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A CLINICAL AND HISTOLOGIC STUDY OF A  
CASE OF EPITHELIOMA OF THE CORNEO-  
SCLERAL JUNCTION.

BY

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(With 3 drawings on text-plate III.)

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FIG. 1.



FIG. 3.



FIG. 2.

# A CLINICAL AND HISTOLOGIC STUDY OF A CASE OF EPITHELIOMA OF THE CORNEO- SCLERAL JUNCTION.<sup>1</sup>

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*(With 3 drawings on text-plate III.)*

On the 30th of October, 1895, J. S., a sixty-nine-year-old laborer was referred to my clinic at Wills Eye Hospital by Dr. James D. Madeira of Reading, Pa. The patient stated that one year previously, without any history of traumatism, a "small pimple" appeared at the lower outer corneal border of the right eye; the growth, which had been painlessly though slowly and steadily increasing in size, having been repeatedly cauterized by caustics for several months previous to his first visit.

As can be seen in Fig. No. 1, reproduced from a water-color sketch made at the time by Miss Margaretta Washington of this city, there was a fleshy and wart-like-looking mass about the size of a large pea, embracing an area equal to almost the lower outer quadrant of the cornea. The growth seemed to start from a broad base in the conjunctiva just beyond the corneo-scleral margin. It was highly vascular in places, and its surface, which was rough and irregular, seemed to be infiltrated with sago-like particles. Running along the base, upon the conjunctival level, there were numerous vascular twigs which connected with several engorged conjunctival vessels. The conjunctiva in this region appeared, upon careful focussing with strong illumination, to be permeated with offshoots and narrow prolongations from the growth itself.

<sup>1</sup> Read before the November, 1896, meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia.

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The cornea beyond the area occupied by the tumor was transparent, the pupil was round, and the iris was unaffected and mobile. Intraocular tension was apparently slightly increased. The eye-ground revealed no gross changes. Vision was reduced to three-fortieths of the normal.

The left eye, with the exception of hyperopia and presbyopia, was unaffected in any way.

The patient was admitted to the hospital and the tumor-mass was removed. The involved portions of the conjunctiva were excised, the entire denuded area being lightly though effectually cauterized by heat. The scarification and cauterization were carried as far around the limbus of the cornea as there seemed to be any blood supply to the tumor-area. A few drops of a weak solution of atropine were instilled and the field of operation was covered with several turns of a roller bandage.

Two days later the entire area of denudation seemed to be covered with a thick and whitish membrane, and the burned points were granulating. The pupil was evenly and almost fully dilated. The eyeball and lids were freely mobile, and there was no pain.

*Microscopic examination* of some of the removed portions of the growth showed that it was epitheliomatous in character.

The patient was allowed to return home with the request to report in about two months' time.

On the 31st of January, 1896, he came back to the hospital, when it was found that the growth had assumed a size which was somewhat greater than before, and the conditions were apparently more malignant than when he was first seen. He was admitted to the hospital, and with the assistance of my colleague, Dr. George C. Harlan, every vestige of the mass was shaved from the underlying cornea and sclera with a Beer's knife, the raw surface left being situated deeply in the corneal lamella. All of the related blood-vessel stems were excised and their tips cauterized as freely as possible. During this operative procedure, as well as during the first operation, there was almost constant oozing of blood as the successive layers of the growth were excised, this at times being so pronounced that it was impossible to get any view of the field of operation. The tumor-mass itself seemed to be composed of a densely packed and friable material very similar to that seen in papillomatous formations.

The eye was dressed in the same manner as was done at the first operation.

Two weeks later, when the exposed corneal membrane became covered with thin layers of almost transparent epithelium, corrected vision rose to one-sixth of normal ( $\frac{5}{30}$ ).

In spite of these two radical procedures the mass again recurred until, in four months' time, it had become so great in size and so angry in appearance that in spite of the good vision it was determined to sacrifice the organ.

On the 27th of May, 1896, the eye was enucleated whilst under the local anæsthetic influence of hydrochlorate of cocaine, this being necessary on account of gross organic cardiac and renal disease. The patient was very weak and feeble. During the operation he did not express any discomfort until the optic nerve was severed, when he experienced a slight deep-seated painful sensation without the appearance of any phosphenes. The operation was performed as quickly as possible, I being assisted by my house surgeon, Dr. D. E. Esterly. All of the doubtful portions of the bulbar conjunctiva left after the eyeball had been removed, were looked over with a strong magnifying lens and freely excised, leaving only those parts that were apparently uninvolved. The patient was profoundly shocked, requiring the free use of whiskey and aromatic spirits of ammonia after the operation. The cavity was thoroughly cleansed with bichloride solution and closed with gauze, cotton, and a roller bandage.

In several days' time a deep and well-formed socket was obtained. The patient was discharged from the hospital a few days later.

At the present writing, April 1, 1897, there are no signs of recurrence.

The specimen (see Figs. 2 and 3 the originals of which were made for me by my friend and assistant Dr. ~~George~~ *Mar* E. Gillespie) was then carefully cut by my friend, Dr. Ada Howard Audenried, of this city. Study of them shows the characteristic polynuclear cell-formation with numerous uncovered epithelial nests which at places fuse and sink into the deeper corneal and scleral layers and the surrounding tumor structures. The external epithelial layers plainly dip into the surface-fissures of the tumor-mass. After a most extended and painstaking search, no appearance of any basement membrane can be found—thus proving the epitheliomatous character of the growth.

*Remarks.*—From a clinical standpoint the case is most in-



teresting. Commencing as a "pimple" in the epithelial structures of the conjunctiva at the transition-border between the cornea and sclera, as is almost universal in such cases, it gradually and painlessly increased in size until it assumed the papillomatous variety of epithelial growth. It then extended into and beneath the epithelium of the cornea far in towards the summit of the membrane. In other words, the tumor-mass evinced its development and growth in a manner that is eminently characteristic of epitheliomatous formations.

The quick recurrence and steady increase of the growth in defiance of the extreme radical measures employed for extirpation, plainly evidenced the necessity of removal of the entire field of malignancy. The almost uncontrollable oozing of blood experienced during the operative procedure plainly showed the extreme vascularity of the neoplasm.

Microscopically, the specimen is exceedingly instructive, not only by reason of presenting the characteristic appearance of epitheliomatous formation in the region involved, but upon account of the undoubted protrusion of the epithelial cells into the interlamellar corneal spaces (which possibly might have been produced or rendered more easy by the operative procedures pursued in the early stages of the disease), and the insertion of the same form of malignant cells into the superficial layers of the sclera (layers which were untouched by operation), but is also of interest in substantiating the view that the deepest penetrations of the epithelial cells into the outermost tunics of the eye are in the transition zone between the cornea and the sclera—that is, at the cornea-scleral junction.

*Explanation of the Drawings on Text-plate III.*

FIG. 1.—Macroscopic appearance of the tumor at the corneo-scleral junction.

FIG. 2.—Microscopic section showing position and extent of the growth.

FIG. 3.—Microscopic section showing infiltration of epithelial cells into the corneal lamellæ.





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