after operation, whilst of those who had to have the avertin supplemented 17 per cent. showed post-operative vomiting.

Of the 700 cases only two had any post-operative respiratory trouble—one a bronchitis, which cleared up in two days, and one case of pneumonia, which ran a high temperature for a few days and then got quite well. There were no deaths in the series due to the avertin. All the patients except two left the hospital alive. One of these had multiple brain abscesses, and died from this condition ten days later. The other was found at operation to have an extensive inoperable abdominal tumour, which caused her death from acute intestinal obstruction three weeks later.

Only eighteen of the cases (2.5 per cent.) gave rise to any anxiety. Eight became pale during the operation without other signs of shock, five had shallow respiration, and four showed shock after operation. These all improved after coramine was injected. There was one case of acute haemorrhagic colitis, which cleared up and made a good recovery.

The best mixture and dosage seem to be:

Avertin: 0.175 to 0.2 gram per kg. body weight.
Morphine: 1/40 to 1/10 grain according to age.
Atropine: 1/180 grain to children under 10 years of age and 1/150 grain to those over 10 years.
Novocain: Enough 1 per cent. solution locally to produce a field block (about 20 to 30 c.cm.).

This seemingly large dose is well tolerated by children, who have the ability to detoxicate and excrete it easily. In this respect the giving of avertin to children compares favourably with its administration to adults. A dose of 0.12 gram per kg. body weight causes more depression of the vital centres in adults than does a dose of 0.175 gram in children.

The most marked effect of the introduction of avertin anaesthesia into the Belfast Hospital for Sick Children was a psychological one. Before its introduction the sight of a child being led away from the ward into the theatre crying and protesting filled the other children with a dread of the time when their turn would come. This is all changed. The child watches the one in the next cot being given his avertin and going off to sleep quite naturally. He then submits himself to the same procedure without fear or suspicion. The patient also appreciates the long sleep after the operation.

Conclusions

1. Avertin can be given to children as a complete anaesthetic with safety, provided a careful look out is kept for danger signals and the patient treated accordingly.
2. Complete avertin anaesthesia in children is better and more suitable than basal anaesthesia followed by an inhalation anaesthetic.
3. Complete avertin anaesthesia in children approaches more nearly the ideal anaesthetic than any other.
4. It is much safer in children than in adults, as in the former there is better detoxication and elimination.
5. The best method of administration to produce complete anaesthesia is to combine avertin 0.175 gram per kg. body weight with morphine and atropine according to age, and 20 to 30 c.cm. of novocain as a field block.
6. A 3 per cent. solution of avertin is better retained than a 2½ per cent. solution.
7. The depth of anaesthesia is best assessed by nipping the skin of the neck and watching the arm for movements.
8. The fall in blood pressure is not of serious moment.
9. Complete avertin anaesthesia is contraindicated in (a) very young and (b) very cachectic children.

I wish to express my indebtedness to Mr. T. S. Kirk, Professor P. T. Crymble, Mr. H. P. Hall, and Mr. Ian Fraser for the opportunity of using avertin with their cases and for their advice and help.

RUPTURE OF THE NORMAL SPLEEN IN PREGNANCY

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Rupture of the spleen is a rare complication of pregnancy. Kotschnow and Manenkow¹ in 1930 were able to collect only fourteen cases from the literature, and to these they added one of their own. Cases have also been reported by Stretton,² by Bohler,^{3 4} and by Smith, Morrison, and Sladden.⁵ In most of these the spleen has been found to be abnormal, or else there has been a history of direct trauma. The present case is recorded, first, because, except for congestion, the spleen was normal, and, secondly, because the trauma, although definite, was slight. It resembles fairly closely the two cases reported by Bohler and that of Stretton.

CASE RECORD

Mrs. X., aged 43, was within a fortnight of the expected date of her sixteenth confinement. She was a healthy woman, with no previous illnesses to record and no complications of labour or of the puerperium with any of her fifteen children, all of whom were well and alive. She had been reading in bed on this particular night, and at about 12.30 a.m. she leant back to switch out the light, which was above and directly behind her. She did this with her left hand. In the very act of reaching for the switch she was seized with pain under the left costal margin, so severe as to prevent her from resuming her original position. In a few minutes she had sufficiently recovered to be able to lie down in bed. The pain persisted throughout the night, and she vomited once. She was seen at 6 a.m. and was found to have a temperature of 99° and a pulse rate of 80. She still complained of pain in the left costal margin, and in this area she was tender. There were no signs of labour having commenced. She was watched carefully throughout that day, and by 6 p.m. her condition was very much as it had been twelve hours previously. During the course of the day she had vomited once and the bowels had moved. She still complained of the pain, and by now she felt weak. Her pulse rate was 86. She was sent into hospital late that evening (May 22nd, 1930).

On admission she had, in addition to a constant pain in the left hypochondrium, vague pains in both flanks. Her temperature was 99° and her pulse frequency 132. There was no blanching, sweating, or sighing respirations. The tongue was dry and covered with a white fur. The heart and lungs were normal, with the exception of diminished movement and impaired air entry at both bases. The abdomen was tense, the fundus uteri reaching almost to the xiphisternum. The wall of the uterus could be felt contracting at regular intervals. The foetus was lying in the left occipito-anterior position and the head had not yet engaged. The foetal heart was not heard, and the patient volunteered the statement that she had not felt movements since the onset of the pain. There was diffuse tenderness in both flanks and also the xiphisternum, together with some resistance, and dullness to percussion in the left flank. There was no pain in the left shoulder. Per vaginam, the external os was closed.

OPERATION

It was thought that some solid viscus had ruptured and that laparotomy must take place without delay. The peritoneum was opened through a left paramedian incision, and a considerable quantity of blood was found in the abdominal cavity. Examination soon showed that the bleeding was coming from the spleen. This organ was somewhat enlarged, and there was a jagged tear throughout the anterior border, some two inches long, extending on to the diaphragmatic and gastric surfaces. At one point the torn surfaces had separated to a distance of

nearly an inch and a half. An attempt to suture the rent was unsuccessful, and there was no alternative but splenectomy. Because of the advanced stage of pregnancy, this was not possible without previous Caesarean section. This was therefore done, and the placenta was found lying anteriorly. The spleen came away with ease, and there were no adhesions. It was noted that the pedicle of the spleen was normal, and it was not thought likely that the enlargement of the organ was in any way due to torsion of the pedicle. Whilst in the operating theatre her condition became critical. An auto-transfusion was performed, and the patient made an uninterrupted recovery, being able within a few days to feed her infant, a healthy male of $7\frac{1}{2}$ lb.

On examination, the spleen was slightly enlarged and very soft. Except for the rent already described, the capsule was intact. The organ was submitted to Dr. W. Wallace for microscopical examination, and he reported that, except for congestion, no pathological feature was to be noted.

Eighteen months later the patient was readmitted to hospital, in the ninth month of pregnancy, on account of abdominal pain, absolute constipation, and vomiting. At operation, a band was found constricting the splenic flexure of the colon. This was divided and the patient made a good recovery. Three days later she delivered herself of a healthy child (her seventeenth).

At the present time (May 1st, 1935) this patient and both children are in excellent health.

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Clinical Memoranda

Modified Attack of Diphtheria following Antitoxin Immunization

In view of recent work on prophylactic diphtheria immunization, the following case may prove of interest.

M. B., aged $8\frac{1}{2}$ years, was immunized in October–November, 1934, in the course of routine school immunization against diphtheria. Three intramuscular injections of T.A.F. (toxoid-antitoxin floccules) were given at fortnightly intervals, in doses of 0.5, 1, and 1.5 c.cm. respectively; the final dose having been given on November 8th, 1934. In March, 1935, the child attended the school clinic and received treatment for recurring "boils" on the arms and legs. On the morning of April 4th, 1935, he complained of sore throat and slight malaise. On examination the left tonsil was found to be covered with a caseous deposit, lightly adherent to the mucous membrane, which latter showed a surrounding zone of inflammatory tissue, suggesting a localized resistance to the focus of infection. There was no definite diphtheritic fetor, no enlargement of cervical glands, and no pyrexia. On swabbing, no bleeding took place from the mucous surface, but examination of the swab proved the presence of the organism of diphtheria. The case was admitted to an isolation hospital on April 6th. On inquiry on April 12th progress was reported to be satisfactory, no further symptoms having developed and two consecutive negative swabs having already been obtained.

In view of the suggestion that immunity from the disease is developed in from four to six months after completion of the course of prophylactic treatment, it might be of interest to learn the experiences of other workers in this field.

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A Treatment for Warts

Having heard from a schoolmaster that he had cured boys' warts by means of the continuous application of elastoplast, I decided to try the method upon two inveterate cases. I append a description of two cases, with photographs of the second case before and after treatment.

CASE I.

A married woman, a grocer's assistant, aged 38 years, had had three warts on the terminal segment of the right ring finger, and one on the palmar aspect of the terminal segment of the right middle finger for six years. On April 18th, 1934, the tips of the fingers were tightly bound with two complete turns of one-inch elastoplast, completely and tightly covering the warts. The elastoplast was removed weekly, and the softened, "mushy," epithelial debris was scraped away with a blunt scalpel. The bandaging was continued until July 4th, when the warts had completely disappeared. There was no other concomitant treatment. On February 20th, 1935, the patient wrote saying that her hands were perfect, that she had no further warts, and that she had previously despaired of ever getting rid of her warts because they had been so deeply rooted.

Case II before and after treatment—thirteen weeks' interval.

CASE II

A twin boy, aged 12 years, had extensive and exuberant warts on the back of his right hand and on all four fingers. (His twin brother also had warts, but these had been cured by other means.) The date of the first photograph is April 10th, 1934. Treatment similar to that used in Case I was given. The second photograph (July 3rd, 1934) was taken about three weeks before the cure was quite complete. I have seen the boy lately, and his hand is still free from warts.

CONCLUSIONS

I report these two cases in detail in order to bring to notice a very simple cure for what is often a very intractable complaint—warts. I do not pretend to offer any explanation as to why cure results—perhaps some dermatologist will oblige. (Lessened blood supply and exclusion of air are possible factors.) Elastoplast, consisting as it does of zinc oxide spread upon an emulsion of gelatin and rubber and incorporated with a cotton elastic bandage, has many uses, and is rather "extraordinary stuff"; for on the base of a varicose ulcer (where there is no epithelium) it rapidly causes normal epithelium to grow, causing the ulcer to heal—as I know in the case of the many hundreds of varicose ulcers that I have treated. Yet, in the case of warts, it seems to destroy abnormal epithelium, substituting for it normal skin.

Perhaps there are other "heaped-up" skin conditions (either chronic inflammatory or simple new growth) which would be common in dermatological practice, and which might also be cured by the continuous binding up with elastoplast.

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