CASE REPORT

A difficult diagnosis: severe Graves' ophthalmopathy

Ivan Yeu Ming Yip,¹ Fizza Mushtaq,² Tristan Reuser²

¹Department of Ophthalmology, Heart of England NHS Trust, Birmingham, UK
²Heart of England NHS Trust, Birmingham, UK

Correspondence to

Dr Ivan Yeu Ming Yip,
 ivanyip@gmail.com

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SUMMARY

An 81-year-old woman with atrial fibrillation, on warfarin, with known hyperthyroidism, was admitted to hospital following a fall with proptosis and severely restricted movements in her left eye. Medics initially thought the presentation was related to an intracranial pathology but through subsequent tests and examination, ophthalmologists diagnosed a severe case of thyroid eye disease with intense inflammation. The patient responded well to systemic steroid treatment. This case report highlights a severe rapidly progressing case of thyroid eye disease with diagnostic difficulties arising from multiple comorbidities in an elderly patient.

BACKGROUND

Thyroid eye disease affects 50% of patients with Graves' disease. Patient's with hyperthyroidism are under the care of physicians and are referred to ophthalmologists if they develop ocular manifestations. Thyroid eye disease is usually mild, however, rarely, between 3 and 5% of cases are severe with corneal ulceration, intense pain and optic nerve compression, requiring urgent ophthalmology input.

Thyroid eye disease can present in a multitude of ways. In this case, despite the patient being hyperthyroid, medics did not place much emphasis on a possible diagnosis of thyroid eye disease on initial presentation due to a lack of recognition that thyroid eye disease can present asymmetrically. The patient also developed intense inflammation in her anterior chamber during her inpatient stay, which is atypical of thyroid eye disease.

By writing up this case we hope to highlight how thyroid eye disease can present and the severity of symptoms that can occur.

CASE PRESENTATION

An 81-year-old woman presented to her general practitioner (GP) with 1-week history of a gritty red sore right eye (RE). Her GP noticed that the patient's left eye (LE) was proptosed and that she had generalised restriction in her eye movements (figure 1); the GP could not explain the findings.

History revealed that the patient had experienced a recent fall and was taking warfarin for atrial fibrillation; she had also undergone an embolectomy procedure in her left brachial artery 3 months previously. She was referred to A&E immediately for a CT of the head to rule out a subdural bleed.

Of note, the patient had been feeling generally unwell for the previous 6 months and was under the care of a consultant endocrinologist, who found the patient to have Graves' hyperthyroidism with the following blood results. Her serum thyroid-

stimulating hormone (TSH) receptor-stimulating antibody level was 12 IU/mL (normal range=0–6), fT4=24.3 pmol/L (normal range=9.0–19.0), fT3=12.5 pmol/L (normal range=2.6–5.7) and TSH<0.01 mU/L (normal range=0.40–4.90) 1 month previously. There had been some difficulty titrating her dose of carbimazole and the most recent advice from the consultant endocrinologist was to increase it to 20 mg once a day.

International normalised ratio was 2.4 and routine bloods were normal on admission. The medical team was aware that the patient had thyrotoxicosis but stated it was not a typical presentation of Graves' as it was unilateral. A CT scan was performed looking only for an intracranial haematoma, and came back negative for any abnormality.

The patient was seen as an urgent case by the ophthalmology team. Examination showed a visual acuity of 6/9 in RE and 6/18 in LE with pinhole, conjunctival injection and chemosis, and punctate epithelial erosions in both corneas. Exophthalmometry showed proptosis of 3 mm of the LE and lagophthalmos. There was no relative afferent pupillary defect, and fundal and disc examinations were normal. On Ishihara testing, the patient scored 10/15 and 13/15 in LE and RE, respectively, which was put down to poor concentration rather than true optic neuropathy. There was severe limitation of left ocular movements in all directions but no associated diplopia.

At this point the diagnosis was active and severe thyroid eye disease and the patient was started on ocular lubricants. She was kept in hospital as it was deemed she would not be able to look after herself or her husband at home.

There was rapid progression of her ocular symptoms over the next 2 days. She developed bilateral hypopyon and lower corneal oedema with associated anterior chamber inflammation with cells 2+. Visual acuity now dropped to 6/38 in LE and 6/75 in RE, both with pinhole. At this point, a

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Figure 1 Left eye proptosis.

Figure 2 (A) MRI showing rectus muscle involvement and (B) T1-weighted MRI image showing enlarged recti muscles bilaterally.

possible diagnosis of intraocular inflammatory disease was considered as thyroid eye disease does not usually affect the eyes in such a rapid and dramatic way. The patient was started on gentamicin, ofloxacin, steroid eye drops and intravenous methylprednisolone 50 mg.

A CT of the head was repeated showing no change and no orbital abnormalities. CT of the abdomen–thorax looking for malignancy was normal. An MRI of the head was performed showing oedematous intraocular muscles, medial rectus in both eyes and superior and inferior rectus in LE and RE, respectively (figure 2A, B). A host of inflammatory blood tests were sent. Antinuclear antibodies, antineutrophil cytoplasmic antibodies, erythrocyte sedimentation rate, complement, rheumatoid factor, autoantibodies all came back normal. A syphilis screen and lymphocyte testing came back negative as well.

OUTCOME AND FOLLOW-UP

The patient was kept on intravenous steroids for a further 3 days, which were tapered down to oral prednisolone. Ofloxacin and gentamicin eye drops were stopped at this point as the hypopyon had resolved. The patient was kept on the same treatment for 2 weeks and her corneal changes improved. Her vision on discharge was 6/9.5 in LE and 6/19 in RE and proptosis reduced (figure 3). She was to continue steroids for another 2 weeks and was subsequently discharged from ophthalmology clinic.

DISCUSSION

This was an unusual case of inflammatory eye disease and we feel it was likely a case of thyroid eye disease. Its speed and severity of progression were, however, atypical. Roughly 50% of patients with Graves' disease develop thyroid eye disease, of these, only 3–5% develop severe disease consisting of intense pain, intraocular inflammation and sight threatening corneal ulceration,¹ as was the case here.

There were a number of coincidental factors making diagnosis in this case difficult, such as the presenting fall, medical clinicians unfamiliar with asymmetrical thyroid eye disease, lack of

diplopia and the patient and her relative not noticing quite marked proptosis.

Graves' disease has an annual incidence rate of 16 women per 100 000 population.² Unilateral thyroid eye disease occurs in 14% of cases but orbital imaging usually confirms the presence of asymmetrical bilateral disease,³ as was the case here.

Graves' disease results from TSH receptor-stimulating antibodies activating the TSH receptor on the thyroid gland causing excessive thyroid hormone production.⁴ Current evidence suggests that orbital fibroblasts are dysregulated through an autoimmune mechanism leading to an increased secretion of hyaluronan, causing enlargement of muscle and expansion of orbital fat.⁵

With severe thyroid eye disease steroids, radiotherapy and, eventually, surgical decompression may be needed. Control of thyroid hormone levels is desired but can be difficult and can exacerbate eye disease possibly through the release of autoantibodies if the thyroid is treated with radioactive ablation. Further

Figure 3 Reduction of proptosis.

surgery to deal with diplopia and lid retraction may be indicated. Owing to difficulties in managing patients with Graves' hyperthyroidism and Graves' ophthalmopathy, it has been suggested that patients may benefit from shared endocrine and ophthalmology clinics.⁶

Learning points

- ▶ Training regarding thyroid eye disease should include the fact that it can present asymmetrically.
- ▶ On rare occasions, thyroid eye disease can present with severe symptoms needing urgent referral to ophthalmologists for immediate treatment.
- ▶ There may be a role for endocrine and ophthalmology shared clinics for thyroid eye disease.

Competing interests None.

Patient consent Obtained.

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REFERENCES

- 1 Wiersinga WM, Bartalena L. Epidemiology and prevention of Graves' ophthalmopathy. *Thyroid* 2002;12:855–60.
- 2 Bartley GB. The epidemiologic characteristics and clinical course of ophthalmopathy associated with autoimmune thyroid disease in Olmsted County, Minnesota. *Trans Am Ophthalmol Soc* 1994;92:477–588.
- 3 Wiersinga WM, Smit T, van der Gaag R, *et al.* Clinical presentation of Graves' ophthalmopathy. *Ophthalmic Res* 1989;21:73–82.
- 4 Rapoport B, McLachlan SM. The thyrotropin receptor in Graves' disease. *Thyroid* 2007;17:911–22.
- 5 Prabhakar BS, Bahn RS, Smith TJ. Current perspective on the pathogenesis of Graves' disease and ophthalmopathy. *Endocr Rev* 2003;24:802–35.
- 6 Soeters MR, van Zeijl CJ, Boelen A, *et al.* Optimal management of Graves orbitopathy: a multidisciplinary approach. *Neth J Med* 2011;69:302–8.

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