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Case Report

Thyroid ophthalmopathy in an adolescent girl: a case report

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ABSTRACT

A 14 year old girl presented with protrusion of both the eyes for duration of 3 months and pain, redness and watering of right eye for 20 days. On examination, she was thin built, poorly nourished and the thyroid gland was found to be enlarged. Both eyes were proptosed and there was incapability of complete closure of the eyelids on both sides. On right eye, conjunctiva was congested and there was a corneal lesion seen inferomedially with an epithelial defect. CT scan of the orbit revealed picture of thyroid ophthalmopathy. Thyroid profile revealed picture suggestive of hyperthyroidism and anti-thyroid peroxidase antibody was found to be very high. She was diagnosed as a case of thyroid ophthalmopathy both eyes with exposure keratitis right eye. She was treated with anti-thyroid medication along with conservative treatment for ocular symptoms and lateral tarsorrhaphy of right eye for exposure keratopathy. Pulse steroid therapy was started and subsequent follow up showed resolution of the signs.

Keywords: Thyroid ophthalmopathy, Proptosis, Adolescent age group, Antithyroid peroxidase antibody

INTRODUCTION

Thyroid ophthalmopathy, also known as Graves ophthalmopathy, is a part of autoimmune process that can affect the orbital and periorbital tissue, the thyroid gland, and rarely the pretibial skin or digit.[1-3] Antibodies stimulating the TSH receptor are thought to be involved in the pathogenesis of this disease and disabling extra-thyroidal manifestations of Graves' disease. Thyroid ophthalmopathy is generally associated with Graves' disease, which is the most common cause of hyperthyroidism.[4] It can also be associated with hypothyroidism and euthyroidism. The antigen present in the muscle wall and orbital fat is the triggering factor for the immune mediated mechanism. The most significant pathological findings in thyroid ophthalmopathy include glycosaminoglycan deposition, fibrosis affecting the extraocular muscles and adipogenesis in the orbit.[5] Cigarette smoking is a risk factor for development of thyroid associated orbitopathy.[6] The ocular manifestations of thyroid associated orbitopathy include eyelid retaction, proptosis, chemosis, periorbital oedema and altered ocular motility with significant functional and cosmetic consequences. To date there is no effective means of preventing the disease or altering its course. Current therapeutic options include corticosteroids, external beam radiation and steroid sparing immunosuppressive agents for reducing the inflammation during active disease and surgery for correcting the residual abnormalities secondary to fibrosis. It is most commonly seen between 4th and 5th decade. In children and teens, Graves ophthalmopathy is less common than adults.[7] In children Graves ophthalmopathy usually has milder clinical presentation and severe orbitopathy is very uncommon. Sight threatening corneal ulceration or compressive optic neuropathy are less frequent or absent in children.[8]

Thyroid ophthalmopathy with prominent proptosis of both eyes with exposure keratopathy in a 14 year old girl must be considered as an uncommon occurrence.

CASE REPORT

A 14 year old girl presented with protrusion of both eyes for duration of 3 months and pain, redness and watering

of right eye for 20 days. On examination, she was thin built, poorly nourished and the thyroid gland was found to be enlarged (Figure 1). Visual acuity on right eye was CF at <1m with retraction of both upper and lower lids (Dalrymple's sign). The right eye is proptosed, palpebral fissure was widened vertically (18mm) with incapability of closing the eyelids completely. Conjunctiva was congested and there was a corneal lesion seen inferomedially with epithelial defect (Figure 2). Pupillary reaction was normal and there was no restriction of ocular motility. On examination of left eye, visual acuity was 6/9 with retraction of both upper and lower lids. Palpebral fissure is widened vertically (16mm) with incapability of complete eyelid closure. The left eye was proptosed eccentrically with slight lateral deviation of 10 prism dioptre with no restriction of ocular motility. All other examinations including fundus examination were within normal limit. Proptosis was measured with Leudde's exophthalmometer and it was 26mm on right eye and 24mm on left eye (moderate proptosis) (Figure 3). Upper lid lag on infraduction (Von Graefes sign) (Figure 4), lower lid lag on up gaze (Griffith sign) (Figure 5), absent creases on forehead on superior gaze (Joffroy's sign) (Figure 6), deficient convergence (Mobius sign) (Figure 7), incomplete and infrequent blinking (Stellwag's sign) were also present in this patient.

Figure 1: Patient at initial presentation with enlargement of the thyroid gland.

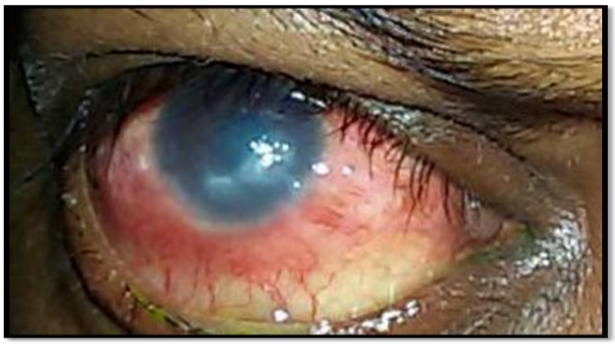

Figure 2: Conjunctival and cilliary congestion with a corneal lesion inferomedially on right eye.

The routine examination of blood including ESR was within normal range. Thyroid profile revealed hyperthyroidism with high T3-2.50 (0.7-2.2ng/ml), T4-200 (55-135ng/ml) and low TSH-<0.05 (0.5-4.5microIU/ml) level. Anti-thyroid peroxidase antibody was very high-577.3 (<8.0IU/ml). CT scan orbit demonstrated enlargement of bellies of multiple muscles with fat stranding in the intraconal space (Figure 8) which was suggestive of thyroid ophthalmopathy.

Figure 3: Measurement of proptosis with Leudde's exophthalmometer.

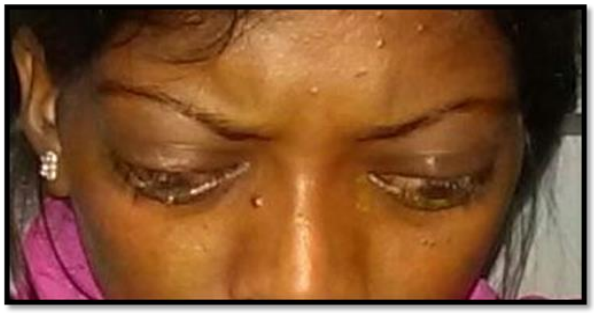

Figure 4: Von Graefes sign.

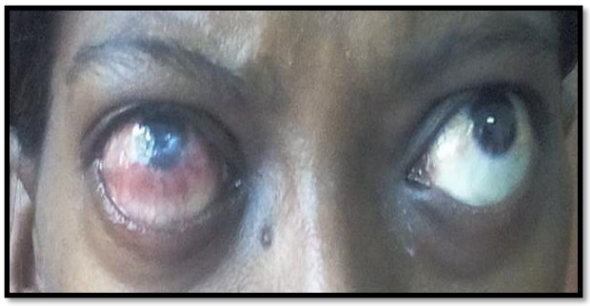

Figure 5: Griffith sign.

Figure 6: Joffroys sign.

Figure 7: Mobius sign.

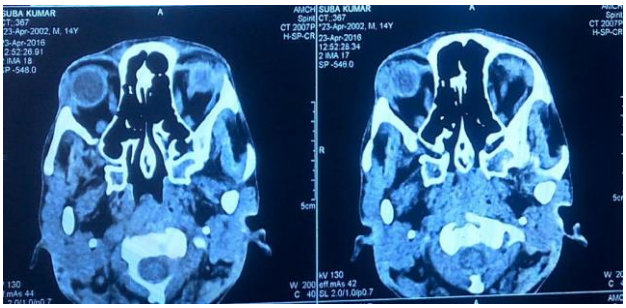

Figure 8: CT scan showing enlargement of inferior oblique and medial rectus muscle bellies bilaterally with fat stranding in the intraconal space.

It was diagnosed as a case of thyroid ophthalmopathy both eyes with exposure keratitis right eye.

After consultation with the Department of Endocrinology, treatment was started with carbimazole 10mg tablets twice daily and propanolol 10mg tablets twice daily. Local treatment was given with lubricating drops and gel on both eyes and lateral tarsorrhaphy was done on right eye for exposure keratitis. IV methyl prednisolone was not started immediately because of presence of active corneal lesion on right eye. Patient was reviewed after two weeks (Figure 9). Exposure keratitis was healed and IV methyl prednisolone pulse therapy was started. Thyroid profile was repeated after 1 month. T3 was 1.02 (0.7-2.2ng/ml), T4 38 (55-135ng/ml) and TSH<0.05 (0.5-4.5microIU/ml) and anti-thyroid medication dose was adjusted accordingly.

Figure 10: Review after 2 weeks of lateral tarsorrhaphy.

DISCUSSION

Thyroid ophthalmopathy is an autoimmune disorder of the orbit associated with thyroid disease. The prevalence as reported by several studies in different countries including India is 0.1-0.3%.[9]

Imaging studies have a pivotal role in diagnosis and management of this disease. CT scan is an excellent imaging modality for diagnosis of thyroid ophthalmopathy. It helps in visualization of extraocular muscles and bony anatomy of the orbit. Ultrasonography is also a convenient examination for diagnosis and to assess the progression or stability of ophthalmopathy. MRI provides excellent imaging of the orbital content.[10]

Thyroid ophthalmopathy is most commonly presents during the fourth and fifth decades of life and females are four times more likely to develop the disease than males.[11] It is rare in paediatric age group, occurring in 0.1 per 100000 pre puberscent and 3 per 100000 post puberscent children.[12] Thyroid ophthalmopathy tends to run in families. The genetics of Graves's disease is complex with some genes conferring susceptibility and other protection. It is more likely a polygenic disease occurring as a result of the interaction of genetic and environmental factors.[13] The ophthalmopathy is characterised by swelling of the extra ocular muscle bellies. There occurs due to deposition of glycosaminoglycan and lymphocytes infiltration in orbital and retro orbital tissues, ultimately leading to lid signs, proptosis and other involvement like optic neuropathy.[6] It has a milder clinical presentation in children and severe orbitopathy is very uncommon. Durairaj VD et al in a study, taking 35 children with Graves' Ophthalmopathy found that clinical manifestations are relatively less severe in paediatric patients. The mean age at diagnosis of thyroid dysfunction was 13.1 years and the mean age of diagnosing ophthalmopathy was 15.0 years.[14] Another study conducted by W Chan, GWK Wong et al taking 83 patients of Graves' disease aged 16 years or below found that ocular signs of ophthalmopathy were present in 62.7% patients. Most of them presented with eyelid abnormalities such as lid oedema, lid lag and lagophthalmos, where lower lid retraction was the commonest clinical sign (38.6%). Of them, 12% had mild proptosis of less than 3mm. They concluded that although 62.7% were identified with positive ocular changes, none of them had visual threatening complications or debilitating myopathy.[8]

Children with Graves' disease have mild ocular signs and limited to the eye lids. Prominent proptosis is uncommon and corneal exposure and restrictive myopathy are seen only in some children.[15]

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