and blue up to about a 2 mm. object size. Yellow was doubtful but a 1 mm. white object was seen.

Donald. Allowing for a deep-set eye the peripheral field of the right eye is full but, as in the case of Thomas, there is a definite central colour scotoma; in this case, however, only red and green fail below a 2 mm. object size. Yellow, blue and white are all seen at a very small angle.

Naturally, neither the R. E. of Thomas nor the L. E. of Donald could be expected to give a field record.

Summary

To sum up, we have here four males in a family of four boys and four girls, the males with exceptionally poor vision, the females apparently unaffected. In the four males the R. V. A. is respectively 6/36, 6/18, less than 6/60, 6/12 attempts; the L. V. A. 6/36, 6/24, 6/24, 1/60. The best binocular corrected V. A. 6/18, 6/24, 6/12 (?). In all four there was an unusual macular condition in at least one eye.

The two oldest have passed out of observation but are known to be bad sighted and to find it difficult to do labouring work, if indeed they find any employment. Of the two youngest, one has suffered from neuro-retinal disease and retinal detachment; he is out of employment. The other has one amblyopic eye and one eye (possibly, indeed, both eyes), affected with the macular disease, if it is to be so designated. This, meantime, appears to be stationary.

A CASE OF RETINAL GLIOMA TREATED BY THE INSERTION OF RADIUM NEEDLES IN THE ORBIT

BY

V. McDowall

HON. RADIOLOGIST AND RADIUM THERAPEUTIST, BRISBANE HOSPITAL

AND

E. O. Marks

HON. OPHTHALMOLOGIST, HOSPITAL FOR SICK CHILDREN, BRISBANE

The treatment of intra-ocular growths by radium has been the subject of communications by R. Foster Moore and others in recent numbers of this Journal. The possibility of treatment by this means as an alternative to excision, particularly where excision would entail total blindness, is a question the importance of which
Retinal Glioma

needs no emphasis, and our sincere thanks are due to those workers for the publication of their results.

The following notes of a case of retinal glioma are submitted, not merely because of the entirely satisfactory results to date, seven months after the application of radium, but because the method adopted seems simpler, easier, and in ordinary hands safer than that used by Foster Moore, which was the insertion of radon seeds actually within the intra-ocular growth.

Fortunately retinal gliomata are not common. This is the only case seen at the Brisbane Hospital for Sick Children for some years, and we may reasonably hope that a similar time will elapse before another occurs. We would have preferred waiting longer before publishing this result in order to make more certain of the permanence or otherwise of the cure, but the exceedingly satisfactory result to date renders it desirable to draw attention to this different method of application while interest is centred on the subject, so that it may be considered by those who have a large number of cases to deal with. We wish to make it clear that while there now seems quite a hope that the result is permanent, it is far too early to be confident.

From an ophthalmological aspect the case has been entirely in the hands of one of us (E. O. M.) and the radium treatment entirely in the hands of the other (V. McD.), both as to dosage and the application thereof. The method and site were the result of consultation between us.

On June 1, 1931, A. H., male, aged 6 months, was referred to the Hospital for Sick Children by Dr. T. H. Mansfield, with the diagnosis of bilateral glioma. The parents had noticed something behind the pupil of the left eye for about three months previously. A few days before admission the eye had become inflamed. No abnormality had been noticed by the parents in the right eye.

On admission the left eye was in a condition of acute glaucoma, the state of the cornea rendering impossible any intra-ocular view. There was no question as to the necessity of removing the left eye, quite apart from whether it was suffering from malignant disease or not.

Pathological examination of the left eye by Dr. J. V. Duhig gave the following report:—

"Retinal glioma. The whole vitreous body is replaced by a degenerating mass of tumour cells in typical rosette formation. Section through the optic nerve shows no infiltration."

To outward view the right eye appeared normal but ophthalmoscopic examination when under the anaesthetic for enucleation of the left eye revealed a white globular mass, traversed by vessels, situated in the upper temporal quadrant. The summit of the mass was visible with a plus 12 dioptre lens, the normal fundus with plus 1.
The protrusion forwards of the tumour was thus represented by about 11 dioptres. The diameter of the tumour was about two-thirds of the distance between the macula and the anterior limit of vision with the atropinised pupil. The tumour just missed the macular area and was situated well away from the optic disc. The remainder of the fundus appeared normal.

While the eye itself was still capable of useful vision if the tumour could be cured, the distance of the tumour from the optic nerve rendering unlikely an immediate extension of the tumour outside the eyeball, it was felt that radium treatment should be tried before advising the ghastly alternative of removing the only eye. This opinion was fully shared by Dr. J. Lockhart Gibson, Honorary Consulting Ophthalmologist to the Hospital. The child was accordingly transferred to the radium clinic at the Brisbane General Hospital.

In view of the fact that an infantile eye is less than two centimetres in diameter, the apex of the tumour being less than one centimetre from the sclerotic, it seemed preferable to apply the radium from the orbit in as close apposition to the base and growing margin of the tumour as possible, rather than run the risk of injuring or infecting the interior of the eye by penetrating it. A further advantage was that the maximum radiation would be in the vicinity of the base of the tumour and not in the vicinity of the centre, with a less likelihood of necrosis in consequence.

Previous experience in radium treatment of a basal celled carcinoma of the bulbar conjunctiva had shown that there was little danger of injury to the sclerotic by the radium.

On June 12, three 0.5 mg. needles of 0.5 cm. active length with a filtration in 0.5 mm. of platinum were inserted through small incisions in the upper lid over the area nearest the base of the tumour, and spaced one centimetre apart. The needles were removed after six days, a total dosage of 216 milligramme hours.

There was a slight reddening of the skin in the vicinity of the incisions, but no inflammatory reaction showed in the eyeball, the eye being kept atropinised. The wounds in the lid healed up readily, and no thickening has resulted, the lid now appearing normal. No reactionary erythema appeared in the lids at any time.

The ophthalmoscopic changes in the tumour have been striking. On June 20, two days after removal of the needles, the child was feverish with some disturbance of the bowels, so that the pyrexia may not have been due to the radium.

On June 22, the child was still sick and appeared to be in pain but the eye was quite free from inflammation. The tumour seemed smaller and the swelling reduced to about 7 dioptres, but the examination was very difficult.
On June 29, a great change was noticeable, the mass being no longer spherical, but irregular, shrunken, and crenated, the summit being visible with a plus 4.0 D. lens.

On July 6, the summit required a plus 2.0 D. lens but no mydriatic had been instilled, and on July 13 a plus 3.0 D. lens was required.

On July 20, the summit was seen with a plus 1.0 D. lens, there being no appreciable raising above the rest of the fundus. The former tumour had now become (and has since remained) an irregular patchy white area with vessels running across it. The remainder of the fundus and the media appear quite normal. At one time there was a slight opacity on the cornea.

Though there was no sign of recurrence it was considered desirable for safety, the original dose having been rather small, to give a further application of radium. From August 7 to 9 radium treatment was applied, through a Columbia paste mould 2.0 cm. in thickness, to the upper part of the orbit and right temporal regions by means of four 4.0 mg. needles each of 2.0 cm. active length and filtered with 0.5 mm. platinum. A total dosage of 960 milligramme hours.

No inflammatory reaction resulted, and the intra-ocular condition remains now, January 12, 1932, as it was at the end of July. So far as can be judged the child sees well. It is the picture of good health.

The initial dose of radium was on the low side because the age of the patient was such that ordinary dosage might produce damage to healthy structures. The response of the tumour showed that it was radio-sensitive. As there appeared no sign of recurrence at the time of the distance treatment, this was also kept within safe limits. The insertion of the radium needles would have been easier if the needles had been curved instead of straight, and by enabling the needles to lie in closer contact with the eye would have ensured a more uniform radiation.

While checking the proofs of the above, the opportunity is taken to bring the information up-to-date, practically one year from the initial application of radium. The eye was again examined under a mydriatic and general anaesthesia on May 27, 1932. Doctors J. and W. Lockhart Gibson and T. H. Mansfield kindly confirmed the absence of any sign of recurrence of the tumour. The condition is now as described for July 20, 1931.
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