

CLINICAL REPORTS.

IV.

*A CASE ILLUSTRATING THE RELATIONSHIP
BETWEEN CEREBRO-SPINAL MENIN-
GITIS AND PNEUMONIA.*

By HENRY HUN, M.D.,

ALBANY, N. Y.,

*Professor of Diseases of the Nervous System and of Psycho-
logical Medicine in the Albany Medical College.*

During the past ten years there is no department of medicine which has made such rapid progress as that of bacteriology; and on account of this great progress many things concerning the etiology and the course of disease are easily explicable which formerly were but very imperfectly understood. The following case, besides being in itself of considerable interest, is also instructive in that a knowledge of bacteriology makes many points in it comprehensible which would otherwise be obscure.

June 14, 1888. S. R., æt. 13, is small for her age, and has always been delicate.

Yesterday she came home from school complaining of a severe general headache and of nausea. She vomited freely, and the headache, nausea and vomiting have persisted up to the present time. She is constipated, her skin hot, and pulse rapid. She was given one grain of calomel every hour for four hours.

June 15.—She was very restless during the night, and was delirious. This morning her headache is less, and the vomiting has ceased, but her head is strongly retracted; it can be bent forward with difficulty, and all movement of it causes pain. The patient lies for the most part on her back, and occasionally turns partially on her left side. No decided intolerance to light or sound. Pupils are equal and respond to light. Tongue heavily coated. A careful thoracic and abdominal examination reveals nothing abnormal. She had one constipated stool in response to an injection. She was given a dose of castor oil and a mixture of bromide and iodide of potassium and of morphia. In the afternoon her pulse was 120, her temperature in axilla 106.2° , her respiration rapid and

labored, and her head firmly retracted. She was then given antipyrin, grs. x, after which her skin became cooler and she fell into a quiet sleep.

June 16.—She was more comfortable during the night. An eruption of herpes has appeared on the lips. Head continues strongly retracted, and at times her mind wanders. She has much pain in the small of her back. Her lungs are normal. By means of castor oil and enemata her bowels have been kept fairly open. She was given antipyrin, grs. v, in the morning and again in the evening. A. M., pulse 116, temp. 104.8° ; P. M., pulse 110, temp. 102° .

June 17.—She was not feverish during the night, but complained of so much pain in the lower part of the left chest that in order to give her some relief her mother or father was obliged to press their hands against her left side most of the night. She also commenced to cough considerably, and the coughing increased the pain in her side. This morning there is dullness on percussion, bronchophony, and high-pitched bronchial respiratory murmur, without râles, over the whole

lower lobe of the left lung. The headache, backache and rigidity of the neck have all disappeared. She continued to cough a great deal during the day, and in the evening with the bronchial respiratory murmur many fine moist râles were heard over the lower lobe of the left lung. In the morning the bromide and iodide mixture was stopped, and she was given quinine sulph., gr. i, four times a day. A. M., pulse 110, temp. 99.5° ; P. M., pulse 108, temp. 100.5° .

June 18.—She feels bright and well. There is no trace either of retraction or rigidity of the muscles of the back of neck, and she wishes to get out of bed, in which she sits upright. Over the lower lobe of the left lung the respiratory murmur is harsh, and there is a moderate number of moist râles. A. M., pulse 72, small and feeble; temp. 97° .

June 19.—Feels quite well, although a little weak. Respiratory murmur still continues rather harsh over the lower lobe of the left lung, and there are moist râles after cough over this area.

June 21.—Patient is sitting up in the front room, and feels quite well and no

longer coughs. There is normal respiratory murmur over the whole chest, and no râles are heard anywhere even after cough.

July 10.—Has remained perfectly well since the last record.

In this case there were at first many symptoms which indicated that an attack of epidemic cerebro-spinal meningitis was commencing (I had attended a number of cases of cerebro-spinal meningitis that winter and spring, in several of which the diagnosis had been verified by an autopsy), and then these symptoms suddenly disappeared with the development of a well-marked attack of pneumonia.

It has long been known that there is a close clinical relationship between pneumonia and epidemic cerebro-spinal meningitis. So many observers have pointed out not only that pneumonia is unusually frequent at times when cerebro-spinal meningitis is epidemic, but also that the two diseases often complicate each other; that this relationship is generally recognized and is stated in text-books of medicine. From the results of bacteriological

investigations this relationship between the two diseases has become more certain. A number of observers have found in the meningeal exudation, and in the pneumonic exudation, micrococci which were apparently identical; and recently Foà and Bordoni-Uffreduzzi* in four cases of cerebro-spinal meningitis, two of which were complicated with pneumonia, have found micrococci which in their appearance, in their characters of growth, and in their staining entirely resembled the micrococcus which A. Fränkel† has lately shown to be the cause of pneumonia, and which Fränkel also found in the meningeal exudation of a case of cerebro-spinal meningitis which occurred as a complication in a case of pneumonia. Foà and Bordoni-Uffreduzzi have injected a pure culture of this micrococcus under the dura mater of rabbits, and have thus produced cerebral meningitis and hyperæmia of the spinal meninges.‡

* Deutsche Med. Wochenschrift, 1886, No. 15, p. 249, and No. 33, p. 568.

† Zeitschrift f. Klin. Med., Bd. 10, Heft. 5 and 6, and Bd. 11, Heft. 5 and 6, and Deutsche Med. Wochenschrift, 1886, No. 13.

‡ Although not pertinent to this case, yet it is certainly an interesting fact that this micrococcus of Fränkel is

It may be regarded, I think, as pretty conclusively settled that the same micrococcus causes cerebro-spinal meningitis and pneumonia, but we have yet to consider why in our case pneumonia developed and not cerebro-spinal meningitis.

It has long been known that in different men different organs are more susceptible to disease than others. This increased susceptibility of the organ to disease being dependent either on inherited characters, on former attacks of disease, on injuries, or on other less clearly defined causes, and has been expressed by the phrase long in use that disease attacks the *locus minoris resistentiæ*.

identical with the micrococcus which Pasteur has found in the saliva of a child suffering from hydrophobia, and which Sternberg has found in the saliva of several healthy persons, and that Foà and Bordoni-Uffreduzzi have found that by injecting pure cultures of this micrococcus subcutaneously there was set up in many cases a severe progressive œdema of the cellular tissues or an extensive dermatitis which caused the death of the animal in six or eight days. But if the virulence of the micrococcus had been lessened (by being cultivated for a number of days in the same culture medium and not being changed daily to a fresh one), then the œdema or dermatitis resulting from their subcutaneous injection did not prove fatal, but the animals recovered in six or eight days. After repeated injections of weakened micrococci the animal acquired an immunity, so that the subcutaneous injection of these micrococci in their freshest and most virulent form did not cause the sickness or death of the animal.

Many experiments in recent times have shown that injuries inflicted on organs previous to the injection of pathogenic bacteria into the body cause the disease to be localized at first in these injured organs. A few of the more important of such experiments are those of Rosenbach,* Kocher,† Becker‡ and Krause§ on osteomyelitis; Schüller|| on tuberculous inflammation of joints; Heubner¶ on diphtheria; Orth,** Wyssokowitsch†† and Prudden‡‡ on malignant ulcerative endocarditis; Grawitz§§ on subcutaneous inflammation; Grawitz||| on peritonitis; and Huber.¶¶

All these experiments prove definitely what has for a long time been vaguely

* Deutsche Zeitschrift für Chirurgie, 1878, Bd. 10, S. 369.

† Deutsche Zeitschrift für Chirurgie, 1879, Bd. 11, S. 87.

‡ Deutsche Medicinische Wochenschrift, 1883, No. 46.

§ Fortschritte der Medicin, 1884, Bd. 2, No. 7.

|| Experimentelle und histologische Untersuchungen über Entstehung u. s. w. der serföhen und tuberculösen Gelenkleiden, Stuttgart, 1880.

¶ Die Experimentelle Diphtherie, Leipzig, 1883.

** Tageblatt der Naturforscherversammlung zu Strassburg, 1885.

†† Virchow's Archiv., 1886, Bd. 103, S. 301 und 310.

‡‡ Transactions of the Association of American Physicians, vol. i., p. 207.

§§ Virchow's Archiv., 1887, Bd. 108, S. 67.

||| Charité Annalen, 11, 1886, Sep. A.

¶¶ Virchow's Archiv., 1886, Bd. 106, p. 22.

known—that the human system possesses the power of resisting the invasion of pathogenic bacteria, and where these latter do set up disease in an organ, that organ is in a weakened condition which predisposes it to disease. And this fact, taken in connection with the fact that the micrococcus which causes epidemic cerebro-spinal meningitis and pneumonia is the same, throws light on our case.

It is evident that the initial high fever and the cerebral symptoms were due to the invasion of the body by micrococci, which at first tended to become localized in the pia mater. This tissue was, however, in a sufficiently healthy condition to resist this invasion, and the disease did not develop fully. Then, perhaps in consequence of the recumbent posture, that fertile factor in the production of hypostatic pneumonia, the resisting power of the lungs became impaired, and the micrococci became localized in this organ of less resistance and caused a pneumonia, which ran its course quickly and favorably. That it was not a case of pneumonia from the beginning is evident both because a careful exami-

nation of the lungs on June 15 and 16 failed to reveal any signs of disease, and because the violent pain in the side and the cough first appeared on the night of the 16th. With the appearance of the pneumonia the symptoms of meningitis rapidly disappeared; and it is of interest in this connection to note that herpes labialis, which occurs very frequently both in cerebro-spinal meningitis and in pneumonia, in this case appeared just previous to the appearance of the pneumonia, midway, as it were, between the two diseases. This change from the symptoms of cerebro-spinal meningitis to those of pneumonia may be called an example of metastasis, inasmuch as that word means a change of place, but it is of an entirely different nature from the extension of a disease through the lymph or blood-vessels, usually by embolic processes, which is what is now generally understood by metastasis.

Finally, the action of antipyrin in this case is of great interest and importance. It was given not only to reduce the temperature, but also with the idea that, as

it was a decided analgesic, it might perhaps exert a favorable influence on the meningitis. It certainly did seem to act very favorably not only on the temperature, but also on the other symptoms of the disease. This single case would, of course, prove nothing; but Mr. G. N. Stephen, of the Cyprus Medical Service, says:* “Antipyrin is of the greatest possible value in epidemic cerebro-spinal meningitis, and is a real remedy against the disease.”

It certainly seems as though antipyrin was worthy of a trial in cases of cerebro-spinal meningitis.

* British Medical Journal, June 9, 1888, p. 1218.

