

only means of saving her life. The patient was then suffering from occasional attacks of pain and was kept under the influence of morphia. She was in an extremely enfeebled condition, so much so that the question of removal had to be anxiously considered. On the 21st I operated. The patient was so feeble that she could not stand; she was greatly reduced and, further, a very rapid and feeble pulse made me anxious about the anæsthetic. This, however, as in the last case, was most admirably administered by Dr. R. T. Bakewell, to whom and to Mr. Sutton, who assisted me in the operation, I feel specially indebted. On opening the abdomen the parietal peritoneum was found completely adherent to the large cyst wall; this was so to its entire extent. The pedicle was completely twisted. This I carefully detached all round before using the trocar and when the cyst had collapsed the bowel was found in various places adherent in festoons to the posterior surface of its wall; in fact, considerable loops of intestine were attached and had to be carefully peeled off, the vessels, where necessary, being ligatured. When all bleeding was arrested I inserted a drainage-tube. This I removed on the fourth day and the patient went to the seaside on June 15th. The recent attack of severe general peritonitis, the universal adhesions, the very enfeebled state of the patient at the time of the operation, and the importance of rapid operation before these adhesions had become stronger are the principal points of interest. Had the operation been delayed its performance, in my opinion, would have been impossible.

The specimen Mr. Targett reports as "a multilocular ovarian cyst, consisting chiefly of one large loculus with imperfect septa. The whole specimen is of about the size of an adult head. The pedicle appears to have been twisted and the surface of the specimen was universally adherent. The mesosalpinx was completely adherent to the cyst wall; the Fallopian tube was normal. There is no evidence of malignant disease."

Harley-street, W.

A CASE OF DEATH UNDER CHLOROFORM, WITH REMARKS.

BY ALEXANDER WILSON, F.R.C.S. ENG.,

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THE following unfortunate fatality belongs to that class of chloroform accidents in which the respirations continue after cessation of the pulse. As I have previously endeavoured to show,¹ the symptoms in these cases indicate that the primary lesion is a paralysis of the circulation, and the respiratory centre is affected as a secondary consequence and succumbs from simple anæmia. The first warning of danger is a change in the circulation, manifested by pallor and a feeble pulse. There is no gradual paralysis of the respiration but, on the contrary, a misleading increase in the frequency and depth of the respirations, followed by incoördinate respiratory efforts which gradually cease. The important and notable point is that effective respiration persists at a time when no pulse can be felt, and respiratory movements may be present when the circulation is damaged beyond recovery.

The patient, a boy, aged fifteen years, was being anæsthetised with chloroform preparatory to the removal of a necrosed metatarsal bone. I was not present at the commencement of the administration, being occupied in the adjoining operating theatre, but I saw the patient the moment dangerous symptoms supervened. Chloroform freely diluted with air was administered from a small square of folded lint. During the stage of excitement there was some struggling with holding of the breath, during which the lint was withdrawn from the face. Suddenly the patient began to breathe deeply and he became pale; the pupils were widely dilated and no pulse could be felt. The head was immediately lowered, the tongue was drawn out, and vigorous artificial respiration was begun. Called in from the next room, I found the boy lying on his back with the head and chest hanging over the side of the couch; the tongue was being held out with forceps and

artificial respiration by compression of the chest was being employed. The cheeks and lips were of a good red colour, which returned slowly after pressure, but much more slowly than would have been the case had the rich colour been due to a vigorous circulation. The most dependent part of the forehead and the tips of the ears were just beginning to show a faint dusky hue. The pupils were of medium size, if anything a little contracted; there was no corneal reflex in either eye and the eyeballs in tension were about normal. There was no trace of pulse in either the facial, temporal, or carotid arteries. The patient was taking deep gasping respirations at intervals of from four to five seconds, and air was freely entering the chest. This fact was made quite clear on suspending the artificial respiration. Vigorous compression of the chest was continued, the body was alternately laid flat and semi-inverted, hot sponges were applied to the cardiac region, the limbs were rapidly and tightly bandaged, a tight bandage with a pad was placed round the abdomen, and a copious warm enema of brandy-and-water was given, &c. The respirations from being full and free soon came at longer intervals and were more of a gasping nature, degenerating rapidly into mere incoördinate respiratory efforts and ultimately ceasing. The rosy colour of the cheeks, present in the semi-inverted position, almost entirely disappeared when the head was raised, to return again on the resumption of the dependent position, but each time to a less degree as the blood became more and more venous, until the aspect at length became corpse-like. The pupils were widely dilated and it was evident that the lad was quite dead. The post-mortem examination threw no light upon the causes which led to the fatal result.

This case illustrates the futility of trusting to any one isolated sign in estimating the effect of an anæsthetic. Thus any observer, judging solely from the general appearance of the patient, the evident vitality of the respiratory centre, the good colour of the cheeks, and the undilated pupils, would have concluded that there was no danger. Yet when viewed in conjunction with the absence of the pulse these very symptoms, in themselves favourable, become symptoms not only of the gravest import but actually signs of dissolution. The exaggerated respirations, accompanied with pallor and an imperceptible pulse, indicated a failure of the circulation so serious as to induce anæmia of the respiratory centre—a condition which only occurs in fatal hæmorrhage or fatal failure of the circulation from other causes. The red, apparently healthy hue of the cheeks, under ordinary circumstances an indication of vigorous circulation, in this case succeeding to the previous pallor on inversion of the patient and being present in a pulseless subject showed merely how absolute was the paralysis of the circulation. It proved that the blood-vessels had in effect become inert tubes, in which the blood, no longer propelled by the heart or restrained by the arterial tone, was under no influence save that of gravity, and free to flow to any part according to the position of the body.

In this case, as in others of the same type, there was no sign whatever of respiratory paralysis in the ordinary acceptation of the term. The respirations and respiratory movements persisted long after cessation of the pulse, until the respiratory centre succumbed from exhaustion, as it does in death from hæmorrhage or in any sudden failure of the circulation. Judging from the invariable effect of chloroform on the blood-pressure, the primary lesion was no doubt a paralysis of the vasomotor centre. The practical point is that in these cases the first warning of danger is exhibited by a change in the circulation, shown by pallor or lividity of the face and alterations in the pulse. If there have been no struggling and holding of the breath and the blood is well aerated the failure of the circulation will leave the face deadly pale. Should there have been struggling, &c., and defective aeration of the blood the face will become livid. The pulse, could it be carefully observed throughout, would at an early stage show some sign of the fall in blood-pressure. It first becomes soft and compressible and quick—"a running pulse"; then it suddenly collapses, the beats coming slower and irregularly trickling under the fingers like a very slow aortic pulse. I have repeatedly noticed this latter condition and by treating it have been able to ward off more serious danger. The respirations, as already pointed out, undergo marked modification in becoming suddenly accelerated, but only at a comparatively late stage when the mischief is often beyond repair. It cannot be too much insisted upon that as the

¹ The Mechanism of Death under Chloroform, THE LANCET, Nov. 17th, 1894, and Sept. 11th, 1897.

primary lesion is in the circulation to the circulation must we look for the first signs of danger and to the improvement of the circulation must treatment be directed. If the case is left until the stage of deep respiration is reached recovery is almost hopeless.

As regards treatment the indications are obvious, but the application of remedies is difficult. We are dependent upon the circulation for the conveyance of remedies to the various organs, and in these cases, as a rule, by the time the danger is noticed there is practically no circulation. Hence all remedies requiring conveying by the blood, such as hypodermic injections, rectal injections, &c., have very little chance of reaching the organs which they are expected to influence. The indications for treatment are to raise the blood-pressure and to stimulate the heart and supply it with blood upon which to contract, while at the same time the flow of blood to the nerve centres should be facilitated. This is best done by mechanical means, which in extreme cases are the only ones possible of efficient application. Thus artificial respiration by vigorous compression of the chest both raises the blood-pressure and stimulates the heart and is the only really useful remedy. Bandaging the limbs and compressing the abdomen help by limiting the area of the circulation. Transfusion if performed quickly might also be of some use. Dr. Leonard Hill has pointed out the influence of the position of the body on the heart, which treatment being easy of adoption is well worthy of trial.

As regards drugs, Professor Schäfer, Dr. H. L. Barnard, and Mr. F. Hobday² have recently drawn attention to the stimulating effect on the circulation of nicotine, extract of suprarenal capsules, hydrocyanic acid, and ammonia. All these possess the disadvantage that to be useful a fair degree of circulation must exist. Probably, from the mode and facility of administration, the most efficient will prove to be ammonia given by inhalations, as suggested by Dr. Barnard, and exhibited at an early stage before the respiration is altered or the circulation is completely paralysed. In my own experience I have found on several occasions in which the circulation showed the signs of failure previously mentioned that compression of the chest was enough to tide the patient over the danger.

Manchester.

A Mirror

OF

HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.

A CASE OF INTUSSUSCEPTION OF THE CÆCUM; REDUCTION
AFTER LAPAROTOMY; RECOVERY.

(Under the care of Dr. F. G. PENROSE and Mr. T. H. KELLOCK.)

THE following very interesting case shows that under certain circumstances an intussusception may exist for three weeks and yet so few adhesions may have formed that the intussuscepted bowel may be withdrawn with comparative ease. The chief circumstance which renders such a thing possible is the fact that the large bowel is the portion of intestine mainly concerned as in this case. The interference with the circulation of the invaginated bowel was but slight and this was shown by the absence of blood from the stools and by the non-formation of peritoneal adhesions. The case is another confirmation of the advisability of performing laparotomy as soon as a patient comes under observation, for it cannot be doubted that in a short time the obstruction to the circulation of the intestine would have increased and it would have been impossible to release the bowel. Dr. Penrose and Mr. Kellock are to be congratulated on the successful

termination of the case. For the notes of this case we are indebted to Dr. G. F. Still, medical registrar to the hospital.

A male child, aged sixteen months, was admitted to the Hospital for Sick Children, Great Ormond-street, on Feb. 9th, 1898, on account of pain in the abdomen. He was the youngest of three children; one of the others had died from enlarged head and spleen and the third was alive and well. There was a history of phthisis on both sides of the family. The patient was a full-term child, apparently quite healthy at birth; he was brought up on the breast alone until he was eleven months old, when he was given cow's milk, puddings, bread, &c. The bowels had always been regular, but the motions were sometimes slimy and offensive. He had had no serious illnesses but he had not appeared to thrive since the time when he was taken from the breast. In August, 1897, he was unconscious for a few minutes after a fall and in September he had discharge from both ears for three or four days. Three weeks before his admission to the hospital the mother noticed that the child had pain in the abdomen which came on suddenly, causing him to roll about and double himself up; this lasted for some hours, and since then these attacks of pain had occurred at least once a day and had been accompanied on three occasions by vomiting. The attack for which he was admitted had been more severe and had lasted longer than any of the previous ones, and during it he had vomited green fluid six times. There had been no blood noticed in the stools or any straining. On admission to the hospital the child was well nourished; he was strikingly apathetic and listless, even rectal examination failing to make him cry. The expression of the face was not at all suggestive of any serious abdominal condition; he lay quietly with the legs flexed on the abdomen, which was not distended or tender and moved well with respiration. In the left iliac fossa a sausage-shaped tumour was felt lying in the direction of the descending colon and reaching to just below the anterior superior spine of the ilium; the tumour was very hard and somewhat irregular in outline, the hardness varying during examination. A less defined tumour of the same shape could be traced as a continuation of this upwards to the left hypochondrium, across the epigastrium about two fingers' breadth above the umbilicus and curving downwards to the middle of the right lumbar region, where it was lost; the right iliac fossa appeared to be more empty than normal. The rectum was found to be partially filled with semi-solid faecal matter; no tumour could be felt there, but a little blood came away on the examining finger. The heart and lungs were normal. The temperature was 99·8° F. and the pulse was 144. The child was noticed to assume the genu-pectoral position, to which he immediately returned if disturbed. On the evening of the day of admission, chloroform having been administered, the abdomen was opened by a 4-in. incision commencing 1 in. above the umbilicus. There was a little fluid in the peritoneal cavity but no peritonitis. The small intestines being kept from protruding by a flat sponge two fingers were introduced and the tumour was easily found lying on the left side. It was extremely hard and was evidently an intussusception which reached the descending colon. The greater part of it was easily reduced by the two fingers assisted by manipulation from the outside and without bringing the tumour out of the abdomen. It was found, however, that the last three inches or so could not be reduced in this way, so this part was brought out of the wound and reduction was effected with some difficulty, the walls of the gut being very thick and hard. The intussusception was found to be one of the cæcum into itself; the last part to be reduced was that which had formed the apex. The vermiform appendix had practically no mesentery; it was slightly swollen, as also were some lymphatic glands near its base. When once reduction was complete there was no tendency for the invagination to return. The bowel having been returned the abdominal wound was completely closed. The child bore the operation well and slept fairly after a small dose of morphia had been given hypodermically. The temperature on the following morning was 103·8°, but it fell steadily and was normal on the third day. Thirty-six hours after the operation the urine was found to be strongly ammoniacal and of a dark green colour; this condition, however, disappeared during the day and with this exception recovery was uninterrupted. For some days the cedematous cæcum could be felt as a hard tumour in the right iliac fossa, but it gradually became smaller and softer. The wound healed by first intention; the

² THE LANCET, Jan. 1st, 1898.