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TRAUMATIC PROLAPSE OF THE IRIS AND ITS TREATMENT.[1]

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EVIDENTLY no single rule of surgical conduct is applicable to each case of traumatic prolapse of the iris, and for the sake of convenience, as well as for therapeutic consideration, these lesions may be considered from the regional standpoint, *i.e.:*

I. *Cases of Prolapse of the Iris Through Wounds at or near the Corneoscleral Junction, Forming the Well-known Pouch-like Hernia.*—If seen early, that is before the anterior chamber has been reformed, owing to closure of the wound by adhesive inflammation, three courses are open to the surgeon:

1. Replacement of the prolapsed iris and the management of the case in the ordinary manner with pressure, bandage, and rest; or, in the event of failure,

2. Abscission of the prolapsed iris, precisely as in the operation of iridectomy.

If either after replacement or abscission the wound shows a tendency to gape, or is not neatly coapted, and hence the danger of reprolapse is rendered likely, the wound may be closed with one or more delicate silk sutures.

[1] Read before the Ophthalmic Section of the New York Academy of Medicine, April 19, 1897.

3. Compressive bandage, rest, etc., without manipulation or abscission of the iris.

Although the advice to replace the prolapsed iris, if possible, is always given, and properly so, in point of fact the opportunities to accomplish this maneuver successfully are comparatively rare, and hence practically the choice lies between an operative and non-operative procedure.

Eyes with this lesion treated without surgical interference, and which heal without infective inflammation, present an adherent peripheral leucoma and an oval, mobile pupil, and have good vision. Sometimes, indeed frequently, healing proceeds without signs of reaction; at other times there is iritic and ciliary irritation, and withal the nuisance of prolonged bandaging and protracted convalescence.

Eyes with this lesion successfully treated by abscission, with or without a stitch, according to the indications, heal with comparatively little scar and present a narrow keyhole-shaped, mobile pupil and non-adherent iris. The time required for cure, as compared with cases treated upon conservative principles, is short. An illustrative case is the following:

Case I.—A laborer, aged twenty-four, was struck in the right eye with a chip of wrought iron, causing a small, irregular wound, beginning directly at the corneoscleral junction in the upper and inner quadrant, and passing irregularly inward across the ciliary region for a distance of one centimeter. When examined, nine hours after the accident, the tension was minus two. Through the wound in the corneoscleral junction protruded a mass of iris and blood-clot and the face of the iris (the anterior chamber was empty) was covered with a large blood stain.

Vision amounted to counting fingers at six inches. A red reflex was visible from the eye, but the details of the fundus could not be seen. After sterilization of the conjunctival sac with repeated forced flushings with a saturated boric-acid lotion, the lips of the wound were separated and all prolapsed iris and adherent clot abscised, in precisely the same manner as when the operation of iridectomy is performed. With a flat spatula, the edges of the coloboma were carefully smoothed and the incision in the sclera neatly coapted. A drop of atropin was instilled, a light, sterile bandage applied, and the patient put to bed with the following directions to the nurse: One-sixth of a grain of calomel every two hours; continuous iced compresses to the injured eye, these compresses being placed upon the folds of the gauze bandage; and rest as much as possible in the dorsal position. In forty-eight hours the wound was closed and the anterior chamber restored. At the end of ten days the patient was dismissed with a neat coloboma upward and inward, a healed corneal wound, an iris of normal color, the media clear, and vision $\frac{20}{50}$ without correcting lens. With correction of the acquired astigmatism, which will lessen, vision became still better.

This is a type of many similar cases, and represents a common experience. I cannot understand what advantage, under these circumstances, a non-operative treatment would possess.

If the case is seen late—that is, after the anterior chamber has been reformed owing to the closure of the wound by adhesive inflammation—two courses are open to the surgeon: (*a*) Compressive bandage, etc., *i.e.*, non-operative, or so-called conservative measures. (*b*) Abscission of the prolapse, freeing of the wound from adherent and incarcerated iris, paring

the wound-edges, and uniting them with a suture; or, if no suture is used, allowing the wound to unite under a compression bandage. Personally, I am governed by the following considerations in the management of this class of cases: If there are no threatening symptoms and no increase in the size of the prolapse, I leave it alone; if, however, there arise irritation from bandaging, ciliary congestion, and increase in the protrusion in spite of pressure, I abscise it, and, in recent years, close the wound with a suture. The following is a case in point:

Case II.—Joseph P., an Italian laborer, aged about thirty-five, came to the Jefferson Medical College Hospital on May 29, 1896, with a small wound in the lower corneoscleral junction, through which there was a pear-shaped protrusion of the iris and sufficient adhesive inflammation to have closed the wound and restored the anterior chamber. A small amount of ciliary irritation surrounded the lesion. Vision equalled $\frac{20}{100}$. The media were clear and the fundus normal. In spite of a pressure bandage, the iris protrusion continued to grow; hence it was abscised, the edges of the wound pared, two silk sutures introduced, and the patient kept in bed for two days. He was dismissed at the end of the third day with a healed wound, restored anterior chamber, and ovoid pupil, such as one sees in a narrow, downward iridectomy. He continued as an out-patient until the wound was free from irritation, and was not again seen until February, 1897, nearly a year after the original accident, when his eye was perfectly quiet, the scar scarcely detectable, and the vision $\frac{20}{30}$ with correcting glass.

In a number of cases treated by abscission of the prolapse and suture of the wound, I have never seen

anything but good results, except in one instance which represents an unusual but not impossible complication. The case has already been reported,[1] but may be briefly referred to :

Case III.—On the 28th of February, 1896, a girl aged three and a half years, was brought to the Jefferson Medical College Hospital for traumatic hernia of the iris. The child had received an injury of the right eye from a pair of sharp scissors at the corneoscleral junction, through which there was an extensive prolapse of the iris. There was little irritation and the anterior chamber had been restored, but as the prolapse appeared to be increasing, it was abscised. The operation was followed by a smart hemorrhage which filled the anterior chamber. A pressure bandage was applied and the child was put to bed. At the end of twenty-four hours, absorption of this blood had taken place, but partly owing to the extreme restlessness of the patient, successive hemorrhages occurred, and when she was dismissed from the hospital three days later, at the request of her parents, although contrary to our advice, the anterior chamber was so full of blood that all underlying tissues were obscured. One week later there were distinct symptoms of cyclitis, a fine flush surrounding the corneal margin. Under atropin and the internal administration of small doses of calomel this condition subsided. In fact, the cyclitis disappeared, in spite of the fact that in the meantime the child was attacked with measles and passed through the ordinary phenomena of this exanthem. As early as the tenth day after the operation, and very markedly after the attack of measles, we began to notice a discoloration of the cornea. This increased until there was typical blood-staining of the

[1] *Philadelphia Polyclinic*, September 5, 1895.

cornea, which caused this membrane to assume a greenish-brown color, with the exception of a small rim, two millimeters in diameter at its circumference.

There is little doubt that the hemorrhage following the abscission of the iris was responsible for the blood-staining of the cornea. Whether the condition would have healed promptly and favorably without operative interference is a matter of pure speculation.

II. *Cases of Prolapse of the Iris Through a Wound Extending Nearly or Entirely Across the Breadth of the Cornea, either Vertically or Horizontally.*—These cases, it seems to me, present an entirely different problem from prolapse of the iris at the corneo-scleral junction; first, because the prolapse usually is more extensive; second, the underlying structures are more apt to be wounded; and third, the position of the prolapse is frequently such that a mydriatic is able to exert its most favorable influence.

If seen early—that is, before there is marked adhesion between the prolapsed iris and the edges of the wound—it may be possible to replace the iris in whole or in part and keep it in position by pressure, atropin, and dorsal decubitus. If it is not possible to replace it through the entire length of the wound, the central portions of it may be freed with the spatula, while the prolapse at the peripheral end of the wound—that is the one approaching the corneo-scleral junction—may be abscised and treated in the same manner as is a prolapse entirely located in this region. These cases must be exceptional, but I have one in mind with good result.

If seen later—that is, when the iris has already be-

come firmly adherent to the edges of the wound and the wound is at all extensive in length—I am inclined to agree with the advice recently recorded by Dr. Knapp, namely, to "treat the case expectantly as long as no threatening symptoms appear." This treatment, I believe, should be the one already detailed, atropin, or other reliable mydriatic, rest in bed, and compressing bandage. The chief reason for it, in my judgment, depends upon the fact that, in addition to the value of pressure, the favorable physiologic action of atropin or other mydriatics upon the iris is secured in a way that is not obtained when the prolapse is at or close to the corneoscleral junction. The mydriatic rolls the iris back and tends to draw the prolapsed portion from the wound. This is proved by the fact that in many of these cases the iris is drawn out of the incision toward the central portion of the wound, while it remains clamped in the periphery where the drag upon it is less effective.

To be sure, even when the prolapse is solely located in the periphery, there is also some influence exerted by the mydriatic to withdraw the attached iris from its position, an effect, however, which is partly, if not entirely, counteracted by the equal effect of rolling back another portion of the iris toward the prolapse. For this very reason, in the peripheral cases, it has been the habit of surgeons to employ eserin, with the hope that under the influence of the contraction of the pupil the iris will be drawn from its attached position in the corneal periphery. My experience, however, is that eserin is very apt to increase ciliary irritation, and is not an accept-

able drug in traumatic prolapse of the iris. I make exception of a few cases of prolapse after cataract extraction, in which I have seen it act very favorably. Moreover, abscission of an extensive prolapse across the corneal breadth results not in a small, smooth coloboma, but in a more or less unshapely loss of iris tissue. Touching this point, the following illustrative case may be introduced:

Case IV.—Mary H., a child about one year of age, was brought to the Jefferson Medical College Hospital on March, 24, 1897, with the history that she was struck in the eye with a piece of metal attached to a window blind. The accident occurred four days before her entrance into the hospital. She had been under treatment in another institution, but the parents becoming dissatisfied, they had sought other advice. The wound extended from a half millimeter in the upper ciliary region, in a curvilinear manner, downward across the cornea, terminating a little beyond its middle. The iris was extensively prolapsed and the eyeball congested, but as far as could be seen there was no injury of the deeper structures. The treatment consisted entirely of pressure bandage and atropin, and resulted in a steady subsidence of the prolapse, so that at the present writing the eye is nearly white and quiet, with a small, non-protruding attachment of the iris near the center of the wound, with the indications that it will be entirely withdrawn into the anterior chamber, the drag on the iris by means of the atropin toward the periphery having been sufficient to draw this tissue out of the lips of the wound, except at the point mentioned.

Bacteriologic examination is an important factor in deciding whether or not there should be surgical interference in cases of prolapse of the iris seen late

—that is, after closure of the wound by adhesive inflammation. As has been pointed out by Knapp, the surrounding cornea is infiltrated with microorganisms, although the iritic tissue itself may be free from them. A case in point is the following:

Case V.—A boy about ten years of age came to me ten days after he was struck in the right eye with a sharp stick, which cut a ragged wound at the inner side of the cornea, extending vertically across its entire breadth. The iris tissue was clamped in the wound and protruding, and a grayish line was manifest about the center of this tissue and extended somewhat into the corneal area. The lens appeared to be partially opaque.

Inoculations from the conjunctiva, which had been frequently washed with a saturated solution of boric acid by the attending physician and had been cleansed only a short time before the inoculation was made, proved to be sterile. Inoculations from the grayish line previously described, which, it should be understood, was not in the iris tissue itself, but on the surface of the lymph which covered it, and in the surrounding corneal tissue, yielded a perfectly pure culture of *staphylococcus cereus albus*.

Although the child was brought with the expectation of operative interference, advice against reopening the wound and abscissing the prolapsed iris was given. The situation of the prolapse was such that the favorable action of atropin could be obtained; there were no marked signs of bandage irritation or ciliary congestion; and opening of the wound would, it seems to me, only have liberated, as it were, staphylococci and presented to them paths for entrance into the deeper ocular structures. Hence, the advice of expectant treatment, with the suggestion

that probably later the case would have to be dealt with on the principles which govern the management of traumatic cataract.

III. *Cases of Prolapse of the Iris Through a Corneal or Corneoscleral Wound, Associated with Lesion of the Underlying Structures, Generally the Crystalline Lens.*—Certainly no hard and fast rule can be given to cover all cases, which, however, naturally divide themselves into two chief classes :

1. Those cases in which the lesion is so extensive that conservation of the eye is problematical. With these instances we are not specially concerned this evening.

2. Those cases associated with injury of the lens and followed by opacification and swelling of its tissue. The urgency of the symptoms and the age of the injury must decide action. Some of these cases must be relegated to the class already referred to and illustrated by an example to which expectant and primarily non-operative treatment is suited. In others, both lesions may be dealt with at one sitting.

Case VI.—For example, in a case not long since under my care, the wound being in the upper portion of the cornea and seen about ten or twelve days after the accident, the lens being opaque and partially protruding into the anterior chamber, a small, upward corneal section was made, the prolapsed iris seized and removed, and the soft lens-matter expressed through the wound. The primary vision, without treatment of the capsule, was $\frac{20}{30}$. Subsequently there was thickening of the capsule and the vision dropped to $\frac{20}{200}$. The patient declined to allow division of the membrane.

Such a procedure, if possible, seems to me more

desirable than a primarily non-operative course, for, at all events, operation later on is sure to be needed.

IV. *Cases of Prolapse of the Iris Through a Corneal Wound, with Prolapse of the Ciliary Body or Process Through its Scleral Extension.* — Under these circumstances, my experience coincides with that recently recorded by Dr. Knapp. The iris portion of the hernia may become quiet, or even withdrawn into the anterior chamber, while the ciliary end of the lesion forms a cyst-like protuberance. Therefore, if I see a case of this character, and it is a proper one for this manipulation, I clear the wound of all protruding ciliary tissue, if I may so express myself, and close it with sutures. These sutures are passed, however, through the conjunctiva overlying the wound and not through the sclera; at least, I am disinclined to pass them through the sclera unless absolutely sure that this can be done without inclusion of any uveal tissue in the stitch.

If the case is seen late, *i.e.*, after the cyst has formed, the latter is excised and the eye treated exactly as after abscission of pouch-like hernias of the iris already described. While it is true, as pointed out by Knapp, that prolapses of the ciliary tissues "are apt to produce cyst-like ectasias which, for their cure, require thorough excision," this rule also meets with exception.

Case VII.—A girl, aged eleven, came to the Jefferson Medical College Hospital in the early portion of 1896, with the history that one year previously she had been wounded in the right eye with the tine of a fork. Downward and inward in the ciliary region, about four millimeters from the cor-

neal margin, was a small, translucent, cyst-like ectasia, with dark-colored base. The eye was otherwise normal. Complaint was made of pain, watering, and photophobia of the left eye, and, apprehensive of sympathetic trouble, the patient was kept under observation for some time. She then disappeared from view, and was not again seen until the present month—more than two years after the injury, when the cyst, about the size of a small pea, was found in exactly the same condition as at her first visit. In the meantime the refractive error had been corrected, and both eyes were quiet and comfortable.

V. *Management of the Adherent, Non-bulging Cicatrix After Healing of an Iris Prolapse.*—As may have been gathered from what has been previously said, one of the chief advantages of operative interference in traumatic prolapse of the iris, under those circumstances in which I believe it to be not only justifiable, but the best procedure, is the securing of a non-adherent cicatrix. Now, although eyes which have healed without infective inflammation and without surgical interference are usually perfectly quiet, non-irritable organs, in a certain number of cases, the slight drag on the attached iris during the movements of the pupil is the cause of pain and discomfort. Therefore, I would like to add one word in regard to what I may call the treatment of the sequel of prolapse of the iris, that is, of the adherent cicatrix. Take, for example, the case of the girl detailed, in which the iris prolapsed through a curvilinear wound extending half way across the breadth of the cornea, and was withdrawn into the anterior chamber at all points except one near the center of the scar. At this point the iris was attached and

lifted up in a minute tent-like extension, the pupil below it being somewhat ovoid in shape. In cases of this character, I am accustomed to free the attached iris from the scar by the ordinary operation of division of anterior synechia. The method I prefer is the one specially advocated by Mr. Lang of Moorfield Hospital, in which an instrument not unlike the Knapp knife-needle is introduced into the anterior chamber and the synechia divided by a slight lever-like movement. The iris drops back into place, a drop of atropin solution rolls it out of danger of reprolapse, and a circular pupil is secured. It is less easy to accomplish this maneuver when the iris is prolapsed in the periphery or angle of the anterior chamber, although it can also be done there with the same result. I have never seen harm follow this slight operation, and I have more than once seen an eye thus relieved, which had previously been persistently painful, grow comfortable and quiet.

The question of prolapse of the iris as the result of perforating ulcers of the cornea is not part of the discussion this evening, but it perhaps is not entirely out of place to say that these cases seem to me to demand the same line of treatment as the traumatic ones, and the management of the case is governed by the same principles as those already enunciated. In a few instances where the prolapse has been an extensive one and has protruded through a large, somewhat irregular opening, which could not be neatly coapted with stitches, I have very successfully planted a flap, after the manner of Gama Pinto.

In one instance, associated with the last stage of a

gonorrheal conjunctivitis, I took the graft from the opposite or sound eye.[1]

With reference to *prolapse of the iris as a complication of the simple extraction of cataract*, my practice is the same, I believe, as that of many surgeons, chiefly Dr. Knapp, namely: If the prolapse is discovered within a few hours after its occurrence, it is cut off and the edges of the iris reduced, exactly as after the operation of iridectomy. If the prolapse is not noted until later, for example, the third or fourth day, it is allowed to remain until the eye is quiet, when, if there is staphylomatous bulging, the protrusion is abscised, or, in other words, treated as is a staphyloma of the cornea.

In a few instances I have inserted after this operation one or two delicate silk sutures, and have been pleased with the result. Once I have seen the prolapse entirely reduced by the use of eserin, the iris being withdrawn into the anterior chamber and the pupil becoming perfectly circular on the sixth day after the accident.

In the beginning of this paper I said, "Evidently no single rule of surgical conduct is applicable to each case of traumatic prolapse of the iris." But if an attempt to formulate such a rule should be made, which, like all other rules, must meet with exceptions, it would read somewhat as follows: Whenever it is possible to secure clean removal of the protruding tissue operative interference is indicated; when this is not possible non-operative measures, as in the instances already described, are worthy of consideration and adoption.

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[1] *Philadelphia Polyclinic*, 1896, vol. v, No. 14.