INFILTRATION OF THE IRIS IN CHRONIC LYMPHATIC LEUKAEMIA*†

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OCULAR involvement is common in the leukaemias though the anterior segment of the globe is seldom involved in the chronic lymphatic type. The angles of the anterior chambers were found to be abnormal on clinical examination in a patient with chronic lymphatic leukaemia. This physical sign has not previously been described in the few reported cases of involvement of the iris in the leukaemias.

Case Report

A man aged 59 was first seen in February, 1964, complaining of ankle swelling and shortness of breath on exertion.

Examination.—There was a grossly enlarged liver and spleen, generalized lymphadenopathy, and mild congestive cardiac failure. Haematological investigation showed Hb 68 per cent., white blood count 102,000/cu. mm. (99 per cent. lymphocytes, 1 per cent. neutrophils), platelets 68,000/cu. mm.

Diagnosis.—Chronic lymphatic leukaemia.

Treatment.—Chlorambucil was given and the patient's general condition soon improved; after a month, although the haemoglobin remained at only 72 per cent., the total white cell count had fallen to 12,500/cu. mm. (87 per cent. lymphocytes).

Progress.—During the next 2 years he remained well and the haemoglobin was maintained at approximately 80 per cent. although the white cell count varied considerably, ranging from 7,400/cu. mm. (90 per cent. lymphocytes) to 109,000 (98 per cent. lymphocytes).

FIG. 1.—Right eye before treatment, showing deformed pupil and loss of iris pattern.

FIG. 2.—Right eye after treatment.

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Eye Involvement.—The patient first attended the Regional Eye Unit on September 6, 1966, when he gave a 2-day history of pain and blurred vision in the right eye.

Examination.—The unaided visual acuity was 6/36 in the right eye and 6/6 in the left. There was slight ciliary injection of the right eye and marked corneal oedema which prevented any further examination of the anterior segment. The corneal oedema was cleared with guttae glycerin 50 per cent., and numerous fine irregular keratic precipitates and a dense aqueous flare with only a few circulating cells then became apparent. The anterior chamber was of normal depth and the pupil was mobile, but slightly "peaked" towards the 10 o'clock position. The iris was thickened, the normal pattern was absent, and small nodules were visible, especially around the pupillary margin. These nodules were of a greyish-yellow colour and extended to the temporal periphery of the iris where they were covered with small haemorrhages and new blood vessels. When the slit-lamp beam was shone onto the temporal limbus, a red glow was visible apparently originating from the region of the angle. Gonioscopy revealed the presence of a small hyphaema. The whole of the temporal angle was obscured by a greyish-yellow vascularized and haemorrhagic tissue. The remainder of the angle was wide open. The intra-ocular pressure was 30 mm. Hg (applanation). Fundus examination performed through an undilated pupil revealed no gross abnormality.

The left eye was white and the cornea clear. There were fewer keratic precipitates than on the right side and the aqueous flare was not so dense. The pupil was circular but the temporal iris and the angle were involved in the same way as in the right eye although to a lesser extent. The intra-ocular pressure was 20 mm. Hg (applanation).

Diagnosis.—Glaucoma secondary to leukaemic infiltration of the iris.

Treatment.—Oral Diamox 250 mg. was given 6-hrly after an initial dose of 500 mg. The next day the ocular tension had fallen to 18 mm. Hg (right) and 16 mm. Hg (left). The cornea had cleared and the visual acuity in the right eye had improved to 6/24 unaided, 6/9 with +0.25 D sph., +4 D cyl., axis 25°.

General Examination.—There was no lymphadenopathy or hepatosplenomegaly. The haemoglobin was 91 per cent. and the white blood count 10,000 per cu. mm. (65 per cent. lymphocytes).

Further Treatment.—Diamox was continued for a week and during this time the intra-ocular pressure in both eyes remained within normal limits, although there was no change in the other physical signs in either anterior segment. A week later, however, the intra-ocular pressure in the right eye rose to 28 mm. Hg despite treatment with full doses of Diamox, and on September 23, 1966, a course of superficial irradiation to the right eye was started, and a total of 500r at 150 kv. was given in five doses over a period of 6 days. Three weeks after this treatment, the intra-ocular pressure was within normal limits although the Diamox had been discontinued by this time. The pupil was circular, the iris pattern was returning to normal, the hyphaema and keratic precipitates had completely disappeared, and the red glow which had previously been noted at the limbus could no longer be detected. Gonioscopy revealed a significant decrease in the amount of abnormal tissue in the angle.

Progress.—On November 29, 1966, the patient experienced some discomfort and blurring of vision in the left eye. When he was seen the next day the tension in this eye was 24 mm. Hg (applanation) but the changes in the anterior segment were little altered except for an increase in the amount of abnormal tissue in the chamber angle. A course of radiotherapy similar to that given to the right eye was begun.

Result.—Since January 11, 1967, the intra-ocular pressure has remained within normal limits in both eyes. There are only a few cells in the anterior chambers and the keratic precipitates and hyphaemata have completely disappeared. The fundi are normal.

Discussion

The highly vascular choroid is the commonest ocular tissue to be infiltrated by leukaemic cells, and histological evidence of this is present in nearly 50 per cent. of patients suffering from the leukaemias (Allen and Straatsma, 1961). Although choroidal haemorrhages

FIG. 3.—Artist's impression of right eye before treatment showing hyphaema and fine keratic precipitates.

FIG. 4.—Artist's impression of right eye after treatment.

occasionally occur and the fundus background often appears abnormally pale on ophthalmoscopic examination, choroidal involvement gives rise to few abnormal clinical signs.

Involvement of the entire uveal tract is rare, but, when the less vascular iris is infiltrated by leukaemic cells, abnormalities which are clinically apparent are usually present. The iris loses its normal architecture and appears yellowish-grey in colour while nodules are often present on its surface, especially around the pupillary margin and towards the iris root. New blood vessels and haemorrhages are also a common feature. There is always an accompanying uveitis with fine, irregular, scattered keratic precipitates, and this is often complicated by hyphaema or hypopyon formation. Although uveitis accompanied by a hypopyon which is surmounted by a hyphaema is regarded as almost pathognomonic of leukaemic infiltration of the iris, it has long been recognized that in some cases only the haemorrhage is present (Sorgor, 1898), while in others only a hypopyon accompanies the uveitis (Deitch and Wilson, 1963; Kearney, 1965). Glaucoma is frequently a complicating feature in these cases (Weekers and Prijot, 1950; Thomas, Vitte, and Guidat, 1954; Deitch and Wilson, 1963), although its precise aetiology has only rarely been determined. Fonken and Ellis (1966), however, described the case of a young girl who was suffering from acute lymphatic leukaemia and had severe bilateral uveitis with hyphaemata and glaucoma. They thought that the raised pressure was due to obstruction of the drainage angle by leukaemic tissue. Pathological examination supported the clinical impression, as the iris, trabecular meshwork, and canal of Schlemm were all found to be heavily infiltrated by leukaemic cells.

After the choroid, the sclera is the commonest structure to be involved, but there is usually no clinical evidence of this infiltration which is most marked around the scleral channels.

Masses of leukaemic cells are frequently seen as yellowish nodules in the subconjunctival tissues near the limbus and can occasionally cause glaucoma by interfering with episcleral venous drainage (Glaser and Smith, 1966). Retinal involvement, like involvement of all other ocular structures, is much commoner in the acute than in the chronic forms of the disease. The retinal veins are tortuous, dilated, and occasionally sheathed. Haemorrhages, which may be present throughout the fundus, may be either superficial or deep. These retinal haemorrhages often have a white component and are occasionally severe enough to lead to pre-retinal or even vitreous haemorrhages. Visual acuity may be further affected by severe retinal oedema, while oedema of the optic disc and soft exudates are frequent additional features.

Apart from the lens, all ocular structures may be involved in the leukaemias but, although the incidence of ocular complications is much higher in the acute leukaemias, it is impossible to distinguish between the different types on the clinical ocular findings.

Summary

A patient with chronic lymphatic leukaemia is described in whom bilateral anterior uveitis with secondary glaucoma occurred as a result of leukaemic infiltration of the irides. The ocular manifestations of the leukaemias are briefly described.

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The artist's impressions were painted by Mr. T. Tarrant of the Institute of Ophthalmology and the photographs were prepared by the Photographic Department at The London Hospital.

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