Thyroid eye disease associated with athyria

EDITOR,—The pathogenesis of thyroid eye disease is believed to derive from fibroblast stimulation by cytokines released by activated T lymphocytes. There is evidence of abnormal cell mediated autoimmune and humoral autoimmune resulting in infiltration of lymphocytes and adipocytes into the extracellular muscles. The success of therapeutic immunosuppressants (steroids/azathioprine/radiotherapy) strengthens this hypothesis. A single definitive cross reacting (thyroid/retro-orbital) autoantibody has not been identified. Zhang et al found that sera from 50% of patients with thyroid eye disease reacted with an eye muscle specific protein of 55 kDa relative molecular weight. Pittsburgh data showed 67% patients with active Graves’ ophthalmopathy have antibodies against a 67 kDa mitochondrial flavoprotein subunit although it has been subsequently found in 20% of controls. They also identified a 220 kDa cell membrane specific protein known as G2S specific to eye muscle and thyroid tissue, but antibodies to this have been demonstrated in both thyroid eye disease patients and normal people. No autoantibody has been demonstrated in every case and all lack specificity. Our case demonstrates that whatever the autoimmune process may be, the presence of normal thyroid tissue or autoimmune disease afflicted thyroid is not essential at the time of onset and development of clinical disease.

CASE REPORT
At age 30, this woman underwent partial thyroidectomy for papillary thyroid cancer. At 36 years she underwent radioactive ablation (2.2 GBq iodine-131) of the residuum for suspected recurrence. At this time there was no evidence of orbital disease. At 70 years, she presented with 6 months’ diplopia and “puffy, gritty” eyes. She was clinically euthyroid on thyroidxine, with bilateral proptosis (worse on the left) with conjunctival congestion, periorbital oedema, a divergent strabismus (Fig 1) and limitation of upward gaze. A clinical diagnosis of thyroid eye disease was made, which was confirmed by orbital computed tomography (Fig 2).

Both her sister and paternal grandmother had goitres without thyroid eye disease. Her sister had thyroid microsomal antibodies.

INVESTIGATIONS
Normal triiodothyronine 1.44 nmol/l (range 1.2–2.2), mildly elevated thyroxine (174 nmol/l, normal range 58–140) in an attempt to suppress the thyroid stimulating hormone (0.9 mU/l, normal range 0.3–4.0). A technetium-99 uptake scan showed no thyroid remnant. An iodine-123 tracer scan showed borderline evidence of uptake in the thyroid bed but avid uptake in the lower thoracic spine suggesting residual thyroid cancer with vertebral metastasis. Her serum thyroglobulin was elevated at 28 ng/ml (normal range <1 in athyria) but there were no antithyroglobulin antibodies. Thyroid stimulating hormone antibodies were negative, as were her thyroglobulin antibodies and thyroid microsomal antibodies. All human and porcine retrobulbar autoantigen were negative including the aforementioned 55, 67, and 220 kDa protein antibodies despite the presence of metastatic thyroid tissue. Her general autoantibody profile was negative for antinuclear antibodies, gastric parietal cell, smooth muscle, liver/ kidney microsomal, mitochondrial and reticulin. The RA latex was weakly positive and the Rose-Waaler was <1:32.

Her thyroid eye disease was treated with radiotherapy to good effect. Her asymptomatic metastatic thyroid cancer is being treated with radioiodine.

COMMENT
This woman, with a family history of thyroid disease and whose sister has thyroid autoantibodies, has developed thyroid eye disease while possessing no significant normal thyroid tissue for 36 years. She was negative for the full array of routine and experimental thyroid autoantibodies and no other autoimmune disease were demonstrable.

If a humoral mechanism is relevant, than there are several possible explanations; firstly the autoantibody could be related to the sodium-iodine symporter in the thyroid cancer cells. That the recurrent thyroid cancer took up iodine may suggest the sodium-iodine symporter protein was present. An antibody to this protein may be a candidate for the cross reaction autoantibody but is not measured. Against this hypothesis is the fact that her sera did not cross react with porcine and human thyroid tissue screening test. Secondly, this observation could be explained by a separate or non-specific, non-thyroid specific immune response cross reacting with the orbital muscles to instigate the pathogenic process. More than one autoantibody may be able to produce thyroid eye disease or this may be part of a multifactorial immune process. Further, it is known that the severity of thyroid eye disease is not related to autoimmune titres but rather to environmental factors such as smoking and iatrogenic factors such as radioiodine treatment of thyrotoxicosis.

While we accept that much current interest in the pathogenesis of this disease is not with humoral mechanisms, but with a T cell mediated cellular immune response, it is equally pertinent that any such event was initiated and progressed in a patient with athyria.

Correspondence in this case are relevant to the understanding of the aetiology of thyroid eye disease in so far as the disease occurred in the presence of differentiated thyroid cancer but in the absence of any normal thyroid tissue or thyroid currently active autoimmune disease (and absence of any detectable amounts of the panoply of currently measurable serum autoantibodies)—this dissociation has not hitherto been recognised.

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Leber’s hereditary optic neuropathy and maturity onset diabetes mellitus: is there a metabolic association?

EDITOR.—Leber’s hereditary optic neuropathy (LHON) is a maternally inherited mitochondrial disease that results in bilateral visual loss. It primarily affects young men. The typical optic nerve head appearance is one of circum-papillary telangiectatic microangiopathy, swelling of the nerve fibre layer around the optic disc, and the absence of capillary leakage on fluorescein angiography.

The mitochondrial inheritance of the disease was confirmed in 1988 by Wallace et al who identified a mitochondrial DNA replace-
COMMENT
Leber's hereditary optic neuropathy is known to segregate in a non-mendelian, maternal pattern. It is also evident that other determinants, whether genetic or epigenetic, play a part in disease expression. All the mDNA mutations associated with LHON alter polypeptides of the mitochondrial oxidative phosphorylation chain which may lead to inhibition of cellular energy production. Epigenetic factors that may play a part in the expression of LHON include tobacco use, alcohol abuse, metabolic disease (especially diabetes mellitus), trauma, and other systemic illnesses including hypertriglyceridaemia and Crohn's disease. This may have placed undue stress on mitochondrial function. The relation between metabolic dysfunction, such as diabetes mellitus, and the development of Leber's hereditary optic neuropathy has been described only rarely.

Du Bois and Feldon described a case of a 9 year old girl with juvenile onset diabetes mellitus and LHON whose vision recovered once the diabetes was well controlled.

CASE REPORT
In February 1998, a previously healthy 50 year old man presented with a 5 week history of progressive deterioration of vision in both eyes. Visual field tests may be normal, show enlarged blind spots, or central scotomas. The disc oedema clears with time and vision typically returns to normal or near normal within 6–12 months leaving residual nerve fibre bundle field defects and/or optic atrophy. In cases of suspected diabetic optic neuropathy, with progressive visual loss and circumpapillary capillary dilatation which does not leak on fluorescein angiography, a diagnosis of LHON warrants consideration. This case highlights the possibility that patients labelled in the past as having diabetic optic neuropathy may have had an additional unrecognised Leber's genetic predisposition.

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Table 1 Clinical characteristics of the case series

<table>
<thead>
<tr>
<th>No</th>
<th>Sex</th>
<th>Age (years)</th>
<th>Eye</th>
<th>Indication for LEC</th>
<th>LEC to reparring</th>
<th>Site for LEC</th>
<th>Harvested site</th>
<th>Graft size (DB/DN mm)</th>
<th>Follow up (months)</th>
<th>Last IOP (mm Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>55</td>
<td>R</td>
<td>POAG</td>
<td>10 days</td>
<td>upper</td>
<td>upper</td>
<td>6×5</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>64</td>
<td>L</td>
<td>POAG</td>
<td>4 years</td>
<td>upper</td>
<td>upper</td>
<td>6×5</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>65</td>
<td>R</td>
<td>POAG</td>
<td>4 years</td>
<td>upper nasal</td>
<td>upper</td>
<td>9×5</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>63</td>
<td>L</td>
<td>POAG</td>
<td>4 years</td>
<td>upper nasal</td>
<td>upper</td>
<td>9×7</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>63</td>
<td>L</td>
<td>secondary</td>
<td>4 years</td>
<td>upper nasal</td>
<td>upper</td>
<td>10×8</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>60</td>
<td>L</td>
<td>secondary</td>
<td>4 years</td>
<td>upper nasal</td>
<td>upper</td>
<td>6×5</td>
<td>6</td>
<td>16</td>
</tr>
</tbody>
</table>

LEC = trabeculectomy, POAG = primary open angle glaucoma, DP = diameter parallel to the limbus, DV = diameter vertical to the limbus, IOP = intraocular pressure.

*Blocker treatment.
COMMENT

We believe that the optimal site for harvesting conjunctival autografts is the fornix side of the leaking bleb, because it has almost no potential as a future filtration site. The paralimbal conjunctiva of the contralateral eye is often a potential future filtration site, since glaucoma is often bilateral. Even with a diagnosis of "unilateral glaucoma" at the time of bleb reconstruction, the potential for development of glaucoma in the contralateral eye cannot be completely excluded. A persistent bleb leak that requires total reconstruction is frequently encountered in eyes that have undergone multiple procedures and treatment with adjunctive antimetabolites. These situations are mostly encountered in eyes with refractory glaucoma, which often have little intact paralimbal conjunctiva remains but have a high potential for multiple filtration surgeries. We believe that intact conjunctiva within 3 mm from the limbus is needed to perform a successful filtration surgery. The reported distances of the conjunctival fornix from the limbus are as follows: upper, 8–10 mm; temporal, 14 mm; lower, 8–10 mm; nasal, 7 mm. These data indicate that conjunctiva may be taken from the upper or lower quadrant, and is most easily taken from the temporal quadrant when harvesting a graft 5 mm away from the limbus. No special attention was required to avoid excising the palpebral conjunctiva during this procedure. Excising the palpebral conjunctiva may be technically difficult during this procedure. We conclude that harvesting a graft from the fornix should be considered when reconstruction surgery is performed with free conjunctival autografts for leaking blebs.

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CASE REPORTS

The clinical features of the five patients are summarised in Table 1. Patients (three men, two women; ages, 57–83 years) were examined at Muikaiti Hospital and Tawanokyo-ouzou Hospital from 1989 to 1999. Patients 1, 2, 3, 4 were outpatients, but patient 5 was an inpatient who had been hospitalised for more than a year. There were no other cases in the same hospital ward or infection of medical personnel. All patients were infected unilaterally (three right eyes, two left eyes). The patients' subjective symptoms were foreign body sensation, visual disorder, and ocular pain. Patient 5 had senile dementia and her symptoms are unknown. Clinical findings were conjunctival congestion, follicles, and whitish worms in the conjunctiva. Patients did not report having had flies in their eyes, but do keep animals such as dogs, cats, and cows. They had never visited the Kyushu region of Japan. The worms were removed (two to five worms per patient) with forceps using topical anaesthesia and antibiotic eye drops (Fig 1). The patients' symptoms resolved and there were no recurrences. The presence of the Thelazia calipeda worms was confirmed by parasitologists.

COMMENT

Kirschner et al reported a case of conjunctivitis caused by Thelazia callipaeda and a fly was believed to have been the possible mode of transmission in the Sierra Mountain foothills of California. Mimori et al reported Thelazia callipaeda infection in a man in Kumamoto Prefecture, Japan, who resided in the mountains. The hospitals in which our patients were examined are located in a remote mountainous region of Shimane Prefecture in western Honshu. Patients lived in the suburbs in which the hospitals were located; the infections might have occurred in their places of residence.

In the case of the infection of the inpatient, the infection route is unclear. Some farms that raise beef cattle are located near the hospital, and it is possible that flies from these farms transported the parasite to the hospital.

The authors have no proprietary interest in any aspect of this report.

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Five cases of thelaziasis

EDITORS—We report five cases of thelaziasis, including a rare case of infection of a hospital inpatient. Thelaziasis is a nematode infection of ocular tissue that is caused by Thelazia callipaeda, which is found in China, India, Thailand, Korea, and Japan. This parasite has been identified in the conjunctival sac, and lacrimal gland and canal of dogs, cats, cows, badgers, rabbits, foxes, and monkeys in Asia.

Thelaziasis results when flies ingest embryonated eggs in the ocular tissue of an infected host; the eggs develop into larvae and are deposited onto the conjunctiva of a new host. Drosophila—namely, Amoto okada, A magna, and A nagatai—are the intermediate hosts.

To our knowledge, with the exception of Japan 157 cases have been reported worldwide (China, 124; Korea, 24; Thailand, 5; India, 2; Russia and Indonesia, 1 each). In Japan, approximately 100 cases have been reported, mostly in the western regions, especially in Kyushu (66 cases). To date, there have been no reported cases of inpatient infections.

Table 1 Details of five cases of thelaziasis

<table>
<thead>
<tr>
<th>Patient No</th>
<th>Sex</th>
<th>Age (years)</th>
<th>Year examined</th>
<th>Infected eye</th>
<th>No of worms</th>
<th>Symptoms and ocular pain</th>
<th>Clinical findings and follicles</th>
<th>History</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>57</td>
<td>1999</td>
<td>Left</td>
<td>1</td>
<td>Foreign body sensation</td>
<td>Conjunctival congestion</td>
<td>—</td>
</tr>
<tr>
<td>2</td>
<td>Male</td>
<td>65</td>
<td>1995</td>
<td>Right</td>
<td>3</td>
<td>Conjunctival congestion</td>
<td>Conjunctival congestion</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
<td>Male</td>
<td>83</td>
<td>1999</td>
<td>Right</td>
<td>3</td>
<td>Conjunctival congestion</td>
<td>Conjunctival congestion</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>Female</td>
<td>57</td>
<td>1998</td>
<td>Left</td>
<td>5</td>
<td>Foreign body sensation</td>
<td>Conjunctival congestion</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>80</td>
<td>1999</td>
<td>Right</td>
<td>5</td>
<td>Conjunctival congestion</td>
<td>Conjunctival congestion</td>
<td>—</td>
</tr>
</tbody>
</table>

Figure 1 Patient 5. Slight conjunctival congestion and a worm in the right conjunctival sac.
left upper eyelid. He had cut off the line but made no attempt to remove the hook. The fish hook had pierced the eyelid from its conjunctival aspect near the outer canthus. It was loaded with nine live maggots that were used as bait (Fig 1). The left eye showed a small superficial linear abrasion of the cornea but was otherwise unremarkable and the visual acuity was 6/6. Under local anaesthesia after removal of the maggots, the hook was rotated back and removed. The patient was snipped o emerging through the eyelid skin. The barb was made no attempt to remove the hook. The fish hook had pierced the eyelid from its conjunctival sac and a topical antibiotic and he made an uneventful recovery.

Even in the absence of serious ocular injury, this case is interesting for the presence on the fish hook of live maggots that were kissing the conjunctiva and eyelid skin!

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Methaemoglobinemia after peribulbar blockade: an unusual complication in ophthalmic surgery

EDITOR.—Peribulbar blockade is frequently used for anaesthesia in ophthalmic surgery. Owing to its short onset time and low incidence of cardiac and central nervous system toxicity, the local anesthetic prilocaïne is a popular choice for peribulbar blockade. Prilocaïne is, however, the most potent methaemoglobin forming local anaesthetic. Prilocaine can cause methaemoglobinaemia when used for peribulbar blockade in patients with reduced tolerance to oxidant drugs.

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