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ORIGINAL ARTICLES.

THE OPERATIVE TREATMENT OF PTERYGIUM.

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It is a pleasure to me to have the opportunity of directing the attention of the Mississippi Valley Medical Association to an operative procedure for pterygium which I have employed for nearly fifteen years with eminent satisfaction and of which I gave a preliminary description in the *Medicinsk Revue*, September, 1885, published in Bergen, Norway. My original operation has in the course of time undergone some modifications, and as I can not, for the time being, conceive of any further improvement, I thought it might be of interest to present it to the medical public at large, and I have chosen this opportunity for the following reasons:

Pterygium is of frequent occurrence in the Mississippi Valley.

The members of the Association are undoubtedly, from personal experience, familiar with this characteristic affliction and many of you without doubt have treated it surgically in the capacity of oculists, surgeons, or general practitioners.

In a goodly number of cases you have obtained good results not only immediate, but also permanent.

The majority of you have, I suppose, employed excision, which is commonly recommended, but which *per se* is unjustifiable, and not infrequently followed by relapse.

Other operative procedures have not yet proven their ability to effect a cure in all cases.

Finally, pterygium is so easy of access, the operation for it so devoid of danger both to life and eye, and its clinical nature so evident, that we must make the reasonable demand that it should be satisfactorily performed with permanent good results by every one in possession of surgical and antiseptic qualifications and in every case.

The etiology and pathogenesis of pterygium are unfortunately not yet satisfactorily settled; it is still a somewhat mysterious calamity. In the days of humoral pathology, pterygium was the local evidence of a constitutional malady which should be treated before and after operation with iodids and sarsaparilla. Nowadays we believe just as much in this as that pterygium is due to strain of the interni, and that it should be treated with glasses. It is a trifle annoying that pterygium preëminently occurs in people who do not strain their interni, and that it occasionally occurs over the interni, which hardly can be over-exerted. A wound of the limbus can not by itself produce pterygium, or we would see pterygia daily in scrofulous ophthalmias; experimentally, pterygium

can not be produced by such wounds; we can safely eliminate this theory which, I grant you, sounds very plausible. Episcleritis has also been advanced as a cause. I acknowledge that episcleritis is or has been present in every case of pterygium, but an episcleritis, which is a disease of quite frequent occurrence, does never (as is notorious) *per se* give rise to true pterygium, so that under all circumstances there must be something peculiar to that episcleritis, which by some is accepted as the cause, and as there is also much which speaks in favor of such an interpretation, it is thus not improbable that the microorganisms, found by some observers in several cases of pterygium, play their part in its causation.

The circumstance that pterygium by preference occurs in people who are especially exposed to wind and dust; furthermore, that a good many positively date the beginning of their trouble to such an exposure; and finally, that I have actually a few times found in my operations on pterygium a minute foreign body in the episcleral tissue near the head, has created the firm conviction that the cause must be an infected episcleritis, in all probability due to a foreign body and that the peculiar mode of growth of the pterygium over the cornea results from the endeavor of the diseased tissue to rid itself of the offending particle. Such a traumatic infected episcleritis, limited to that part of the eyeball exposed, when the lids are open, is a common affection among the farmers of the west; but only when this episcleritis invades the cornea, dragging the superadjacent conjunctiva with it, do we call the disease a pterygium; there are, however, more such episcleritides than pterygia. As long as this episcleritis is active, the process is progressive in all directions, most conspicuously toward the center of the cornea, where the supposed foreign body presumably makes its escape.

As is well known, pterygium is divided into two general classes: crassum or sarcomatosum, and tenue or membranosum; this simply means that in the first group the disease is active or progressive, and in the second passive or stationary.

It may perhaps seem superfluous that I have dwelt so long upon the episcleritis, which I believe to be the cause of pterygium, since even a successful treatment of this condition can not effect anything toward the cure of pterygium itself, which is the affection we are consulted for, while we rarely are asked to treat the underlying condition, which gives the patient little annoyance, if any at all. Nevertheless, we must take cognizance of this casual factor, because, first, there may be question in some cases of a prophylactic operation, and second, in our operation on the pterygium proper we should also eradicate the episcleritis.

Pterygium is only a clinical term. Scrutinized from a pathologic standpoint it offers unmistakable evidence that it is a dislocation of a certain part of

the conjunctiva toward and upon the cornea, because: First, the pterygium is histologically identical with the conjunctiva; second, it is continuous with it; third, we can observe how the semilunar fold in nasal pterygia is drawn forward and later obliterated; and fourth, we also notice how the caruncle is dragged forward from its original position to assume the shape of a horizontal oval.

The dislocated part of the conjunctiva is usually the seat of a moderate conjunctivitis in the progressive form; in the stationary form the conjunctiva is normal except at the point of attachment to the cornea where there is a limited hyperplasia.

To sum up: Pterygium is a dislocation of a certain part of the conjunctiva over the cornea, dependent upon a localized episcleritis, in all probability due to an infected foreign body, which has penetrated the subconjunctival tissue and which is expelled at the apex of the pterygium, whereupon the latter becomes stationary.

While the preceding considerations ought to furnish valuable indications for the treatment of this affection surgically, a short synoptic review of leading symptoms is necessary to determine *when* such procedures are desirable.

The principal symptoms of pterygium are deformity, limited mobility with double vision, epiphora, irregular astigmatism, and amblyopia.

Deformity, whether great or little, is a plausible indication for operation for cosmetic reasons. Limited mobility justifies operation as soon as it produces double vision. Annoying epiphora, a natural result of the displacement of the parts concerned in the physiologic absorption of the tears, is likewise indicative of operation. Double vision and epiphora belong, however, to advanced stages of the disease, where more important indications present themselves for consideration. Amblyopia, due to irregular astigmatism, may occur in pterygia which have not encroached on the pupillary area; it is caused by traction on the cornea and is relieved by operative interference. Amblyopia caused by invasion of the pupillary field is by all means the most important symptom of advanced pterygium; surgery at this late stage of the disease will certainly accomplish much good, but it is not to be compared with the results afforded by operation undertaken before this invasion has occurred, and it is a very difficult matter to distinguish between a stationary and a progressive pterygium.

There are therefore in my opinion weighty reasons, cosmetic as well as prophylactic, to advise early operations, which in addition are easier to perform and give more ideal results than those undertaken in later stages.

I am thus totally at variance with the majority of authors who advise operation only when the pupillary field is invaded.

Unfortunately pterygium occurs preëminently in a class of people and usually at an age, when they do not particularly care about a little disfigurement, limited mobility, epiphora, and irregular astigmatism, in many cases also little about the amblyopia; at any rate in my experience, it is a noticeable fact that the minority of cases submit to operation, which is to be regretted, as I maintain that pterygium is absolutely under our surgical control.

The treatment of pterygium can, according to the preceding, only be an operative one. A dislocation of the conjunctiva must be treated upon the same surgi-

cal principles, which obtain in any dislocation, by *reposition* and *fixation*. I protest against operative procedures which aim at excision of the pterygium, as such mutilation is as unjustifiable here as in dislocations in any other parts of the body, and its only excuse is that it ordinarily is followed by good results.

Before I pass to the description of my operation of reposition and fixation for the cure of pterygium, a few remarks on the antiseptic technique will be in order, so that septic complications of annoying, even if not dangerous character, may be avoided, and a rapid and uneventful recovery ensue. For the operator, it is sufficient that he disinfects his hands. I confine myself in this respect to scrubbing thoroughly in a warm 1 per cent. lysol solution; then I wash the patient's face with the same sort of solution. The instruments, gauzes and bandages and the bottle containing the cocain solution, have been sterilized in Boeckmann's small sterilizer for combined sterilization. The field of operation is flushed with the cocain solution (my favorite formula being cocain mur. 3 per cent. dissolved in a saturated solution of boracic acid and sulphate of quinin); to quiet the other eye, a few drops are instilled into it. The speculum is introduced and I proceed to the

Reposition.

Reposition: The head of the pterygium is grasped with a good forceps and it is carefully dissected from its corneal attachment either by scissors, knife or evulsion. It must be dissected to its full extent and even a little beyond; after this the dislocated conjunctiva is unfolded by putting it on the stretch, which is simply effected by placing the blades of the scissors underneath it and lifting it up away from the globe. After this the conjunctiva will retract somewhat from the corneal periphery and assume its anatomical position as nearly as possible.

Fixation: In order to effect this properly we must recognize as a fact, that a *sine qua non* for the establishment of pterygium is the existence of the subconjunctival connective tissue. This is indeed the medium which makes it possible for the conjunctiva to slide over the cornea; if it did not exist, if in other words the conjunctiva around the cornea was intimately connected with the sclera, a pterygium would be an impossibility. If we remove the subconjunctival tissue to an extent that the edge of the replaced conjunctiva is freed therefrom and brought into direct contact with the sclera itself, a solid adhesion between the two will result and a successful fixation established.

With one forceps therefore, the conjunctiva is lifted up near its junction with the corneal margin (above or below) and with another forceps the subconjunctival tissue is dragged forward, and, steadily pushing the conjunctiva back, a good sized band of connective tissue is removed with the scissors along the whole extent of the conjunctival edge. If there is active episcleritis we do well to remove all inflamed tissue as good practice for the cure of the episcleritis itself and as an additional safeguard against a possibility of relapse.

After the excision of the subconjunctiva, the conjunctival edge will retract further backward, whereupon the whole wound, scleral and corneal, is thoroughly scarified and scraped for inflammatory remnants with a cataract knife. The hyperplastic conjunctival edge is trimmed off. To secure the conjunctiva in position, until adhesion is firm, and to prevent it from sliding over the cornea again by the movements of the eye, I fasten the edge to the internus (externus) muscle at its insertion with a single fine catgut suture and the act of fixation is complete.

We have now a triangular wound outside of the cornea, the free edge of the cut conjunctiva in direct contact with the denuded sclera, and a fresh corneal wound extending to Bowman's membrane. Cicatrization will follow rapidly from all sides and by virtue of this cicatrix a recurrence of the dislocation will be prevented for all time.

Fixation.

The after-treatment is extremely simple. The eye is occluded with folded sterilized gauze; the bandage is changed daily and a 2 per cent. solution of nitrate of silver applied to the conjunctiva for a week; the bandage is then removed and the patient discharged.

Only one eye is operated on at a time as bandaging of both means discomfort.

I take the liberty to recommend this operation to the profession as being in my mind and according to my experience a rational, a justifiable and, when properly performed, an always reliable method.

Lowry Arcade.

AMBULATORY TREATMENT OF FRACTURES OF THE FEMUR; NEW MATERIAL FOR SPLINTS AND ORTHOPEDIC APPARATUS.

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Although I am perfectly well aware of the obstacles which still beset the ambulatory treatment of fractures of the lower extremities, I nevertheless claim that it is not necessary to confine the patient to bed for more than a week, even with fracture above the middle of the femur. On admission, the whole extremity should be carefully disinfected with soap, water and alcohol, and the hair removed. Then strips of cotton lining are pasted on the skin with Heusner's fluid adhesive plaster, and included in the dressing in such a manner as to leave the ankles free and to allow a small square board to be fastened at least three inches below the sole. To this board weights for extension are fastened. In the morning when the ambulatory apparatus is put on again, the weights are taken off and the strips are reversed and fastened with pins. In this way is secured a permanent extension with weights varying from ten to fourteen pounds according to the strength of the muscles. If, while

the leg is being dressed, it is carefully stretched, the patient experiences very little pain or inconvenience.

A glue dressing should be carefully applied and, beginning from the toes, should include the whole extremity up to the inguinal region. Rollers of soft muslin or, better, of light flannel, should be used, and also the best white glue. The glue should be boiled and then cooled sufficiently not to scald the patient. The rollers, which are about two inches wide, should be moistened on the end with glue and pasted on the skin in such a way as to prevent creases. Should it become necessary to fold the bandage, it must be cut and repasted. It is of the utmost importance that the toes, the foot, the leg and a space of at least 3 inches above the fracture, be provided with this tightly fitting compression bandage, as it would be impossible to endure a perpendicular position of the injured limb without it. Care should be taken that those parts at the joint of the foot which are especially subjected to pressure—the heel, Achilles tendon and the instep—are protected from pressure by a thin layer of absorbent cotton, and that the bandages are not pasted in this place, as motion will cause the glue to crumble and the skin will be irritated. I wish to particularly emphasize that in applying the bandage too much care can not be exercised in placing the foot in a perpendicular position to the leg, in order, by shortening the Achilles tendon, to prevent an equinus position, as this would be difficult to correct later on. On taking off the first bandage it may frequently be observed that the foot is already in a pes equinus position, which will later prevent the patient from using the extremity, even if the fracture is well healed, and a tedious and painful course of treatment will be necessary to overcome what might have been avoided in the first place by the observance of a few simple rules.

A firm "contentif" (compression) bandage in which the patient can walk may be obtained by including strips of thin fiber or pasteboard at the seat of the fracture. This will make a dressing not thicker than the blade of a knife, very light and yet firmer than the plaster dressing. If after a few days the bandage becomes too loose, a strip must be cut out and the defect remedied by pasting on new strips. Glue as an adhesive material produces compression like collodion, but, at the same time, does not interfere with the sudoriferous glands of the skin and forms a safe protection against the invasion of pus microbes and saprophytes. As soon as the glue touches the skin the patient will experience a sensation of coolness and relaxation. With this bandage, which within twenty-four hours becomes thoroughly dry, forming a solid capsule, the patient is enabled to walk about on crutches, since the leg can be suspended in a perpendicular position without pain.

The three following cases of fracture of the femur in the service of Drs. E. H. Lee, Halsted and Tope, were treated at the Cook County Hospital:

Case 1.—I saw the patient about nine days after the accident, when he was placed in an extension apparatus with twelve-pound weights. He was furnished with a tightly fitting glue dressing and the same was strengthened on the femur with thin pieces of pasteboard. After the extension apparatus was put on he walked from the table with the aid of two canes. He never experienced any inconvenience or edema. On one occasion I found him playing ball on the hospital grounds. At the end of six weeks the apparatus was taken off. The leg was shortened less than one-fourth inch. The muscles of the femur, particularly the quadriceps, which is most liable to atrophy, had the same strength as on the other side. At no time did edema or other disturbance of the circulation occur.