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*Compliments of
Dr. Keyser*

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COCAINE IN OPHTHALMIC SURGERY.

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IT IS NOT always pleasant to call a halt; but as a cautionary measure it is often necessary, for thereby many disasters are prevented. Such is the position I feel now compelled to take as regards the free and ready use of cocaine in the eye for all and every operation.

When it was first introduced as a local anæsthetic in the eye, I procured some of a 2-per-cent solution of Merck's salt of the hydrochlorate and like all others, was perfectly delighted with it in a few minor operations that I made after its instillation. But finding that it did not appear to be sufficiently strong to extend its action deep enough for tenotomy in strabismus, I got some of the salt itself from Mr. L. E. Sayre, Pharmacist, of this city, and made a 4-per-cent. solution. I found that everything went well with this—in so far that during the operation there was

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no pain—but in more or less all of the cases there was pain, and quite severe pain at times, soon after the operation, which continued for some length of time—until I came to cataract operations, when affairs took a different turn and arrested my ardor in its use.

On Nov. 13th last my colleague at the Wills Eye Hospital, Dr. Strawbridge, used it in an eye on which he made extraction for cataract, and in less than twelve hours after there was panophthalmitis developed. He called my attention to it, wondering if it could have been caused by the cocaine. But at that time, never having had any bad luck with it, nor having heard anything unfavorable in its use, I really thought it could not have had any bad effect in the operation and so informed him; believing that it was one of those unfortunate cases that sometimes, but rarely, occur in the operations for cataract by V. Graefe's method. I still went on using it with happy results in strabismus, iridectomy, etc., but not without pain in enucleation, but less when injected under the recti muscles and back of the ball and along the optic nerve, until Dec. 13, 1884, when I made at Wills' Eye Hospital two extractions as follows, with very bad results:

Caroline Baur, æt 59, a healthy, well-nourished woman; double cataract. R. E., 6 years duration, L. E., 1 year. At 2:30 p.m.

three drops of a 2-per-cent. solution of the hydrochlorate of cocaine, made by Mr. L. E. Sayre, pharmacist, from the pure salt made by Merck, Darmstadt, were instilled. At 3 p.m. three drops again, and at 3:05 o'clock one drop, after which the operation was made perfectly and no mishaps of any kind. The vision was good, fingers counted promptly. There was not the least pain experienced during the operation.

That night at 1:30 a.m. pain had set in, and became so severe that the nurse called the resident surgeon of the hospital, Dr. Geo. T. Lewis, who found some purulent discharge coming from between the lids, slight œdema of the lids with marked injection and swelling of the ocular conjunctiva and cornea infiltrated. Hot water was applied, giving temporary relief. At 3 o'clock a.m. he found pain and all the other symptoms more marked. Hot water applications did not give relief, so he gave one-eighth grain of sulphate of morphia by the mouth. At 10 a.m. I saw her and found a strong, well-developed panophthalmitis, and ordered an instillation and wash every three hours of a solution of hydrarg. bi-chlor. corros. gr. $\frac{1}{8}$ to $\frac{5}{3}$ i water, and hot water (104° F.) fomentations on the eye three times daily for 15 minutes at a time.

12, 15, 1884. Lids more swollen, ocular conjunctiva slightly less injected, the cornea more extensively and more densely infiltrated.

12, 16, 1884. Less pain in the eye, being more on the top of the head than in the eye. Swelling about the same.

12, 17, 1884. Swelling receding—that is, not such tension; pain still in the head.

12, 18, 1884. Swelling still less, and from this time gradual recession went on to atrophy of the ball.

On the same day and a few minutes after, I operated on John Cull, æt 18, for traumatic cataract and anterior synechia which was causing sympathetic irritation. The cocaine was of the same strength and instilled at the same intervals as in that of the above mentioned case, Caroline Baur. The incision of the cornea was made without pain, and anterior synechia cut loose and the lens-mass let out. The operation went well and vision good. After the operation, exactly the same inflammatory action took place as in the former case.

By 1:30 a.m. that night it was necessary to call the resident surgeon to him, and coming from Mrs. Baur he found the same condition of panophthalmitis. I saw him also at 10 a.m., and ordered the same treatment as in my first case.

On the 17th the swelling was so intense and the pain so great that I found it necessary to split the lower lids to relieve the pressure it was exercising across the cornea and ball. This operation gave him relief.

In both of these cases panophthalmitis set in about ten to eleven hours after the operation, just as in Dr. Strawbridge's case. This naturally called my attention to the fact that the cocaine might have been perhaps the cause in all these cases from the sudden reaction of the vessels which takes place after its use.

My friend and former pupil, Dr. S. S. Koser, of Williamsport, Pa., was in my clinic shortly after the above occurrences and informed me of his bad luck with cocaine as follows:

Dec. 1st he made an iridectomy for occlusion of the pupil, using a 4-per-cent. solution of cocaine as a local anæsthetic, and had panophthalmitis in ten or twelve hours after. On the same patient he had made a few weeks previously, a successful operation for an artificial pupil on the other eye without cocaine.

I noticed in my cases that the inflammation arose just or much like that after the use of the jequirity in trachoma, excepting that there was more swelling of the ocular conjunctiva, and even more so and somewhat different from that in panophthalmitis traumatica. In the latter the inferior part of the bulbar conjunctiva is much more swollen than the superior part, which really has very little swelling at first, being only well and fully injected, while in the cases after the use of cocaine the superior part of the conjunctiva was as much swollen

as the inferior. This whole œdematous condition of the bulbar conjunctiva was especially marked; more so than in anything I have seen. Dr. Lewis says that he noticed the same in Dr. Strawbridge's case. This may be pathognomonic of the action of the cocaine in the inflammation which may occur in the reaction that takes place from the blanched condition of the vessels and tissues caused by its use.

I would not have thought anything about the cocaine causing any trouble had only one case of mine gone badly, but when the two, an old but healthy person and a strong, vigorous, healthy young man, and both operated on the same day under like circumstances, were affected exactly alike and in the same stage of time, I was forced to consider not only my own but also Dr. Strawbridge's case again and compare them carefully, and send a line of caution to the profession.

In no paper upon the subject have I as yet seen any suggestions of the physiological action of the drug. From my observations I think that it no doubt paralyzes the nerves of the vessels, causing at the same time a constriction of the same as seen by the blanching of the part acted upon. It may also interfere with the sympathetic system and nourishment of the tissue, and then the reaction which takes place after its use is too sudden, and congestion and inflammation oc-

curs. It may be that coagulation of the blood takes place in the vessels and inflammatory action may arise therefrom. A case showing the sudden reaction and filling of the vessel came under my observation in an operation for cataract by my assistant, Dr. Frank Fisher, a few weeks ago. A preliminary iridectomy was successfully made, without cocaine six weeks before the time of extraction of the lens, and when the lens was to be removed I went with him in consultation and dropped in a 2-per-cent solution of the cocaine three times before the operation. The cornea was opened, capsule lacerated and lens delivered without the least mishap or a drop of blood to be seen. The next day on examining the eye the anterior chamber was nearly half filled with blood. There was no pain during the operation, but after an hour some pain took place for a while and then passed away. The eye did well, although the hypæmia was a considerable time in being absorbed. I know from experience on myself in rectal fissures that there is more and longer pain after its use than when treated without it.

The solution of cocaine I used was comparatively fresh, being only a few days old, and under the microscope showed in a little mould that soon had formed, nothing deleterious in the least. My friend, Dr. Carl Seiler, was kind enough to examine it with me and

found no micrococci to cause the inflammation.

I have had but seven cases of personal observation of its use in extraction of cataract and in three of these panophthalmitis took place, and in one a hemorrhage in the anterior chamber almost immediately after, which is to my mind rather a bad showing in its favor in this delicate operation, and rather intimidates me in its use in these cases, and in iridectomies, although as yet my iridectomies have done well.

As a local anesthetic in the removal of foreign bodies from the cornea, strabismus and such external operations, I know of nothing equal to it. But I would be very careful in its free use where the cornea is opened and the iris incised.

While writing this article I learned of two other cases of panophthalmitis occurring after its use, but have not had time to get the particulars.