

## THE POSSIBILITIES OF MUSCLE OPERATIONS.

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This paper reports eight cases illustrating the results obtained by operations on the ocular muscles, if nonoperative treatment has been faithfully tried and a safe operation done on the right muscle. It was read before the Pacific Coast Oto-Ophthalmological Society, August 4-6, 1919.

The object of this paper is to remind those who may be interested, of the possibilities of muscle work, nonoperative as well as operative, and to illustrate by citing cases typical of each class of heterophoria. Squint cases are omitted as there is but little difference of opinion as to the proper treatment of such, and because the results are much less satisfactory than in the phorias where we expect functional improvement from accurate mechanical readjustment of the muscle balance.

The two cases of vertical deviation are from about 35 operations for such conditions. Contrary to accepted teachings on that point my best operative results have been in that class of deviations. This I feel sure is due to the safety of my shortening procedure and the almost complete absence of tenotomies. I seldom perform even a partial tenotomy of a vertical rectus and never a complete.

### CASE 1. Hyper-cyclo-exophoria.

This was seen first May 1, 1908 in Manila.

MUSCLE BALANCE.—Exophoria 20; left hyperphoria 3; left plus cyclophoria 7.5. Refraction practically emmetropic.

Operation on June 1, 1908. This was done according to Todd's method but making the cuts so that the pull came from the lower end of the attachment of the left externus and in this way offer a chance of securing a triple correction. This was successful and continued so; for, somewhat over a year later, he measured absolute orthophoria in all directions.

Remarks. This case proves that a cyclophoria can be corrected by a Todd lengthening therefore it is fair to assume that one can be produced by it.

### CASE 2. Hyper - cyclo - esophoria. Seen first Dec. 2, 1915.

Muscle Balance.—Esotropia 25 (left eye squinting); left hyperphoria 10; left plus cyclophoria 10.

Operation Dec. 11, 1915. This, in hopes of again securing a triple effect, consisted in one of my double hitch shortenings confined to the lower margin of the left externus. Test immediately after operation gave as follows: exophoria 1; left cataphoria 1; left plus cyclophoria 1. This for practical purposes was a full triple correction. He was seen last June 2, 1919 when he measured esophoria 4, left hyperphoria 2, no cyclophoria. His eyes were straight objectively and there were no subjective symptoms.

### CASE 3. Cataphoria (left) with exophoria. Woman who had headaches for many years.

Refraction Right—plus S. 0.25 with plus cyl. 0.50 axis 100=20/20. Left—minus S 5.25 with plus cyl. 7.00 axis 85=20/50.

Muscle Balance.—Exophoria 12; left cataphoria 12; right hyperphoria 16; insufficiency of convergence, diplopia occurring at 12 inches. Rotations measured by tropometer showed defective, upward and also inward in the left eye, bearing out the noncomitant vertical deviation.

Operation Aug. 25, 1916, consisted in shortening of the left superior rectus. Sept. 11, she measured horizontal and vertical orthophoria, converged to six inches, and was able to read in comfort, headaches coming on only after prolonged near work. The permanency of this result cannot be told for she contracted pneumonia later that same winter with fatal result.

### CASE 4. Esophoria.

A student who had been compelled to give up a course in law because of an esophoria which had resisted all the usual nonoperative procedures such as exercises, prisms. Headaches were severe and continuous. Refraction Right and Left plus S. 1.25 with plus cyl. 0.50 axis 90°.

Muscle balance after wearing a monocular patch measured esophoria 7, and the patient reported entire relief from eye trouble while wearing it.

Operation August 19, 1916, consisted in a shortening of his left externus. Relief was immediate so that he could read continuously without trouble. One year later he measured one degree esophoria but was free from symptoms. He now measures the one degree and relief has been permanent. In this case failure to obtain relief by ordinary methods changed this young man's entire future.

#### CASE 5. Exophoria.

An attorney who complains of severe headaches except in near work. Investigation of this proved that, for near, he allowed one eye to diverge, while for distance he used binocular vision and so had his troubles. He had had three muscle operations six years before consulting me which had given him great relief for a time.

Muscle Balance.—Exophoria right 7, left 12, noncomitancy probably being the result of the operations. Inward rotation weak in left eye.

Operations: First on Aug. 8, 1917. Left internus shortened. Resulted in reducing the deviation to 5 degrees at end of month. Not enough taken up. Second on Sept. 7, 1917. A Ziegler tenotomy of left externus correcting to orthophoria, but at end of healing measured the five degrees again, being what usually occurs in all partial tenotomies that do not actually lengthen the tendon. Third on October 1, 1917. An actual lengthening of the right externus. This gave a permanent correction to esophoria one-half degree, which he maintains to present time, and has been entirely comfortable in the use of his eyes at all distances.

#### CASE 6. Hyperphoria.

A young lady referred to me by a rhinologist, because of severe headaches, who had found nothing in the nose to account for them.

Muscle Balance.—Exophoria 8; left hyperphoria 7; right cataphoria 7; no cyclophoria. Convergence to 5 inches.

Operation Feb. 17, 1917, a shortening of the left inferior rectus. On Feb. 21 she tested lateral orthophoria and a left cataphoria of 1. Head felt much better. May 17, measured vertical orthophoria but the exophoria was back to the original amount. However, she is using her eyes with practically no discomfort even after prolonged near work.

#### CASE 7. Convergence insufficiency.

Unable to use eyes for near. Has had a number of abdominal operations to cure nausea and vomiting but without success.

Muscle Balance.—Exophoria 3.5 converges to 11 inches left eye diverging at this point; no cyclophoria; no vertical deviation; left inward rotation weak.

Operation May 12, 1916, shortening of left internus. July 19, 1916 tested orthophoria horizontal and vertical and converged to 3 inches. Has comfort in use of eyes for near. No more nausea.

#### CASE 8. Hidden hyperphoria.

A young lady who has had headaches as long as she can remember but becoming worse lately. Several changes in glasses with no relief. Referred to me for esophoria after an attack of dizziness with blurry vision.

Muscle Balance.—Esophoria 3; no vertical deviation and no cyclophoria. This on May 12, 1919. Refraction: Right—plus cyl. 0.25 axis 75°. Left—plane.

A patch was ordered on left eye with the idea of developing a latent esophoria in excess of the 3 degrees. By May 21st she measured exophoria 4.5; right hyperphoria 4; left cataphoria 4, and had entire relief from her symptoms while using the patch. Accordingly she was given glasses containing prisms 1.5 base down in right eye and up in left. One month later she reported entire relief from all symptoms even after prolonged near work. "Can not get

along without glasses." She had trouble the first week getting accustomed to the prisms.

This case has more than ever impressed me with the necessity of watching before making a positive diagnosis in heterophorias.

Finally I wish to emphasize the fact that *operations should not be done simply to change measurements but should be done to relieve symptoms*. Proper study of cases should enable one to determine whether or not the muscle imbalance is the cause of symptoms. Once

this is established nonoperative treatment should be instituted. If this fails to do good, the patient is at least entitled to know that a *safe operation* done on the *right muscle* will do no harm and in practically all cases will secure good results. The man who fails to give his patients this chance or who goes so far as to warn them against muscle operators is in my opinion not practicing his specialty fairly either to his patient, to himself or to those specialists who are trying seriously to relieve this class of cases.

## REMOVAL OF FOREIGN BODIES FROM THE EYE.

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This paper discusses practical points with reference to the diagnosis and removal of foreign bodies lodged in the eyeball, using the publication of McReynolds' views as an occasion for the expression of his own.

In the September 13th Number of the A. M. A. Journal appears an article by Dr. John O. McReynolds of Dallas, Texas, on foreign bodies within the eyeball. McReynolds' review of the situation is excellent, and takes into consideration almost all ordinary aspects of this interesting and diversified subject. There are, however, some views expressed by Dr. McReynolds that it might be serviceable to discuss with him, and this is the purpose of this review.

**DETECTION BY X-RAYS.** McReynolds speaks of objects being so small as to be unnoticed by the X-ray. It would hardly be wise to positively challenge this statement, but the writer of this review believes he has never seen this opinion verified; altho his experience is somewhat extensive in this particular line of work, and he has removed steel particles from the vitreous so small as to be almost invisible to the naked eye. He has, of course, been deceived, as has probably every eye surgeon, in the X-ray findings; but it has probably never been on account of the size of the foreign body. It has been on account of a poor picture, or

an unfortunate head posture, concealing the object behind a piece of thick bone, or an inaccurate X-ray reading; but probably never, as has been said before, on account of the size of the object.

McReynolds refers to those puzzling cases where the missile has passed completely thru the eye, and lodged in the socket behind the globe. Of course, where it is positively ascertained by the X-ray, orbital measurement, and the localizer, that the object is in the orbital tissue, it can, unless excessive inflammatory conditions exist, be safely left pending future developments. But there are puzzling cases, where the object has just passed thru the posterior sclera and is entangled in the tissues immediately connected with the eyeball. In such instances it is often difficult to determine whether the object is inside or outside the scleral structure, which of course involves the question of operation. The writer has, in such doubtful cases sometimes, made use of what might be termed a moving picture—that is, he has had the patient move the eye two or three times during the