the unilateral symptoms, then the transverse symptoms. The transverse symptoms, generally preceded by root-pains, make you suspicious. If to these you add the characteristic condition of the cerebro-spinal fluid, the xanthochromia, and the increase of albumin, and if X rays show that lipiodol is abnormally held up, then the diagnosis is a certainty; it is one of the few certain things in medicine.

What is the prognosis? The prognosis of secondary neoplasms is uniformly unfavourable. The prognosis of caries and of primary neoplasms is much more hopeful. Severe scoliosis, if causing pressure, is also an operable condition. The ultimate prognosis depends on the escape or otherwise of the arteries at the level of the lesion, because if the local arteries are already thrombosed there is an area of permanent necrosis, which, of course, cannot be replaced. On the other hand, if the arteries are not yet thrombosed, and if it has only been a case of venous congestion, as in our first case, then the prospects for the patient are excellent when once the pressure has been removed.

TREATMENT.

What is the treatment? If the patient is lucky enough to have had a spirochætal infection, he or she may get well, if given ordinary specific remedies—mercury, salvarsan, iodides, bismuth. But if the patient has a primary neoplasm, the only prospect of relief is by operation; in our first case the neoplasm has been removed, and improvement has already begun. If the neoplasm is a malignant one, operation may be supplemented by the application of deep X rays to what remains of the tumour. We had a woman here a little time ago with paraplegia from a malignant chondroma, and we relieved her spinal compression by laminectomy. Part of the tumour, however, was inoperable, so we followed up by applications of X rays, and she was walking about well when we last saw her.

With regard to the treatment of caries, we may open any abscess which may be present, but unless we can be sure that an abscess is present, it is better not to operate on the bones, because it is not the bones but the thickening of perithecal tissues which cause the pressure. Operation results in caries have proved disappointing; much better results have been got from prolonged rest and counter-extension. A patient with spinal caries may require to be laid up in bed for 6 or 12 months, but if the vertebræ are kept passively extended most of the patients get well, and the time is well spent.

What about secondary neoplasms? All you can do there is palliative treatment to relieve the pain. How can that pain be relieved in a secondary case? You can relieve it by morphia or heroin, which gives the patient relief from pain for the remainder of his illness. These are cases in which you are justified in giving morphia, whether a drug-habit ensues or not. No tribunal will quarrel

with you for giving morphia in full doses to a patient with malignant root-pains.

Is there any alternative to giving morphia? Yes, sometimes there is. If you are a neural surgeon you may divide the pain-fibres in the spinal cord above the level of the lesion. That is done by notching the spinal cord near its lateral surface where these fibres run up. If you go too deeply in, there is the risk that you may also notch the pyramidal fibres. This operation of chordotomy was devised, I believe, by Frazier of Philadelphia. But if it is ever my misfortune to have a secondary neoplasm of the spine, I hope someone will give me morphia or heroin, and keep me under it continuously until the end.

SOME CASES OF DIFFICULTY IN DIAGNOSIS

WHICH A CLINICAL PATHOLOGIST MAY ENCOUNTER.*

BY

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I WISH to deal with those difficulties which you as practitioners present the pathologist when, as you often do, you send him a *single* specimen of the patient's blood or excreta to examine. As practitioners I am afraid you sometimes blame the pathologist when he cannot from a single specimen make a diagnosis for you. The following cases will illustrate some of the difficulties which you as practitioners and myself as a pathologist will encounter in dealing with that very common condition which we call

CONTINUED PYREXIA.

CASE 1 is that of a young woman, aged 24, who was admitted into the female wards of this hospital with the history that *suddenly* after completing a day at the wash tub she was seized with general pains and shivering. She rapidly became so ill that she was obliged to take to her bed, where she was attended by her doctor for 14 days prior to admission. When seen by us she presented simply those symptoms and physical signs associated with pyrexia. There was no diarrhoea or enlargement of the spleen, or any sign of "rose-coloured" spots. Typhoid or paratyphoid seemed the most likely diagnosis, but to my disappointment I was unable to find any evidence of agglutination to the typhoid or paratyphoid groups. The fæces examination was likewise negative, but on the third day of incubation a bacteriological examination of the blood showed the presence of bacilli which proved on investigation to be *B. typhosus*. The especially interesting point was the complete absence of any agglutination even at the end of the second week of the fever, and it will interest you to know that this patient did not show any evidence of agglutination until she was well convalescent at the end of the fourth week of the disease. Had it not been,

* A Lecture delivered to the Post-graduates of the Fellowship of Medicine at the Westminster Hospital Medical School, September, 1926.

therefore, for a bacteriological examination of the blood the diagnosis in this case might have remained uncertain.

CASE 2 is also that of a young woman with a similar history to that of our previous patient except that she was not severely ill. The diagnosis was of a very obscure nature, but typhoid or paratyphoid was strongly suspected. Agglutination tests and a bacteriological examination of the blood gave entirely negative results, but on plating out the faeces on Drigalski-Conradi medium, colonies, which subsequently proved to be *B. paratyphosus* B, were found. The diagnosis now became quite clear, but at no subsequent period at which this patient's serum was examined could any agglutination be obtained with cultures of paratyphoid B, though five different strains of this organism were tested.

CASE 3 is that of a man, aged 32, who was admitted with similar symptoms to those of the preceding cases save that in this instance we were never able to discover the actual cause of his pyrexia. It started as a bronchitis, which was accompanied by the sort of temperature which is typical of one of the typhoid groups of fevers. In this man's case, however, we had the history that one year previously he had been in the hospital with a pleural effusion which had cleared up after one tapping. It is possible, therefore, that in this case we were dealing with some form of pleuropneumonia or even possibly tuberculosis. In a case such as this it would be only possible to prove the original effusion to be tuberculous if such pleural fluid had been injected into a guinea-pig. This, however, was not done, as tuberculosis was not at that time suspected. I may say that in my experience complement-fixation tests for tuberculosis are unsatisfactory.

CHRONIC EMPYEMA.

The next series of cases are of extreme interest to medical practitioners. Both of them are conditions of chronic empyema due to an infection with streptothrix actinomycosis.

CASE 1 is that of a young boy of 19, who was admitted to the hospital with a history roughly corresponding to that of an ordinary pneumonia which had refused to clear up. On admission to the hospital a diagnosis of an empyema of the right side of the chest was made, and this proved to be correct at the operation. There was nothing suspicious about the pus which was evacuated from the chest and indeed there is no record of it having been sent to the laboratory for examination. The case went progressively down hill and finally death occurred after three months' illness. At the necropsy an extensive condition of actinomycosis was found involving the liver and practically destroying the whole of the lower lobe of the right lung.

CASE 2 is that of a young school-teacher, aged 24, who had always been resident in London. Her history was similar to that of the young man we have just discussed—viz., some pneumonic symptoms and physical signs which had not cleared up. Again, in this young woman an empyema of the right side was diagnosed, and this diagnosis was found to be correct at the operation. There was nothing particularly noteworthy about this pus, certainly none of the typical "granules" which are found in actinomycotic pus were seen. However, on examination in the laboratory films showed very suspicious though degenerated filaments resembling streptothrix. Subsequent paraffin sections of the more solid portions of this pus revealed typical actinomycotic fungus. The prognosis in this case up to the present is very bad indeed, since all treatment, both medicinal and surgical, has failed to produce any improvement, and I have as a last resort made up a vaccine from the fungus grown from this case which is now being tried in the hope that some good result may be obtained, as is claimed by some authorities to occur in actinomycosis when treated with vaccines.¹

¹ Since giving this lecture the doctor in charge of this case reports great improvement in the condition of this patient, and he remarks that it coincided with the administration of the vaccine.

One more sample will serve to illustrate the sort of case that may readily cause the greatest difficulty in diagnosis to both practitioner and pathologist.

CASE 3 was that of an athletic young man of 23, who, after his club had been victorious at a Rugby match, celebrated the event at a team supper, and under its influence subjected himself to the risk of infection. Seven days later there appeared a discharge which contained gonococci. A fortnight afterwards a small superficial sore appeared on the foreskin, and this was carefully examined for spirochaetes with negative results. No enlarged glands were present in the groin, and a Wassermann test (though it was early to expect a positive result) was done and proved negative. This sore never at any time showed induration, and quickly healed up. A "provocative dose" of N.A.B. was next given and the Wassermann reaction again done, which test again proved negative. This brought the date of the last test up to five weeks from the time of infection. Tests were done twice more at intervals of a month and proved negative. This now brought the date of the last test up to three months from running the risk of infection, and no signs or symptoms of a suspicious nature arising, no need was obvious for further tests to exclude syphilis. The gonococcal infection followed a very ordinary course and cleared up, the patient going away finally for a holiday.

Shortly after his return from this holiday he had a very sore-throat, and being seen by me it was obvious that the condition was syphilitic, and, moreover, the Wassermann reaction now proved a strong positive. With the exception of the sore 14 days after running the risk of infection, which quickly cleared up, this sore-throat was the first manifestation of syphilis that the patient had had, and this sore-throat appeared six months after the original risk of infection. There is absolute certainty that this young man had not run any such risk before or after the night of the club supper.

The great interest of this case, apart from the lateness of any real manifestations of the disease, is the fact that in spite of all ordinary (and one might almost say extraordinary) care taken to exclude syphilis, this infection had in fact occurred. It is in my experience very rare for a sore to be syphilitic if the Wassermann reaction remains negative three months after running the risk of infection and after a "provocative dose" given in the course of those three months.

I have endeavoured to show from examples of recent cases in hospital and private practice that if you as practitioners have difficulties in making your diagnosis from the carefully considered clinical signs and symptoms of your patients, the pathologist no less than you has considerable difficulty in assisting your diagnosis unless he has the opportunity of dealing with the case *from every aspect*. You will see how wrong it is for you, on the one hand, to make a diagnosis for or against one of the typhoid fevers on a single examination of the patient's serum for agglutination, and, on the other hand, that you should blame the pathologist for not assisting you if you have not given him every opportunity for doing so.

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