

**Further observations on the treatment of spasmodic torticollis / by
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*Further Observations on the Treatment of
Spasmodic Torticollis.*

BY

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FURTHER OBSERVATIONS ON THE TREATMENT OF SPASMODIC TORTICOLLIS.

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MANY years must of necessity elapse before sufficient material can be gathered to enable us to determine whether by any treatment—medicinal, mechanical, or surgical—perfect and permanent cure of spasmodic torticollis can be promised. The experience of the past would indicate that this result will be attained only in a very modest proportion of the well-established and severe cases. In so important a subject it seems justifiable to report early progress rather than to await the final results, since the latter plan in each case requires a long term of years.

Due allowance should certainly be made in early reports for the time element. Recoveries, apparently brilliant, either from operation or from other treatment, have been followed by disheartening relapses, and, on the other hand, operations, apparently useless, have paved the way for gradual improvement. In reporting progress we have endeavored to supplement recent reports by the later results of cases previously published.

A word upon the pathology may be pertinent. It has recently been objected that the operation is illogical, because no disease of the nerves has been found. If the trouble results from central irritation, no object, it is maintained, is to be subserved by excision of the nerves.

We do not feel that this is a just criticism. The excised nerves, it is true, have been found normal; it is not improbable, therefore, that we have to do with central irritation. But does this fact contraindicate operation? Before considering this question, we would offer the following theoretical considerations as giving a clue to the process.

There is a limit to the amount of continued work which the muscles can endure. In some instances degeneration follows overuse, as in certain forms of muscular atrophy; in others rebellion is shown by spasm, with or without pain. Of the latter condition, writers' cramp and other occupation-neuroses, as well as spasm of ciliary muscles, are familiar examples. If we stop to consider the amount of work put upon the muscles supporting the head, we realize that it is not inconsiderable. From early life these muscles are called upon during the waking hours

for almost continuous use. Within certain limits they are fitted for this use. It is safe to say that a person following an ordinary out-of-door occupation, which does not call for a continued constrained position of the head, is not likely to suffer from spasmodic torticollis. When, however, the occupation is such as to require fixing the *eye* intently, whatever the position of the head, another element enters into the question. When we attempt to concentrate in this way the vision we find that the first muscular effort is that of steadying the *head*, without which preliminary it is no more possible to fix the vision than to focus a camera resting upon an unsteady tripod.

The pain in the back of the neck which sometimes follows long-continued writing, more especially in those unaccustomed to this form of employment, and particularly in persons of neuropathic make-up, illustrates in a mild degree the rebellion of the muscles to long-continued effort, accompanied by use of the eyes. If hypermetropia be present, this symptom is aggravated. This pain appears with special readiness when the gaze must be fixed intently on distant objects. Even the comparatively short time required for watching a game of football, in which the interest is so great that the ball is closely followed, is sufficient to produce it. Oculists, by the adjustment of proper glasses, have not infrequently relieved persistent pain not only in the neck, but in the back, between the shoulders, and even lower. Pain in the back as a symptom of eye-strain has never been explained. We would suggest that the muscular effort for steadying the head, already alluded to, must of necessity extend to the back, as forming a part of the base of support. The effort here is so diffused, however, among comparatively large muscles, that pain is produced, as a rule, only in extremely delicate persons.

These considerations are, it is true, merely suggestive, tending to explain one variety only of muscular rebellion to overuse, namely, pain. The fact, however, that spasm offers another variety of such rebellion is a matter of common knowledge. Just why one variety appears in one case, the other in another, and a third offers the combination of both, we are unable to explain. The muscles affected would indicate that *certain movements of the head determine the seat of spasm*, rather than that a central irritation of accidental distribution is at the root of the trouble. By far the most common combination is, as we have already stated, spasm of the sterno-mastoid on one side, and that of the posterior rotators on the other. We have seen only one case in which spasm of all the posterior muscles occurred, drawing the head directly backward; in one case spasm of both sterno-mastoids was the principal symptom. This would indicate that the movement of the head determined the onset of the affection, rather than that cerebral irritation was primary. Such a distribution of primary idiopathic disturbance would certainly be extremely improbable.

Why the rotation should begin and continue in one direction rather than the other, we have not yet been able to determine. With reference to the possible connection between ocular defect and the position assumed in torticollis, Dr. Kilburn has made the following suggestions, which seem to us pertinent: Either hypermetropia or astigmatism may be the predisposing cause of wry-neck. In hypermetropia with one eye, say the left, more affected than the other, the patient by rotating the face away from a near object (in this instance to the left), while tilting the head toward this object, can by this means use as a fixing eye the one requiring the least effort of accommodation. The adoption of this posture removes the left eye (the more hypermetropic) to a greater distance from the point of fixation, and thus lessens the amount of accommodation demanded.

If both eyes are hypermetropic, the stimulus to convergence in excess of the amount required for a given distance, to prevent diplopia, compels a restraining movement on the part of the externi. The nerve-force required by this increased effort on the part of the ocular muscles, added to the labor of an already overtaxed brain, increases the rebellion of the muscles of the neck, to which allusion has been made, whether such rebellion results in pain or in spasm, or in both.

Astigmatism, especially if the principal meridian be oblique, may be a predisposing cause of wry-neck, because a patient with this form of refractive error easily acquires the habit, when reading or writing, of tilting the head to one side, in order to bring his meridian of least refractive error parallel to the vertical lines of the letters.

That the position of the head (even in persons suffering from spasm) is influenced by the refractive condition is, we understand, well recognized among oculists; and insufficiency of ocular muscles seems to be an especially potent factor. Isolated instances in which posture has apparently been replaced by spasm have been cited, but as far as we know no systematic investigation of this point has been instituted. Such investigation would probably lead to interesting, and perhaps to practical results. The demonstration of uniform connection between refractive error, or insufficiency, and spasmodic torticollis would tend to emphasize the importance of correcting such errors before serious symptoms result.

Dr. Cheney has examined the second and third cases reported in this paper with the following results:

CASE II.—

V. O. D. with — 2.25 spherical = 1.

V. O. S. with — 2. spherical = 1.

No insufficiency.

Fundus normal.

CASE III.—There is no insufficiency in either eye. There is hypermetropia of a half-diopter in the right eye. The same degree of hypermetropia exists in the left eye, and in addition moderate astigmatism with oblique axis (angle 105° to 110°).

The latter case would tend to corroborate Dr. Kilburn's proposition as regards astigmatism, but does not aid us as regards the theory that the less hypermetropic eye is turned toward the object of fixation. This patient turned the head to the right, though the left eye (including the astigmatism) showed the greater refractive error; it is not impossible, therefore that further investigation will develop the exact converse of Dr. Kilburn's proposition in this regard. This would prove equally interesting, and by no means lessen the value of his suggestion.

In the case of the patient alluded to under the question of massage, the spasm involved both sterno-cleido-mastoids, the head being little, if at all, inclined to one side. Dr. Amadon found here astigmatism (0.50) with an axis of 90° in each eye, and esophoria 3° .

In a recent case of combined spasm in which the face was turned to the right and tilted, Dr. Proctor examined the vision at our request and sends the following report:

V. O. D. with — 25 spherical \ominus — 0.37 cyl. ax. 175 = 1.

V. O. S. with — 0.75 cyl. ax. 5 = 1.

1 (r) hyperphoria, esophoria (distance) 3° .

This patient had used the eyes to excess in embroidery for three years and a half; the head began to turn three years ago. The time of onset is suggestive, but may be, of course, only a coincidence.

Dr. Shattuck has kindly allowed us to report the ocular examination of an extremely interesting case at present under his care at the Massachusetts General Hospital:

The case is that of a man, aged thirty years; occupation, boarding-house keeper. For fifteen years spasmodic movements of the head had existed in varying directions. The prevailing direction is to bend the head to the right, to retract the chin, and *turn* the face to the left. The sterno-mastoids are rather prominent, but no muscles are especially hard. When the eyes are closed the head is fairly quiet. Dr. Amadon reports that there is rotary nystagmus, excepting when the patient is giving close attention to an object directly in front. There are spasmodic contraction of the obliquus and twitching of the brows and lids in fixing the eyes. Esophoria, 9° :

V. O. D. with — 1 cyl. axis horizontal = 1.

V. O. S. with — 0.50 cyl. axis horizontal = 1.

A connection between the eyes and the neck has already been suggested, with a view to treatment rather than to pathology. The hope has been expressed that correction of errors of refraction or the adjustment of lenses for insufficiency may remedy the difficulty. We formerly shared this hope, and our routine treatment for a long time has included the correction of such errors. Results have been negative, and though we have not abandoned the idea of a connection between ocular effort and muscular spasm, we have been forced to the conclusion that

the late correction is unavailing, and that continued fixed use of even the normal eye may be the occasion, though not the direct cause, of rebellion on the part of the muscles supporting the head, especially in the neuropathic individual.

When we speak of the rebellion of muscles, we really mean, of course, rebellion of the cerebral centres supplying them. Granting this pathology, or something similar, is it illogical, in the event of other treatment proving futile, to cut off the supply by severing the nerve-connection? The question has been asked, Would a surgeon think of performing neurectomy for writers' cramp? The answer is: If writers' cramp were a distressing affection, totally incapacitating the sufferer; if, moreover, the spasms were limited to certain muscles; and if, again, removal of the nerve-supply to those muscles in no way impaired the usefulness of the hand, the operation of neurectomy should seriously be considered.

Nor are we dealing with an untried problem. Certain results have been obtained by operation, not very brilliant or numerous, it is true, but, on the whole, more satisfactory than those reached by any other method. Cerebral surgery has not been abandoned, though the percentage of success is lamentably small, especially in brain-tumors. The only question here, as there, is, are we dealing with cases otherwise hopeless? It may now be fairly assumed, we believe, that treatment by drugs is useless, that serious cases cannot bear the restraint of apparatus, and that electricity in all forms is ineffective.

The methods which have, possibly, not received as yet a complete trial, are continuous rest in bed, hypnotism, and massage. Each has its advocates, and we await the final result with interest. In one of four cases Dr. Goldthwait has tried the continued-rest treatment for many months without definite result. The patient found that massage increased the pain—a not uncommon complaint. We understand, however, that he has recently consented to a six months' trial of daily massage, as recommended by Dr. Putnam. At our request Dr. Lindstrom in a number of cases has used massage and passive motion for periods of several months, with favorable results in one case only, and that a comparatively mild and recent one (Case IX. of our former report). We have always regarded massage as a useful adjunct to operation, and have observed rapid benefit from its use in convalescence, even in those cases in which it was previously unavailing.

Dr. Coggshall, in a recent communication, has reported favorable results from persistent massage and passive movement. This will encourage us to renew the effort, though, in view of past experience, it must be admitted, with little enthusiasm. We have begun this trial in the case of spasm of both sterno-mastoids, to which allusions have been made. The disease in this instance, though of ten years' duration, is not painful nor excessive, the patient being a rather delicate young woman, anæmic and over-

worked. She will also have the benefit of vigorous tonic treatment as well as of rest in the hospital.

Few sufferers appeal more strongly to our sympathies than the class under consideration. Those who have seen cases of moderate severity only, or cases rheumatic in character, can hardly appreciate the pain and distress caused by spasmodic wry-neck of the severe type. Such patients are rendered unfit for occupation or society, resting the head either in the recumbent or semi-recumbent position, or unsuccessfully attempting to relieve the spasm by holding the hand to the cheek. Before many years have elapsed they, as a rule, welcome operation, even though only moderate hope of cure is offered.

With regard to the degree of benefit attained: A certain number of cases have been cured; others have been much relieved; if in others the spasm is not increased, we feel that too timid rather than too heroic surgery has been employed. The question presenting itself to the writers is: How far shall we venture? Is it justifiable to remove on both sides more than the spinal accessory nerves, and the three or four posterior branches? As far as paralysis is concerned, it appears from Gardiner's experience that the excision of these nerves does not impair the ability to hold the head erect; even were this not the case, our opinion is that, rather than suffer such torture as we have witnessed, relief should be welcomed, even at the cost of complete inability to support the head, and with the alternative of a supporting collar.

Coming to the present status of our own experience, we have more favorable progress to report than immediate results would have led us to expect.

Case VII. of our former paper,¹ whose spinal accessory alone was excised, after which operation troublesome rotation persisted for a considerable time, rendering a second operation necessary, is now (after an interval of several years) reported free from spasm. Case XI. suffered from spasm of sterno-mastoid on one side and posterior rotators on the other. The case was so severe that the head had to be constantly upon a rest, and even then the hand was held against the cheek to relieve the tension. As is our custom in these cases, the spinal accessory alone was excised at first, the patient being warned that the posterior branches also would probably require operation later. This case has far exceeded our expectations, for at this time, nearly a year after the operation, the head is held quietly, the patient expresses herself as very comfortable, and the only complaint is of pain, not severe, in the side of the neck.

The patient reported as Case VIII., in which operation was advised, but postponed to enable a more hopeful physician to try electricity and other treatment, finally returned for operation in the spring of 1895. There was at that time marked spasm of the sterno-mastoid and of the

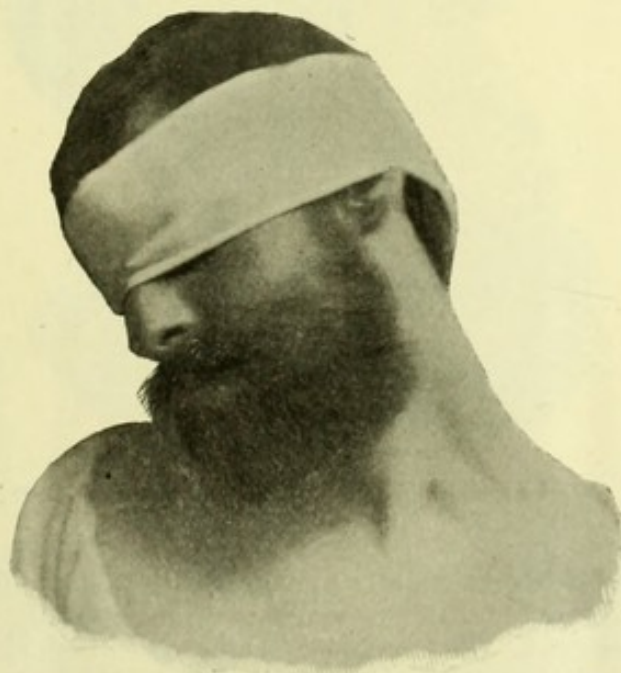
¹ THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, vol. cix. p. 36.

platysma-myoides on the one side and of posterior rotators on the other, the position being similar to that photographed in our previous paper, but with more depression of the chin. The spinal accessory was excised in the usual manner, and the patient advised to await progress for some months before submitting to the more important posterior operation. Up to this time no improvement has been noted.

Case I. of our former communication, one of the most troublesome, in which the improvement after the first operation on one spinal accessory nerve was followed by a relapse and second operation, now carries the head naturally and shows no tendency to spasm.

The tardy nature of the relief in these cases does not militate against the operation as the cause of improvement, when we consider that the patients were growing worse and worse for years up to the time of operation, from which time improvement has been steady, though in some cases gradual.

FIG. 1.



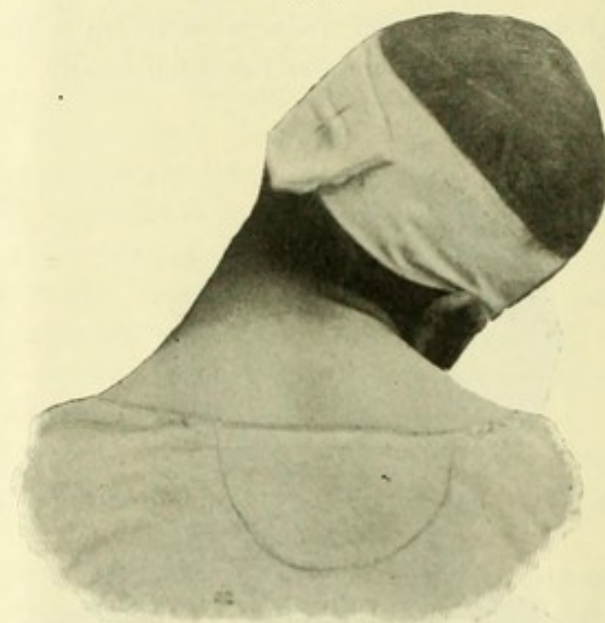
Before operation.

CASE I.—Mr. E. L., aged thirty-five years, music-teacher; a patient of Dr. Davis, of East Somerville, began to have cervical spasms three years ago. In childhood he had been subject to chorea. Dr. Bullard treated him for a year by means of internal medication. From this treatment he received only temporary relief. An attempt was then made by Dr. Lovett to control the spasm with a head-brace, but the apparatus could not be borne. During the past year massage has been used without benefit. Galvanism has also been faithfully, though unsuccessfully, tried.

The patient was brought to St. Margaret's January 16, 1895. His condition was pitiful in the extreme. The head was so drawn to the

right that the ear nearly touched the shoulder. At the same time there was slight rotation to the right. The head, brought originally by intermittent spasm into this position, became finally more or less fixed by permanent contractions. The head, even when he was profoundly etherized, could not be brought to the erect position. Though the opposing movements were thus limited, spasmodic rotation to the right, with inclination toward the shoulder, continued. The patient was deformed; his sleep was disturbed; he could not work; his discomfort at times amounted to agony; life was hardly worth living. He had tried medicines, rest, massage, electricity, and fixation—all without avail. Far from the attitude of dreading, as the last resort, a surgical operation, he welcomed it; he feared rather that an operation would be refused.

FIG. 2.



Spasm of posterior rotators and sterno-cleido-mastoid of same side; unusual.
Before operation.

After careful deliberation, and in consideration of the fact that every method of relief other than surgical had been faithfully tried, surgical relief was attempted. The patient was etherized January 26, 1895, and placed on his left side. Even in this position the head was held up half-way to the right shoulder, and the contracted muscles stood out as tense cords and bands. A cut was then made from the external occipital protuberance to the sterno-clavicular notch and every contracted muscle was carefully divided. The muscles affected were the trapezius, the complexus, the splenius capitis, the trachelo-mastoid, the obliquus inferior, the omohyoid, and the sterno-mastoid. The deep muscles inserted into the upper cervical vertebræ—the levator anguli scapulæ and the scaleni—were found slightly contracted, but were not cut.

The operation consisted chiefly of a long open incision by which practically every contracted muscle was divided. The posterior branches of the upper four cervical nerves were cut and avulsed.

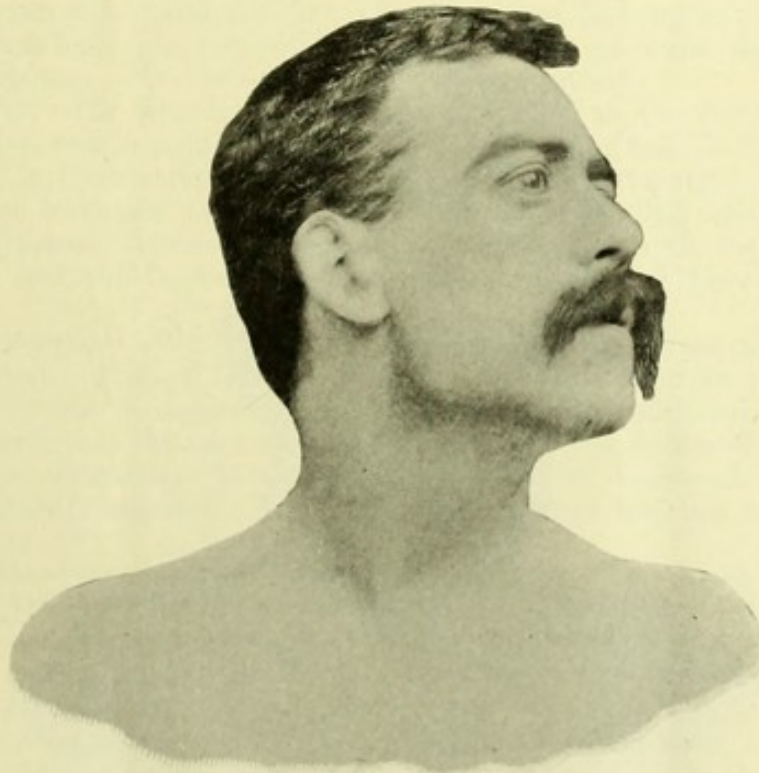
Union by first intention followed this operation. Convulsive movements ceased immediately, except for a slight twitching of the deeper

muscles. After two months' treatment by massage these also ceased. He is now perfectly well. He can hold the head erect, play the piano, and ride a bicycle.

Muscle-division was combined with nerve-section in this case. In Case VII., previously reported, the second operation consisted in complete division of the sterno-mastoid with destruction of the spinal-accessory nerve. The combination of muscle-section with nerve-avulsion, thus carried out with brilliant success, suggested a similar course in the two following cases :

CASE II.—Mr. E. F., clerk, entered the Massachusetts General Hospital March 4, 1895. The family history was negative. Up to the beginning of the present trouble he had always been well. Early in September, 1894, he found himself, with no apparent reason for doing

Fig. 3.



Before operation.

so, constantly putting one hand or the other to the head, more often to the right side. The head soon began occasionally to rotate toward the left. This movement increased gradually in force and in frequency. About four weeks before admission to the hospital the head began to be drawn backward as well as to the left. The muscular spasm was accompanied by pain. Various methods of treatment had been used from the beginning of the malady, comprising bromide of potassium, electricity, calisthenics, massage, and hypnotism.

Pain was a prominent and distressing symptom throughout the disease.

It extended over the whole head, and was described as severe; so severe, in fact, especially during massage, that this method of treatment was abandoned, though under it there had been apparently some improvement.

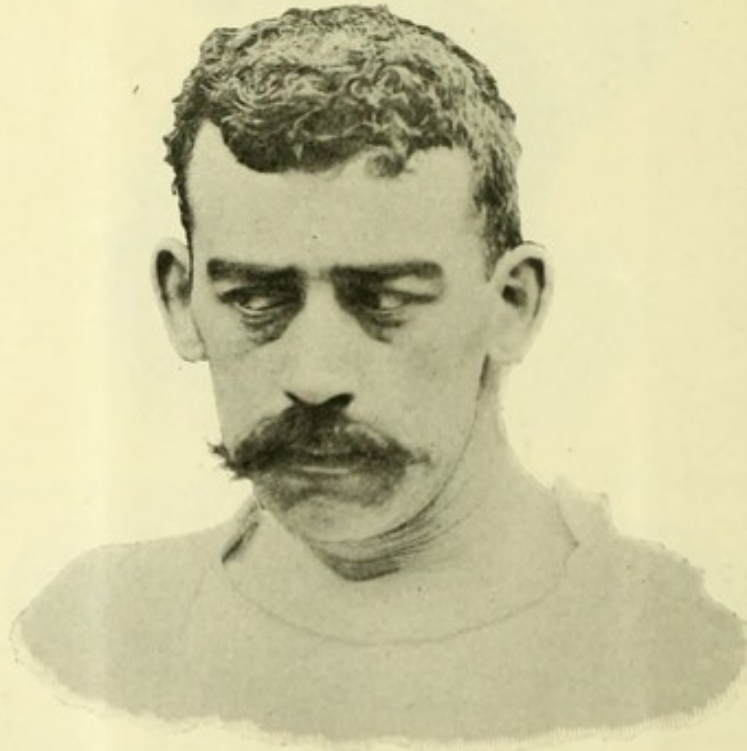
The right sterno-mastoid was found on examination hard and tense, the left trapezius firm and contracted. The trouble began, the patient says, in the region of these muscles. The head was drawn toward the left. All motions of the head were limited.

Fourth day: The patient is being treated in the neurological department with bromide of potassium, electricity, massage, and calisthenics. He is disheartened and anxious for operation, similar methods having been tried unsuccessfully for many months.

Sixteenth day: The patient seems to have more voluntary motion than on entrance; the head is not drawn so far from the median line.

Twenty-third day: He has become anxious and discouraged; he is eager for operation and impatient of delay. Drs. Porter and Warren, in consultation, advise operation.

FIG. 4.



After operation.

About an inch of the left spinal accessory nerve was excised March 31st, through an inch incision made along the anterior border of the sterno-mastoid. The wound was healed by first intention April 5th.

The result of the operation was in the beginning somewhat encouraging. The sterno-mastoid spasm was immediately relieved; the left-sided rotation continued.

In the course of a few weeks spasmodic rotary movements were complicated by a strong backward pull. Examinations were made repeat-

edly by Drs. Putnam and Walton with a view to avoiding, if possible, further operation. Palliative measures were further augmented by hypnotism, a method which was absolutely unavailing. A second operation was not only agreed to, but urged, by the neurologists and others.

April 12, 1895. Second operation. The incision extended from the external occipital protuberance along the anterior border of the trapezius nearly to the clavicle. The posterior nerve-branches of the first, second, third, and fourth nerves were severed, the great occipital alone being spared. The complexus, splenius capitis, and obliquus inferior were completely, the trapezius and trachelo-mastoid partially, severed. The rectus posticus major was not disturbed. The wound united by first intention.

The position of the head was immediately and permanently improved. It was noted in ten days that the "head is carried much straighter; flexion and extension are good. He can rotate the head to the right nearly 45°. The muscles that now pull are the platysma and the omohyoid."

May 2d. His condition is greatly improved, and movements are much freer. Spasm is now insignificant. The head was done up in plaster-of-Paris, which had to be removed on account of the pain and discomfort which it caused. He was discharged relieved May 3d.

December. He now holds the head somewhat to the right of the median line, but in a fairly erect position. His chief and, in fact, only complaint is the restriction of voluntary motion to the right, due not to muscular weakness, but in part, at least, to the binding effect of the cicatricial tissue. He says that he would rather have all the muscles paralyzed and the head in a collar than to revert to his previous condition.

Third operation, 1896. Slight spasm of the left sterno-mastoid muscle had recurred. The left spinal accessory nerve was found at the outer border of the sterno-mastoid muscle and traced backward and upward. It was found that the nerve had become restored at points of division at previous operation. The nerve was extensively destroyed and the muscle partially severed. This operation removed the last traces of spasm.

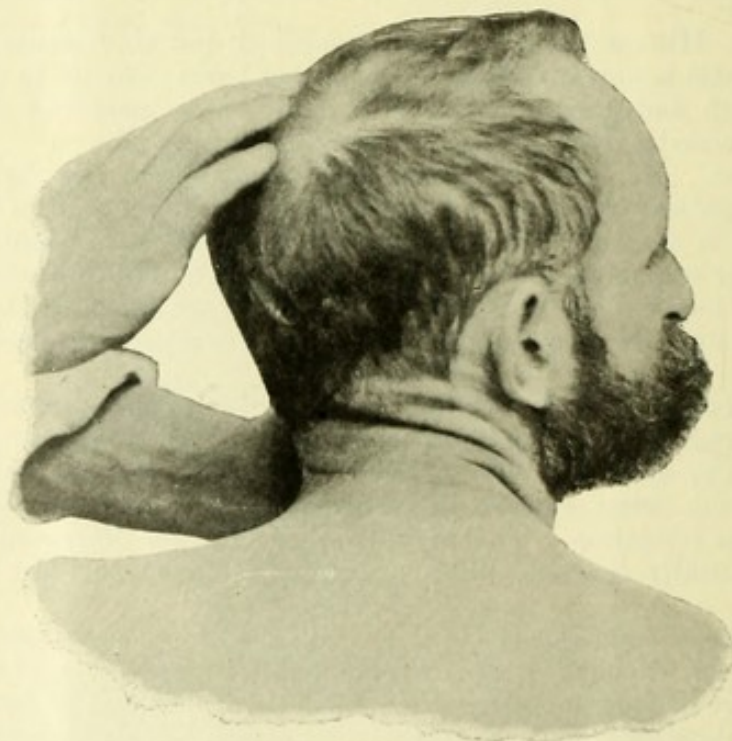
CASE III.—September 18, 1895. C. B., aged forty-two years, grocer, patient of Dr. Woodbury, of Groveland, and Dr. Anthony, of Bradford, began three or four months ago to have "turning of the head." He noticed it especially when he was writing orders. This turning steadily increased until it became an almost incessant and uncontrollable spasm.

Four months before, in May, 1895, in helping lift a horse that had broken through the barn floor, he felt "something break in the neck." As a result he carried his head for a while on one side. Dr. Richardson found, September 18, 1895, a spasmodic condition of the left sterno-mastoid muscle in conjunction with that of the right posterior rotators. The movements of the head were incessant and painful. In this case, in view of the severity and pain of the spasm, especially in the sterno-mastoid, no palliative measures were advised. The left spinal accessory nerve was immediately excised. The wound healed by primary union. Only slight benefit followed this operation, although the sterno-mastoid was immediately relieved from spasm and the pain lessened. Rotary and backward motions persisted. He was very much discouraged by this result. In October, when he entered the Massachusetts General Hos-

pital for observation, the head was rotated to the right and bent backward. The second day after entrance a plaster helmet was applied, which the patient was unable to endure, after a few hours' trial, on account of extreme pain. Fixation aggravated so intensely the previous discomfort and pain that this method was absolutely impracticable. Opposition to the spasm only increased the violence of muscular contraction.

On the fourth day partial immobilization was attempted by means of sandbags, with the result of increasing the spasm. Manual fixation demonstrated vividly the rebellious nature of the muscular paroxysm. Slight pressure would for a time control this contraction; firm pressure increased it; forcible pressure produced a tonic and painful paroxysm. Dr. Richardson being decidedly averse to further operation, referred the case with full powers to Drs. Putnam and Walton. Both became con-

FIG. 5.



Before operation.

vinced of the inutility of palliation and urged operation upon the posterior rotators. Neither was willing even to consider the usual preliminary measures of massage, calisthenics, electricity, and hypnotism. In view of the remarks of Dr. Goldthwait made upon our previous communication, the patient was then referred to him for observation and for treatment. Dr. Goldthwait reported against palliation; he thought that mechanical treatment would be a waste of time.

Operation. The patient was etherized and placed face downward over the end of the table. The extending muscles were thus put upon the stretch. A long incision was made from the occiput toward the scapula, parallel with the fibres of the trapezius. The muscles were separated and divided until the posterior branches of the four upper cervical

nerves were found, of which all branches were avulsed, including the great occipital. Most of the muscles were also cut across, the trachelo-mastoid alone remaining intact.

December 5th. The head still rotates to the right, though with less violence than before and with longer intermissions. One of the deep muscles, apparently the trachelo-mastoid, can be felt to harden spasmodically during rotation. This is the nerve, the patient states, which has seemed to him the principal cause of the trouble throughout. Massage is begun to-day.

11th. Examination shows a strong spasmodic contraction of the trapezius and of the trachelo-mastoid. It is proposed to treat these muscles persistently by massage and by other remedies; in the event of failure after a reasonable time, free division of the remaining fibres will be made.

13th. Daily massage has been continued up to the present time. From the beginning of this treatment the spasm was considerably relaxed.

14th. The head is now fairly quiet. The trapezius and trachelo-mastoid spasm seems to have largely disappeared, though after being up and about for some hours it reappears to a moderate extent.

This patient, like the last, expresses himself as greatly pleased, and states that rather than return to his previous condition he would choose to have all muscles paralyzed and wear a collar.

He adds that he was formerly so helpless that he could not sign checks, dress or feed himself. He gave his chief-clerk power of attorney for the former purpose, and required the assistance of his wife for the latter. When he attempted to go through a door he was in danger of striking the doorway. He used to sit holding his head in both hands, with elbows resting on something. He once attempted to ride, resting the elbows on the seat before him, but had to discontinue after riding a mile on account of distress.

This patient was discharged December 14th. Whether this improvement is permanent or not we cannot say. The absolute immobilization by the operation of the greater portion of those muscles which produce the spasms may have relieved, in some obscure way, the one or two remaining muscles. It seems not impossible that those muscles remaining unimproved in an extensive co-ordinating group, the others of which have become for the time being paralyzed, may through their altered nerve-supply, or from some other cause connected with the operation, have been unable further to give expression, by spasm or otherwise, to the central or other source of irritation; they may be too limited in size and in function to carry the burden of rebellion before distributed among so many muscles. On the other hand, we frequently see spasms shift from a single muscle to an extensive group, as in all those cases in which the posterior rotators become involved after avulsion of the spinal accessory. The burden of giving expression to the irritation is thereby divided, but we have never seen the spasm go further than this.

Benefits received from an operation *per se* are likely to be observed in those cases only in which massage, electricity, gymnastics, and especially hypnotism have been most helpful—cases in which operative measures are seldom needed. Excepting in one case (XI.), we have failed to observe improvement in any set of affected muscles by the cure by operation of an associated group. On the contrary, spasm, as a rule, becomes more pronounced; for example, paralysis of the left sterno-mastoid and trapezius may be followed by increased posterior spasm, or it may even be followed by the spasm of these muscles when none existed before. It can hardly be said, therefore, that operative measures *per se* have any favorable influence upon allied groups of real muscular spasm.

In view of a recent discussion of this subject, renewed hope of the benefits of massage, gymnastics, and hypnotism has been encouraged, and we await with interest further trials of these methods in aggravated cases. Surgical measures should certainly not be instituted until every rational means of non-operative treatment has been exhausted, unless the case is too well established and severe to justify delay. It may then be resorted to, not as an untried experiment, but as a rational surgical procedure, based upon a by no means discouraging experience.

