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COMMUNICATIONS

CHOROIDAL SARCOMA TREATED BY THE INTRA- OCULAR INSERTION OF RADON SEEDS

BY

R. FOSTER MOORE

LONDON

THE following is a case of melanotic sarcoma of the choroid which has been treated by means of radon seeds inserted intra-ocularly, and is now reported after twelve months have elapsed.

I want particularly to express my thanks to Mr. Duke-Elder who, knowing of my interest in such cases, was good enough to transfer the patient to my care, and has been so good as to examine him with me again on February 18, 1930, *i.e.*, precisely a year after the institution of treatment.

I shall be asked why I carried out treatment of so experimental a nature when the removal of such an eye would generally be believed to hold out the best prospect of cure, and the reply is that the right was an old blind eye and the patient refused to have the left, the only seeing eye, removed.

The patient, A. I., was a man aged 65 years, admitted to St. Bartholomew's Hospital under my care on February 8, 1929. He was emphysematous. His blood pressure was 185/105. The urine contained neither albumen, sugar, nor melanin. He had recently noticed a pigmented mole on the right nipple.

He had suffered from chronic blepharitis of the left eye for several years. The right eye was convergent, and was the subject of a large dense leucoma adherens; with it he could just see hand movements.

Three weeks previously he had attended Moorfields under the care of Mr. Duke-Elder who diagnosed choroidal sarcoma. The sight had failed for the last six months and had deteriorated more rapidly in the last three weeks.

On examination there was a large, very dark globular mass in the lower part of the globe. (Plate I.) As seen with the ophthalmoscope it invaded the dilated pupillary aperture to the extent shown in Fig. 1. The vitreous was muddy. There were no keratic precipitates and no evidence of iritis was present. The acuity was 6/60 and the visual field was reduced. (Chart 1.)

FIG. 1.

CHART 1.

PLATE I.

PLATE II.

The tumour was completely opaque to transillumination, the lower part of the iris was pushed a little forward, the tension was normal.

In order to be as sure as possible of any changes that might occur as time went by, it was clearly important that as precise observations as possible should be made before instituting treatment and should be continued afterwards. I therefore got Messrs. Hamblin to send a draughtsman to make a drawing of the intra-ocular appearances the day before operating. (Plate I.) At the same time I made as accurate a diagram as I was able, to indicate the position

FIG. 2.

of the tumour with regard to the edge of the dilated pupil (Fig. 1) (in Fig. 2 is represented Mr. Milner's estimate of the same point) and got Mr. Milner and Mr. Stallard to make similar observations, and these have been continued at intervals of never more than a month ever since.

Professor F. L. Hopwood, who is in charge of the Radon Department of the Hospital, was good enough to prepare the seed. It was of 1 millicurie strength and was filtered through 0.5 mm. of platinum.

On February 15, 1929, under general anaesthesia the first seed was inserted. I had the advantage of the assistance of Mr. Milner and Mr. Stallard. The conjunctiva was incised by means of a Beer's knife along the lines indicated in Fig. 2 and the flap so outlined was reflected so as to expose the sclerotic.

My endeavour was to insert the seed directly into the thickest

part of the growth so that if possible it would be completely embedded in it. For the incision of the sclerotic I chose a knife of such a breadth as I judged would make a hole just large enough and no larger than was sufficient to admit the seed and for this reason I purposely avoided the use of any form of introducer. The flap of conjunctiva was dissected cleanly off the sclerotic and the knife was pushed straight into the globe at the point A (Fig. 2) with a slight backward slope.

Bleeding was moderate but soon stopped. The seed was taken in a pair of finely ribbed forceps and inserted straight into the growth along what was judged to be the track of the knife. Its hindmost end was pushed just within the sclerotic, and the attached silk, black in colour so as to facilitate the finding of it at a later date, was cut to the length of about an inch, and the conjunctival flap replaced in position.

The inside of the eye was now re-examined with the ophthalmoscope and no alteration of any kind was discoverable. There was no intra-ocular haemorrhage, the seed did not show outside the growth and the growth itself was not altered in appearance.

As will be seen in Plate I a star-shaped opacity was present in the posterior part of the lens. It is a point of passing interest to note that this completely disappeared under the influence of the radium, but what seemed to be a fresh opacity of rather greater density was later developed in the posterior cortex.

Blepharitis of long-standing was present and consequently there was and has been ever since a rather considerable degree of conjunctival discharge, but in spite of this no intra-ocular infection occurred. A small eschar-like area was developed in the conjunctival flap and this appearance has remained ever since but there has been no other change; one feared at first lest there should be sloughing of the sclerotic where it was nearest to the seed but this did not occur nor has it occurred in any subsequent case where seeds of greater strength have been used.

On the morning following the operation the patient complained of a headache which was relieved by aspirin and in the following days complained repeatedly of periodic shooting pains. These were described as lasting a few seconds and came on at intervals of one to several hours. On February 20 the note was:—"There is some bruising over the site of the scleral puncture, no ophthalmoscopic change is visible, still sticky discharge. Last night patient had several attacks of shooting pain in the eye lasting for a few seconds. One attack was followed by a 'knocking' pain described as like a hammer. It was situated just above the eye and lasted for about five minutes. The eye often waters a good deal after the shooting pain."

The condition underwent no substantial change but a duller and

more continuous pain occurred and as a posterior synechia formed it was probably of iridic origin. It may be said that from first to last there has been no pain that could in any way be called severe. No change could be observed with the ophthalmoscope, but on February 26 for the first time an area of " slate-coloured " staining was noted over the site of insertion of the seed.

A skigram (Plate II) was taken at this date which shows the seed *in situ*.

On March 1, *i.e.*, fourteen days after the insertion of the seed it was removed under general anaesthesia. The original conjunctival flap was turned backwards, the attached black silk was easily identified among the tissues and by its aid the seed was removed without difficulty.

Apart from the recurring pain which was probably due to iritis no important change was noticed. The tension remained the same, the cornea remained clear and bright, there were no keratic precipitates and no certain alteration could be observed in the tumour. He was discharged from Hospital on March 20, 1929. The urine was examined for melanin by Dr. G. A. Harrison and both the ferric chloride test and the Thormählen reaction were negative, and these same tests again gave a negative result on October 29, 1929.

It had been noticed whilst he was in Hospital that there was a dull brownish colour under the conjunctiva in the region of the scleral incision. I had taken this to be due to the dye coming out of the black silk which was attached to the seed, though the colour looked too brownish. When he next attended at out patients I examined this area with the slit-lamp and by its aid it could be seen that the colouration was produced by little colonies or collections of pigmented cells which were tracking, as it were, from the region of the incision in the sclerotic; whether they had simply escaped from within the eye at the time of insertion of the seed, as I suspect, or whether they had grown out afterwards, I do not know. They, however, completely disappeared in the course of a few weeks, presumably as a result of the effects of the seed, and did not appear again.

The patient was readmitted to the ward on May 13 with the view of considering the advisability of inserting another seed. He had no pain, the blood pressure was 220/120, there was no loss of weight. As it was thought the tumour was a little reduced in size nothing further was done and he left the hospital eight days later.

He again attended regularly as an out patient until June 6. At this date the growth was still easily visible and it seemed advisable to insert another seed.

On June 11, therefore, another seed was inserted by precisely the same technique as had been used for the first one but it seemed wise to use a greater strength. Professor Hopwood therefore

prepared one of a strength of 5 millicuries with 0.5 mm. platinum filter and an endeavour was made to insert it at the same spot and in the same way as on the previous occasion.

On examining ophthalmoscopically immediately afterwards as on the previous occasion there was no intra-ocular bleeding, the seed did not show outside the growth and it was clearly completely buried within the tumour.

On June 21, *i.e.*, ten days afterwards, the conjunctival flap was again turned back and the seed removed easily and the flap replaced, and except that there was a good deal of conjunctival injection it healed well and again no intra-ocular disturbance resulted from the removal of the seed.

On September 3 it was noted that the star-shaped lens opacity was no longer seen, the visual acuity was 3/60, the site of insertion of the radium looked nearly normal except for the whitish eschar-like area in the overlying conjunctiva, and by now it was clear to all of us that the growth was shrinking and this has continued gradually up to the present time. The vision has deteriorated somewhat and for this I believe the developing lenticular opacity previously mentioned was entirely responsible.

At this date the visual acuity was 3/60 as previously. Since this time he has been under monthly observation by Mr. Milner and Mr. Stallard as well as myself, and has been seen by a number of other observers. Except for the blepharitis, which remains troublesome, his eye has given him no bother, he has had no pain in it, there has been no extra-ocular growth in spite of the pigmented cells previously referred to.

Mr. Duke-Elder was good enough to see him with me on February 18, 1930. He had seen nothing of him since January 18, 1929.

The growth, which at first was slow to undergo change, so that for some months we were not prepared to be positive that it was smaller, has now, February 18, 1930, become shrunken to such a degree that it is seen with difficulty and then only by looking right downwards behind the iris. It has lost its tense globular shape, and appears shrunken and of an irregular surface. It is of a dull ashen grey colour instead of the dense dark colour previously.

The posterior synechia at 6 o'clock remains. There are no keratic precipitates. The red reflex is uniform all over the upper part, the tension is normal, there is a good deal of opacity in the vitreous. The field of vision is certainly not reduced as compared with a year ago, *c.f.*, Charts 1 and 2. For the purpose of this paper I asked Mr. Duke-Elder if he would be good enough to let me have a written statement as to his present observations. He says:—
“The remains of the growth are now to be seen only by looking well down behind the iris. The mass is about one quarter of the

previous size of the growth, dull greyish in colour and shrunken in appearance; it seems to me likely that it represents fibrous tissue residue of the former neoplasm. There is no extra-ocular extension. The lenticular opacity, chiefly in the posterior layers of the cortex, prevents a clear view of the rest of the fundus and is largely responsible for the reduced vision."

It seems desirable to make a critical survey of the foregoing experience to see whether this form of treatment has justified itself.

CHART 2.

I think it may be said in the first place that an intra-ocular melanotic sarcoma can be made to shrink greatly and perhaps to disappear by this treatment, and thus the point of paramount importance is with respect to the menace of dissemination; with the commencement of the shrinkage of the growth are we justified in assuming that the danger of dissemination ceases from that time?

It is clear that at present there can be no authoritative reply to this question. We can only judge on general principles and to me it seems unlikely that actively growing cells will be thrown off from a tumour which has begun to regress, and that in fact so soon as the radium has had its effect so soon perhaps does the danger of dissemination cease. If this is so the eye no longer remains as a menace to the subject, and he is in fact as much protected against dissemination (no more and no less), as if he had had the eye removed.

If we are prepared to accept this view it would seem reasonable to treat any case of accessible intra-ocular sarcoma by the foregoing means where the growth has not as yet seriously spoiled the eye, and in the rare cases where the growth occurs in an only eye or in an eye which is the only useful eye it would seem the proper treatment to adopt. It is, however, clearly impossible to make any dogmatic statement at this stage and further experience must be awaited.

The fact that dissemination may already have taken place before the seed was inserted makes it additionally difficult to form a sound judgment. I have known a patient die of dissemination twelve years after the removal of an eye for melanotic sarcoma, and without any local recurrence, and in such a case it seems necessary to suppose that dissemination occurred twelve years before causing death but had remained latent. (*Roy. Lond. Ophthalm. Hosp. Reps.*, 1914, XIX, Part III, 421.)

With regard to technique it may be stated that it is not difficult to insert, and afterwards to remove, a radon seed from the substance of some cases at least of intra-ocular melanotic sarcoma without causing intra-ocular haemorrhage or any other complication, and I have since shown in other cases that this can be done even though the tumour is so far back as to be close to the optic disc.

With regard to the strength of seed that should be used it would seem that 1 millicurie is insufficient, that 5 millicuries may safely be used and experience may prove that a greater strength is preferable.

SARCOMA OF THE IRIS

BY

M. S. MAYOU

LONDON

SARCOMA of the iris is a rare disease. There are about 100 cases on record. The growths may be pigmented or unpigmented. The four cases described below all belong to the former group. Of the pigmented group there are those which definitely start in large pigmented naevi which have been noted to be present beforehand, or those which are supposed to have started in the stroma of the iris. In nearly all the cases the tumour consists of large spindle cells to which the cases recorded below are no exception. These large spindle cells are characteristic of growths derived from naevi and it is probable that most of the tumours which are recorded as having been derived from the stroma of the iris may have had their origin from small naevi of the iris which have not been noted beforehand. Coats (*Trans. Ophthalm. Soc. U.K.*, Vol. XXXII,