

My analysis at that time was based on 3,000 women who had borne children, in which number there were 109 who had lesions that were directly traceable to the tear. While I have not since attempted another analysis, yet from the recollection of my observations I am constrained to hold a similar view today.

From the foregoing it will be seen that I do not claim that all lacerations are productive of pathologic changes; neither do I claim that there is any time limit as to symptoms showing themselves after the injury. According to Cleveland the average time in his cases was four years and six months; but this may be shorter or longer.

Montrose A. Pallen, whose assistant I was during the early part of my professional life, held that all tears should be closed immediately after delivery; but it will be conceded that this is not practical or necessary, except in case of hemorrhage from an exceptionally extensive tear. It is far better to wait until the effect of contusion has passed off and bleeding has ceased, so that one may inspect with exactitude. Moreover, many small tears heal spontaneously post partum. After, say from four to six weeks post partum, however, the genital tract should be inspected, particularly in primiparas, because for these the operation is particularly intended, and if a tear of some extent is found, it should be repaired.

#### TECHNIC

My present method of repair is simpler than formerly—so simple, in fact, that any one with a little surgical ability can easily adopt it.

The patient is placed in the lithotomy position and the customary disinfection attended to. If she is not hypersensitive and not nervous, no anesthetic is required, for the operation is not very painful.

The cervix is pulled down with a pair of well-working bullet forceps, and exposed with vaginal retractors. The bullet forceps are then adjusted, one pair in the line of the cervical canal on the anterior lip, and one pair similarly applied on the posterior lip. With a narrow but very sharp scalpel—sharp especially at the point—a superficial film of tissue is scraped off the torn surface, taking particular care that the angles of the tear are made raw. For sewing I usually use a full-curved, medium-sized Martin needle, which has cutting edges; but one may use any other needle, if more accustomed to it. A No. 2 chromic catgut is passed so as to include the entire depth of the tear. Usually two sutures suffice for each side of the tear. Sometimes only one suture is required for one side, it frequently being the case, in instances of bilateral tear, that the extent of the tear on the sides are unequal in extent. This also holds good for stellate tears. Care should be exercised in tying. The surfaces should be brought together just snugly, never too tight, so that the sutures may not cut into the tissue. No after-treatment is necessary, and the patient may be about as usual after the operation.

It will be seen from the foregoing that the operation is not applicable to any case in which the tear has existed long enough to cause pathologic changes, in which scar tissue is present in the angles. In all such patients the scraping, or making the torn surfaces raw, does not suffice. That is why I say that it is particularly applicable for primiparas who have not previously sustained a tear, and that in the case of every primip-

ara it should be part of the accoucheur's duty to make a visual inspection in about four to six weeks subsequent to delivery, and then to repair any existing laceration (unless it be of negligible extent) in the way outlined.

It is understood that in scraping the edges scrupulous care should be taken to avoid the mucosa of the cervical canal.

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### A METHOD OF TESTING MUSCULAR STRENGTH IN INFANTILE PARALYSIS\*

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The determination of the strength of partly paralyzed muscles in infantile paralysis, if made at all, has been done in the past by the roughest sort of guess, most often by pressing the hand against the contracting muscle. It was suggested to the physiological department of Harvard University in the winter of 1914-1915 that a more accurate means of estimating muscular strength would be of great value, and the method here described was formulated, with the following aims:

1. To enable a more accurate diagnosis to be made in the way of picking out the seriously affected muscles after an attack.

2. To obtain a means of indicating the muscles which were most promising for mechanical or operative treatment.

3. A quantitative measurement of this sort which would give a means of gaging the effectiveness of different modes of treatment.

4. A method of this kind might enable one to pick out from supposedly abortive cases certain cases in which remained a residual muscular paralysis too slight to be perceived by other methods.

To be of service the technic should be relatively simple and the results reliable. The method, which has been developed and used in a large series of tests extending over six months, seems to satisfy both these criteria to a reasonable degree.

The index of muscular power employed is the resistance of the muscle group to a steady pull sufficient to overcome it. A sling is adjusted in an assigned position over the part of the limb in which the muscle group to be tested has its insertion. The sling is fastened to an accurate spring balance through which the pull is exerted. The balance must be held carefully in a line at right angle to the axis of the part of the limb to which the sling is adjusted, and is read either at the instant the muscle yields, as in the test of plantar flexion, or when the member is drawn into an assigned relationship with the body, as in knee extension.

A standard technic has been worked out for each of the following movements: In the legs, plantar and dorsal flexion, inversion and eversion of foot; adduc-

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tion and abduction, flexion and extension of the hip; flexion and extension of the knee. In the arms, pectoral, latissimus dorsi, anterior and posterior deltoids; forearm flexion and extension; thumb adduction and abduction. These include the important groups except the trunk muscles and the rotators, which are mechanically difficult to test reliably. The tests in detail will be described in a subsequent communication.

To be able to judge fairly the degree of impairment of an affected muscle group one must know what should be expected of the same group when normal. To this end we have prepared, on the basis of tests of a large series of normal children, tables of standard muscle strengths for all the groups listed above, for ages from 4 to 16 years. These tables give information not only of the normal strength of each group of muscles, but also of the relative strengths of the different groups.

To judge, on the basis of repeated tests, whether an affected muscle has improved or deteriorated, allowance must be made for possible variations in the vigor of voluntary innervation. To obtain data for this allowance we test regularly all the leg groups of both sides in cases that have any leg muscles affected, and all the arm groups when there is impairment of the arm.

Such changes of power as are shown by the *unaffected* muscles after a short interval are not referable to changes in muscular condition, but must signify changes in innervation. We can conclude, from the records of the unaffected muscles, what allowance to make for changes in innervation, and so determine how much of the change shown by the affected muscle is actual increase or loss of muscular power.

In favor of the method it may be said that successive tests at short intervals on the same subjects show the readings as to individual muscle groups to be, in a large percentage of cases, remarkably constant.

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## SUDDEN BLINDNESS DUE TO SUPPURATION OF THE ACCESSORY NASAL SINUSES

WITH REPORT OF THREE CASES \*

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That the intimate anatomic relations existing between the nasal accessory sinuses and the orbital contents has caused much eye complication has long been well known, but it is only within the last few years that special attention has been given this subject, as is shown by the literature on the subject.

In the last three years I have had in my practice three cases of sudden monocular blindness, which were diagnosed as due to nasal suppuration, and cured by endonasal treatment. These cases were of such a nature that diagnosis was not easy, one case being diagnosed by the presence of central color scotoma for red and green; one by dilated pupil, and one by dilated pupil, color scotoma and involvement of the ocular muscle. These cases led me to investigate the ophthalmic literature, to see if by tabulating the symp-

toms of all cases reported there would not be found some more definite way of diagnosing the eye condition and locating the nasal trouble. I have collected from the literature 88 cases of sudden blindness from nasal disease, most of them with normal fundus (those that were not normal having only optic neuritis, with the exception of two which had a neuroretinitis), leaving out the cases that were complicated by a history of syphilis, tuberculosis, detached retina, uveitis, and including only two having orbital abscess. This confines the cases to that form which we recognize as retrobulbar neuritis. In 69 of these cases one eye, in 19 both eyes were affected. Of the 88 cases, 16 are from the English literature, 14 from the French, and 58 from the German, and date from 1839 to the present time. The French seem to have reported more in the early literature, but of late years the German reports have predominated. Of the total, 63 cases have been reported in the last ten years. In order that my own cases may be commented on under the separate heading of "Symptoms," I herewith give their history:

CASE 1.—H. O. J., aged 35, came under my care Feb. 11, 1911, with the following history: In November, 1910, while he was standing on a steel cable attached to an engine, the engine started, throwing him in the air and causing him to alight on a steel rail on the right side of his head, cutting his ear in the median line and causing a fracture of the base of the skull with the usual accompanying symptoms of hemorrhage from the ear, etc. He was trephined within forty-eight hours and a blood clot removed; he remained unconscious for several days. After regaining consciousness, it was noticed that he had a paralysis of the right externus muscle, causing diplopia, due, undoubtedly, to involvement of the sixth nerve of that side. When referred to me, one month after the injury, examination showed that he had a normal vision in each eye, but up to that time had developed no movement of the right externus muscle. He was placed on increasing doses of strychnin, and his right eye covered with ground glass, to relieve him of the troublesome diplopia. He was under treatment for three months, with slight improvement, when he was referred to me again, May 2, with a history of the vision in the left eye suddenly becoming obscure April 28. He was able to read in the morning, but in the afternoon could only see objects indistinctly, the vision gradually growing worse up to the time I examined him, when the vision in his left eye was 21/100, vision in the right eye being normal. Examination of the left eye showed the pupil regularly reacting to light and accommodation; no fundus change was found, except a possible engorgement of the retinal vessels; peripheral field of vision, normal for white, but an absolute color scotoma for red and green; no sign of exophthalmos or orbital involvement; urine negative; no syphilitic history. At this time he gave no history of nasal trouble, and nothing was found on examination. Thinking there might be some syphilitic trouble, he was sent home and placed on increasing doses of potassium iodid. He returned to me on the twenty-second, vision having decreased to counting fingers at a few feet. The pupils were still normal in reaction; central color scotoma was still present, and no sign appeared of orbital involvement. Examination of the nose at this time showed pus coming from under the middle turbinate on the left side. Probing disclosed no uncovered bone; no involvement of the frontal or maxillary sinus could be found. The sphenoid was not probed, but there was no pus coming from this region. Diagnosis was made of retrobulbar neuritis, due to empyema of the ethmoid cells. In order to drain them, the usual preliminary operation of removing the anterior end of the middle turbinate was done, and he was placed on 5 grains of hexamethylenamin three times a day. There was an increased discharge of pus, and in five days his vision went up to 20/20; the color scotoma was still present; there was no marked decrease

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