The Journal of the American Medical Association

VOL. XIX.

CHICAGO, SEPTEMBER 10, 1892.

No. 11.

ORIGINAL ARTICLES.

A FEW EXPERIMENTS WITH THIERSCH'S GRAFTS IN THE OPERATION FOR PTERYGIUM.

Read in the Section of Surgery and Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June 8, 1892.

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A pterygium is nothing but a fold of ocular conjunctiva drawn over and fastened to the cornea, and to make our operation for pterygium a permanent success, we must after releasing the conjunctival fold from the cornea, arrange matters so that the conjunctiva cannot be drawn back over the cornea again. In a pterygium of moderate size this aim is usually attained by a very simple operation. The conjunctival fold is carefully dissected from the cornea, and allowed to retract as far as it will, from the corneal margin. This leaves between the retracted conjunctiva and the cornea, a small wound area to close which we draw the conjunctiva from above and below together, and unite the edges by two sutures. If this wound heals by first intention, there is no danger of a recurrence of the pterygium.

But in a number of cases the pterygium is so large, and the gap in the ocular conjunctiva after its dissection and retraction is so wide that it is very difficult, sometimes almost impossible, to close it with conjunctival sutures. At all events, the strain upon these sutures is so great that often they cut through in the first twenty-four hours and allow the wound edges to separate. The resulting gap is then gradually closed by granulation tissue, which is also filling the corneal area from which the pterygium has been removed. And when this new tissue begins to consolidate into a cicatrix, its shrinkage will gradually pull with an irresistible force the ocular conjunctiva over the cornea again. The pterygium has returned; our operation is a failure.

These failures make everyone wish for an operative procedure which promises better results. When, therefore, last year in August, I had occasion again to operate on a pterygium of this unpromising kind, I decided upon trying a new plan. I had by this time convinced myself in a number of cases of symblepharon that the thin skin shavings obtained by Thiersch's method are an excellent material for patching up defects in the conjunctiva. I give them decidedly the preference to graftings of mucous membrane; for the Thiersch grafts are much easier to handle and to fit; they need no sutures; they grow better and shrink much less. And as to appearance, they are as smooth as the surrounding conjunctiva, but look paler, more whitish.

Now it seemed to me worth the trial to fill the gap

in the ocular conjunctiva caused by the dissection of a broad pterygium, with one of these Thiersch skin grafts; for if it adhered it would most assuredly keep the conjunctiva away from the cornea, and as it probably would look whitish, its color would blend well with the white of the eyeball.

These considerations induced me to try the skin grafting in the pterygium case last August. The pterygium reached to the center of the cornea, and the sides diverged from the apex backwards so rapidly, that when they crossed the corneal border they included about one-fourth of the corneal circumference. This pterygium was dissected off from the cornea, and the subconjunctival fibres which bind the pterygium to the sclera and cause the foldings of the conjunctiva, were carefully and thoroughly divided all the way back to the caruncle so that the conjunctiva could retract and unfold itself. The retraction left a large area of the sclera (10 mm. wide and 12 mm. high) denuded of conjunctiva. To fill this defect I shaved a Thiersch graft from the inside of the patient's forearm, transported it from the razor directly to the denuded sclera and spread it out smoothly over the entire wound. I had cut the graft a little larger than the wound so that when the graft was smoothened out over the sclera, the edges of the conjunctiva were overlapping the graft. My idea in tucking the edges of the graft under the conjunctiva was that the overlapping conjunctiva would assist in keeping the graft in place, and protect its edges against being rolled up or wrinkled by the frictions of the eyelids on the eyeball during the latter's rotations. But this part of the plan did not work well; for on the next day I found the edges of the graft were not under but even with the conjunctiva, and the graft reached about 2 mm. over the cornea. It had evidently been pushed toward the cornea just so much as it had been tucked under the conjunctiva. On the third day when I was satisfied the graft was firmly attached to the sclera, I lifted the edge which overlapped the cornea and trimmed it back even with the margin of the cornea. At first the graft had a pink color; but after the second week it was white, being covered with epidermoidal cells which could easily be scraped off. Later on the layer of epidermoidal cells become thinner but firmer, and now (I saw the patient on April 23 the last time) the surface of the graft is smooth and shining, and only a very little higher than the ocular conjunctiva. It has shrunk a little, more in the horizontal than in the vertical diameter; but it holds its place well, and forms a firm immovable bar which makes it absolutely impossible that the conjunctiva should ever again be drawn into the cornea.

In February I applied the same plan to two other cases of pterygium; but profiting by the experience of my first trial I cut the grafts smaller than the defects they were to patch up. In the second case the

defect measured 12 by 10 mm. and in the third eye 6 by 10 mm.; the skin grafts were cut 10 by 8, and 5 by 8 mm., respectively. Both took well and though after two months their horizontal diameter was reduced from 10 to 6 in the one and from 5 to 3 in the other eye, they still serve the purpose well of holding the conjunctiva back from the cornea.

I do not wish to draw any positive conclusions from these few experiments; but it seems to me they show that Thiersch's skin grafts readily adhere to wounds on the eyeball; that they may be utilized in patching up defects in the ocular conjunctiva; and that the insertion of a Thiersch graft may prove a valuable means to make the operation for pterygium a permanent success, even in the worst kind of cases.

Discussion.

Dr. A. E. Prince, Springfield, Ill.:—The valuable paper of Dr. Hotz commands recognition. I think the work an excellent one. I have had two cases in which there has been a similar experience and the results have been so satisfactory as to lead me to be very much encouraged. In one of the cases the conjunctival complication was a symblepharon. I transplanted a considerable portion of conjunctiva from a white rabbit's eye and greatly ameliorated the condition. In the second case the transplantation was taken from the inner surface of the lip and the purpose was to overcome a blepharophimosis. I took out a rhomboid section of mucous membrane of the lip and transplanted it. The result was very good in the relief of the symptoms.

Dr. G. C. Savage, Nashville, Tenn.:—I am inclined to the opinion that the reason for some of the returns of pterygium is to be found in the condition of the cornea left after removal. I do not think that it is proper to attempt to dissect off by instruments the corneal attachment of a pterygium. In that way we leave an unfavorable condition for the development of epithelium so as to rapidly cover in the denuded surface of the cornea. We leave some of the growth when we attempt to remove it by scissors or knife. I have never operated after the method of Dr. Prince in peeling off the corneal attachment with a strabismus hook, although I think that it would be better than the use of the knife or scissors. My plan is to make a puncture above and below the growth at the corneal margin through which I pass one blade of the scissors and make a V shaped incision with the opening toward the cornea. Then dissecting up carefully to the cornea I seize the loosened growth with fixation forceps, instruct the patient to look towards the nose while I pull in the opposite direction when every vestige of the growth is removed. Of course if there is much of the sclera exposed because of the broad base of the pterygium, then I conceive that the operation of Dr. Hotz is a good one, and I shall make use of it. If the open space is not so great, the edges of the conjunctiva can be brought together by sutures; and, before cicatricial tissue has formed, the corneal abrasion has been covered by epithelium. My experience is that the pterygium is not likely to recur after this method of operating. This operation is not new to me. I got the idea from some one, but I can not now say where.

Dr. H. M. Starkey, Chicago.:—I should like to make a suggestion in regard to a method of treatment of pterygium which I have employed with highly satisfactory results in a few cases, not a sufficient number to make a report upon, but simply to suggest that others may try it. It is particularly adapted to those cases where there is a minimum amount of fibrous tissue and a large amount of vascular tissue. The method is that of electrolysis. We know how quickly a mild current of electricity will shrivel up blood vessels. In a case of pterygium which seemed to be composed almost entirely of blood vessels, it occurred to me that electricity would be of service. I therefore employed the negative current in a strength of one or two milliamperes with a platinum needle pressed under the growth and in two sittings the blood vessels were obliterated and the condition has not recurred. This is a painless operation under cocaine, is followed by little reaction and no mutilation. I have used it in half a dozen cases and have been well pleased with it.

Dr. A. R. Baker, Cleveland, O.:—It seems to me that the suggestion of Dr. Hotz is of immense value in symblepharon in which there is excessive loss of conjunctival tissue, but I think that it can not take the place of the old operation of

transplantation of the pterygium below the cornea. You simply transplant the healthy conjunctiva to the place occupied by the pterygium. I have done this operation a number of times and have never felt the need for any other. Where the pterygium is very broad split it and put one part above and the other below the cornea. In this way we can manage any pterygium no matter how large.

Dr. J. E. Minney:—I use Prince's method in the main and find it very good. If I find that a portion of the pterygium remains I take a knife and scrape it off aiming to get it entirely smooth. I find that if I destroy the blood supply at the margin of the cornea, there is less liability to a return. The method which Dr. Hotz suggests is one that I shall give a trial. I have had cases in which I needed just such a method.

Dr. Henry D. Noyes, New York:—I had not the pleasure of hearing the paper of Dr. Hotz, but I should like to make a statement in regard to pterygium. In former times I regarded incipient pterygium as of no importance and thought it not necessary to interfere, but I have changed my views and in the last five years, experience has shown me that it is important to deal with pterygium even at an early period before it has advanced toward the middle of the cornea as it interferes with the curvature of the cornea. I have found by examination with the ophthalmometer the cornea rendered astigmatic by the pressure of a pterygium and that its removal has altered its curve. For this reason I have made up my mind that it is desirable to operate for pterygium at a period when it does not mechanically cause any interference with sight.

Dr. F. C. Hotz, Chicago:—As to the method of removing the corneal part of the pterygium, I cannot see why the removal should be less complete if we carefully dissect the conjunctival part from the cornea with a scalpel than if we remove it by the brute force of pulling. I am always opposed to any brutal manipulation about the eye and this pulling out of a pterygium looks to me like one of these manipulations. I think that I can more accurately gauge my interference with the tissues with the knife because I can control the effect of my cutting absolutely, but if I tear I cannot control that any more than when I tear a piece of cloth. But whether you remove it by traction or by the knife, there is a denuded surface of the cornea which must heal. If superficial, it may heal over at once with epithelium. In an old pterygium where the superficial layers of the cornea have been involved, it fills up with granulation tissue and forms a scar; and as this scar extends from the cornea back over the sclera, it draws upon the ocular conjunctiva and pulls it towards the cornea again.

The philosophy of transplanting the pterygium I could never understand except on the ground that the pterygium is a foreign growth, and from the remarks of Dr. Baker, I am inclined to think that he takes that view. But a pterygium is no new growth, but the conjunctiva which has become changed by chronic inflammation and drawn into the cornea. Fuchs has recently published a paper in which he says in regard to the histology of pterygium that it is a conjunctival fold in which there has been chronic inflammation with subsequent changes in the connective tissue, one of the characteristic features of which is a predominance of elastic fibres. Whenever you lift up a pterygium, you can see that it is connected loosely with the sclera, except along a transverse line following the extension of the horizontal meridian of the cornea toward the caruncle. Along this line, the conjunctiva is bound to the sclera by firm bands like cicatricial tissue and when these are cut you will see that the conjunctival folds spread out smoothly.

This goes to prove that the peculiar foldings of the conjunctiva in the pterygium are produced by the contraction of the subconjunctival connective tissue.

THE CARTWRIGHT PRIZE FOR 1893.—The usual award of this prize, valued at five hundred dollars, will be made in June, 1893. The alumni of the Medical Department of the New York College of Physicians and Surgeons are the sponsors for this valuable premium for original medical investigation. Any person may compete, and he may write upon any subject connected with the science of medicine. About the only restrictions are the provisos that the prize may not be given to two or more persons working jointly, or to a competitor who has sent his essay elsewhere to compete for another prize. The personality of the author should be, as is the usual rule, concealed, and the papers must be sent to the secretary of the alumni on or before April 1, 1893.