

may be followed by a disappearance of normal cutaneous and tendon reflexes for a number of hours, or may be followed by the temporary return to the normal of pathologic reflexes.

2. The operation of laminectomy may have a profound effect in certain pathologic states of the spinal cord and may so modify or check the disease that a return to normal conditions is even possible.

3. On account of the relative safety of laminectomy in experienced hands, except in the region of the conus and cauda equina, and for the reasons stated above, exploratory operations should be done more often.

## TRICHINOSIS AND THE CEREBRO-SPINAL FLUID

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It is now over two years since I demonstrated for the first time the *Trichina spiralis* in the cerebrospinal fluid, in a patient suffering from trichinosis.<sup>1</sup> I then expressed an opinion that perhaps lumbar puncture may become a useful method for diagnosing this disease. My hopes were fully realized. Before this procedure can be a real factor in the diagnosis of this malady, however, the parasites must be found in the cerebrospinal fluid (1) sufficiently early in the disease and (2) with a fair degree of constancy. My findings of the *Trichina spiralis* in the cerebrospinal fluid have recently been confirmed by Leon Bloch, Young and others. It is noteworthy that in Young's case the parasites were readily demonstrable in the cerebrospinal fluid but not in the muscle tissue.

I wish to add three more cases in which I found the *Trichina spiralis* in the cerebrospinal fluid. I am indebted to Dr. Moshkowitz for the cerebrospinal fluid. The patients were all Italians and ate pork infected with *Trichina spiralis* twenty-one days prior to the lumbar puncture. The cases developed into typical cases of trichinosis and showed the usual subjective and objective symptoms of the disease, including the eosinophilia.

In performing the lumbar puncture every precaution was taken not to introduce into the trochar parasites which may happen to lodge in the muscle of the back. The trochar was introduced with its stilet, and the latter was withdrawn only after the trochar was successfully introduced into the cerebrospinal canal. The cerebrospinal fluid was collected into sterile test tubes.

In appearance the three fluids differed in no wise from that of normal cerebrospinal fluid. They were perfectly clear and contained no sediments. Chemically only one out of the three fluids failed to reduce Benedict's solution; all showed a faint trace of albumin and no increased amount of globulin. The specimens were centrifuged, and the sediments showed but an occasional lymphocyte and from one to four trichinae per field. These embryos were fairly motile and retained this activity to some extent at the end of three days when kept in the cerebrospinal fluid at room temperature. These embryos are not in the least

affected when placed in normal urine, and have no effect on red or white blood cells in suspension.

Should the trichinae be found in the cerebrospinal fluid with a fair degree of constancy, this method clinches the diagnosis rapidly, as but few other single procedures do.

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## A CASE OF TRICHINOSIS WITH EMBRYO IN THE SPINAL FLUID

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*History.*—G. F., man, aged 39, Greek, laborer, was admitted, Feb. 27, 1916. Family and previous personal history were negligible. January 22 he, together with five associates in the railroad section gang, ate some undercooked pork. The present illness developed thirty-two days later with pains and soreness in the flexor muscles of the arms and the calves of the legs. No history of initial abdominal pains and diarrhea could be elicited. On admission the muscular pains had increased in severity and had involved the muscles of mastication. Moderate frontal headache was present.

*Examination.*—The patient was well nourished and well-developed. There was no jaundice. Moderate periorbital edema was present. The pupils were normal. The tongue was red, moist and clean. There was slight dulness and roughening of breath sounds at both apexes. The heart and abdomen were normal. The spleen was not enlarged. Pressure over the biceps and leg muscles elicited well marked soreness. Urinalysis revealed specific gravity, 1.024; acid; albumin trace; glucose negative; phosphates, no casts. Blood pressure was 140 mm. systolic, and 90 mm. diastolic.

*Treatment and Course.*—After two or three days the periorbital edema disappeared, but the muscular pains and soreness increased, now involving the thighs and buttocks. From time to time there was some general abdominal tenderness. There was no diarrhea prior to the administration of purgatives. At the end of the third week after admission the patient was much improved so that there remained only slight tenderness of the biceps, calves and thighs.

Temperature, on admission, was 100.6, and for ten days maintained an average evening reading of 102, when it fell to normal and then maintained an average thereafter of 99. (The maximum temperature was 104.) The pulse was disproportionately low with an average of 95 during the highest temperatures; likewise, respirations, 21.

Castor oil, 2 fluidounces, was given on admission. Calomel and magnesium sulphate were given at intervals of a few days. Salol, 5 grains, was given three times a day. Free catharsis was maintained.

*Laboratory Examinations.*—The *Trichina spiralis* was not found in the feces on one examination during the period of catharsis and well marked muscular pains. Only venous blood was examined during the fourth week, following the technic of Stäubli, and was negative. At this time several specimens of sedimentized urine were examined and were likewise negative. The parasite was demonstrated in large numbers in the gluteus maximus muscle in the fifth week of the disease when there were definite muscular pains and tenderness.

On admission, the leukocyte count was 10,400, and rose to a maximum of 13,400 three days later. The minimum count was 7,900, six days later. The patient was discharged apparently well after thirty days in the hospital, the eighth week of the disease, with a leukocytosis of 9,600 and eosinophilia of 28 per cent. The maximum eosinophilia was 53 per cent.

The cerebrospinal fluid withdrawn during the fifth week of the disease showed after an exhaustive search of several sedimentized specimens one sluggishly motile embryo of characteristic appearance. Its length was 0.1 mm., breadth, 0.006 mm. The parasite in places appeared finely granular. The oblique, clear band, described by Stäubli, between the anterior quarter and the posterior three quarters was not observed. The motility was a slow, rhythmic bowing of the

1. Van Cott, J. M., and Lintz, William: Trichinosis, THE JOURNAL A. M. A., Feb. 28, 1914, p. 680.

entire body with a bending of one end and then the other. The spinal fluid was clear and under a moderately increased pressure. Cells 3; globulin (ammonium sulphate and butyric acid) negative. At this time there was no headache and all reflexes appeared normal. The Kernig sign was negative.

## COMMENT

Since in this case at the fifth week there were negative cytologic and chemical findings, and sluggish motility of the parasite, earlier examinations would appear advisable. A routine spinal puncture (unless contraindicated) and neurologic examination of every trichinosis case may reveal much of interest in demonstrating the extent of parasitic migration into a hitherto unexplored field.

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## A CASE OF BETA-EUCAIN POISONING

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The following case is reported from the Surgical Clinic of Dr. M. T. Sudler, in the Bell Hospital, University of Kansas:

A farmer, aged 60, admitted to the hospital for operation for double inguinal hernia and left hydrocele, with negative family history and negative personal history except for occasional palpitation of the heart, had had the left inguinal hernia for twenty-five years, the right hernia for two years, and the left hydrocele for ten years.

The patient was rather heavy, and was healthy looking. There were dilated venules on the face. The right eye was artificial. He had pyorrhea alveolaris. The heart was irregular, with an extrasystole from every three to six beats. The radial vessel walls were palpable. The blood pressure was 160. There was a moderate cloud of albumin in the urine. There were double inguinal hernia and left hydrocele.

On the day after admission, under beta-eucain, 0.25 per cent., anesthesia, the Bassini operation for indirect inguinal hernia and operation for removal of the hydrocele sac were performed. Twenty minutes before operation one-fourth grain of morphin was given hypodermically.

The local anesthetic was administered in the usual way, and the hernia operation completed. When the removal of the hydrocele sac was begun, it was noticed that the patient had begun to perspire freely, and he soon began to complain of being tired. When the patient left the table, at 10:40 a. m., he was perspiring profusely, and the skin had begun to feel clammy. Respirations were now and then sighing in character. The pulse was 88 and weak, the respiration 20 and regular, except for interruptions by sighing. At 11:30 the pulse was 84 and irregular, the respiratory rate slow and irregular. The venules of the face were much engorged. The skin over the entire body was cold and clammy. The pupils were contracted. Five minims of epinephrin chlorid were given in the vein, which caused a transient increase in the strength of the pulse. The patient complained of pain in the head and abdomen. At 12 o'clock it was impossible to feel the pulse, the respirations were of the Cheyne-Stokes type, and at times there were intervals of almost a full minute without breathing. Ten minims of epinephrin were then given, after which the pulse was 60. At 12:45 the pulse was 46. One one-hundredth grain of atropin was then given hypodermically. One thousand cubic centimeters of saline were given intravenously with 15 minims of epinephrin. At 5:30 p. m. the pulse was 46, and the patient's general condition somewhat improved, though he complained of numbness of the left hand and foot. At 7 p. m. he was more comfortable, his pulse 64. At 8:30 p. m. the pulse was 74, the respirations still of the Cheyne-Stokes type, but the period of complete cessation of breathing was not longer than fifteen seconds. At 10 p. m., almost twelve hours after the onset of toxic symptoms, the pulse was 76 and of good quality, and the respirations were 20 and regular. The next day he had apparently completely recovered.

The patient's improvement was uneventful until the fifth day after the operation, when at 2 o'clock in the morning, in the absence of the nurse, he sat up in bed to take a drink

of water, and dropped back on his pillow dead. The necropsy showed an embolus in the left coronary artery.

The quantity of beta-eucain used in this case did not exceed 3 ounces of a 0.25 per cent. solution. Three ounces was the quantity placed on the instrument table for use. If all of the solution had been injected into the tissues, the quantity of the drug would amount to 3.4 grains. When waste is considered, it is highly improbable that so much was actually absorbed by the tissues.

Hertzler<sup>1</sup> states that "beta-eucain may be used in quantities up to 3 grains, it is said, and as much as 15 grains have been used without alarming effects." Barker<sup>2</sup> reports the use of as much as 6 ounces of a 0.2 per cent. solution of beta-eucain in a goiter operation without toxic effect. M. T. Sudler has used as much as 5 ounces without causing any symptoms of intoxication.

In a hurried review of the literature, I have found reference to six cases of intoxication due to beta-eucain. Way<sup>3</sup> reports a case of poisoning while doing a circumcision. In his case, less than 2 grains were used. Kraus<sup>4</sup> describes a case of poisoning from injecting 10 c.c. of a 2 per cent. solution into a urethra the day following an internal urethrotomy, which caused very distressing toxic symptoms. In the same article he refers to two cases reported by Marciniowski, one by Dolbeau, and one by Simon. In one of Marciniowski's cases only a transient syncope was noted, and the patient was subject to fainting attacks. In the other case, after injection of 1.5 c.c. of a 10 per cent. solution, the patient exhibited tonic and clonic spasms, which gradually subsided after fifteen minutes, but were followed by stupor and weakness, the symptoms all passing away by the end of six hours. Dolbeau's case was caused by the intravenous injection of the drug. The case reported by Simon was characterized by transient headache and vomiting in a man whose bladder had been filled with 80 c.c. of a 4 per cent. solution for a Bottini operation.

## New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

### GLYCOTAURO (See N. N. R., 1916, p. 61).

The following dosage form has been accepted:

*Enteric Coated Glycotauro Tablets.*—Each tablet contains glycotauro 2 grains and is coated with salol. Prepared by Hynson, Westcott & Co., Baltimore, Md.

**PETROAGAR.**—Each 100 grams contains petrolatum 0.72, agar 0.22, with powdered licorice, cocoa and oil of anise sufficient to flavor. U. S. trademark applied for.

(Accepted for inclusion with the appendix to New and Nonofficial Remedies.)

Prepared by H. C. Merker Co., Chicago, Ill.

**PETROBRAN.**—Each 100 grams contains petrolatum 0.74, bran 0.22, with powdered licorice and "oil of pineapple" (ethyl butyrate) sufficient to flavor. U. S. trademark applied for.

(Accepted for inclusion with the appendix to New and Nonofficial Remedies.)

Prepared by H. C. Merker Co., Chicago, Ill.

1. Hertzler: Local Anesthesia.
2. Barker, A. E.: Practitioner, London, September, 1907.
3. Way: Jour. Roy. Army. Med. Corps, August, 1914.
4. Kraus: Deutsch. med. Wchnschr., 1906.