Case Reports

ADRENOCORTICAL STEROIDS AS A DIAGNOSTIC AID IN ENDOCRINE EXOPHTHALMOS

W. C. DUCKWORTH, M.B., B.CH. (RAND), F.C.P. (S.A.) AND J. E. COSNETT, B.SC., M.B., B.CH. (RAND), M.R.C.P. (LOND.),
Department of Medicine, Edendale Hospital, Pietermaritzburg

The differential diagnosis between a retro-orbital tumour and endocrine exophthalmos in the euthyroid patient may be difficult. In these circumstances Kinsell *et al.*[1] and Hoffenberg and Jackson[2] have suggested that a trial of adrenal cortical steroids may be of value. With endocrine exophthalmos a rapid resolution of symptoms may occur, whereas no improvement will follow if a retro-orbital tumour is present.

We record here 2 illustrative cases:

Case 1

A 28-year-old Bantu male was admitted for investigation of proptosis of his left eye. He had noticed gradually increasing pain and swelling of his left eye for 3 months. Examination of the left eye showed proptosis, conjunctival injection and limitation of ocular movements, especially lateral deviation. No abnormal pulsation or bruits were present. On retinoscopy dilated veins and early papilloedema were seen. The right eye appeared normal. There was no evidence of hyper- or hypothyroidism and the thyroid gland was not enlarged. Further physical examination was negative.

X-ray examination of the chest, skull and orbit were normal. A left carotid angiogram was normal. A blood count was normal and a Wassermann reaction was positive. The serum cholesterol was 186 mg./100 ml. and the protein-bound iodine estimation was 4·5 μg./100 ml.

Because a retro-orbital tumour was suspected the left orbit was explored by a lateral approach. The muscles and retro-orbital tissues were found to be swollen and oedematous, but no tumour or aneurysm was found. Part of the orbital roof was removed, but an extensive orbital decompression was not performed.

He was first seen by us after operation, at which stage the ophthalmoplegia had progressed to total loss of all movements. The exophthalmos of the left eye was now gross, and marked chemosis had developed (Fig. 1). Severe papilloedema was present, and the visual field of the left eye showed restriction in its upper half. In addition, changes in the right eye—slight proptosis and limitation of upward gaze—were apparent.

A diagnosis of endocrine exophthalmos was made and the patient was given 250 mg. of cortisone orally every 6 hours. Improvement was dramatic. The severe pain, which had prevented him from sleeping, eased after only 3 doses of cortisone. Regression of the ophthalmoplegia and swelling was noticed within 2 days of the onset of therapy; the proptosis regressed more slowly.

The dose of cortisone was gradually reduced and on discharge 7 weeks later he was taking 30 mg. of prednisone daily. His eyes then appeared normal (Fig. 2). Three months later the prednisone dose had been reduced to 15 mg. daily without recurrence of symptoms.

Case 2

A 50-year-old Bantu male was referred for investigation of headache and progressive deterioration of vision in both eyes of 4 months' duration. He had been totally blind for 2 weeks before his admission to Edendale Hospital. His only other complaint was of a chronic cough.

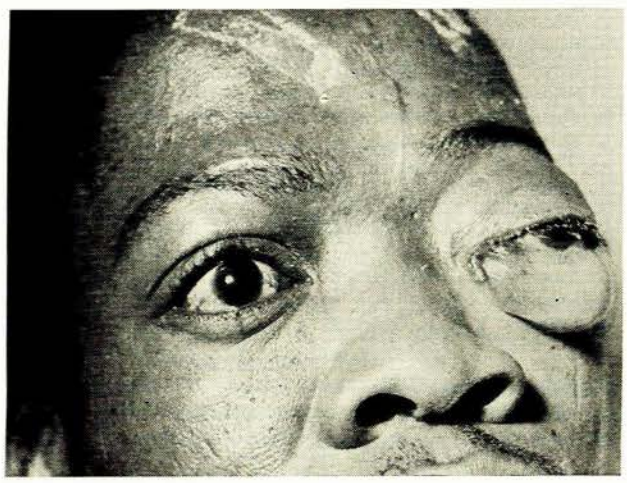
On examination he was completely blind and had gross bilateral proptosis and chemosis. The exposed conjunctiva was injected. The pupils were moderately dilated and immobile. The ocular fundi were normal except for some venous congestion in the left fundus, which was the most severely affected eye. Horizontal and vertical movements of both eyes were severely restricted, but the paralysis was not explicable on the grounds of focal nerve lesions. The diffuse incomplete limitation of movement suggested that the lesion was muscular rather than neural. No pulsation or bruits were present. Further physical examination revealed no other abnormal signs and there were no signs of thyrotoxicosis.

X-ray examination of the chest showed a single thick-walled abscess in the upper lobe of the right lung. Radiographs of the skull showed an abnormal texture of the frontal bone surrounding the orbits with loss of clear definition of the inner and outer tables of these areas. Bronchoscopic appearances were normal. The cerebrospinal fluid was normal in all respects.

On admission to hospital, before investigations had been completed, it was thought likely that the diagnosis was endocrine exophthalmos. On account of the grave condition of his eyes the patient was given 50 mg. of prednisolone every 6 hours. He was also given penicillin and sulphasomidine as treatment for the lung abscess.

There was no appreciable improvement on this treatment, and following a week's therapy the proptosis and chemosis had become more marked. At this time he began to complain of nasal obstruction and slight epistaxis, but examination did not show any tumour of the nose or post-nasal space.

These features, in particular the lack of response to prednisolone, the equivocal appearances on X-ray examination of the skull, the presence of a chest lesion, and the nasal symp-



Figs. 1 and 2. The patient before and after receiving treatment for endocrine exophthalmos with steroids.

toms, led us to consider the possibility of an infiltrating lesion of the anterior cranial fossa and retro-orbital tissues. Surgical exploration was performed through a right frontal craniotomy. The pericranium, cranium and dura mater were found to be extensively invaded by firm tissue, biopsy of which showed metastatic squamous carcinoma. He died 18 days after operation and permission for postmortem examination was refused.

DISCUSSION

The diagnosis of endocrine exophthalmos is not difficult if it is associated with hyperthyroidism. In the euthyroid patient, however, the differentiation between a retro-orbital tumour and endocrine exophthalmos may be difficult. Furthermore the serious condition of the patient's eyes often demands an early diagnosis, and delay may endanger the patient's sight.

The cause of endocrine exophthalmos remains uncertain. Two hormones seem to be related to the condition:[9] the first is an anterior pituitary hormone, exophthalmos-producing substance (EPS), which is separate from thyroid stimulating hormone (TSH); the second is the long-acting thyroid stimulator (LATS) described by Adams,[10] which may be of extrapituitary origin.[15] Although EPS can be assayed by its effect on the intercorneal distance in fish, and LATS by measuring the release of thyroidal ^{131}I 7-16 hours after sample injection,[9] these investigations are not readily available. Furthermore the correlation between exophthalmos and increased blood levels of LATS or EPS is not exact, and patients with exophthalmos can show normal levels of these 2 substances.[13,14] A clinical diagnostic test would therefore be of value, and the response to steroids would appear to be worthy of trial before more radical procedures are performed. Large doses, as high as 1 G of cortisone daily, are necessary, and this may explain the contradictory reports in the literature concerning their efficacy.[1-3,5,6,8]

The value of a therapeutic trial of steroids is illustrated in the cases reported. In the first case a fruitless exploration of the orbit for a suspected tumour could have been avoided if a trial of cortisone had been given. In the second case, which presented in a very similar fashion, the true diagnosis was indicated by the absence of any response to steroids.

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ADDENDUM

In case 1 the cortisone was progressively reduced and was finally stopped on 1 April 1965. When the patient was seen on 1 May 1965, no recurrence of symptoms had occurred.

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