used as a guide. This merely anaesthetizes the skin at the site of puncture, and the patient feels no pain till the point of the needle strikes the third division as it emerges from the foramen ovale. If at the same moment the needle is felt to enter a narrow cavity it is probably in correct position. The syringe is then attached and a few drops of alcohol injected to test the degree of resistance. If the piston slides down without effort the needle has passed to one or other side of the nerve, and the alcohol is not entering the ganglion. The needle is withdrawn a few millimetres and reinserted until a position is found in which there is a definite resistance felt on pushing down the piston. After a few drops have been injected sensation is tested by pricking the skin of the face with a fine needle. The development of numbness confirms the position, and the injection is then completed. I am satisfied if I get anaesthesia of the second and third divisions with numbness of the first, and many cases have been relieved of their pain in which I obtained numbness of the second and third divisions only. Of fifty-two injections I failed in eleven to get satisfactory lasting anaesthesia. This is roughly one case in five. In some of these I reinjected successfully and in the others I operated. I was guided in my choice by the difficulty experienced in injecting, and to some extent by the wishes of the patient.

Results.

Taking cases which were injected at least a year ago, twenty-five have been traced and eleven of these are still free from recurrence. The periods since the injection of these eleven are 12 months, 15 months, 17 months (2), 18 months, 2 years, 2 years and 3 months, 3 years (2), 3 years and 8 months, and 5 years respectively. Cases in which recurrence is known to have taken place are fourteen in number, and the average period of relief was one year and nine months. This hardly gives a fair estimate of the benefit conferred on the patient, for it has frequently happened that the recurrence of pain has been slight and temporary, so that further treatment has not been necessary. For example, a patient reported that she had been quite free from pain except for an attack a year ago, which lasted only a fortnight; this patient regards herself as cured, and is very grateful, but she appears in my statistics as having only one year's relief. It may fairly be said, therefore, of injections that four out of five are successful in giving relief for an average period of twenty-one months, and that there is quite a reasonable chance of the relief being permanent. How great this chance is can hardly be estimated from so small a number of cases, but a rough idea may be obtained by considering the figures quoted above. Of twenty-five cases traced, eleven have remained free, the average time since injection being twenty-eight months. As the cases which recur do so on an average in twenty-one months, it is not unreasonable to hope that most of these will be permanently cured. The only complications experienced in these cases treated by injection were that two patients complained of partial deafness, one in the same and one in the opposite ear. There were no cases of conjunctivitis.

OPERATION.

Operation was reserved for patients whom I failed to relieve by injection, or who had had repeated injections elsewhere and desired more radical treatment. The Hartley-Krause method of approach was used, and in the first few cases I contented myself with dividing the second and third divisions of the nerve inside the skull and injecting alcohol under direct vision into the ganglion. The recurrence of pain in a case treated on these lines by another surgeon led me to doubt the reliability of this procedure, and in subsequent cases two-thirds of the ganglion was removed. The method of dealing with the middle meningeal artery advocated by Jordan Lloyd was adopted, the artery being plugged in the foramen spinosum with a suitable peg (Lloyd used a match), and consequently only needing to be tied in one place instead of two. This makes its division much easier, so long as the peg does not come out.

Results.

I have performed this operation on thirteen occasions, and though some of the patients were over 70 years of age there has been no mortality. Not only was there no mortality, but in only one case was there any cause for anxiety. This was a case in which the peg came out of the foramen spinosum. I had found Jordan Lloyd's matches too soft and had tried an oak peg. This must have been too hard to fit snugly, for violent haemorrhage occurred on the following day, and in my absence from Birmingham my colleague Mr. Rose very kindly tied the external carotid, with an entirely satisfactory result. With this exception, all the cases had a good convalescence. There was a remarkable freedom from ophthalmic complications, and only one case of conjunctivitis has to be recorded. This, however, was severe, and, owing to the patient's refusal of treatment, resulted eventually in loss of vision in that eye. Other complications experienced were a seventh nerve paralysis, due, I think, to forcible retraction of the flap, and a temporary third nerve paralysis which I cannot explain.

All these cases were relieved of their pain with a single exception, but, as my first operation was only done two years ago, I can produce no evidence of permanent cure from my own experience. It is, however, well recognized that in all but the rarest cases removal of the ganglion cures the condition permanently. In fact, I have felt justified in telling my patients that, though the operation is severe, the cure is certain. This confidence was rudely shaken a few months ago by the last case I operated upon. The operation proved exceptionally easy, and I had such a perfect exposure of the ganglion and its roots that I was led to try the operation of division of the sensory root instead of resection of the ganglion. The patient had absolutely no relief whatever. As this was my first failure I naturally attributed it to the different operation I had performed, and said hard words to myself for trying to paint the lily. I explained the position, and suggested that I should make sure of relief by removing the ganglion. I then removed the lower two-thirds of the ganglion with a part of the mandibular and maxillary nerves, and had the removed tissue microscopically demonstrated the ganglion cells. There was not the slightest relief from pain! This was either a case in which the lesion was on the central side of the ganglion or one of purely subjective pain. The patient showed obvious signs of mental derangement, but these had naturally been attributed to the severity of her suffering.

Of the remaining eleven cases the pain has recurred in one. This was one of the earliest operations in which the ganglion was injected and not removed, and occurred in the patient who developed conjunctivitis. It has finally destroyed any hope I had that injection of alcohol under direct vision might prove a satisfactory alternative to excision.

It has been suggested that though the operation relieves the pain it turns the patient into a chronic invalid. Of two patients who recently wrote to me, one is working as a collier in a mine, and the other is the successful head mistress of a large school for girls.

ACTINOMYCOSIS SUCCESSFULLY TREATED BY IODINE IN MILK.

BY

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THE rapid and uninterrupted recovery of four consecutive cases afflicted by this distressing and usually fatal malady seems worthy of record.

The treatment adopted was evolved as the result of an observation made during the course of the following fatal case.

Late Treatment: Death.

A. S., a farm labourer, was admitted to the Bristol Royal Infirmary under my care in February, 1923, suffering from what appeared to be acute appendicitis. The appendix was removed. It was situated behind the caecum, and was bound down by dense adhesions. After an uneventful recovery the patient was

discharged to a convalescent home in March. Four weeks later a small abscess in the scar was opened in the casualty department.

He was readmitted in July with an abscess below Poupart's ligament, flexed hip, pain on walking, and a mass in the right iliac fossa. The diagnosis of actinomycosis was made, and confirmed by the recovery of the organism from the pus.

He was treated by x rays, large doses of potassium iodide, by vaccines (both stock and autogenous), and later by collosol iodine given by the mouth and injected into the sinuses. His progress was, however, steadily downward.

In December he was bedridden and apparently moribund. The whole peritoneum seemed to consist of one huge abscess, which extended down the thighs almost to the knees. No doubt a very mixed infection was present.

About this time our pharmacist, Mr. A. L. Taylor, expressed the opinion that collosol iodine contained little if any iodine in a colloidal state, and suggested that tincture of iodine freshly added to milk would give a more truly colloidal solution. The patient was therefore given this preparation by the mouth.

Within a week the sinuses had all closed, and he was out of bed greatly improved in his general condition. Unfortunately, in April a fresh abscess, containing staphylococci and other organisms, re-formed in the abdomen, and he died on April 29th, 1924.

The Four Successful Cases.

During the period of improvement in the case just recorded my colleague Mr. C. F. Walters showed me a similar case.

CASE I.

A boy, who also had been operated upon for appendicitis, subsequently presented intensely hard chronic inflammatory masses in the abdomen; they spread across to the left iliac fossa, and finally invaded the skin. In places small areas of softening were noted. At my suggestion this patient was given the same preparation of iodine and milk.

The effect was almost incredible, for in a few weeks the masses had melted away and not a trace of the disease remained. The boy has remained perfectly well ever since.

It will be observed that no opportunity arose of confirming the diagnosis microscopically, but clinically it was as definite a case of actinomycosis as one could possibly meet.

Mr. Rendle Short adopted the same line of treatment in the following case.

CASE II.

The patient was a girl who had suffered from actinomycosis of the jaw and face for five years. The organism had been recovered from the pus. She had undergone numerous operations, including removal of portions of the lower jaw and zygoma. In spite of very free removal the disease always recurred. In November, 1924, she too was put upon iodine and milk. Seeing that bone was invaded a rapid response could hardly have been expected in this case, and one further abscess did develop in January, 1925, but since then all sinuses have healed and she appears to be completely cured.

CASE III.

In December, 1924, a butcher was sent to me by Dr. Dix of Clifton. This man had a large left-sided abdominal tumour. It was palpable by the rectum, and extended to the lower border of the ribs. It was proved by incision and microscopic examination to be actinomycotic in nature.

The same treatment was carried out, and within three weeks no trace of the tumour could be detected. The patient has remained perfectly well ever since. Skin markings showed that the diameter of this mass, which felt like a lump of wood, sometimes diminished by fully an inch within twenty-four hours.

CASE IV.

The last case, a young woman, was also under the care of Mr. C. F. Walters. She had a hard inflammatory mass in the neck, attached to the lower jaw. Several small abscesses in connexion with this had been opened during the course of some six weeks. In March, 1925, another abscess was opened and typical sulphur granules were discovered in the pus.

After a fortnight's treatment on the same lines as the other cases all sinuses were soundly healed and no trace of the inflammatory mass remained.

There appears to be no necessity to push the dose of tincture of iodine; 5 to 10 minims in half a cup of milk taken three times a day have proved ample, though more can be given without any harmful results.

In looking through the literature bearing upon the subject of actinomycosis I have only been able to find one case in which treatment produced results at all comparable to those obtained in these cases. This was recorded by Bigland and Sergeant in the *BRITISH MEDICAL JOURNAL* of July 14th, 1923 (p. 61). The patient in this case was a man suffering from actinomycosis of the lung complicated by empyema; he recovered after having his empyema cavity washed out with collosol iodine, which drug was also administered intravenously. In addition he was given large doses of potassium iodide by the mouth. Possibly collosol iodine given intravenously,

although it contains little iodine in a colloidal form, may produce the same curative effect as does a truly colloidal solution when given orally.

I hope that this article may attract the notice of the veterinary profession, and that a trial may be given of this method of treatment in the case of animals.

In conclusion I must express my indebtedness to my colleagues Mr. C. F. Walters and Mr. Rendle Short for permission to make use of their cases in conjunction with my own; to Mr. A. L. Taylor for his happy suggestion as to the best way to make colloidal iodine; and to Professor McBain for his kindness in demonstrating the fact that when tincture of iodine is added to milk it does make a truly colloidal solution.

RUPTURE OF ANEURYSM ON BRANCH OF LEFT RENAL ARTERY, COMPLICATING PREGNANCY.

BY

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ON November 5th, 1924, a woman, aged 28, about seven months pregnant, was brought to the maternity department of the Dundee Royal Infirmary in a very collapsed condition. The pulse was rapid and weak, and the face was very blanched.

According to the history, treatment had been carried out for the past three months for cystitis with frequency of micturition. The patient had had a miscarriage about a year before. The present acute condition dated from the day prior to admission (November 4th). The statement made was to the effect that while walking she was suddenly seized with severe pain in the back and almost collapsed. She was seen by a doctor, but the medicine he gave was at once vomited.

The patient was admitted to hospital at about 11 a.m. Accidental haemorrhage was suspected, but there was no sign of blood externally. Examination of the abdomen did not tend to confirm the original provisional diagnosis, however. A very hard and acutely tender resistant area was felt in the left flank. It was considered wise to keep the patient under observation before intervening, and thus give her time to settle down in hospital, with the possibility of some improvement taking place. I saw her again at 4 p.m., when her condition was even worse than before, as vomiting had supervened, rather suggesting the possibility of intestinal obstruction. It was decided that an exploratory laparotomy must be done, in spite of the very critical condition of the patient. She was certain to die if left alone, and it seemed that operation would give her the only chance of recovery, although a very poor one.

Somewhat later, therefore, I opened the abdomen under ether anaesthesia, some 1/2 per cent. novocain being injected into the muscles. The incision was to the left of the mid-line, the rectus muscle being pulled outwards. A normal pregnant uterus was found, and the intestines were not unduly distended. On palpation the right kidney seemed to be very small. The explanation of this will be seen in the pathological report. A large hard retroperitoneal mass was present on the left side, and discoloured blood was seen between the layers of the mesentery of the pelvic colon and, to some extent, round the gut, in the region of the descending colon and pelvic colon. The mass turned out to be a very large blood clot.

I opened the posterior parietal peritoneum over the swelling, but very little blood came away, as clotting had already taken place to some extent. It would have been running an unjustifiable risk to begin clearing away the clot. A moment's uncontrollable bleeding would certainly have caused immediate death. A drain was inserted through a stab wound in the left flank to the region of the clot—although there was little chance of much drainage taking place—and the opening made in the posterior peritoneum was closed as far as possible. The abdomen was closed in layers. Shortly afterwards the patient died. This was expected, considering her condition.