ARTIFICIAL PNEUMOTHORAX.

BY

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ARTIFICIAL pneumothorax is comparatively easy to induce; the immediate death rate is low, and the continuance of treatment interferes little with the patient's vocation. The results contrast favourably with those of untreated cases of equal severity. The only drawbacks to the use of this treatment by the general practitioner are: (1) lack of x-ray apparatus—a very valuable, if not essential, adjunct to this procedure; (2) the difficulty of selecting suitable cases, on which the whole success of the treatment depends; and (3) the lack of a definite course on tuberculosis in many of the medical schools.

It is not possible to induce artificial pneumothorax in every case. There must always be a percentage of failures, depending on the type of case selected and the number of doubtful cases tried. The percentage of deaths later on among artificial pneumothorax failures will give some idea of the range of cases attempted. The two chief causes of failure are extensive adhesions and pockets. In our experience the treatment is of little use in these as the collapse is negligible. We consider that the only way to say whether or not a pneumothorax is possible is by trying it. The x-ray appearance and the movement at the costo-diaphragmatic angle may be useful, but can in no way displace the trial by needle.

The probability of the occurrence of pleural effusion is quite outside our prognostic powers. Whether this fluid is due to tubercle, local anaesthetic, cold air, too much gas, and so on, we have found it quite impossible to say. We agree that the prognosis is not ultimately worse, but we do not agree that it is improved. The mental effect is very detrimental, and during the fever the patient's condition may be rather alarming. The loss of weight in a large percentage is at the beginning noticeable, probably owing to altered metabolism caused by purely mechanical intervention, and in some cases displacement of the mediastinum.

The results of combining sanocrysin with artificial pneumothorax treatment have not been what we expected. Sanocrysin in our hands has been, we think, a failure. We believe that, possibly, on the whole we delay too long before inducing a pneumothorax—not using this method till we are honestly convinced that there will be little response to the usual treatment. This is probably better than indiscriminate advocacy of the method. At present we operate on no really early case. We have found no material change in the blood pressure attributable to this treatment.

STATISTICS OF 111 CASES.

End-Results of 89 Successful Inductions, 1924-29.

Period Since Induction	No. of Inductions in Period.	No. of Cases Alive.	No. of Cases Dead.	Percentage Alive Now.
Under six months	17	16	1	94.0
Six to twelve months	10	9	1	90.0
Twelve to eighteen months ...	11	6	5	54.5
Eighteen months to two years ...	15	8	7	53.3
Two to three years	23	10	13	43.5
Three to five years	13	6	7	46.0
Totals	80	55	34	

Number of successful inductions 89 = 80 per cent.; number of failures 22 = 20 per cent.

Percentage of cases alive out of inductions which took place: over one year ago, 58 per cent.; over two years ago, 44 per cent.

Generally it seems to be better for the patient to have one physician the whole time through, especially if there is anything out of the common in the psychology of the patient or in the technique of the case. We try never to vary the diet of a patient who has either haemoptysis or fluid, if we can avoid it.

Immediate Results. On Discharge from the Sanatorium.

Eighty inductions were successful; of these 14 died or were given up = 17.5 per cent.; 66 left the sanatorium with prospect of further refills. Of these 66, 44 were improved and 22 showed little or no improvement. Of the total inductions, therefore, 55 per cent. left definitely improved.

Of the improved cases, as regards weight, 3 remained stationary, 17 gained weight, 22 lost weight, and 2 were doubtful. Of the improved cases, therefore, 50 per cent. lost weight, in most cases slight.

Analysis of 12 Cases (3 Male, 9 Female) at Present in the Sanatorium.

Haemorrhage was the reason for induction in 4 cases. Two of these patients had temperatures usually over 100° in the evening for some weeks, and one reached 102.8° on occasions. The two others had no high temperatures, but frequent small haemorrhages. The average refill in these four patients (all women) was 450 c.cm.; the average end-reading 0 + 8, 2 + 8, 3 + 8, and - 2 + 4. In none has haemorrhage been repeated after the third refill, and they are all up and about as we write.

Active disease, almost confined to one side, was the reason for induction in four cases. Three of these patients had done extremely well, and the other one has definitely improved. All run normal temperatures.

Discase on both sides, more extensive on one, was the reason for induction in the remaining four cases. Of these patients, one shows little or no improvement, one shows slight improvement, and two have definitely improved. Three of the four run normal temperatures as a rule.

*Points of Importance or Interest regarding Inductions or Refills.**Inductions.*

Do not keep the patient in suspense between deciding on the induction and doing it.

The technique should be simple and speedy. The sooner the needle is in the chest the better.

Morphine is in most cases unnecessary; it upsets the patient and makes him more apprehensive than need be. No preparation at all is necessary.

The operation should cause extremely little pain. Novocain is probably the best anaesthetic. It is more important to anaesthetize the pleura than the skin.

We use the sharp needle for inductions, and have never had any trouble with it.

The idea of pneumothorax, suitably explained, appeals to the average patient, and consent to the operation is not difficult to get.

X-ray treatment is extremely useful before, during, and after the employment of artificial pneumothorax.

The air should be run in slowly, and only 300 to 400 c.cm. given the first time. If the patient is nervous, give even less.

The site of puncture will vary with each case. Where a first puncture is unsuccessful another may be tried at the same sitting, and three more if necessary on a future occasion. When the procedure succeeds it usually does so before then.

The air should not be introduced before there is reasonable certainty that the needle is in the pleural cavity.

The single manometer, *plus* x rays, is quite satisfactory for the average case.

In doubtful cases the patients should be warned that failure is probable.

Refills.

It is better to exceed rather than to let the number of refills be insufficient. Large refills are to be avoided.

The optimum pressure should be found as soon as possible and maintained.

The intervals must vary in each case; fix the optimum pressure and endeavour to maintain it over the greater part of the period. Give a refill at once on any signs of renewed activity.

The patient should for some time rest on the day of refill; we generally keep patients in bed for the remainder of the day. We never let a patient up all day at once after the induction, no matter how good the temperature, but gradually increase the time allowed.

Artificial pneumothorax may be abandoned at any time. It should be remembered that though the treatment does throw an extra strain on the sounder side, this may be partly neutralized by rest in bed, and by the removal of general toxæmia due to the bad lung, which undermines the resistance and retards the healing of the better side.

Toxic cases do best.

The side on which the operation is done, whether right or left, seems to have little or no influence on the result. We have about equal proportions of good and bad on either side.

Treatment of Fluid.—Fluid is a very common accompaniment; in a large percentage of our cases fluid appeared at one time or other. Where the amount is small it is as well to leave it alone; where it is large and upsets the appetite we remove it. We have had few serious cases of pleural effusion—that is, where the fluid became infected by other organisms.

Shortness of Breath.—It is surprising how soon the average patient gets accustomed to artificial pneumothorax treatment, and how little distress it causes him.

Loss of Weight.—Though about 50 per cent. of the patients lose weight, this has little influence on the ultimate prognosis.

Return to Work.—It is difficult to state with accuracy the number of cases fit for work, as this depends so much on the type of work the patient attempts to do, his home surroundings, and his employer, etc. Again, many of the patients are women who are occupied with light housework. A good number of the men we know are engaged in rather heavy work, and doing quite well at it.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

CONGENITAL OBSTRUCTION OF THE POSTERIOR URETHRA.

THE case here recorded is of interest because of the peculiar condition of the skin, and also owing to the absence of dilatation of the ureters and of hydronephrosis, although the bladder wall was much thickened.

This case is that of a male child, aged 3 days, admitted to Dr. William Johnson's ward at the Royal Liverpool Children's Hospital on March 7th, 1929, with the history that there had been no micturition since birth. The birth was normal and the child passed meconium three times before admission to hospital. Circumcision was performed the day before admission, but no urine was passed subsequently. The parents were healthy, and there was one other child, a healthy boy. The child was apparently full term. The remnant of the umbilical cord showed no signs of infection. The whole skin of the body was in a condition of solid oedema, with absence of pitting on pressure. The limbs were stiff, as if in rigor mortis. Nothing abnormal could be detected in the heart, lungs, or abdomen. The child was drowsy and refused its feeds. Death occurred a few hours after admission, no urine having been passed.

Post-mortem Examination.—There were no external structural abnormalities. The skin condition was as described above. The kidneys were smaller than normal, congested, and tough on section. The capsule of each kidney was more adherent than normal, but not so adherent as to tear the kidney substance on stripping. The surface of the kidney was smooth. The cortex and medulla were of normal proportion, and of normal appearance to the naked eye. There was no hydronephrosis. The ureters were not dilated, but the wall of the lower end of the right ureter was thicker than normal. The bladder wall was one-third of an inch in thickness, both epithelial and muscular coats being thickened. The bladder was not dilated, but contained about one drachm of thick yellow urine. There was a septum in the urethra, immediately distal to the verumontanum. The passage of the finest probe was not possible either way. The septum was apparently complete, and not valve-like in type. The urethra distal to the septum was of normal calibre, but the proximal urethra was dilated, and an ordinary lead pencil could be passed from the bladder up to the obstruction. There was nothing abnormal found in other organs. Microscopical examination of the kidneys showed slight generalized fibrosis, with hyaline swelling of the glomeruli, but the tubules were of normal microscopical appearance.

Young, Frontz, and Baldwin (*Journal of Urology*, October, 1919, vol. iii) report twelve cases of congenital obstruction of the posterior urethra observed at Johns Hopkins Hospital, the youngest patient being 11 days old. They have also

collected twenty-four cases from the previous literature. In the latter series two infants died shortly after birth, and the necropsy revealed a valve at the lower end of the verumontanum, with dilatation and hypertrophy of the bladder, dilatation of the ureters, and hydronephrosis. One case recorded by them is that of a foetus (5 to 6 months) with a similar condition, and another case is that of a still-born child. The other cases were of infants and older children.

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A CASE OF SCLEREMA NEONATORUM.

SCLEREMA neonatorum occurs so rarely that the following case seems worth recording.

On Christmas Day a 4-para in the early stages of acute pneumonia was delivered of a premature male infant weighing about 5 lb. The infant, though small, was vigorous. On the second day the nurse called my attention to a slight swelling of the foreskin and a bluish patch of induration on the right buttock. Urine was freely passed. In a few days the induration extended all over the infant's body, limbs, and face, and at this stage his body was more or less rigid. The eyes could not be opened and sucking became impossible. There was regurgitation of fluid through the nose, with development of snuffles and a haemorrhagic discharge. Crying ceased, respiration became slow, and during the last hour of life blood came freely from the nostrils with every breath. The induration was of a peculiar icy blue colour. There was no pitting on pressure. The skin felt hard and could not be pinched. The temperature was subnormal.

I believe the etiology of this disease is little understood. One view is that it is a coagulation or degeneration of the subcutaneous fat in premature infants which some authors attribute to external cold. In the case above described it may have been due to a toxin derived from the placental blood. It is interesting to note that though the mother made a rapid recovery lactation never appeared, possibly owing to atrophy of the fat-producing cells of the secreting acini.

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PERFORATED DUODENAL ULCER.

THE main points of interest in the following case of perforated duodenal ulcer are (a) the patient's advanced age, (b) the short history of gastric symptoms, (c) the absence of malignant disease, and (d) the patient's easy convalescence and subsequent good health.

The patient, a man aged 75, was admitted to Croydon General Hospital, on March 26th last, with a history of three days' "indigestion"; previously his digestion had been good. Seven hours before admission he had sudden severe pain in the epigastrium, followed by repeated vomiting. When we saw him he was collapsed; he had a dry tongue, brown in colour, and a rigid abdomen. His temperature was 37° F., and his pulse rate 72. The heart, lungs, and urine were normal. A diagnosis was made of acute perforated gastric ulcer.

With the patient under gas and oxygen anaesthesia the abdomen was opened, and a small perforated ulcer, simple in character, was found in the first part of the duodenum. This ulcer was invaginated with a purse-string suture, free fluid was swabbed out, and the abdomen closed without drainage. The operation was completed in about twenty minutes.

Twenty-four hours after the operation the patient was given small feeds by the mouth, and a week later he was allowed to sit up out of bed. Convalescence was uninterrupted, and on April 15th he was discharged, having been given instructions about his diet and the advisability of taking alkaline medicines. Since then he has gained about 10 lb. in weight, and has had no abdominal discomfort. He is still careful about his food.

I have so far failed to find in the literature any reference to a case of simple perforation in a patient of such advanced age. In a similar case, of which an account was published in the *British Medical Journal* of July 20th, 1929 (p. 100), the patient's age was 70.

I am indebted to Mr. E. M. Cowell, the surgeon in charge of the case, for permission to publish these notes.

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