THE USE OF PARALDEHYDE BEFORE ANAESTHESIA.

BY

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AFTER using paraldehyde before operations in over 250 cases of all kinds I have come to the conclusion that, so far as my experience goes, its uses are somewhat limited.

Dr. Harold Sington, in the able paper he read before the Anaesthetics Section of the Royal Society of Medicine in the early part of last year, showed the great value of this drug when dealing with children. With most of his deductions I entirely agree, but even in their case the results are not always absolutely satisfactory.

At St. Vincent's Orthopaedic Hospital I have for nearly two years used paraldehyde in every case for operation, and the sister in charge of the surgical division reports that after being put back to bed the patients are usually very sick and often excitable for half an hour, but when that period is over they go to sleep and remain quiet for twelve to eighteen hours. Gas and oxygen, with occasionally a small quantity of ether, is the anaesthetic given. She also states that there is considerable difficulty in getting small children to retain the whole dose, and in such cases apparently the small dose tends to make them excited. At the Hospital for Sick Children, Great Ormond Street, the results are quite satisfactory, and there has been very little vomiting, as also in other nursing homes and hospitals where it has been used by me for children. With them I do not care to use it for abdominal work or with those children who are suffering from shock or much sepsis.

In my series of cases administration of paraldehyde to adults has not been so satisfactory, even with a preliminary dose of omnopon (or morphine), atropine, and scopolamine, as advocated by Rowbotham. To many patients the mere introduction into the rectum is distasteful; many others cannot stand the smell.

As to whether it is going to be a success, a great deal depends upon the nurse who gives the injection; she must be tactful and very patient, because it is most important that the solution should be run in very slowly, as, if it is not, some of the fluid may be returned, in which case the full dose has not been absorbed, with the result that there may be much excitement, occasionally verging on delirium. This possibly necessitates manual restraint for some hours, and at all events very careful watching. Abdominal pain, sometimes acute and which lasts until it is deadened by the action of the drug, is another result of too rapid injection.

In order that full benefit be obtained the administration of paraldehyde should be commenced one and a half hours before operating. It must be given very slowly, and then the patient moved about as little as possible; therefore it is best to place the patient on a trolley either before or soon after the introduction. It is still better to give the solution on the operating table if the patient does not mind the surroundings.

Induction by general anaesthetics is certainly smoother, and a smaller quantity is required; special care must be taken to be sure that the airway is free. It is not, however, easy to be certain when anaesthesia is sufficiently advanced to allow the surgeon to commence his work. Complete relaxation is more difficult to obtain for abdominal work, as one is apt to be misled by the quiet and rather shallow breathing. In brain surgery and profoundly toxic subjects paraldehyde is contraindicated.

The after-effects in adults vary considerably, but I am convinced that among patients who have paraldehyde there is a higher percentage who vomit than among those who do not have it. The vomiting, while it lasts, is severe, but as a rule does not continue for very long. A feeling of general misery for some days is not an uncommon phenomenon after the use of the drug, and one occasionally finds patients who are actually mentally unbalanced for

the time being. The excitement or delirium already mentioned places a considerable strain on the resources of the nursing staff, as such cases frequently necessitate two nurses to restrain them.

After the patient returns to bed just as much care must be exercised in preserving the airway free as during the operation, so that until the patient is showing signs of recovering his reflex he must be constantly under supervision.

There are many advantages in the use of paraldehyde, particularly for nervous people and for those who have a strong objection to the smell of ether, or have a dread of losing consciousness. In a satisfactory case the patient knows nothing of going up to the theatre and having an operation, and for many hours time is blotted out. Thyroid cases especially appear to be suitable, and these require a minimum of general anaesthetic.

Tonsillectomy lends itself to a successful exhibition of the drug, because, if the patient is amenable, the first few hours of great pain and discomfort are got over before return to consciousness. Still, even these cases are not without risk, as it is easy to overlook oozing owing to the comatose state of the patient. In orthopaedic work the advantages are similar, except that it may not be wise to use it when the operation is in the region of the hip, pelvis, or upper part of thigh, since some patients, especially young ones, occasionally evacuate some of the fluid.

Undoubtedly certain individuals have an idiosyncrasy towards paraldehyde, and the following two cases exemplify this.

A young healthy man, aged 23, weighing 10 st. 4 lb., was operated on for removal of tonsils; this being one of my early cases, I had ordered 8 drachms in saline to be given an hour beforehand, and soon after an injection of atropine, but no morphine. He arrived in the theatre quite comatose, and did not regain consciousness for forty hours, though the reflexes were active, and during the first thirty hours he could not be roused. His pulse being regular, quiet, and of good volume, I was not worried, but the condition gave rise to much alarm among the nursing staff and also to the patient's relatives.

The second case was that of a boy, aged 9, and weighing 4 st. 5 lb., who was having fasciotomy, wrenching, and plaster done on both feet. He was given 4½ drachms in saline, commencing at 7.30. Atropine was given three-quarters of an hour later, and he was brought up to the theatre at 9 a.m. During induction he was extremely restless and had to be held down. At 4.30 the same evening the youngster was sitting up in bed, very lively, and having a good tea.

I have used paraldehyde in conjunction with spinal injection in a few cases with good results; also together with local infiltration of novocain; men who have used this more than I have speak favourably of this combination.

In conclusion, I consider that paraldehyde should not be given as a routine before every operation, but only in selected cases. Its great advantage is that, when successful, the patient knows nothing from soon after the introduction of the drug until some hours after the operation.

CHOLECYSTO-COLIC FISTULA WITH UNUSUAL RADIOGRAPHIC FINDINGS.

BY

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THE following case is of interest, both from the unusual radiological findings and from the long clinical history.

The patient, a married woman, aged 69 in 1929, with four children, was admitted to University College Hospital under Dr. Batty Shaw in April, 1923, with a history of a sharp attack of pain in the abdomen lasting about twelve hours and accompanied by vomiting immediately after food. At that time a smooth, oval, hard mass could be felt in the right hypochondrium reaching to just below the level of the umbilicus and measuring 3½ by 3 inches. The lower and median borders of this tumour were smooth and rounded, and the lateral border ill defined. The mass was dull to percussion and was apparently in continuity with the liver. There was no jaundice. A radiogram of an opaque meal showed no abnormality in the alimentary tract, and an occult blood test was negative. She was then regarded as a case of cholecystitis with a Reidel's lobe.

The patient was readmitted in August, 1928, as a surgical emergency, with pains of a severe gripping character, irrespective of taking food. These had been present for thirteen days, and were worse for the three days immediately preceding admission. She had vomited once only, immediately after a dose of castor oil taken at home. She was subsequently transferred to my care on the medical side whilst acting as deputy to Dr. Batty Shaw. Between the two attacks the patient had been treated for rheumatoid arthritis, but had complained of no symptoms which might draw attention to her abdomen.

Her condition was as follows: There was no evidence of jaundice. Examination of the abdomen showed considerable divarication of the recti. The liver, spleen, and kidneys could not be palpated, but there was an indefinite mass deep in the right hypochondrium. The tumour noted at the previous admission had disappeared. An occult blood test was positive.

Radiograms of an opaque meal taken at this time showed no abnormality in the stomach, but an unusual shadow was seen passing outwards and to the right from the second part of the duodenum (Fig. 1). The true significance of this abnormality was

FIG. 1.—Tracing from a radiogram of a barium meal taken in the supine position a quarter of an hour after the meal was given. It shows the stomach partially filled with barium and undergoing active peristalsis. The duodenum is normal, with the exception of a fistulous track passing downwards and to the left from the second part.

not realized until an opaque enema several days later was screened and photographed. This was found to pass directly from the colon to the duodenum, while at the same time the biliary passages and even the intrahepatic bile ducts were outlined in an unmistakable manner (Fig. 2).

FIG. 2.—Tracing of a radiogram of a barium enema. The opaque substance passed easily into the colon. From a fistulous opening in the transverse colon the barium can be seen to have entered the duodenum and the bile ducts. There was no evidence of barium in the alimentary tract immediately preceding the enema.

A cholecystography was attempted three months later, the dye being given by the oral method. No evidence of gall-stones could be detected, nor was the gall-bladder outlined.

It was decided to adopt an expectant method of treatment, owing to the age of the patient and the absence of any urgent symptoms. This course has, I think, been fully justified, as I have recently (September, 1929) been in communication with the patient, who states that she feels well and has had no abdominal discomfort for some time.

Comment.

The most probable explanation of the case would appear to be that, at the time of her first admission to University College Hospital in April, 1923, she had a mucocele of the gall-bladder due to impaction of a stone in the neck of that viscus. This remained in a quiescent state until August, 1928, her second admission, when the stone ulcerated through

the gall-bladder into the alimentary tract. It is well known that an impacted gall-stone may ulcerate either into the colon or the duodenum. In this case, however, it would appear that there is a connexion between all three viscera—namely, the biliary passages, duodenum, and transverse colon. The possible explanations are three:

1. That a single large stone passed into the duodenum and then ulcerated into the colon.
2. That there were two separate stones, one of which ulcerated into the duodenum at the first attack, and the other into the colon at the second.
3. That a stone ulcerated from the biliary passages into the colon, damaging the subjacent duodenum in its passage.

Against the first hypothesis is the fact that a stone sufficiently large to obstruct the duodenum and ulcerate thence into the colon would almost certainly have produced urgent signs and symptoms of acute intestinal obstruction with vomiting. With regard to the second possibility, there was no radiological evidence of ulceration into either the colon or duodenum at the time of the first admission, the occult blood test was negative, and the patient was discharged with what was probably an enlarged gall-bladder. One is left with the third suggestion, which would seem to fulfil all requisites.

Apart from this somewhat academic discussion of the methods by which an undoubted short-circuit has been produced between the biliary apparatus and the large intestine, the really interesting point is that the patient had barium from her colon forced into the intrahepatic bile ducts without any apparent ill effect at the time, and has subsequently remained in good health.

I have decided to call this case one of cholecysto-colic fistula, as although there is no very definite evidence of the gall-bladder in the radiograms, yet, from the absence of obstructive jaundice, the stone could not have been lodged in the common bile duct, but, as has been previously stated, was probably impacted in the neck of the gall-bladder.

I have searched through the *Quarterly Cumulative Index* for references to similar cases. There are several instances reported of barium leaving the duodenum as in Fig. 2, but none, so far as I am aware, in which the intrahepatic bile ducts have been filled.

I wish to thank Dr. Batty Shaw for giving me permission to publish the case.

THE ESTIMATION OF PROTEIN IN URINE AND ITS RELATION TO CASTS.

BY

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IN the routine examination of a large number of nephritics during 1925-26 certain facts came to light which are not without interest to the general practitioner. The first was that the general impression that protein stands in close relation to casts was borne out. In order, however, to arrive at this result it was necessary to have a fair idea as to the amount of protein present and that casts should be properly looked for.

As to casts, I am indebted to Dr. Broughton-Alcock for the following method of search, which I am convinced is the best:

Take up the material to be centrifuged from the bottom of the container, which has been allowed to stand (not too long in the case of children). After centrifuging at a fairly high speed, take up with a bacteriological pipette, which has been thoroughly rinsed between-whiles, about 0.5 c.cm. from the bottom of the centrifuge tube, and spread out in a large flat oblong layer on a slide, the large area thus provided being carefully explored on the mechanical stage with the one-third objective. A good deal of practice is necessary before certainty can be attained, but by this method casts will rarely be missed.

It was evidently of interest to determine the value (if any) of the conventional terms used in estimating protein at a glance, and though it must be admitted at once that those who deal with a large number of specimens are rarely