Asymmetric graves ophthalmopathy as a sole manifestation of autoimmune hypothyroidism

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SUMMARY

Graves ophthalmopathy (GO) is commonly associated with hyperthyroidism, however its coexistence with hypothyroidism is seen uncommonly in 5% of cases. The ophthalmic signs in GO are usually bilaterally symmetrical, however in 10–15% of cases patients may present asymmetrically. The ophthalmic signs in GO are commonly seen with other systemic features of thyroid disease, however when a patient present with asymmetric ophthalmic signs in the absence of other thyroid manifestations, it is difficult to consider the possibility of thyroid disorder, which may result in delayed diagnosis and further progression of disease. Here, we report a case of 22-year-old man who presented with progressive painless bulging of right eye without other features of thyroid disease which on workup was diagnosed as a case of autoimmune hypothyroidism.

BACKGROUND

Graves ophthalmopathy (GO) is a chronic autoimmune inflammatory disorder affecting the retrobulbar tissue resulting from thyroid dysfunction. GO is mostly associated with hyperthyroidism in 90% of patients; however it may coexist with euthyroid and hypothyroid conditions in 6% and 5% of cases, respectively.^{1 2} Asymmetric ophthalmic signs are seen uncommonly in 10–15% of cases of GO.³ Ophthalmic signs are commonly seen concurrently or follow the other systemic manifestations of thyroid disease, however in 20% of cases it can precede other clinical presentation of thyroid disease.⁴ We present here a 22-year-old man who presented to us with painless progressive bulging of right eye for 6 months without other features of thyroid disease, which later on was diagnosed as a case of autoimmune hypothyroidism. This case is important because it is easy to diagnose GO when a patient presents with symptoms of thyroid dysfunction with bilateral ophthalmic involvement. However, when a patient presents with unilateral bulging of eye with no features of thyroid disease, it is difficult to consider thyroid disorder as differential diagnosis. GO is difficult to treat, however early recognition and treatment is important to prevent further progression of disease as seen in our case.

CASE PRESENTATION

A 22-year-old man of average built, non-smoker presented with progressive painless bulging of right eye for 6 months. The patient did not have complaints of headache, retro-orbital pressure, photophobia, tearing, diplopia or visual blurring and any symptom suggestive of thyroid disease. Family

history was insignificant. There was no history suggestive of diabetes mellitus or trauma in the recent past. The patient never had any symptoms suggestive of hyperthyroidism nor was ever treated for the same. Detailed clinical examinations did not reveal any abnormality except for proptosis of right eye (figure 1). Ophthalmological examination showed visual acuity of 6/6 in both eyes, lid retraction of 3 mm (Dalrymple's sign) and lid lag in right eye. The pupils were bilaterally equal and normally reactive. A non-pulsatile exophthalmos was documented by Hertel exophthalmometer in right eye. Eye movements were full in all gazes in both eyes. Fundus examination was normal bilaterally. Clinical activity score (CAS) was 0 and a NOSPECS of class 3 was observed.

INVESTIGATIONS

Routine investigations revealed normal haemogram, blood sugar, blood urea nitrogen and liver function test. Assessment of thyroid function revealed T3–45.7 ng/dl (normal 77–135 ng/dl), T4–2.2 µg/dl (normal 5.4–11.7 µg/dl) and thyroid stimulating hormone (TSH) 190.7 µIU/ml (normal 0.34–4.25 µIU/ml). Thyroid peroxidase antibodies were >1300 U/ml (normal <60 U/ml) whereas TSH-receptor antibodies were normal (<5 U/l). Contrast CT of orbit showed streaking of orbital fat surrounding bilateral inferior rectus muscle which was more marked on right side (figure 2). MRI of orbits revealed hyperintense signal in bilateral inferior rectus muscle and surrounding fat (right more than left) as shown in figure 3A,B

Figure 1 Proptosis of right eye with no obvious thyroid swelling in the patient.

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Figure 2 Contrast CT of orbit (coronal view) showing streaking of orbital fat surrounding bilateral inferior rectus muscle, more marked on the right side.

DIFFERENTIAL DIAGNOSIS

- ▶ Orbital tumours
- ▶ Dermoid and epidermoid cysts
- ▶ Orbital pseudotumour
- ▶ Carotid cavernous fistula

TREATMENT

The patient was prescribed levothyroxine 100 µg/day.

OUTCOME AND FOLLOW-UP

The patient achieved euthyroid status after 6 months of treatment with levothyroxine. For the follow-up of 1 year, patient's exophthalmos remained stable.

DISCUSSION

Diagnostic criteria for GO include eyelid retraction with retraction of the upper lid at or above the superior corneoscleral limbus, exophthalmos with an exophthalmometer measurement greater than 20 mm or optic nerve dysfunction or extraocular muscle involvement in the form of restrictive myopathy.⁵ Muscle enlargement on imaging studies such as CT or MRI confirms the diagnosis in a questionable case. NO SPECS classification is commonly used for assessment of disease severity.

Our patient fulfilled the above mentioned criteria of exophthalmos clinically documented by the exophthalmometer which

was further confirmed on radioimaging of orbit. Thyroid function tests revealed decreased level of T3, T4 and elevated level of TSH with high titres of thyroid peroxidase antibodies and normal TSH-receptor antibodies suggesting autoimmune hypothyroidism.

Diagnosis of GO is easy to make when a patient presents with symptoms of thyroid dysfunction with both eye involvement. However, when a patient presents with unilateral bulging of eye without features of thyroid disease, it is difficult to consider the possibility of thyroid dysfunction. In such a condition, other local causes like space occupying lesions of orbit should be ruled out clinically as well along with radioimaging of orbit. MRI is a very sensitive modality as it has shown extraocular muscle enlargement in 71% of patients without overt finding on physical examination.⁶ In our case, MRI of orbit also revealed bilateral inflammation of inferior rectus muscle though clinically the patient presented with bulging of only right eye.

The treatment of GO includes ophthalmological and endocrinal therapies. Since our patient did not have any other local eye symptoms except for proptosis, hence he was treated only for hypothyroidism to which he responded well.

Learning points

- ▶ Graves ophthalmopathy (GO) may be seen uncommonly in hypothyroidism.
- ▶ GO usually has a bilateral symmetrical presentation; however a few cases may present asymmetrically.
- ▶ Early recognition and treatment is important to prevent further progression of disease.
- ▶ Thyroid-related ophthalmopathy must be considered in the differential diagnosis for any case of asymmetric exophthalmos even when a patient does not have clinical features of thyroid disease.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

Figure 3 (A) MRI of left orbit (sagittal T2 fat suppressed image) showing hyperintense signal in inferior rectus and surrounding fat. (B) MRI of right orbit (sagittal T2 fat suppressed image) showing hyperintense signal in inferior rectus and surrounding fat.

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