Leeds, for valuable assistance in investigating the pathology and bacteriology of some of my cases; and to Mr. S. D. Lodge and the sisters of my wards in the General Infirmary at Leeds, and to various tuberculosis officers for the careful supervision and execution of the treatment.

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OCULAR SARCOMA WITH WIDE EXTENSION, INVOLVING BRAIN AND SPINAL CORD

BY

HUMPHREY NEAME

LONDON

(Conclusion)

**Report on the specimen submitted by Mr. H. Neame, F.R.C.S.,
to the Pathological Committee***

A PATHOLOGICAL Committee was formed at the meeting of the Ophthalmic Section of the Royal Society of Medicine, for the purpose of examining the sections of this specimen and of reporting thereon.

The Committee have examined the specimen submitted to them and are unanimously of opinion that it is impossible to arrive at a definite conclusion as to whether the growth was primarily intra- or extra-ocular.

The majority of the Committee are inclined to the view that the growth was primarily intra-ocular. The sight remaining good for some time after the appearance of an epibulbar growth is not inconsistent with flat sarcoma of the choroid, of which cases have been reported of long duration without serious symptoms.

Flat sarcomata starting in and spreading along the lymph spaces cause almost uniform thickening of the uveal tract, as in this case. They are also specially prone to extend outside the

* See *Proceedings of the Royal Society of Medicine*, 1922, XV (Sect. Ophth.), p. 22.

globe along the perivascular spaces of such perforating vessels as they may encounter.

If in this case the growth had extended from without inwards one would have expected localized enlargements at the sites of the perforating vessels within the globe.

The fact that the whole of the uveal tract is so extensively and evenly infiltrated they consider strong evidence that the growth was primarily intra-ocular.

One member of the Committee (E. T. C.), on the other hand, can find nothing to contra-indicate the view that the growth started in the lymphatic tissue of the conjunctiva at the limbus, and spread from that situation by centrifugal lymphatic permeation, in a similar way to that which epibulbar epithelioma has been found to do. From the conjunctiva it may have permeated along the veins leading to the canal of Schlemm, and from it to the lymphatic spaces of the uveal tract, giving rise to a flat intra-ocular growth. Extraocularly it may have extended similarly into Tenon's capsule, and from it along the lymphatic channels of the perforating blood vessels into the sclera.

Such a view seems to him more consistent with the clinical recorded observations, the growth having first attracted attention in the epibulbar region, and the failure of vision and other intra-ocular symptoms not having been observed until considerably later.

(Signed)

E. TREACHER COLLINS,
W. T. LISTER,
M. S. MAYOU,
J. HERBERT PARSONS.

Further notes on case of Ocular Sarcoma

F. B. This man was examined again on June 10, 1922. He had the experience of being decidedly weaker than previously. He complained of numbness of the feet and the back of each leg, also of the buttocks and anus. He stated that during defaecation he was not certain as to whether faeces or flatus were passed. He had a similar deficiency of sensation on micturition. The knee jerks were absent; his gait was unsteady, wide-based and with the help of a stick. The left orbit was in the same condition as before, except that there was slightly more discharge on pressure around the scar, which was still unhealed in the centre. The patient was transferred to the London Hospital, under the medical unit, in the immediate charge of Dr. G. Riddoch.

(Admitted to the London Hospital on June 23, 1922.)

On admission, the central nervous system showed the following signs:—

Loss of sense of smell.

Reflexes: Knee jerks not obtained.

Sphincters: Does not wet himself nor soil clothes. Delay in micturition.

Sensation: Definite loss of postural sensibility in toes of both feet.

Muscles: General wasting of both lower limbs, but no local atrophy of muscles.

Loss of power in both lower limbs.

Slight inco-ordination in both lower limbs.

C. S. fluid, examined in the Clinical Laboratory, was of pale yellow colour and contained an excess of protein, and showed a great excess of cells. The nuclei of these cells were much indented and multi-lobulated, and many of them showed irregular mitosis. In the opinion of Dr. P. N. Panton the only possible diagnosis was that of sarcoma⁽³¹⁾.

Blood: Polynuclear neutrophiles	...	72.5	per cent.
Small lymphocytes	...	13.5	„ „
Large „	...	1.5	„ „
Large hyaline cells	...	12.5	„ „
		100.0	

There was a perforation of the hard palate, about 0.5 cm. in diameter, with smooth healed edges. An obturator was present to close this.

On July 24, 1922, there were cramps of both legs. The arms showed slight ataxia. Wasting of both forearms and hands and slight weakness of arms were noted.

On August 26, 1922, the patient had two fits lasting 10 minutes and 5 minutes. He remained unconscious and died on the same day, 3 years and 3 months after the onset of the first symptoms.

At the post-mortem examination was found a grey gelatinous infiltration of the optic nerves, to a slight extent of the basal cisterns and convolutions, and of the third cranial nerves, right and left. There was a similar infiltration beneath the arachnoid membrane over the whole of the spinal cord, which was most marked in the lower lumbar region and cauda equina. There was also a mass of firm gelatinous growth filling the left orbit. There was a perforation of the hard palate, replacement of the body of the ethmoid by grey gelatinous and opaque yellow tissue. There was foul purulent rhinitis, and a rounded mass, about 1 cm. in diameter, in the right testicle. Liver, spleen and kidneys showed no macroscopic involvement.

Pathological examination of a lumbar nerve root

Specimen fixed in Bouin's fluid. Paraffin embedding. Ehrlich's haematoxylin and eosin, v. Gieson and Weigert's iron haematoxylin staining.

Transverse section of nerve root.

There is some spacing of the connective tissue around and between the nerve bundles and also of nerve fibres in the bundles. There is a diffuse infiltration, not very dense, of cells in the connective tissue of the septa. Also to a slight degree within the nerve bundles. Many of the cells are free. They are of various shapes and sizes, with fairly abundant cytoplasm, which takes a well-marked eosin stain (much as the connective tissue fibres).

The nuclei are of varied form and size. They show for the most part a very deeply-stained boundary, deeply-stained nuclear granules, and coarse chromatin threads with irregular spaces between them. Some have a crenated margin and bear a resemblance to those described by Dr. Panton,⁽³¹⁾ which were obtained by lumbar puncture in this case. A few cells show karyomitosis. In this connection the rarity of invasion of nerves by cells of sarcoma or carcinoma may be emphasized, as pointed out by Shattock.⁽³²⁾

The histological investigation of other tissues and organs from the post-mortem examination reveal the following:—

Left orbit. A mass of new growth implicating the optic nerve and surrounding and invading the latter. The cells of the growth lie in the fibrous septa of the nerve and some also within nerve bundles.

Basal cisterns, right temporal and right parietal cerebral cortex, floor of fourth ventricle, cervical cord, thoracic cord, and cauda equina all show infiltration with cells of new growth, particularly marked around the blood vessels.

The sections of the right testicle show a rounded mass of new growth with some haemorrhages in it.

The prostate shows infiltration with similar cells, and abundant haemorrhages.

Part of the ethmoid—decalcified—contains a layer of new growth which extends to the mucosa.

In all these situations the cells are, in the main, of rounded form, with irregularities owing to contact with neighbouring cells. There is fairly abundant cytoplasm to about one third of the diameter of a cell. The nucleus is round, oval or kidney shaped, considerably larger than that of a lymphocyte, and containing two or three darkly-stained nucleoli and coarse chromatin threads.

In the description of the microscopic appearance of the original ocular growth it will be remembered that attention was drawn to

certain points of resemblance between the minute structure of this growth and that of "glioma" retinae—called by some general pathologists "round-celled sarcoma of retina." In the extension of this growth along the nerve structures and its wide spread in the meninges there is a still more remarkable resemblance.

Conclusion

The consideration of this case would not be complete without a revision of the evidence as to the origin of the neoplasm, in the light of the post-mortem findings.

The structures and regions involved were: Eyeball, orbit, ethmoid, brain and spinal cord, testicle, prostate.

The fact that symptoms were not referred to the testicle or to the prostatic region, and that the mass in the testicle was small, and that there was no obvious enlargement of lumbar lymphatic glands at the autopsy is sufficient to allow of exclusion of each of these organs as primary focus.

The probability of origin of the growth in the ethmoid and extension therefrom to the orbit and eyeball is not great. The issue is confused to some extent by the concurrence of tertiary syphilis of palate and nasal cavities.

Arguments against the adoption of a theory of nasal origin are:—

1. The subsidence of nasal symptoms with specific treatment.
2. The long history of presence of swelling on the eyeball—3 years and 3 months from the time of its discovery until date of death—without any obvious exacerbation of nasal symptoms during that time.
3. The central position of the orbital recurrence.

It would seem, therefore, that an ocular origin is fairly established.

Whether the round-celled sarcoma originated in epibulbar tissue or in the uveal tract it was remarkable for its wide extension in the planes of the tissues of the eyeball, for its spread along the meninges of the brain and spinal cord, and for the absence of visceral metastases apart from those in one testicle and the prostate.

The writer expresses his indebtedness to Sir John Herbert Parsons for facilities received for the examination of the patient and for permission to report the case; also to Professor H. M. Turnbull for the free use of the pathological material of the autopsy; and to Dr. P. N. Panton and Dr. G. Riddoch for their assistance.

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