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THE OPERATIVE TREATMENT OF SPASMODIC TORTICOLLIS, WITH CASES.

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Medical treatment of this obstinate and distressing affection has proved, and continues to prove, so unsatisfactory that it seems not improbable that internal methods will be one day no more considered in the therapeutics of spasmodic torticollis than in that of writer's cramp, with which it is doubtless allied. Mechanical support to the head, again, has been found not only inefficacious, but unendurable, the restraint only adding to the discomfort and the tendency to spasm. This method will doubtless, therefore, be entirely abandoned also. We have massage, electricity, and operation left. The first has not been given as yet, perhaps, a sufficiently thorough trial to establish its exact place as a therapeutic agent in this affection, but the experience of the writers is encouraging enough to warrant advising the use of massage at least as a temporary resort, while awaiting the time for operation, in the hope that an occasional patient may be so far relieved that he will not require the more radical measure. In one of our cases (a comparatively recent one), in which operation was considered, Dr. Lindström gave massage, passive movements, and stretching with so decided benefit that the patient has returned to his work. It has been suggested that frequent stretching may do some good, by the plan sometimes tried (though not with specially satisfactory results) for locomotor ataxia and other spinal troubles. We can hardly venture to hope, however, for permanent improvement from any treatment of this kind except in recent cases.

Electricity has often been tried in this affection, most commonly in the form of galvanism to the affected and faradism to the opposing muscles. In certain instances improvement has appeared at first, but, as shown by Smith's *résumé* of cases—notably, those of Althaus, Poor, Knott, and Reynolds—this treatment has proved in the long run as little satisfactory as internal medication in the true spasmodic torticollis. We have tried systematic use of the galvanic current, both with and without faradism to the opposing muscles, especially in the case of

Mrs. H., reported further on, without favorable result. A brief trial of static electricity was given, at Dr. Putnam's suggestion, upon another of these cases, with an apparent improvement only on the first application, after which its results were negative.

As an illustration of the therapeutic measures persistently but unsatisfactorily used for this affection we quote from a communication of Dr. John Goss regarding a certain patient: "The treatment has included alkalies, the iodides and bromides of potassium, colchicum, quinine, arsenic, valerianate of zinc, and cannabis indica, while various external remedies have been tried, such as iodine, sinapisms, atropine ointment, compound camphor liniment, and belladonna and aconite liniments, with chloroform. Due attention has been paid to diet, open-air exercises, and other hygienic measures, while the bowels have been carefully kept open; but the patient still remains *unrelieved*." The case upon which these remarks were made was finally cured by resection of the spinal accessory and part of the posterior branches, performed by Dr. Noble Smith, who quotes the case.

As an illustration of the heroic yet unsuccessful use of drugs may be mentioned the exhibition in paralyzing doses of conium and gelsemium. The former was tried by Dr. John Harley up to two daily doses of four drachms each of succus conii, the spasm relaxing only during the toxicological effects.

In all the cases recorded by the writers the methods of treatment commonly advised have been tried successively, and in various combinations, without benefit worthy of record. We have also recommended relief of ocular defects without practical benefit, though *à priori* considerations would lead to a hope from this direction. We have now practically discontinued these efforts, and are in the habit of recommending massage only, combined with hygienic and other general measures, and whatever special treatment the case may demand, including ocular treatment when necessary, until the patient may become reconciled to operation.

Our experience has led us to endorse emphatically the dicta enunciated by Mr. Noble Smith in his excellent review of the subject up to 1891, from which we quote extensively. He states first that "neither drugs, local applications, nor other general methods are of any permanent use in the treatment of well-established spasmodic wry-neck." Secondly, that "electricity has failed to do any permanent good except in some recent cases which probably differed entirely in their nature from those referred to."

Search through reports of cases published since 1891 shows that further experimentation with other modes of treatment have added nothing to our resources in this direction. As examples may be mentioned cases of Allyrand (all medicines unavailing) and Guilbert (no

improvement under medicines or electricity, antipyrine, baths, bromides, etc.).

Coming to the question of operation, nerve-stretching may be dismissed with passing notice. The report of only one case has come under our observation in which this method proved of more than temporary benefit. Among the published operations may be noticed those of Southam, Annandale, Smith, and one quoted by Bowlby. This procedure was attempted in Case IV. in our report—with moderate benefit, it is true. The successful case alluded to was that of Page. Too little hope can be offered by this operation, on the whole, to warrant subjecting the patient to the discomfort and inconvenience of undergoing two operations when the more radical one will be ultimately necessary, to say nothing of the loss of time and the prolonged suffering thereby entailed.

The operation of neurotomy need hardly be considered, as the most to be expected from simply dividing the nerve is the postponement of spasm during the few months required for the cut ends to unite.

We are brought, therefore, to the operation which alone offers hope of lasting benefit, namely, removing a considerable portion of the nerve or nerves supplying the affected muscles.

Since the initial operation (in 1866) by Campbell de Morgan (in which resection was resorted to in an obstinate case, after failure of drugs and local applications, only temporary improvement having followed neurotomy) neurectomy upon the spinal accessory nerve has been so often performed that the knowledge of this branch of the subject may be deemed almost exact. The operation on the posterior cervical branches has been less frequently performed, but, thanks to the efforts of such pioneers as Keen and Smith, we are rapidly becoming sufficiently familiar with this part of the subject to approach it with confidence. Among many operations on the spinal accessory nerve may be mentioned, for illustration, those of Campbell de Morgan, Sands, Tillaux Hansen, Ballance, Annandale, Southam, Allyrand, Gould, Noble Smith, Owen, Griffith and Halwell, and Hall.

Petit, in 1891, formulated twenty-six cases as follows: thirteen of success, seven of improvement, two of slight improvement, three of temporary benefit, and one of death from phlegmonous erysipelas.

The characteristic position of the head from affection of the spinal accessory is that of spasm of the sterno-cleido-mastoid, namely, the head bent forward, the chin turned to the opposite side and elevated. The illustration of Case III. (Fig. 1) gives a typical picture. If the trapezius is also affected, the position is the same, but the head is drawn more backward and sidewise. This tendency to rotation may be overcome, it would appear, by implication of the posterior rotators *on the same side*. Smith describes two such cases at length, in which

the head was bent in the same direction in which it was rotated, both anterior and posterior muscles being affected on the same side. As a rule, however, it would appear from our own experience and from reported cases, that *the posterior rotators are generally affected on the opposite side, tending to assist, therefore, rather than to counteract the action of the sterno-cleido-mastoid as regards rotation.*

The technique of the operation on the spinal accessory calls for no comment here. The method preferred by the writers appears in the description of the cases following, operated on by Dr. Richardson.

Mr. Smith states that resection of the spinal accessory not only effects relief of the spasm of muscles supplied by this nerve, but is likely to remove spasm set up in other muscles, although other nerves are apparently involved. Our experience hardly lends strength to this hope (see Cases II. and IV.). We should not proffer this expectation with any confidence, but rather warn the patient that other muscles not apparently affected may in time succumb to the disorder and require further operation.

To the statements of the writer already quoted, that when other muscles remain affected the spasm may be removed by section of the nerves supplying those muscles, we are glad to subscribe from reports of cases, though we have had as yet no opportunity of personally verifying the fact. We have, however, advised further operation in several cases, and expect to be able at a future date to report the results of such interference.

This brings us to the question of operating upon the posterior cervical nerve-roots. The muscles of the posterior group may be divided roughly into those which draw the head back, those which rotate, and those (the larger number) which do both. Following the classification of Ballance, in the second group are placed the inferior oblique and rectus capitis posticus major. These are supplied by the sub-occipital nerve. Those which extend, namely, the rectus capitis minor, superior oblique, and complexus, are supplied by the same nerve. The larger muscles which when both sides are acting extend, and when one side is acting rotate, include the splenius, trachelo-mastoid, and complexus. The splenius, trachelo-mastoid, and the complexus are supplied by the succeeding posterior primary divisions of the cervical nerves. All the rotators here considered turn the face toward the affected side, as opposed to the muscles supplied by the spinal accessory, which turn the face away from it.

The posterior muscles appear to be more powerful than the anterior group. This is shown as regards rotation by the two cases mentioned by Smith, quoted above, and as regards extension by several of our cases. In these instances the head was drawn backward rather than forward, though the sterno-mastoid was apparently equally affected; all united to rotate, however, in the same direction.

The operation on the posterior branches has been performed times enough to remove the doubt, which naturally presented itself, whether the patient would be able to maintain the upright posture of the head after so extensive a paralysis.

The first case operated on by Smith was one involving the spinal accessory on the left and the posterior nerve-roots on the right, the head being rotated, therefore, to the right. Stretching was first performed on the left spinal accessory, followed at the end of six weeks by excision of the same nerve. About a month later the posterior branches were excised (through a longitudinal incision) on the right, from the second to the fourth inclusive, the sub-occipital being spared. This patient was seen a year after the operation, and remained quite well.

Keen published in January, 1891, a case illustrating his method of operating on these branches, using the transverse incision as a result of repeated experiment on the cadaver. His idea was to resect the first three branches supplying the principal posterior rotators—namely, the splenius capitis, the rectus capitis posticus major, and the obliquus inferior. Amelioration of the condition resulted.

Powers reports operation on a case involving the right posterior rotators without implication of the spinal accessory group. He describes the operation as intended to paralyze the three rotators (inferior oblique, rectus capitis posticus major, and splenius capitis, the former supplied by the first and second cervical, the second by the sub-occipital, and the third by the second and third cervical). He chose the transverse incision of Keen. The patient, seen one year later, showed a shortening of the plenius, and a tonic spasm in the right trapezius and levator anguli scapulæ. Rotation was easy when the head was extended; difficult when it was flexed (this movement being apparently antagonized by the muscles on the right). A month later the patient was much better and able to work; all movements were free.

Gardner and Giles report two cases treated by partial resection of both spinal accessory nerves and subsequent operations upon the posterior branches of the second and third cervical nerves. In one case perfect recovery followed, the patient being seen five years afterward; in the other, slight spasm in the posterior rotators on the left persisted, which it was expected would be relieved by another operation. Gardner claims precedence over Keen in this operation.

These writers advise allowing a considerable period to elapse after the operation on the spinal accessory, partly in the hope that the whole trouble will be thereby relieved, and partly to enable more exact study of the muscles involved, after paralysis of the trapezius. They advise operating on both spinal accessory nerves at one time, but separating the posterior operation into two parts.

Detailed description of the operation by transverse and longitudinal

incision will be found, the former in the articles of Keen and Powers already quoted, and the latter in Smith's monograph. Smith prefers the longitudinal incision, while Powers advises the longitudinal incision for thin, the transverse for stout people.

With regard to the sex, time of life, and side affected, search through reported cases, as far as made by the writers, shows no preponderance of one sex over the other. The face was rotated to the right in more cases than to the left, but the difference was not sufficiently marked to establish the greater tendency. A rather striking fact regarding age was shown by an analysis of thirty-two cases taken consecutively, fifteen occurring between the ages of thirty and forty, as against six between twenty and thirty; three each between forty and fifty, and fifty and sixty; two between ten and twenty; two being described, one as middle-aged and one as of mature age; the age of one case is not stated.

The best incision for exposing the spinal accessory nerve seems to us to be along the anterior border of the sterno-cleido-mastoid muscle, where the nerve, passing obliquely downward and backward from the jugular foramen, is crossed by the fibres of the muscle. This point will be found about an inch and a half below the mastoid process, as we have demonstrated by numerous dissections. The centre of this incision, which need not be over an inch and a half in length, should be, therefore, an inch and a half from the tip of the mastoid process. After crossing the internal jugular vein the nerve lies upon the pre-cervical muscles and fascia. It is usually found with ease by careful dissection just above and internal to the point where it passes behind the muscle.

This nerve varies considerably in size and strength. It sometimes fails to follow the usual course. In one instance, in a dissecting-room subject, the spinal accessory came from the anterior divisions of the second and third cervical nerves; it was impossible to demonstrate the position of the nerve in this subject without extensive dissection of the deep parts. Had this very unusual variation existed in the cases operated upon, the search would have been unsuccessful. A similar anomaly was probably present in the case reported by Dandridge, and accounts for the failure of the procedure (*Trans. Amer. Surg. Assoc.*, 1880, p. 500).

As soon as the dissection, carried directly backward toward the prevertebral space, exposes the fascia covering the rectus capitis anticus major, the nerve usually is seen, especially if the dissection has been bloodless. A dry and bloodless field seems a sufficient advantage to justify great care in controlling hemorrhage as the operation proceeds, for with everything stained with blood it may be extremely difficult to find this nerve even within the narrow limits of its normal position.

We have at times found the exact position of the nerve by irritating it with the nail of the index finger—drawing the nail firmly across the bottom of the dissection at right angles with the nerve, and at the same

time pressing firmly backward against the cervical bodies. In this manner the filaments are irritated enough to cause a sharp contraction of the sterno-mastoid and trapezius muscles. This procedure is so useful in case there is any difficulty in finding the nerve that we recommend it strongly. Instead of the nail, the handle of a scalpel or the blunt points of scissors may be used.

The nerve having been distinctly isolated, it should be drawn out of the wound as far as possible and cut. Both extremities may be stretched enough to allow the removal of at least two inches of nerve tissue, or the main trunk may be grasped with forceps and avulsed in both directions. We have never torn out the spinal accessory in this manner, however, on account of the danger of injury to the structures in the jugular foramen and at the base of the brain. From numerous experiments upon the cadaver we have found that the main divisions of the trifacial can be avulsed with little or no danger of injury to any intracranial structures.

After division of the nerve the sterno-mastoid becomes at once flaccid; the head can be brought easily into normal position, and if necessary, kept there. In one or two instances we have fixed the head for some days after dividing the nerve. Little is accomplished by this treatment, however, and its discomforts are so great that we no longer recommend it.

Case I.—Mr. S. P. H., aged fifty-five years, October 15, 1890. This gentleman, robust and of good family history, twenty-three years ago was troubled by a drawing of the head to the right. Dr. S. Cabot thought this was due to writing. Complete rest was followed by recovery. For years there was no further trouble, though there was a sense of uneasiness in the right sterno-mastoid muscle. Four or five years ago he began to have a disagreeable drawing feeling in the neck. This symptom was not excessive, being controlled sufficiently by local applications and by rubbing. About a year ago, however, the trouble began to grow worse, to affect him when lying down, and to be spasmodic in character. At this time the patient described the affection as a drawing of the head to the left, with considerable pain in the opposite side. The pain he referred to the spasm of the muscle. Dr. Irish, of Lowell, referred him to Dr. Walton, who advised first bromides and massage. This treatment proved ineffectual. The symptoms grew insupportable, the sleep was disturbed, and without hypnotics impossible.

There was a marked contraction of the right sterno-mastoid muscle, by which the head was strongly rotated to the left; at the same time the head was slightly retracted by contraction of the posterior flexors of the occiput. There was partial voluntary control over this muscular act, but the head would immediately resume this position on the slightest relaxation of these strong efforts of will.

The general condition of this patient was poor, owing partly to the constant distress in the daytime, and to painful spasms when in the recumbent posture, with inability to sleep. The face was pale and somewhat waxy; the expression was weary and anxious.

After careful observation for some days we decided to try without fur-

ther delay resection and avulsion of the spinal accessory nerve. This operation was performed through an incision one and a half inches in length, on October 20, 1890. The nerve was isolated without difficulty, drawn out as far as possible, and divided. About an inch and a half of the nerve was destroyed in this manner. The muscle was paralyzed at once, the spasm immediately ceased, and for the first time in many months the patient was able to sleep in comfort. He was discharged on October 31, the wound having united firmly by first intention.

The condition was relieved for about a year, when the spasm began to recur in the same locality. In February, 1892, a year and a half after the operation, he was as bad as ever. Complete rest in the hospital afforded temporary relief only, and a second operation on the same nerve was deemed advisable. This was performed on April 20, 1892.

An incision was made along the anterior border of the sterno-cleido-mastoid muscle three or four inches in length. The nerve was found at the bottom of the wound, but only with great difficulty. In searching for the filaments in the scar tissue of the previous operation the sterno-mastoid muscle was very extensively cut, so that practically the operation of neurectomy was supplemented by that of muscle division. The difficulties in the performance of this operation were very great. The isolation and destruction of the nerve were deemed at the time unsatisfactory, owing to the impossibility of recognizing beyond a doubt the nerve tissue. The result, however, was brilliant, demonstrating most satisfactorily the success of the procedure, for there was immediate and permanent cessation of spasm.

Relief has been continuous up to the present, no spasm appearing either in the muscles supplied by the spinal accessory nerve or in others.

Case II.—Mrs. T., aged forty-five years, a patient of Dr. Townsend, of Natick, was referred to Dr. Richardson by Dr. Folsom for a spasmodic torticollis that had for many months proved intractable to all palliative measures. The right spinal accessory nerve was resected, with immediate benefit. On August 10, 1894, Dr. Townsend writes: "The operation was a perfect success, and she has had little or no treatment since. A slight and temporary impairment of power in the corresponding arm was the only symptom left after her return home.

Case III.—A woman of middle age. Typical spasm in right sterno-cleido-mastoid, as shown in photograph (Fig. 1). Resection of spinal accessory. Complete and permanent relief to date. Absolute relief for a time, with reported recurrence of less distressing symptoms later. (Posterior rotators?)

Case IV.—J. D., aged twenty-eight years, entered the Carney Hospital, under the care of Dr. W. N. Bullard, on April 10, 1886, with a history of spasmodic twitching of the neck of eight months' standing. This began by a slight twitching at intervals of a week or two. From April until August the patient was treated without benefit by means of an immovable headgear. Large doses of quinine, salicylate of soda, and iodide of potash, were used without success. On August 3d, through an incision four inches in length along the anterior border of the sterno-mastoid muscle, the nerve was isolated and stretched, and a tension of ten pounds put upon it. The twitchings entirely disappeared, and the muscle remained perfectly quiet for two months. Soon after the operation the left sterno-mastoid began to twitch. On October 11th examination showed that there was still rapid contraction of the right sterno-mastoid muscle, though much less than before the operation.

The patient gradually improved, and was able to work about the wards of the hospital, where he remained several years. Dr. Ballard writes that improvement was permanent, though movements persisted.

FIG. 1.

Spasmodic torticollis relieved by operation. Typical case of involvement of sterno-cleido-mastoid.

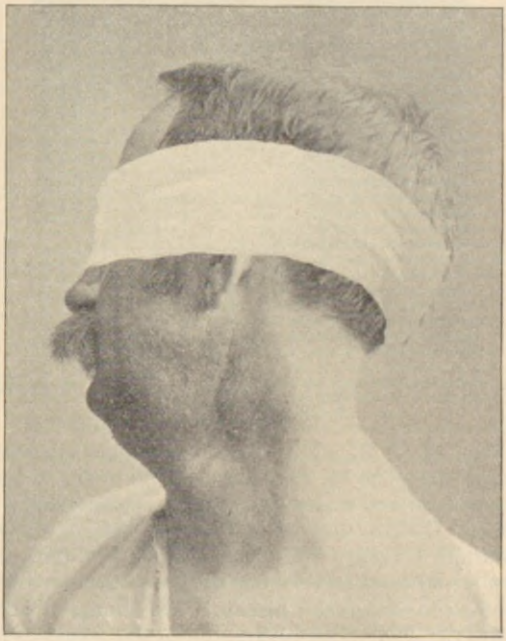
CASE V.—Mrs. M. J. H., aged sixty-seven years, entered the Massachusetts General Hospital on October 3, 1892. Ten years before she had neuralgia of head and face. Five years ago she began to carry the head to the left. On entrance to the hospital there was spasm of the right sterno-mastoid muscle. The trapezius was not affected. On October 8, 1892, under ether, the nerve was exposed through an inch incision in front of the sterno-mastoid muscle. Two inches of the nerve were removed. Ten days later, after firm union of the wound, some tendency was observed for the head to turn to the left. She was discharged on October 21st.

The following case shows that other muscles may become implicated after resection of the spinal accessory nerve, even though the spasm is practically limited to the muscles supplied by this nerve.

CASE VI.—W. B. A., aged forty-four years, blacksmith, married; had influenza in February, 1872. In March he strained his neck. In April he noticed wry-neck. No spasm was present at first; the spasms now draw the chin to the right. Dr. Richardson resected left spinal accessory nerve on July 7, 1892; relief was only temporary. He can bring the head and eyes to the front and even to the left, but this causes spasms. There is no strabismus. The pupils are equal. He decided against further operation August 25, 1892. September 7, 1892, he was no better and no worse, except that the head was drawn backward. Fig. 2 shows the position of the head some time after operation. The scar of operation is visible. It will be seen that no spasm is present in the sterno-cleido-mastoid, which was completely paralyzed by the resection. The head is, however, still rotated to the right, but, instead of being drawn forward is now drawn forcibly backward, showing that the posterior rotators on the right have become involved. In the back

view (Fig. 3) these muscles are seen to stand out prominently. It would seem now advisable to perform an operation on the posterior cervical branches on the right—an operation which we may fairly hope will complete the cure, although it cannot, of course, be absolutely promised that other regions will not become invaded.

FIG. 2.



W. B. A. after operation.

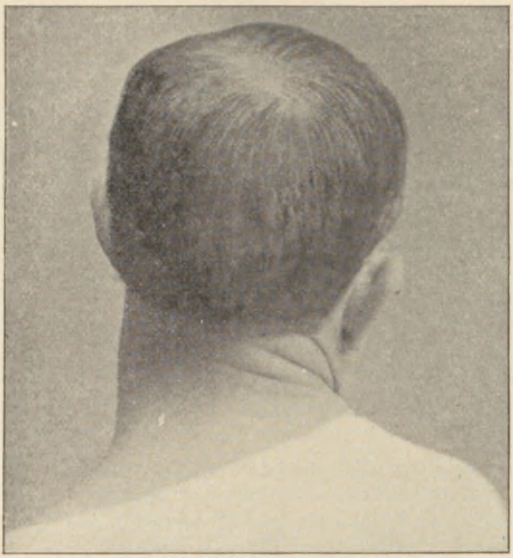
CASE VII.—Mrs. H., a woman in middle life, of a decidedly neurotic temperament, was first seen in August, 1889. She was well up to three years ago, when she had an attack of pneumonia, with protracted convalescence, after which she was subject to colds. She had an attack two years ago of what was termed diphtheria, though she was in bed only one day. Soon after this she complained of weakness and prickly sensations in the arms and legs—symptoms from which she had also suffered after the pneumonia and after childbirth. She has suffered much from pain in the back for many years. She has had two children, the youngest is now eighteen. Physical examination shows typical spasm of the left sterno-cleido-mastoid and trapezius muscles, the head being turned constantly to the right, the patient using the hand to counteract the tendency. The eyes were examined by Dr. Bradford, who prescribed glasses for the error of refraction, without the least amelioration of the spasm. Electricity was faithfully tried, galvanism being used to the affected and faradism to the opposing muscles, without benefit.

Operation was performed on December 15, 1889. The nerve was found by means of the anterior incision. It was drawn out of the

wound, and as long a piece excised as was practicable. Immediate correction of the spasm followed; the wound healed by first intention.

Spasms recurred for some time after the operation in the affected sterno-cleido-mastoid. These, however, ceased, and it was hoped that recovery would ensue; but rotation of the head to the left became more and more marked and troublesome, and has persisted up to the present time, with temporary remissions. The patient when last heard from was comparatively comfortable, and great hopes were entertained that the trouble was disappearing.

Fig. 3.



W. B. A. after operation.

Case VIII.—Male (referred by Dr. Hooker, of Springfield), a man aged forty-six years. Father died at eighty-eight of old age, though he is said to have had paralysis. His mother is said to have been of nervous temperament, but died of cancer at the age of seventy-four. One of his children has suffered from chorea. The patient himself was never robust. He is of nervous temperament, but had no special trouble until two years ago, when the spasms appeared. The movements came on gradually, growing steadily worse—rapidly so during the past few months. He is foreman in a printing establishment, but has not set type for ten years. When he did so it was not necessary for him to hold the head in any special position. There have been no symptoms of lead poisoning, but there is a blue line upon the gums. Astigmatism is present in the left eye. Vision in the right eye is wanting through congenital defect. The illustration (Fig. 4) shows the head rotated to the right and bent rather backward than forward. The left sterno-cleido-mastoid is tense, as well as the rotators at the back of the neck on the right, the case furnishing an excellent illustration of the common association of spinal accessory spasm on one side with spasm of the posterior rotators on the other. A course of iodide of potassium was advised and

carried out by Dr. Hooker, without result. Operation was then decided upon and preparations made, the plan being either to operate first upon the left spinal accessory and afterward upon the posterior rotators, or to operate upon both at the same time, as might seem advisable. At the last moment, the patient, having been advised by another physician to undertake a course of treatment, decided to postpone the operation until this attempt had been made.

FIG 4.

We have lately heard that the head is now drawn directly backward, probably due to implication of posterior muscles on the other side. This would doubtless have occurred if operation had been performed, and illustrates the importance of guarded prognosis.

CASE IX.—This case illustrates a different condition from any of the preceding in that the posterior muscles of the neck are affected on both sides. It is also important as showing the benefit of systematic massage and stretching, at least in recent cases.

The patient, a clerk, referred by Dr. Sherman, of Newton, was first seen in September, 1893. He had been well with the exception of a short attack of malarial fever two years ago. Within the past two weeks his head has been drawn involuntarily backward and somewhat rotated to the left. He has been obliged to give up work. The movements are not present while he is lying down, but are increased on attempts to work or walk. Tincture of gelsemium has been thoroughly tried, beginning with five drops every four hours and increasing to twenty-five. He is now taking ten drops. At the onset of the trouble he was given one-sixth of a grain of sulphate of morphine every four hours, for four doses; and quinine, two grains every two hours. He has been kept in bed. No marked change has appeared since the onset. There are tender spots in the middle of the back and on the neck and at the mastoid insertion of the sterno-cleido-mastoid on the right. Has slept poorly. To relieve this condition, seven and a half grains of chloral have been given at night. He has been at his present work for ten years. The position of the head is not constant, being

drawn sometimes directly backward, the chin elevated, the face being sometimes rotated to the right, at which times the left sterno-cleido-mastoid is prominent. The photograph (Fig. 5) shows the head drawn almost directly backward. Massage and stretching were undertaken by Dr. Lindström, and continued for seven weeks—three times a week, at the end of which time the head was held naturally and the patient was able to return to his work. While the result of this case would lead us to advise massage in preference to internal medication, or electricity, the case was so comparatively recent that it hardly subverts the dictum of Smith, that treatment other than operative is ineffectual in *well-established* cases of spasmodic torticollis, under which category this case would hardly come.

FIG. 5.

Spasm of the posterior muscles of both sides, relieved by massage (comparatively recent case)

CASE X.—Mrs. M. A. R., aged forty-eight years, entered the Massachusetts General Hospital on October 17, 1887. She had suffered from contraction of the right sterno-mastoid and trapezius muscles for four years. The head was drawn to the right and slightly rotated. She had been under the care of Dr. Putnam, who had used many remedies without effect, including electricity and immobilizing apparatus. The right sterno-mastoid was rigid and permanently contracted. When fully relaxed the head could be brought to an erect position, but no further than that. She could hold the head erect herself, but on relaxing her efforts it would be drawn toward the right shoulder and rotate toward the left.

On October 28th, the nerve was found and excised through an incision one inch in length, made along the anterior border of the right sterno-mastoid muscle, which became immediately soft and flexible. The head could be carried erect, and there was no pain.

A few weeks later she re-entered the hospital to have the right trapezius divided. The anterior fibres of that muscle were found somewhat contracted, and it was impossible to bring the head to more than an erect position on account of the shortening of these fibres. The trapezius and the sterno-mastoid muscle were very much relaxed, and the spasmodic contraction had ceased. In addition to the contraction of the anterior fibres of the trapezius, the scalenius medius was also shortened. No operation was performed upon these muscles, and the patient was discharged.

On October 29, 1894, Dr. Putnam writes: "I remember Mrs. R. well, and have seen her several times since the operation. There was some improvement, but the posterior muscles became more strongly affected than they had been before. Her general health became very poor also. I think she always considered that the operation had been of some benefit, but not so much so that her friends were willing that she should undergo another, as I suggested to her."

CASE XI.—This case (just operated upon) offers so typical an illustration of the more common form of spasmodic torticollis that it is inserted to show our present manner of dealing with these cases, though it is too early to record the result.

The patient, a woman of middle age, referred to us by Dr. Ely, of Providence, has suffered from steadily increasing spasm for about seven months. Nothing unusual is discoverable in her habits, manner of life, heredity, or previous history. When seen one month ago the head was almost constantly rotated to the left, and somewhat retracted, the right sterno-cleido-mastoid stood out distinctly, and the posterior rotators on the left were somewhat hard. She had already been informed by Dr. Ely that operation would be the probable outcome, but it was recommended to try first massage for a month or two. At the end of a month the spasm had so far increased, and was so troublesome, that the patient herself desired immediate operation.

The nerve was removed on November 14, 1894, through an incision a little over an inch long, made not exactly parallel with the anterior fibres of the sterno-cleido-mastoid, but at a slight angle, in order to bring the scar in the line of a well-marked wrinkle, to avoid deformity. The dissection was carried down in the usual manner, until, with the finger, the bodies of the vertebræ could be felt. Across this space the nerve was felt as a tense cord—a very unusual condition in our experience. In previous operations the nerve has been relaxed at the bottom of the wound, and its situation has at times been determined only by irritating it with the nail, as described above. In this instance the cord could be felt very plainly, and the slightest digital pressure caused spasmodic contractions of both trapezius and sterno-mastoid. The nerve was drawn out of the wound and cut as high up as possible. The distal end was twisted out on the hæmostatic forceps. The whole portion removed in a state of laxity measured two and a half inches. The operation lasted twelve minutes, and was practically bloodless.

It is hoped that complete recovery will follow; if, however, the head is still rotated and retracted at the end of a month, the first posterior branches of the cervical nerves will be resected.

The description of other cases in which operation has been either declined or postponed is omitted.

Conclusions.—1. Palliative treatment, whether by drugs, apparatus, or electricity, will rarely prove successful in well-established spasmodic torticollis.

2. Massage may prove of value in comparatively recent cases.

3. Resection affords practically the only rational remedy.

4. Operation on the spinal accessory nerve may afford relief, even if other muscles than the sterno-cleido-mastoid are affected; on the other hand, the affection previously limited to the sterno-cleido-mastoid may spread to other muscles in spite of this operation.

5. No fear of disabling paralysis need deter us from recommending operation, as the head can be held erect even after the most extensive resection.

6. The most common combination of spasm is that involving the sterno-mastoid on one side and the posterior rotators on the other, the head being held in the position of sterno-mastoid spasm with the addition of retraction through the greater power of the posterior rotators.

7. It seems advisable in most cases to give preference to the resection of the spinal accessory as the preliminary procedure.

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