for letters and figures, that the remarkable difference is observed.

I have shown elsewhere that words as motor processes, which they are from one point of view, parrot-like reproductions of articulate sounds, must be organized bilaterally in the bulb and central ganglia, all the muscles concerned in speech being bilaterally associated, the word cell-groups being ready for employment by the higher centres, and, in my opinion, this bilateral organization extends as high as the third frontal convolutions. Word cell-groups exist in the right third frontal as well as in the left, and are habitually employed in speaking in association with the left third frontal, the two being connected by commissural fibres of the corpus callosum. It is through these word groups on the right side that aphasia is obviated in some cases of right hemiplegia with marked paralysis of the face and tongue, the lesion having taken place in the white fibres of the internal capsule sufficiently low down to leave intact the commissural fibres of the corpus callosum between the frontal convolutions of the two hemispheres.

In support of this view may be cited the remarkable phenomenon of mirror writing. Some people can write currently with the left hand, but the writing is not only backwards from right to left, but reversed, so that a mirror is required in order to interpret it, when it is found to resemble the ordinary handwriting. Here the graphic centres must be bilaterally associated, and the left must have educated the right.

I may be permitted here to recall the fact that before the identification of the sensory and motor cortical areas by Hilzig and Ferrier I had inferred that they would be found in the Sylvian, Rolandic, calcarine, and occipital convolutions, since radiating fibres from the bulb and central ganglia were distributed only to those convolutions, the intermediate superadded convolutions constituting much the largest area of cortex receiving no radiating fibres. This structural arrangement, made out by tracing the fibres, has been confirmed by Flechsig on developmental grounds. I have some right, therefore, to assume that other conclusions at which I arrived are valid. The most important of these was that the fibres of the corpus callosum and anterior commissure were distributed to exactly the same convolutions as the radiating fibres, and constituted a commissure between corresponding gyri in the two hemispheres. I found also a large longitudinal commissural system.

REFERENCE.

¹ *Transactions of the Royal Medical and Chirurgical Society*, vol. lv, 187.

Clinical Remarks

ON

A CASE OF

CEREBRO-SPINAL MENINGITIS OR SPOTTED FEVER TREATED BY LUMBAR PUNCTURE AND VACCINE INJECTIONS: WITH RECOVERY.

By HECTOR MACKENZIE, M.D., F.R.C.P.,
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THE following case of cerebro-spinal fever has several points of interest. It was the first case to be notified in London during the recent visitation of the disease in this country. Although it was a very severe type of the disease, at first suggesting the malignant form, it happily ended in recovery. No conclusions of any value can be drawn as to the effects of treatment in one case. With regard to lumbar puncture, which was repeatedly performed, I should like to say that, after an extended use of this method of treatment during a number of years, I consider it of great value in all forms of meningitis. It should be performed as soon as one diagnoses the nature of the case, and should be repeated at short intervals, especially where there are signs of intracranial pressure. The immediate improvement in the patient's condition after lumbar puncture is usually most striking, and I believe that several lives in my own practice have been saved by its means. I have always used the needle of an ordinary antitoxin syringe for this purpose. The fluid should be allowed to come away gradually drop by drop

as it usually does, and should be collected in a test tube. As a rule no suction should be employed.

In this case in nine punctures nearly 9 oz. of fluid were removed. In two punctures no fluid was obtained. The fluid obtained was at first very turbid, then was clear, again was very turbid on the fourth puncture, while afterwards it was either opalescent or clear. The cells contained in the fluid were throughout chiefly polymorphonuclears. The micro-organisms were intracellular, Gram-negative diplococci, and on one occasion the *Staphylococcus albus*. After the end of the fifth week the fluid was sterile.

The vaccine used was prepared and administered by Mr. Leonard Dudgeon, Superintendent of the Clinical Laboratory at St. Thomas's, to whom I am much indebted for the care and attention given to this case. It is obvious, however, that the value of such a vaccine as has been here used can only be determined by experience in a sufficient number of cases. It is impossible to say how far the recovery was due to the lumbar punctures and the vaccine injections respectively. I am convinced of the benefit to be derived from lumbar puncture. Of the effects of the vaccine we can speak with no certainty at present. For the following notes of the case I am indebted to Mr. W. O. Sankey, house-physician, and Mr. W. N. Child, clinical clerk.

Florence H., aged 6 years, was admitted to St. Thomas's Hospital under the care of Dr. Hector Mackenzie.

The only previous illness she had had was measles when 2 years old; otherwise she had been quite healthy.

On Thursday, January 24th, 1907, the child seemed perfectly well, but next morning, before breakfast, she shivered, and complained of pain in her left shoulder.

She took her usual breakfast, however, and went to school, but at eleven o'clock she said she felt ill, complained of headache, and was allowed to walk home.

The headache, which was frontal, continued, but the pain in the left shoulder was not mentioned again.

She vomited twice during the afternoon. Between 7 and 8 p.m. she became unconscious, her fingers were constantly twitching, and she kept looking round in a frightened manner. During the night she spoke incoherently of the pain in her head.

Next morning, Saturday, January 26th, at 10.30, the child, who was still unconscious, was brought up to St. Thomas's Hospital and admitted. She lay on her side with her legs drawn up and was in a comatose condition. The face was cyanosed and the respiration shallow. The radial pulse could only just be felt. Strychnine and ether were at once given hypodermically.

On inspection in the ward the child still lay on her side with the legs, thighs and trunk flexed; from time to time she straightened out her limbs and screamed loudly.

The head was retracted and the muscles of the neck were stiff. The knee-jerks were brisk on both sides; the plantar reflex was extensor and Kernig's sign was obtained. The skin had a bluish mottled appearance, and on the front of the chest, back and legs there was a scanty dark blue petechial rash; in one or two places the haemorrhages were as large as a three-penny-piece. The pupils reacted to light, and there seemed to be marked photophobia.

Nothing abnormal was detected in the chest.

The abdomen was flat and retracted, and nothing definite could be felt of the organs.

The tongue was dry and furred.

The temperature was 101.4°; pulse, 144 per minute; respirations, 32 per minute.

Lumbar puncture was performed two hours after admission, and about 5 drachms of very turbid fluid ran out through the needle; this contained a number of cells, in which a diplococcus be could seen. A subsequent examination revealed the presence of "a large number of cells, chiefly finely granular polymorphonuclear cells, and many intracellular Gram-negative diplococci."

The child was noisy and restless during the afternoon, but slept well after being given chloral, 5 grains.

The temperature rose to 102.8° during the night.

On the following day, Sunday, January 27th, some fresh spots were seen; the child was quieter, and recognised her mother; she took milk well. After admission there was no more vomiting. Lumbar puncture was performed again, but no fluid could be obtained, even by aspiration.

The temperature went down to 101.2° during the day.

Until Monday, January 28th, the condition steadily improved.

The child was able to talk intelligently and answer questions; she said she had no pain at all, and her eyes did not ache. There was still some retraction of the head and stiffness in the neck, and the tongue was still furred. The haemorrhagic spots were now brownish-yellow, and no fresh spots had appeared; some labial herpes was present.

The pulse was steady and regular at 126 per minute, and the temperature was 102.8°.

Some films were made from swabs taken from the nose, and in these diplococci were seen.

On the next day, Tuesday, January 29th, the mouth was dry, and in a foul condition. The temperature had fallen to 99.2°.

Urine acid, deposit of urates. No reduction of Fehling, and no trace of albumen.

Lumbar puncture was performed, and 4 drachms of clear fluid were obtained in which a meningococcus was seen; the cells were almost entirely finely granular polynuclear; a few intracellular diplococci were seen.

On the same date 120,000,000 meningococcus vaccine was injected; on this and on subsequent occasions of injection considerable oedema and hyperaemia of the tissues round the site of injection were caused. The number here given in connexion with the vaccine is that of the microbes contained in the dose administered.

During the next eleven days, from Wednesday, January 30th, to Saturday, February 9th, the temperature remained in the same condition—that is, varying from 100° to 103° or 104°; whenever the latter figure was reached (for example, on the nights of February 2nd, 3rd, and 4th) the child was carefully sponged, after which the temperature always fell again.

She was usually restless at night during this period and irritable at all times.

An ice-bag for the head was begun on February 5th. Chloral was given on three nights; calomel was given twice, and mist. hyd. c. cret. on several occasions.

Lumbar puncture was performed on January 31st, February 5th, and February 8th; the amount of fluid obtained on each occasion and the results of examination will be found in the table given below.

Meningococcus vaccine (20,000,000) was injected on February 7th.

After February 9th the temperature fell by lysis, until on February 16th and 17th it varied from 97° to 98.6°. The child was still irritable and restless at night; the knee-jerks were brisk, but not easily obtained. On the latter two or three days of the fall of temperature the child was much better and slept a good deal during the day as well as the night; she had no headache and sat up and played with her toys.

During this period lumbar puncture was performed twice and on February 14th vaccine (143,000,000) was injected.

The optic discs were examined twice (January 30th and February 16th) up to this time, and beyond slight hyperaemia of the left disc and a suspicion of haemorrhage (not verified at second examination) of the right no abnormalities were found.

From February 17th onwards, until March 6th, there was a period of sudden changes of temperature; three times lumbar puncture was performed when the temperature rose to between 102° and 103° on February 18th, March 1st and 5th, and each time fluid was obtained, as shown in the accompanying table. Vaccine was injected (71,000,000) on February 26th. On February 21st, soon after the first relapse, a sudden rise

of temperature was checked by sponging and followed by a rapid fall.

During this period the knee-jerks were still brisk, plantar reflex was flexor and ankle clonus not obtained.

Aspirin, 15 grains, were given on March 2nd.

On March 8th vaccine was injected (32,000,000), and from that date the temperature was subnormal.

On March 15th the child was moved into another ward with other children, and since then the temperature has been irregular but about normal.

On March 23rd vaccine (64,000,000) was injected and aspirin, 5 grains given.

Patient got up first on March 29th, and left the hospital quite well towards the end of April. Knee-jerks brisk; nothing abnormal in chest or abdomen; optic discs normal; mental condition unimpaired.

Summary of Chief Features of the Case.—Temperature continually above normal for the first eighteen days, mainly between 101° and 104°. The removal of fluid by lumbar puncture always relieved symptoms. The child usually slept for eight or ten hours after each puncture. There were two well-marked relapses. There was no diarrhoea, purgatives being necessary on several occasions. No important treatment was given beyond vaccine and lumbar puncture; the vaccine was prepared from organisms cultivated from the fluid withdrawn by lumbar puncture. The diplococcus was present in seven out of the nine specimens of fluid withdrawn. Injection of the vaccine caused oedema and hyperaemia of tissues around injection site.

A Lecture

CIRCUMCISION AS A RITE AND AS A SURGICAL OPERATION.

DELIVERED AT THE MIDDLESEX HOSPITAL,

By J. BLAND-SUTTON, F.R.C.S.,

SURGEON TO THE HOSPITAL.

CIRCUMCISION may be described as the most ancient as well as the simplest operation in surgery, but it differs from all other recognized surgical procedures in possessing among many races and tribes of men a ceremonial value. In this lecture it will be considered from the religious, the ethnic, and clinical standpoints.

I do not think an apology is needed for devoting a lecture to this simple and common operation, especially when such great masters as Botticelli and Fra Bartolommeo considered it worthy their high art to represent the performance of circumcision.

Among the magnificent frescoes on the wall of the Sistine Chapel there is one representing Zipporah, the wife of Moses, circumcising her son with a sharp stone, according to the description contained in Exodus iv. 25.

The earliest mention of the rite of circumcision occurs in Genesis xvii, when Abram's name was changed to Abraham, and God made a covenant with him that he should be fruitful and multiply. The sign of this covenant was circumcision, and the instructions in regard to it are very explicit: "Every man child among you shall be circumcised," and that there should be no mistake in the meaning of the term the following verse runs: "And ye shall be circumcised in the flesh of your foreskin," and the age at which the rite should be performed is deliberately fixed for the eighth day after birth. Abraham, it should be remembered, was 99 when he submitted himself to the operation.

There has been much quibbling in regard to circumcision as to whether it should be regarded as an ordinance for cleanliness or a purely religious rite; the text, however, is very clear; it was to ensure fruitful coitus in order that the seed of Abraham should multiply according to the covenant. A long foreskin is a recognized hindrance to convenient coitus. Apart from any consideration as to the rite of circumcision being instituted for the mere purpose of cleanliness, the Jews must have regarded it as a sacrament, for in many of the Old Testament narratives "uncircumcised" is used as a term of contempt, and nowhere with more force than by Ezekiel xxxii. 17-32, from which it would be inferred that the place for the wicked is among the uncircumcised in the nether pit (hell).

One of the most dramatic events connected with circumcision in the Old Testament is the massacre of the Hivites by Simeon and Levi three days after they had been circumcised in order to make Shechem an eligible husband for

Lumbar Puncture and Results.

No	Date.	Temperature Before.	Temperature After.	Characters of Fluid.
1	Jan. 28th	101.2°	101.0°	5v. very turbid. Large number of cells, chiefly polymorphonuclear. Many intracellular Gram-negative diplococci present.
2	Jan. 27th	101.4°	102.0°	No fluid obtained.
3	Jan. 29th	101.8°	100.4°	5iv. clear. Cells entirely polymorphonuclear. A few intracellular Gram-negative diplococci seen.
4	Jan. 31st	103.0°	99.8°	5j. very turbid. Meningococcus and <i>Staphylococcus albus</i> present.
5	Feb. 5th	103.8°	98.6°	5ij. opalescent. Sterile. Many cells present.
6	Feb. 8th	103.8°	100.2°	5ix. almost clear. Pure culture of meningococcus. Pus cells abundant, but very few intracellular diplococci.
7	Feb. 11th	101.4°	99.8°	5j. opalescent. Polymorphonuclear cells and a few intracellular diplococci. Pure culture of meningococcus obtained.
8	Feb. 15th	98.4°	98.0°	No fluid obtained.
9	Feb. 18th	101.2°	99.0°	5j. clear fluid.
10	March 1st	102.0°	100.0°	5j. clear. Sterile.
11	March 5th	101.2°	97.4°	5vij. opalescent. Sterile. Polymorphonuclear cells.