

VALK (F.)

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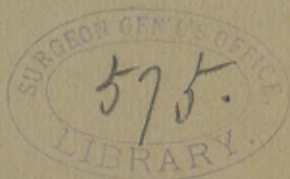
BY

FRANCIS VALK, M. D.,

Professor of Diseases of the Eye
in the New York Post-Graduate School and Hospital.

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THE operation for advancement of the ocular muscles has been in use by ophthalmic surgeons for many years and has been changed and modified by many, but as it is performed at the present time it is a delicate and extensive operation in which an assistant is required; furthermore, the subsequent removal of the sutures is almost a second operation. I believe that owing to these conditions the operation is seldom performed unless it is absolutely necessary, as in cases of extreme divergent squint and paralysis of some one of the ocular muscles.

For the past two years I have successfully attempted a different method to attain the same object, provided the result desired is not too great, and think that I have succeeded in devising a method of shortening the ocular muscles that is easy to perform, that does

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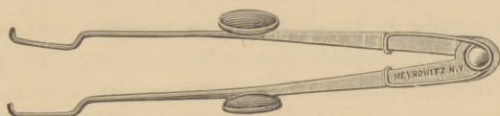
not require an assistant or the removal of the suture, and that, moreover, produces an entirely satisfactory result.

Dr. G. C. Savage, of Nashville, Tenn., suggested in an editorial published in the *Ophthalmic Record* two years ago, the idea of shortening the straight muscles of the eye in insufficiency by taking a tuck in the muscles, using for this purpose a silk suture with two needles. I believe he was the first to publish the method of operation; but my attempts were made independent of Dr. Savage, as I was not at the time aware of his article. Still, as we have the two methods of operating, I must leave the choice to the profession, and I will describe the procedure as I now use it, showing also a new instrument that I find very useful and of great assistance to me while passing the suture. This instrument was made for me by Mr. E. B. Meyrowitz, of this city. I would also state that I was the first who used the catgut suture to take a tuck in these muscles and allowed it to be absorbed, therefore requiring no further interference with the eye in order to remove the suture. For the above-mentioned purposes I profess to be the first who has used the catgut suture in eye surgery, though I understand that Knapp has used it for some time, but for altogether different purposes—as, for example, tying the conjunctiva, etc. I have found this new method very useful in convergent squint with amblyopia, in divergent squint, in paralysis of the externi and interni, and particularly in insufficiency of the ocular muscles where the indications are to strengthen the weaker muscles, instead of as in the old method of weakening the stronger muscles by a partial or a complete tenotomy. This method of shortening has been described in the *Post-graduate* for May, 1896, and

in the *Ophthalmic Record* of the same month; but to bring it more fully to the attention of the profession, I will describe the procedure as I now perform it.

The muscle to be shortened or strengthened is first exposed by a horizontal incision in the conjunctiva and subconjunctival tissue; then, after passing two strabismus hooks beneath the muscle and forcibly separating them to the desired extent, I now pass beneath the muscle this little instrument, which I call twin strabismus hooks. This instrument consists of two arms connected by a hinge, over which hinge is placed a small spring sufficiently strong to keep the two hooks placed at the free ends of the arms well apart or separated while the suture is being applied. When in position the instrument is resting on the patient's cheek out of the operator's way. I now take a suture of No. 0 or 00 sterilized catgut that I have had put up in capsules, each containing sufficient for one operation, armed with a fine, round, half-curved needle. This needle is now passed through the tendon close to the sclera and beneath the hook, coming out above, then passing it from within outward through the upper edge of the belly of the muscle at a point as far back as we desire to shorten the muscle. It is now carried across the muscular tissue and is again passed from without inward through the lower edge and comes out below; we now pass the needle back beneath the hook through the lower part of the tendon and the needle is cut off. In passing the suture we may commence below and so simply reverse the process. Now remove the hooks and carefully tie the suture according to the desired effect. When the suture is tied we see the small knuckle or *tuck* formed at the incision; this will slowly disappear

as the suture is absorbed and the tissues firmly united. After the suture is tied I bring the edges of the opening



made in the conjunctiva as nearly together as possible and then simply apply cold-water dressing. The eye is never bandaged except when the patient is going out, and, moreover, it may be used. In cases of strabismus, either convergent or divergent, I generally cut the opposing muscles by a complete tenotomy before tying the suture.

I give the records of twenty operations performed by this method, and in all the results for the relief of symptoms or for the correction of squint have been very gratifying. In only one case has there been any failure for rapid and complete healing of the muscle and conjunctiva. In squint with amblyopia this operation, combined with tenotomy of the opposing muscle, has been very successful, and I think that my experience has been sufficiently good to recommend the procedure to the profession.

The following twenty operations will illustrate the conditions in which I think the use of the suture is indicated:

For convergent concomitant squint (1st class)	9
For convergent concomitant squint (2d class)	3
For paresis.....	1
For insufficiency of ocular muscles.....	7
	—
Total	20

In the last-mentioned cases the results have seemed to me far superior to that of a partial or a complete tenotomy, for by this method we strengthen a weak muscle instead of weakening the action of a strong one.

CASE I. *Paresis of Left Externus*.—Mr. F. A. F., aged thirty years; homonymous diplopia. May 20, 1894, put catgut suture in left externus. Result: complete relief of diplopia.

CASE II. *Weakness of Externi*.—Mrs. H. N. T., aged thirty-eight years, San José, Cal. Pain in head extending down the spine; can not use the eyes; when reading, pain much more. Refraction examined under atropine and glasses ordered; after one month's trial they do not relieve the pain in the head. Repeated examinations of muscle balance show add. 20° , abd. 0° , esophoria 6° .

January 17, 1896.—Catgut suture in left externus. Result: add. 20° , abd. 5° . Two months after the operation she reports, by letter, that she is using the eyes for reading and the pain is relieved.

CASE III.—E. W. A., aged twenty-three years. Sent to me by Dr. Carter. Headaches, frontal, extending backward. Manifest hyperopia of $+ .50$ D. V. = $\frac{2}{3}^{\circ} +$. After repeated tests add. 16° , abd. 0° .

May 5, 1896.—Catgut suture in left externus.

Result: headaches stopped; add. 16° , abd. 4° .

In this case there was some infection of the wound.

CASE IV. *Weakness of Interni*.—Miss A. S., aged thirty years. Headaches, frontal and occipital. Refraction; compound myopic astigmatism, axes toward temples, corrected with glasses, but after four months no relief from pain. Has crossed diplopia; by prism test add. 2° , abd. 10° . From July, 1894, to July, 1895, put catgut suture in both interni and did partial tenotomy of both externi.

Result: add. 16° , abd. 8° ; much better but not completely relieved.

CASE V.—Mr. C. J. F., aged thirty-two years. Has not used the eyes for working or reading during past three years; neurasthenic; complains of drawing sensation in back of head and neck. Has myopic astigmatism

fully corrected by glasses, but they do not give him any relief. Crossed diplopia; by prism test 4° , and at times has double vision. Add. 12° , changing by repeated trials; abd. 10° .

November 1, 1895.—Catgut suture in right internus. Two weeks after, add. 30° , abd. 8° . Two months after operation reports by letter that he is back at work, book-keeping, and feels better than he has for several years.

CASE VI.—Miss S. J., aged twenty-five years. Is very dizzy, and has had double vision for past six months. V. = $\frac{2}{3}$ —, Hm. 50 D., add. 3° , abd. 5° . Catgut suture in right internus. Two months after, all symptoms disappeared and add. 12° , abd. 5° . To use + .50 D. glass for reading. I saw this lady fifteen months after the operation, and on examination the lateral balance of the muscles was add. 16° , abd. 5° .

CASE VII.—Mrs. G. H., aged forty-nine years. Headaches, frontal, and has dizzy spells. V. = $\frac{2}{3}$ — w. + 1 D., cyl. ax. 90° = $\frac{2}{3}$ —. Add. 6° , abd. 6° . Catgut suture in left internus. Three months after, reports much better. Add. 12° , abd. 6° .

Convergent concomitant squint, first class, seven cases.

CASE VIII.—W. G., aged twenty years. R. V. = $\frac{2}{3}$ +; L. V. = fingers at two feet.

December, 1895.—Tenotomy of left internus. Immediate result good, but squint returned.

January, 1896.—Catgut suture in left externus. Two months after, perfect cosmetic effect; no change in vision.

CASE IX.—D. B., aged seventeen years. R. V. = $\frac{2}{3}$ +; L. V. = fingers at ten feet. Has compound hyperopic astigmatism.

September, 1895.—Catgut suture in left externus and tenotomy of left internus. Perfect cosmetic result. Ordered + 2 D., cyl. ax. 90° .

CASE X.—S. D., aged five years; glasses for two years, correcting refraction of + 1 D. in each eye, but no improvement in squint. Operation at hospital under ether.

May, 1896.—Catgut suture in left externus and tenotomy of left internus. Perfect cosmetic result.

CASE XI.—Mrs. L. B., aged thirty-one years, Liberty,

N. Y. R. V. = $\frac{5}{200}$; L. V. = $\frac{2}{30}$ w. + $\frac{1}{15}$ C + $\frac{1}{48}$, cyl. ax. 180° = $\frac{2}{30}$. Put catgut suture in right externus with perfect cosmetic result.

CASE XII.—E. A. P., aged eight years. This boy has slight nystagmus in both eyes with the squint. R. V. = $\frac{2}{100}$, Hm. 2 D.; L. V. (?); oph. shows Hy. 6 D.

May, 1895.—Under ether and assisted by Dr. Coffin, I put catgut suture in left externus and did a complete tenotomy of left internus. Four months after, perfect cosmetic result. R. V. = $\frac{2}{100}$; L. V. = fingers at 4 ft.; no nystagmus. Eight months after, same vision.

CASE XIII.—E. W., aged twenty-three years. R. V. = $\frac{2}{40}$, Hm. 1 D.; L. V. = $\frac{1}{200}$, Hm. 3 D.; ophthalmoscope same degree of hyperopia.

March, 1895.—Catgut suture in left externus and tenotomy of both interni. Perfect cosmetic result.

CASE XIV.—F. L., aged thirteen years. This young girl had hysterical amblyopia associated with her convergent squint. Refraction, compound hyperopic astigmatism. R. V. = shadows, L. V. = $\frac{2}{200}$.

February, 1896.—Catgut suture in left externus while under ether. One month after, no squint and vision slowly returning. R. V. counts fingers, L. V. = $\frac{2}{40}$.

Divergent concomitant squint, first class, two cases.

CASE XV.—S. D., aged fifteen years. R. V. = $\frac{2}{200}$; L. V. = $\frac{2}{30}$ —; can fix with both eyes at near point, but at distant vision right eye turns outward.

March, 1896.—Catgut suture in right internus. Has hyperopic astigmatism, and I ordered +.50 D., cyl. ax. 90° for each eye. Result perfect.

CASE XVI.—A. C., aged fifteen years. Divergence of right eye since childhood. R. V. = $\frac{6}{200}$; L. V. = $\frac{2}{15}$. Refraction R. = compound myopic astigmatism; L. = Hm.

May, 1896.—Catgut suture in right internus and tenotomy of externus. Perfect cosmetic effect.

Convergent concomitant squint, second class, three cases.

CASE XVII.—G. F., aged seven years. Alternating squint. Hyperopia, 3 D. Atropine and glasses tried for two months; no result.

January, 1896.—Catgut suture in left externus and tenotomy of internus. Six weeks later ordered + 2 D. each eye. Result perfect.

CASE XVIII.—H. H., aged thirteen years. Right eye turns inward. R. V. = $\frac{2}{200}$ w. - 4 D. = $\frac{2}{4}$; L. V. = $\frac{2}{7}$ w. - .50 D. = $\frac{2}{4}$. Under atropine R. V. = $\frac{2}{200}$ w. - 1.50 D. = $\frac{2}{4}$; L. V. = $\frac{2}{7}$ w. - 50 C - .50, cyl. ax. 30° = $\frac{2}{4}$. + glasses do not correct the squint, so I put catgut suture in right externus. Result perfect.

CASE XIX.—D. O. C., aged twenty-eight years. Convergent squint since childhood. R. V. = $\frac{2}{7}$ w. + .50, cyl. ax. 90° = $\frac{2}{4}$; L. V. = $\frac{2}{7}$, imp. w. + .50, cyl. ax. 90° .

August 5, 1895.—I did a complete tenotomy of right internus and next day put in catgut suture in left externus. Result perfect and with binocular vision.

In the history of my squint cases my reasons for dividing them into two classes have been published, and I note perfect cosmetic results, as I have very little confidence in the restoration of vision in an amblyopic eye, or that binocular vision should result.

In all of these cases, from both private and clinical practice, in which the suture was inserted twenty times, the results for the relief of muscular asthenopia, paresis, and squint, with or without amblyopia, have been perfect and satisfactory. In the asthenopic cases we have immediate relief and gradual improvement; in paresis the diplopia disappeared, and in squint the cosmetic effect was all that could be desired. In all the cases, except one, healing was rapid with only slight œdema of the ocular conjunctiva for a few days, and in that case there was some infection of the wound, due, no doubt, to carelessness on the part of the patient; but it finally healed with a good result. I have had Meyrowitz prepare the sterilized catgut for me and put it in

small capsules, each containing a sufficient quantity for one operation; for we can only depend upon it being readily absorbed when it is perfectly sterilized.

In concomitant squint, either convergent or divergent, with amblyopia, I put in the suture and then cut the opposing muscle before the suture is tied, thereby completing the operation and placing the eye in its proper position with but one operation.

The suture can be easily applied under the anæsthetic effect of cocaine, except in young children, when I prefer to do it while they are under ether.

Fifty years ago, before Donders made his great discovery that asthenopia was due to hyperopia, the surgeons of that day frequently performed tenotomy of the lateral muscles for the relief of asthenopia, and in many cases gave relief; but Donders's discovery seems to have changed the opinions of the ophthalmic surgeons, and we now depend on glasses for relief in all cases. But modern methods of investigation have proved that while many patients are relieved by glasses, still there are those which we meet with very frequently that do not derive the expected relief from their glasses; and when we do find a decided want of balance in the power of the muscles, compared with that of the normal proportion, as stated in a paper by myself in the *Medical Record* of July 21, 1894, we are then justified in an operative procedure which will relieve the asthenopia.

In cases of muscular asthenopia I depend entirely upon the prism tests for indications in the use of the suture, for we should not deprive the eyes of their most useful function, the guiding sensation or fusion power, at the same time bearing in mind the natural uses of the straight muscles to move the eye in different direc-

tions; and from the foregoing we can readily decide when and where the deficiency exists, and can apply the suture for its correction.

There has been so much opposition in the profession to the partial and graduated tenotomies, and still further so many failures, that some, I think, have perhaps ceased to operate; but I do not believe the same objections can hold in the case of the procedure to which I have reference. It can be applied to so many cases of insufficiency of the straight muscles without the least danger of overcorrection or of producing squint that I offer it to the profession for a fair and complete trial.

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EDITED BY

FRANK P. FOSTER, M.D.

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