

Argyrosis of the conjunctiva and lachrymal sac following the prolonged instillation of a five per cent solution of protargol : microscopic examination of the excised sac / by G. E. de Schweinitz.

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Argyrosis of the Conjunctiva
Sac following the Perforation
of a Five Per Cent. Nitro-Cellulose
target—Microscopic Examination
of the Excised Tissue

By G. E. DE SCHWEITZ
PHILADELPHIA

[Reprinted from Transactions American Ophthalmological Association]

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Argyrosis of the Conjunctiva and Lachrymal
Sac following the Prolonged Instillation
of a Five Per Cent. Solution of Pro-
targol—Microscopic Examination
of the Excised Sac.

By G. E. DE SCHWEINITZ, A.M., M.D.,
PHILADELPHIA, PENN.

[*Reprinted from Transactions American Ophthalmological Society, 1903.*]



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ARGYROSIS OF THE CONJUNCTIVA AND LACHRY-
MAL SAC FOLLOWING THE PROLONGED IN-
STILLATION OF A FIVE PER CENT. SOLUTION
OF PROTARGOL—MICROSCOPIC EXAMINA-
TION OF THE EXCISED SAC.

By G. E. DE SCHWEINITZ, A.M., M.D.,

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A number of microscopic examinations of the conjunctiva from cases of argyrosis, or argyria, have been made, and it is well known that silver is deposited there in the form of an oxid or an albuminate, especially on the elastic fibers. So far as I am aware, however, microscopic examination of the lachrymal sac under these same circumstances has not been reported, and therefore a brief reference to the case described in the title of this paper may not be uninteresting.

A married woman, aged 33, applied for treatment in the Eye Dispensary of the University Hospital on August 10, 1901, and gave the following history: She had always been a healthy woman, except that four years prior to her visit in a difficult labor complicated by placenta prævia she had lost a great quantity of blood. From this accident she seems to have recovered entirely until three months before her visit to the hospital, when she began to manifest the symptoms of lachrymal obstruction. It is probable, however, that nasal-duct stricture had existed for some years prior to this date and that what she really suffered from at that time was an acute exacerbation in the form of a dacryocystitis. The duct had been slit at some other hospital, and the usual treatment of passing probes carried out. This was continued at the University Hospital and the patient given a 5 per cent. solution of protargol and instructed to report daily

at the dispensary. She failed to follow these directions and did not again visit the dispensary until eight months later, in the meantime having daily instilled the protargol solution into the right conjunctival sac. A pronounced argyrosis of the conjunctiva of the right eye was evident. The protargol was discontinued and the duct probed from time to time.

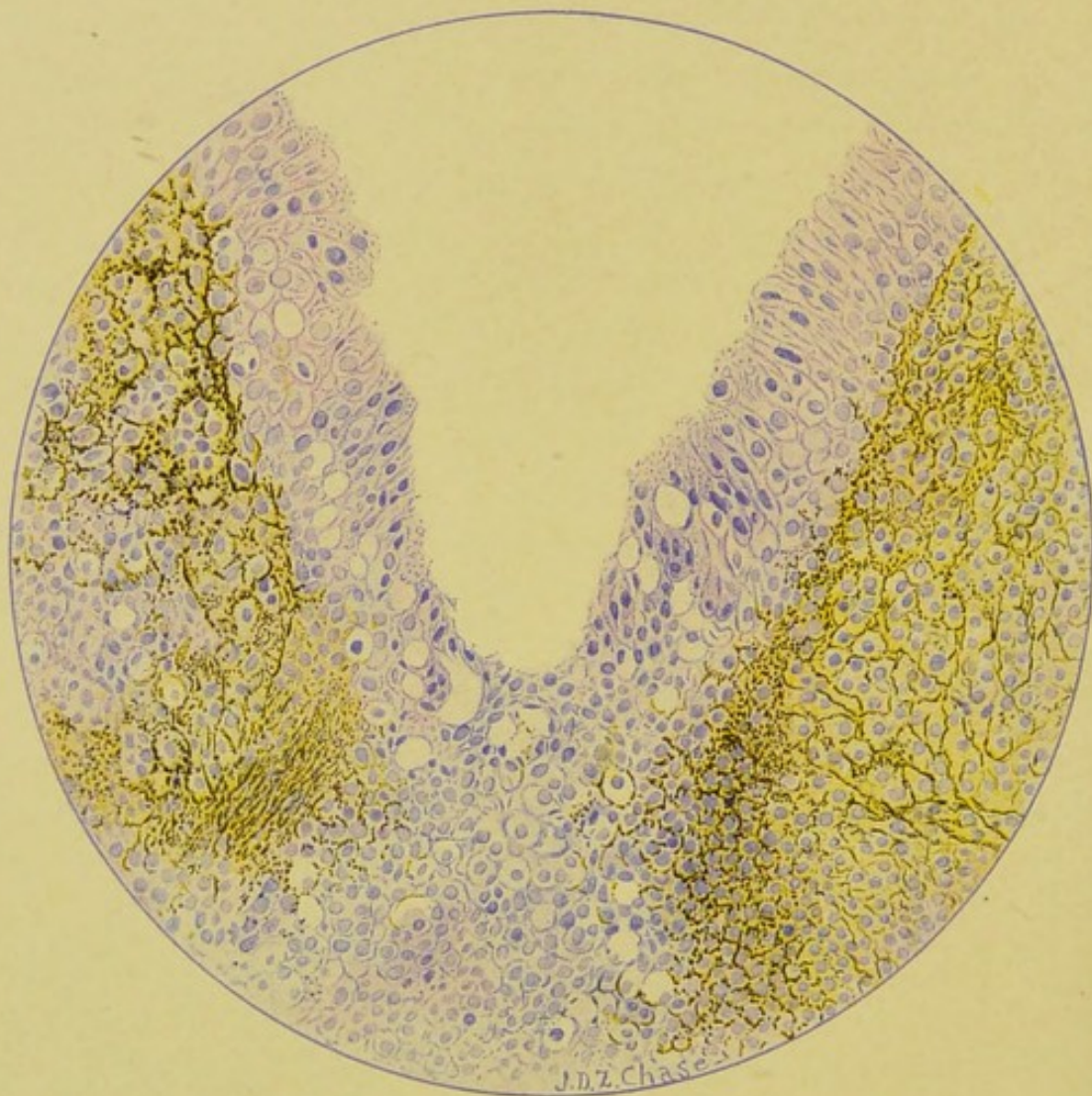
When I took charge of the service in October, 1902, I found this patient with the following conditions: Vision of the right eye 6/30, of the left eye 6/15, myopia of 3D., a conus surrounding each optic nerve, and general choroidal disturbance. From the right lachrymal sac pus exuded freely, and the conjunctiva was stained in the most remarkable manner. Up to the very margin of the lid, both bulbar and tarsal conjunctivæ were deeply pigmented, the pigmentation of the retrotarsal folds being almost chocolate in color, while that of the bulbar conjunctiva was a yellowish-brown. The caruncle was deeply colored, as was also the slit canaliculus. The palpebral edges were free from the stain.

She was admitted to the hospital January 21, 1903, and on the following day the lachrymal sac was excised. Its exposure was unusually easy, as it presented itself after the ordinary dissection as a densely pigmented sac, almost bluish-black in color.

After hardening in formalin serial sections were made, for the preparation of which I am indebted to Dr. E. A. Shumway, and the following lesions found:

The pigment is not deposited in the epithelium, but in the submucous tissue along the elastic fibers which make up the meshes of the tissue. The epithelium lining the sac consists of tall cylindrical cells, below which two rows of polygonal cells are evident resting upon a basement membrane. The latter is densely covered with the pigment patches. In addition to uniform incrustation around the elastic fibers, some pigment grains are deposited free in the tissue, although many of the apparently free particles should be regarded as cross sections of the incrustated fibrils. The pigmentation extends to a depth of three-quarters of a millimeter below the basement membrane and out-





ARGYROSIS OF THE WALL OF THE LACHRYMAL SAC. INCRUSTATION OF
THE ELASTIC FIBERS WITH THE SILVER SALT.

lines the meshwork of the tissue with beautiful distinctness. The surface of the sac is denuded in many places and the number of lymphoid cells greatly increased, so that the wall of the sac is greatly thickened and all structures of the submucous tissue obscured. In addition to the pigment around the elastic fibers, it may be seen outlining the inner wall of the capillaries. It is brownish-yellow by transmitted light. The accompanying drawing by Mrs. P. P. Chase very accurately illustrates the lesions which have been described.

The whole subject of the clinical and anatomical investigation of argyrosis has recently been reviewed by Hoppe.* He found in his case that the epithelium was practically free from pigmentation, an observation which corresponds with that made by Grossmann,† who failed to observe any trace of pigment in the epithelium, the coloring being exclusively confined to the elastic fibers. Hoppe further notes that in the already well-known manner the elastic fibers were colored and also the cement substance of the muscle cells of the vessel walls. In addition, there were found coarse granules scattered throughout the tissue, and by the application of concentrated sulphuric acid the pigment became free and changed into yellow granules, although it was not mechanically isolated from the tissue elements to which it clung. In general terms, the coloration consisted of a fine granular precipitate of albuminate of silver, which appeared at or after the diffusion of the nitrate of silver lotion through the epithelial layer, and as soon as it came in contact with the alkaline tissue fluid. Gradually pigmentation of the superficial layers took place by a process of reduction.

As is evident from the specimens which I have exhibited and the description which I have given of them, the same condition of affairs applies to the present instance, and the process of staining in the lachrymal sac, as well as the method of the deposition of the pigment, is the same as in the conjunctiva. Moreover, this occurred under the action of protargol and not

* *Archiv. f. Ophth.*, 48, 1899, p. 660.

† *Ophthalmic Review*, Vol. VII, 1888, p. 167.

under that of nitrate of silver. Therefore the two in this respect are identical in their effects.

It may not be out of place to call attention to the fact that there seems little doubt that protargol is capable of very rapidly, perhaps more rapidly than nitrate of silver, producing argyrosis. This is doubtless true because it may be used with such freedom as a lotion, as it is almost unirritating in its qualities. The practice of allowing patients to have solutions of this character is greatly to be deprecated.

Pergens* has called attention to the danger of protargol from this standpoint, and has observed argyrosis after fourteen weeks' use of this medicament. He also quotes the observations of other surgeons. Exactly how long a time elapsed before staining of the conjunctiva began in my patient I cannot say, but probably not more than three or four months, and I am quite sure that I have seen cases in which the duration has been a much shorter time than this. In our own country Dodd† has directed attention to the ease with which protargol may produce argyrosis in cases of trachoma.

DISCUSSION

DR. PERCY FRIDENBERG. — I would like to say that nitrate of silver makes a very similar stain in the lens. I examined a number of sections a few years ago and found just the condition that Dr. de Schweinitz describes; that the epithelium was not changed, but the incrustations were shown in the fibrous structure, and the striæ of the lens star could often be demonstrated.

* Monatsbl. f. Augenheilk., 1903, p. 256.

† Ophthalmic Record, Vol. X, 1901, p. 47.

