252111628. PMID: 39519180; PMCID: PMC11546489.
[5] Recent advances in thyroid orbitopathy treatment: A narrative review by Ankita Jaiswal, IJCEO.