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presented by H. C. Wood Jr

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By CHARLES J. KIPP, M.D., of Newark, N. J.

(With Plate VIII.)

William Coates, æt. 36, a well-built, robust man, residing at 73 Boyden Street, Newark, N. J., presented himself at St. Michael's Eye and Ear Infirmary, Newark, on account of loss of sight in his right eye. He states that he has always enjoyed excellent health, that he has never had syphilis, and that neither of his eyes has ever received any injury. With the exception of his father, who has a large epithelioma of the lower lid of his right eye, no member of his family has been or is now suffering from disease of the eyes or from tumors of any kind. Twelve years ago he first noticed a reddish nodule, of about the size of a pin's head, near the lower pupillary margin of the iris of the right eye, but as it gave him no pain he paid no further attention to it. The growth of this tumor was exceedingly slow till about a month ago; since that time it has, however, grown more than in the preceding twelve years. During the last few weeks he has also noticed a gradual failure of sight, and has occasionally suffered from pain in his right eye.

Present condition.—The left eye presents no abnormality. S. $\frac{20}{20}$. Right eye: The lids and surrounding structures are normal. The mobility of the globe is unimpaired. The conjunctiva and the episcleral tissues are in a healthy condition, and the cornea is perfectly transparent. The anterior chamber is of normal dimensions, and partly filled by a growth (Tab. viii., Fig. 1) of a flesh color, apparently measuring 7 mm. in height, a little more than 5 mm. in breadth, and about 4 mm. in thickness in its upper portion. The tumor appears to be attached to the inner lower quadrant of the iris by a broad base, extending from the pupillary margin to about $1\frac{1}{2}$ mm. from the ciliary margin of the membrane, and projects forwards, upwards, and outwards into the anterior chamber. With the exception of a slit-like space in its upper portion, the pupil is covered by the growth. The lower half of this tumor is of a uniform pinkish color, its anterior surface is slightly covered and perfectly smooth, whilst the

upper half is slightly nodular, of a somewhat lighter color, and studded with numerous minute dark-red points, which, looked at with a magnifying glass, appear to be small extravasations of blood. The upper portion of the tumor is somewhat thicker than the lower, and is in contact with the posterior surface of the cornea, and also, apparently, with the anterior surface of the lens capsule.

The aqueous humor is clear. The iris is in its normal plane, and when it is not covered by the tumor it is normal in color and structure. The upper half of the iris responds readily to the action of atropine. There are no posterior synechiæ visible. After dilatation of the upper part of the pupil, the lens and the vitreous humor are found to be perfectly transparent, and the optic disk, retina, and choroid present the same healthy appearance as in the left eye. The eye is emmetropic. S. $\frac{20}{20}$ after dilatation of pupil. The tension of the eye is normal.

Pain in and around the eye, and lachrymation on exposure to light are the only symptoms of which he complains. His health is excellent.

Believing the tumor to be a primary sarcoma of the iris, which had not as yet given rise to secondary foci, and being convinced of the practicability of removing the growth, with that part of the iris to which it appeared attached, through a large section in the lower sclero-corneal margin, I advised the patient to submit to the operation without delay. After considerable hesitation his consent was given, and the operation performed on the 12th of December, 1873, in the presence of several medical gentlemen, including Dr. H. Knapp, to whom I am especially indebted for advice and assistance in the operation.

Operation.—The patient being under the influence of ether, the point of a very narrow Graefe's cataract knife, with its cutting edge directed downwards and forwards, was entered at the lower sclero-corneal margin, 2 mm. outwards of the vertical meridian, passed through the lowest portion of the anterior chamber, the back of the knife hugging the lower boundary of the tumor, to a point at the inner sclero-corneal junction about 4 mm. below the horizontal meridian, and the section completed by pushing the knife onward. The section thus made being apparently too small to permit the easy delivery of the tumor, the incision was enlarged for about 3 mm. at the inner angle, with a strong pair of scissors. The iris did not prolapse. A pair of iris forceps, with their blades widely open, were now passed into the anterior chamber, as far up as the lower pupillary margin, and a large fold of the iris grasped on both sides of the base of the tumor. Slight traction sufficed to draw both iris and tumor out of the chamber. The operation was completed by cutting off the protruding portion of the iris close to its ciliary margin.

The subsequent treatment consisted in the application of the protective bandage and instillation of a solution of atropine.

On the following day the wound was closed and the anterior chamber restored. Two days later a very slight iritis manifested itself, and continued for about a week, without, however, causing any posterior synechiæ. On the thirteenth day all symptoms of irritation had disappeared, and on examination the sight of this eye was found to be equal to that of his left (S. $\frac{20}{20}$).

The patient was last seen about eighteen months after the operation, at which time the eye was entirely free from disease, and his general health was unimpaired.

The microscopic examination was made after the tumor had been sufficiently hardened in Mueller's fluid. The tumor consisted principally of beautiful, white, spindle-shaped cells, with long thin processes, and of some free oval nuclei. The spindle-shaped cells were finely granular, had each a distinct oval nucleus and a round nucleolus (Fig. 3, Tab. viii.*), and were closely packed in groups, with their long axes directed nearly parallel to each other (Fig. 2, Tab. viii.). The free oval nuclei, which had also each a shining necleolus, were embedded in a scantly homogeneous matrix, and were found exclusively at the periphery of the base of the tumor.

The tumor contained a considerable number of blood-vessels (Fig. 2 and 3, *v*), some of which were quite large. Their walls consisted of a single homogeneous transparent layer. Pigment was present only in limited quantities. It was found mainly at the base of the tumor in free granules (Figs. 2 and 3, *g*), in groups of disks (Figs. 2 and 3, *d*) and in irregular masses (Fig. 2, *p*).

Sections through the base of the tumor showed the neoplasm to be in immediate connection with the pigment layer of the iris (Fig. 2, *u*), except at the outer, lower and inner periphery, where a thin layer of apparently healthy iris stroma intervened between the tumor and the uvea.

The portions of the iris removed with the tumor were normal.

From the above description it will be seen that the tumor under consideration was a true, white, spindle-celled sarcoma. Its

* This drawing was made from a section mounted in Canada Balsam, and does not show the details plainly.

starting-point was in all probability the stroma of the iris. With regard to the causes which produced the growth, nothing is known; the eye had never received an injury, and there was no evidence of sarcomatous disease in any other part of the body.

Cases of sarcoma of the iris are so very rarely seen that it may not be uninteresting to refer briefly to the cases already on record. The first of these occurred in the practice of *von Graefe*, in 1868, and was published by *Hirschberg* in the Archiv f. Ophthalmologie, Bd. XIV. Abtheilung 3, p. 285. The patient was a man 38 years of age. The tumor, which had developed in the course of a year from a congenital pigment spot in the lower half of the iris, was of a dark-brown color, and nearly filled the lower two-thirds of the anterior chamber. Central and eccentric vision were unimpaired. *Von Graefe* made the diagnosis of malignant growth of the iris, and enucleated the eye. The patient was last seen five months after the operation, at which time there were no signs of a relapse in the orbit, and his general health was good. The microscopical examination made by *Hirschberg* proved the tumor to be a pigmented spindle-celled sarcoma, which had probably developed from the middle layer of the iris. With the exception of the lower half of the iris, from which the tumor grew, all parts of the eye had preserved their integrity.

The second case of this disease on record was published in the early part of 1874, in these Archives (Vol. III., Part 2, page 106), by *Drs. A. Robertson*, of Edinburgh, and *H. Knapp, of New York*.

The patient, a healthy-looking woman, 24 years of age, was admitted under Dr. Robertson's care in the ophthalmic wards of the Royal Infirmary, Edinburgh, on June 29, 1871. Fourteen months before that time she had had a slight painless inflammation in the right eye, of short duration. Six months later she had occasional attacks of severe pain in right eyebrow and temple. Two months after this she accidentally discovered that the sight of the right eye was greatly impaired. On admission the *left* eye was found to be normal. In the *right* eye the pupil was larger than in the left, and immovable. In the upper and outer part of the iris, and at its junction with the ciliary ligament, was an oval, brownish tumor measuring $1\frac{3}{4}'''$ in length by $1'''$ in breadth, and extending downwards from this tumor, keeping to

the ciliary margin of the iris, there was a chain of three other similar tumors about ½‴ in diameter. The patient could hardly distinguish bright light from darkness. T. + 2. With the exception of a deep glaucomatous excavation of the disk, the fundus presented nothing abnormal. Dr. Robertson viewed the case as one of melanotic sarcoma of the iris, and enucleated the eye on July 4, 1871. Two years after the operation there were no signs of a return of the disease. The eye was examined by Dr. *Knapp*, who found all the coats of the eye, except the iris, in a healthy condition. The posterior and middle layers of the iris were unchanged, but the anterior layer was thickened and studded with small oblong and round tumors. Sections through the larger tumors disclosed a uniform, cellular, extremely vascular texture in immediate contact with the pigment stratum. The structure of all the tumors consisted of densely crowded, small, round, and oval cells, or nuclei, surrounded by scant protoplasm, embedded in a homogeneous matrix. The pigment, which was very scant in the smaller nodules, but conspicuous in some parts of the larger tumors, was found in isolated granules, in clusters of small disks, and in round and irregular forms.

The third case on record is described in the *London Lancet*, of January 16, 1875, page 82, by *Dr. J. Dreschfeld*, of *Manchester, England*. The patient, a woman, aged 53, was under the care of *Dr. David Little*. The tumor had developed in the course of about two years and a half, and its growth had been attended by repeated hemorrhages into the anterior chamber. It was of a reddish-gray color, about the size of a split pea, and was situated in the lower half of the iris of the left eye. As the eye was painful, its sight impaired, and the intra-ocular tension increased (T. + 2), Dr. Little enucleated the eyeball in the latter part of July, 1874. Of the subsequent history of the case no mention is made in the report. The anatomical examination showed the exterior parts of the eye to be normal. On making a vertical section of the eye, the mass filling the lower half of the anterior chamber was found to be a small tumor, in section whitish, soft, and granular. It was bounded anteriorly by the cornea, to which it was firmly attached ; posteriorly to the pigment layer, which it had left intact ; inferiorly by the ligamentum pectinatum, which appeared also quite normal ; the superior boundary of the tumor

was free. The ciliary body below was pushed back a little, and with it the lens, the anterior and lower part of which was opaque. The upper half of the iris and all the other parts of the eye were normal. Thin sections at different regions of the tumor showed it to be composed of two parts. The one less transparent consisted of white spindle-shaped cells, with a large well-defined nucleus, and a highly refractive nucleolus. There was hardly any intercellular substance between them. The other more transparent portions, forming round or oblong islets, surrounded everywhere by the spindle-cells, from which, however, they were separated by a layer of pigment, proved to be cells of organic muscle. Besides these elements there were small blood-vessels and masses of pigment in all parts of the tumor. When the tumor had abutted against the cornea, the posterior epithelial layer of the cornea had disappeared, fat granules filled up the interior of the corneal corpuscles, and were also found free in the inter-lamellar spaces. Dr. Dreschfeld is of opinion that the tumor originated in the intermuscular tissue of the iris.

From the above it will be seen that the treatment pursued in all of the recorded cases, except my own, was that of enucleation of the eyeball. At the time I operated on my patient's eye I was not aware that a sarcomatous tumor of the iris had ever been excised, but since then I have learned from *Prof. Arlt's Operationslehre* (*Handbuch der Gesammten Augenheilkunde, redigirt von Prof. A. Graefe und Prof. Th. Saemisch*, Band III., Cap. II., page 420, published in 1874), that he knows of two cases in which such tumors were removed by a procedure analogous to an iridectomy. No history or description of the cases is given, but it is stated that they were last seen five or six weeks after the operation, and that at that time there were no signs of a relapse.

Fig. 1.

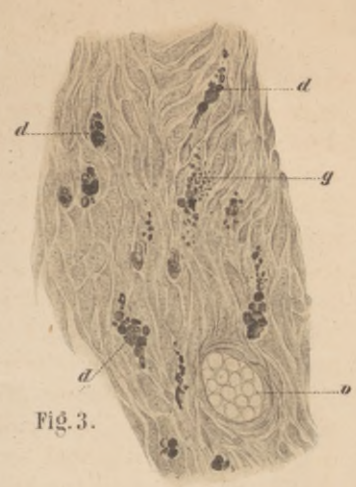
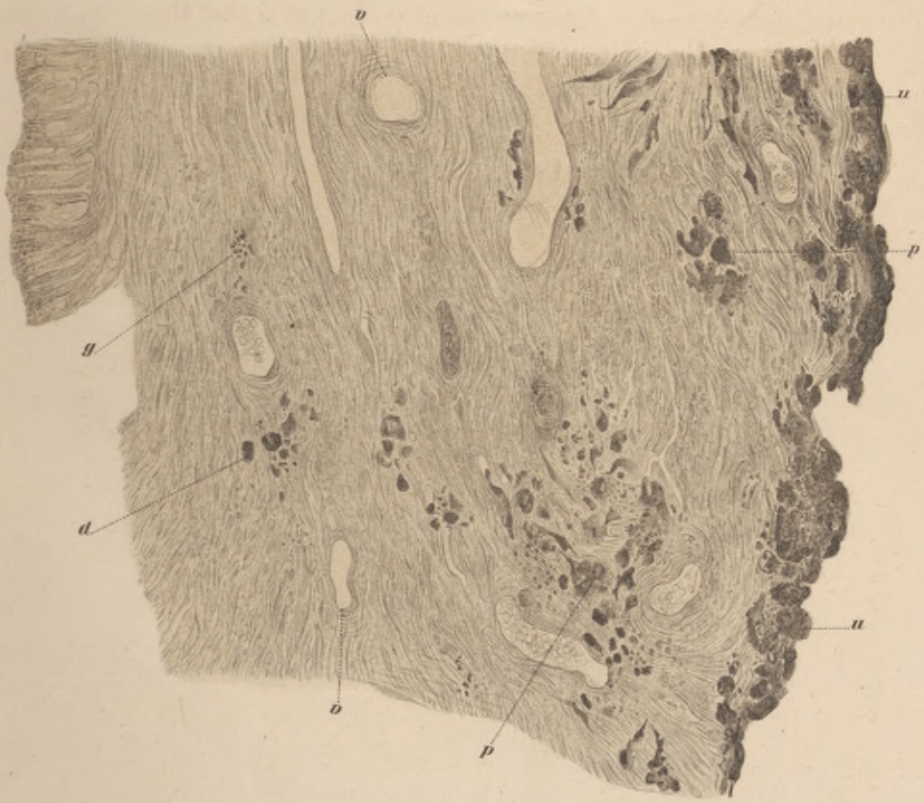


Fig. 3.

Fig. 2.



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