the case which had had no morphine prior to the operation had had the heroin administered much sooner than in the first case. Since this episode, which nearly ended in a catastrophe, my practice has been (1) to be quite sure that the patient is fully round from the anaesthetic before any hypodermic injection is administered, and (2) to give only 1/12 grain of heroin, and to repeat it if necessary. My preference for heroin over morphine is still very strong; but the above two cases show that its effect on the respiratory centre may be exceedingly dangerous unless it is given in small doses. It is to draw attention to this fact that I have thought it advisable to publish these two cases.

THREE CASES OF VOLVULUS OF THE SIGMOID FLEXURE OF THE COLON.

BY

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In the first half of 1928 three cases of intestinal obstruction due to volvulus of the sigmoid flexure of the colon came under my care and recovered after operation.

CASE I.

A woman, aged 45, was admitted to the Bedford County Hospital on January 6th, 1928, suffering from extreme abdominal distension, severe pain, and great difficulty of breathing. She gave a long-standing history of constipation, sometimes getting no action of the bowels for three weeks. For three years she had been liable to attacks of abdominal pain, but had never vomited. The history of the present attack was absolute constipation for five days, abdominal pain for two days, retching but no vomiting, and great difficulty in breathing.

On admission to hospital the abdomen was greatly distended, no movement was visible, and there was tenderness in the lower abdomen, especially on the left side.

Operation.—The abdomen was opened in the middle line, and a large quantity of stinking blood-stained fluid escaped. A large cyst-like swelling presented, filling the pelvis, extending well above the umbilicus, and measuring ten or twelve inches vertically. This swelling was black in colour, resonant, and evidently was gangrenous bowel. It was too large to extract through the incision, so was punctured with a large trocar, giving vent to horribly fetid gas. The gangrenous bowel was then delivered from the abdomen, and a piece about eighteen inches long was found to be twisted. This was resected, and the ends of healthy bowel were brought out of the wound and tubes tied in. The cut ends of healthy gut were fixed to one another and to the edges of the peritoneum. When the patient recovered from the anaesthetic her first remark was that she could breathe freely.

The colostomy acted three days later. On February 20th the spur between the divided ends of bowel was crushed by an enterotome, and came away on March 2nd.

She left the hospital on April 23rd with a small sinus. When last seen, on October 19th, there was a pinhole aperture from which a little gas escaped; her bowels were acting well, she had grown stout, and was in perfect health. After the operation x-ray examinations with a barium meal and enema showed that the part of bowel removed consisted of sigmoid flexure and pelvic colon.

CASE II.

A lady, aged 19, pupil at a physical training college, was taken ill at 4 a.m. on May 27th, 1928, with abdominal pain situated chiefly under the left costal margin and in the left loin. She did not vomit, and there was no rise of temperature. Enemata were given without result, and no flatus was passed. These symptoms continued until I saw her on May 28th, at 7 p.m. There was then slight distension of the abdomen, and the chief pain was in the left upper quadrant. There was considerable difficulty of breathing. Morphine and atropine were given, as it was thought the symptoms might be due to enterospasm.

On May 29th there was no improvement, and she was admitted to a nursing home for operation. A subumbilical median incision was made, and the sigmoid flexure of the colon was found to be enormously distended, twisted, and gangrenous. It measured about six inches in diameter, and pressed on the diaphragm. The gangrenous bowel was brought out of the abdomen and resected. Tubes were tied in the cut ends.

On June 2nd, as the abdomen remained distended and there was no discharge from the colostomy, a caecostomy was performed, and 25 c.cm. of *B. welchii* serum was given. Ten days later the caecostomy closed, and on July 1st the patient got up.

On July 11th an enterotome was inserted to crush the spur between the divided ends of the bowel. The bowels acted naturally on July 18th, and next day the clamp was removed. From this time the opening rapidly closed, the bowels acted daily, and on August 4th she left the nursing home with a minute fistulous opening. On October 30th this had completely closed; the bowels acted daily after a dose of petroleum.

Before the attack of volvulus the patient had been very healthy except that she suffered from constipation, for which she had taken large doses of various aperients.

CASE III.

A gentleman, aged 74, was admitted to a nursing home on June 10th, 1928, suffering from symptoms of intestinal obstruction of three or four days' duration.

Previous History.—In 1917 he suffered from constipation, with pain in the back and chest due to flatulence. In 1919 he had a similar attack. In 1926 he had a worse attack, and was in bed for a month.

On admission to the nursing home he had absolute constipation, and no flatus could be passed. Enemata had no effect. He had been vomiting for two days. The abdomen was very distended.

A subumbilical median incision was made and an enormous distension of the pelvic colon and sigmoid flexure was found, due to a twist. Owing to the age of the patient and to the bowel not being gangrenous resection was thought to be contra-indicated. After untwisting the bowel an opening was made near the lower end of the volvulus and a large tube inserted. This gave some relief, but the abdomen remained distended. At the operation 25 c.cm. of *B. welchii* serum was given.

On June 16th caecostomy was performed. This was followed by acute gastric dilatation, manifested by great swelling over the stomach and persistent vomiting. The viscous was washed out two or three times a day for three days, and saline enemata, pituitrin, and strychnine were administered.

He gradually improved, and the caecostomy and colostomy openings discharged freely. He gradually regained health and strength, and, except for the bowel acting through the colostomy, may be considered to have regained his normal health.

Remarks.

The interest of these cases lies in the fact that they all recovered, that they occurred within six months, and are the only cases of volvulus I have met with in a period of over thirty years' work as surgeon to a hospital.

THE SAFETY OF ETHYL CHLORIDE, AND THE POSITION OF THE PATIENT DURING GENERAL ANAESTHESIA.

BY

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At a coroner's inquiry into a recent death under ethyl chloride in Melbourne the question was raised as to the safety of ethyl chloride as an anaesthetic. Like every other anaesthetic, there is a risk in its administration under certain conditions, especially by the closed method—that is, a method in which air is not admitted to the patient during induction—but given a free supply of air during induction and used in either the open or semi-open method, it is one of the safest of all anaesthetics, not even excepting nitrous oxide and oxygen. The above remarks do not mean that one can be free and easy with it; no anaesthetist at any time can ever be free and easy with any anaesthetic. By the semi-open method the air valve in the inhaler, which should have a diameter of not less than half an inch, is gradually closed over as induction proceeds, so that by the time induction is completed—which is, as a rule, in from one and a half to two and a half minutes—the air valve is fully closed. This will give from three to five minutes' full anaesthesia.

Ethyl chloride is not a drug that should be used for prolonged anaesthesia, nor is it intended that it should so be used, except under very exceptional circumstances, and in the hands of an expert. This is for two reasons: first, its great cost, and secondly, its wastefulness when used for any length of time by the open method. It is one of the very best of all the anaesthetics we have for short operations of from one to five minutes or for preliminary induction to ether. In using the words "ethyl chloride," I include also somnoform, which is 83 per cent. ethyl chloride, 16 per cent. ethyl bromide, and 1 per cent. methyl bromide. At the Melbourne Dental Hospital and the Melbourne Eye and Ear Hospital it has been used in considerably over 75,000 patients of all ages during the past twenty-three years, and there have been two deaths, one of which I think should not have happened. The collapse occurred during a second administration of ethyl chloride to an exceptionally delicate female patient who had recently had a very severe haemorrhage and was not, in my opinion, a fit subject for the second administration of an anaesthetic, either local or general.

This morning (December 6th), on reading the report of the inquest in the morning papers, I decided to test for myself the so-called dangerous effects of ethyl chloride under what would normally be considered disadvantageous circumstances. Feeling off colour with a threatening cold, I took 15 grains of antipyrine and 5 grains of caffeine citrate in half a glass of hot water, and followed this by a good breakfast. I then went down to the Melbourne Dental Hospital and, sitting upright in the dental chair, had the following administrations given to me by Dr. Aird.

<i>First Administration.</i>	
Pulse before induction (good, regular) ...	100
Blood pressure before induction ...	158 mm.
Anaesthetic—Ethyl chloride by the semi-open method ...	8 c.cm.
Pulse 1 minute after induction began ...	104
Blood pressure 1 minute after commencing induction ...	170 mm.
Pulse 2 minutes after commencing induction ...	102
Blood pressure 2 minutes after commencing induction ...	162 mm.
Time of induction ...	2 min. 10 sec.
Duration of anaesthesia ...	5½ min.

There was then an interval of fifteen minutes before the second administration—this time semi-open somnoform.

<i>Second Administration.</i>	
Pulse before commencing administration ...	80
Blood pressure before commencing administration ...	158 mm.
Amount of somnoform used ...	5 c.cm.
Pulse 1 minute after administration ...	104
Blood pressure 1 minute after administration ...	176 mm.
Pulse 2 minutes after administration ...	104
Blood pressure 2 minutes after administration ...	164 mm.
Time taken to induce full anaesthesia ...	2 min. 35 sec.
Duration of anaesthesia ...	4½ min.

Interval of fifteen minutes. This time the method used was open ethyl chloride.

<i>Third Administration.</i>	
Pulse before commencing administration ...	84
Blood pressure before induction commenced ...	156 mm.
Amount of ethyl chloride used ...	13 c.cm.
Time taken in inducing full anaesthesia ...	2½ min.
Pulse 1 minute after induction ...	102
Blood pressure 1 minute after induction ...	150 mm.
Pulse 2 minutes after induction ...	104
Blood pressure 2 minutes after induction ...	156 mm.
Duration of anaesthesia ...	5 min. 40 sec.

The first administration was commenced at 11.35 a.m., and the third at 12.20 p.m. Following upon the third administration I felt slightly sick, but with no real tendency to vomit. I left the hospital at 12.45 p.m., and after a pick-me-up enjoyed a hearty lunch at 1 p.m. It will be noticed that the blood pressure rose during induction in both the semi-open methods and remained about normal during the open method of induction. The pulse rate also rose during induction, and was always of good volume. On each occasion the anaesthetic was taken quietly, without any attempt to struggle, and in all three administrations the induction was of a quite pleasant nature. At no time was there the least feeling of want of air, fullness in the head, or pulsation of the heart, but just a very pleasant sensation of drifting off to sleep, with a creepy feeling gradually spreading from the feet upwards.

At the Melbourne Dental Hospital all general anaesthetics are given in the upright position at an angle of about 80 degrees. In my own work, for all classes of cases and patients of all ages, I always prefer the head and shoulders well raised and at an angle comfortable for the patient during induction. Whatever general anaesthetic is used comfort of the patient during induction is an essential. No patient can take an anaesthetic decently if he is in an uncomfortable position while going under. The same patient who will resist going under in a head low or prone position will take chloroform quite naturally and quietly if sitting comfortably in an armchair. He will have none of that feeling of fullness in the head or increased pumping action of the heart, so frequent and so very disturbing to a full-blooded patient when placed in the prone position. The comfort with which a patient will take a general anaesthetic in the upright position, as against the distress felt when in the prone position, was markedly

illustrated in many cases in which I was able to give chloroform and ether to able-bodied men in the Royal Navy and Royal Australian Navy during the war. I was fortunate in having frequent opportunities of trying induction on one and the same patient in both the prone and the upright position, and the lurid remarks passed by these men against the prone position, as compared with the upright or semi-upright, were very instructive.

Persons undergoing general anaesthesia show during induction a marked tendency to cerebral congestion, which expresses itself as cerebral excitement and a tendency to struggle; this is especially the case if the patient is not comfortable. No anaesthetist should commence his work until he is assured of the comfort of his patient. With an upright patient not only is there less tendency to struggle, which means there is less strain thrown on the heart, but less anaesthetic is required for induction purposes. We are working with the advantage of a not overcongested brain. The anaesthetist can always lower the patient quietly to a more prone position for the comfort of the surgeon, after induction, should it be necessary to do so. Personally, I always prefer to retain, whenever possible and not inconvenient to the surgeon, a certain amount of head and shoulder elevation throughout the operation.

Conclusions.

Using these methods for over thirty years in patients of all classes and all ages, I have not had a single anaesthetic fatality. During induction we require a brain as anaemic as possible; we can get all the congestion required from the anaesthetic itself during induction. Induction of anaesthesia in a patient with a congested brain produces struggling, general discomfort, noises and a feeling of fullness in the head, and throws an extra strain on the heart. If that heart is abnormal or lacking in tone, then the extra strain may result in collapse and in a death, which might have been avoided.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

LEPROSY IN AN INFANT.

MANY cases of leprosy in infants have now been recorded, but in the present instance some unusual clinical details appear worthy of publication.

A female child was born in the leper home at Kangpokpi (Manipur State, Assam) on December 25th, 1924; both parents were Kabui Nagas undergoing treatment for leprosy. The mother was said to have had leprosy for twelve years, but the only signs of the disease were a few anaesthetic patches. The father had more extensive lesions and raised bacilli-bearing patches; after the birth of the child he developed a nodular eruption, thus proving that his disease was systemic and infectious.

The child at birth was noticed to have an ulcer on the plantar aspect of the right heel, about one-half by three-quarters of an inch; it did not readily heal on the application of zinc oxide ointment, and at the end of a week, since the child was born of leprosy parents, it was thought wise to put her on local applications of hydriocarpus oil. Within two weeks the ulcer had healed completely, leaving a firm but slightly depressed scar, which has not broken down.

In May, 1925, the child and her parents were discharged as probably cured, but returned in seven months' time; before they left the colony no evidence of leprosy could be found in the child, but on its return a typically discoloured patch, measuring about 2½ by 3 in., on the left scapular region was noticed; this was treated by the usual method of subcutaneous injections of hydriocarpus oil and creosote (4 per cent.), and entirely cleared up in two months. There has been no recurrence since (June, 1928), and the area which was affected is normal both in colour and sensation.

Soon after the return to the asylum of the parents the mother of the child developed ascites, with a large liver and spleen; she went downhill rapidly and died greatly emaciated. No necropsy could be performed. The child is still living with the father.

The question at once arises whether this is an authentic case of pre-natal leprosy. If it is, then the theory that leprosy can be transmitted to the offspring of lepers before birth is strengthened. The initial ulcer, though suspicious, cannot be definitely proved to have been of leprosy origin, and it is known that hydriocarpus oil will heal indolent ulcers when other remedies fail. *B. leprae* was not found in the ulcer, but this certainly does not exclude the diagnosis of leprosy, and anaesthesia in such a small child