TABLE VI.—Showing the Percentage Death Rates, with their Standard Errors, of Immature Infants Delivered by Caesarean Section under General, Local, and Curare Anaesthesia

Anaesthetic	No. of Immature Infants Delivered	No. of Infant Deaths	Death Rate	S.E. of Death Rate
General ..	57	8	14.0%	± 4.8
Curare ..	38	2	5.3%	± 3.7
(Local) ..	(128)	(27)	(21.09%)	(± 3.7)

The figures for local analgesia are included for rough comparison, but they are not strictly comparable with the others.

agreed that, though the mortality in this group is very high, it is difficult to incriminate the anaesthetic technique, especially when the favourable results encountered in the corresponding group of mature infants are taken into consideration.

Summary

The advantages of local analgesia and curare with light general anaesthesia for caesarean section are discussed. A statistical analysis of the neonatal mortality occurring after caesarean section performed under ordinary general anaesthesia, curare sequence, and local analgesia supports the view that local analgesia is to be preferred to ordinary general anaesthesia. There is no evidence to indicate clearly the position of the curare sequence in the three methods considered.

We gratefully acknowledge our debt to the authorities of the Liverpool Maternity Hospital for giving us access to their records, and to Professor T. N. A. Jeffcoate for his helpful criticism.

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Medical Memoranda

Suppurative Pericarditis Complicating Osteomyelitis Treated with Streptomycin

Much has been written on suppurative pericarditis, and consequently the methods of treatment have been varied. The successful treatment of a critically ill patient by the administration of streptomycin is recorded.

CASE REPORT

A boy aged 10 was admitted to hospital with a history of pain in the right hip for ten days. He subsequently developed flitting pains in other joints, but there was no articular swelling. He had been given sulphonamides and salicylates by the family practitioner, but the boy's condition deteriorated and he was admitted to hospital.

On admission he looked ill and toxic. His temperature was 104° F. (40° C.), pulse 130, respirations 26. The tongue was dry and covered by a brown fur, the lips were cracked, and sordes had accumulated on the teeth. He was restless and delirious. In the cardiovascular system, the pulse was rapid and thready but regular; the apex beat was in the fifth space inside the mid-clavicular line, with a wavy precordial impulse. The maximum impulse of the apex beat was palpable

$\frac{1}{2}$ in. (1.25 cm.) inside the outer border of the area of cardiac dullness. No thrill was detected. On auscultation the heart sounds were normal, with no appreciable diminution in intensity. At the base there was the typical to-and-fro murmur of pericardial friction. The blood pressure was 110/60. Electrocardiographic tracings were not done owing to the patient's condition. No abnormality was detected in the respiratory, alimentary, or central nervous systems, and no swelling of any of the joints was found. There was, however, marked diminution of movement of the right hip, with spasm of the muscles of the thigh. Some movement of the hip-joint was definitely present in all directions and there was no pain on percussing the heel with the leg extended. There was, however, excruciating pain on palpation over the upper and outer end of the right femur. The urine contained no sugar or albumin. A blood count showed: white cells, 9,200 c.mm. (polymorphonuclear neutrophils 63%, lymphocytes 32%, monocytes 5%). The "stab" cells numbered 25%.

The white cell count was comparatively low, but it was realized that the boy had been given liberal sulphonamide therapy, and the high relative number of "stab" cells indicated the presence of a suppurative process. The quality, and not the number, of the polymorphonuclear cells present was the all-important factor.

Osteomyelitis of the femur was diagnosed, and at operation pus was released from the upper part of the right femur. Culture of the swab produced moderate growth of *Staphylococcus aureus*. He was given 200,000 units of penicillin three-hourly by intramuscular injection. During the next few days his general condition improved slightly, but he still ran a remittent fever (100–102° F.—37.8–38.9° C.) and the pulse remained at 100 to 120 a minute.

The pericardial friction rub, however, persisted at the base, and paracentesis of the pericardium performed on the second day after operation yielded 10 ml. of a turbid yellow fluid, which on culture produced a few colonies of *Staph. aureus*. Unfortunately, the fluid clotted before microscopical examination, so a cell count was not possible. The dosage of penicillin was increased with no better result after 48 hours. Streptomycin, 0.25 g., by intramuscular injection was given six-hourly and the fever began to subside, but the evening temperature was still between 99 and 100° F. (37.2 and 37.8° C.) and the pericardial rub was still audible. Streptomycin, 0.25 g. in 3 ml. of distilled water, was then injected intrapericardially. The temperature became normal the next day and the patient made an uninterrupted recovery.

Five months after discharge from hospital the boy leads a normal life and plays all games. No evidence of adherent pericardium could be discerned by clinical, radiological, or electrocardiographic examination and, most important of all, the heart was functionally normal.

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Intra-arterial Injection of Thiopentone-Curare Mixture

In these days, when it is not unusual for anaesthetists to use thiopentone-curare mixtures, the following case report may be of interest.

CASE REPORT

A youth aged 17 was operated on for acute appendicitis on September 6, 1949. He was premedicated with "omnupon" 1/6 gr. (11 mg.) and scopolamine, 1/300 gr. (0.22 mg.) one hour before operation. A mixture of 3 ml. of thiopentone (5%) and 5 mg. of "tubarine" was injected into a superficial aberrant ulnar artery in the mid-third of the right forearm in the mistaken belief that it was a vein. The patient complained of an agonizing burning pain in his right hand. The needle was immediately withdrawn and the remainder of the syringe

containing 7 ml. of thiopentone and 10 mg. of tubarine was injected into a vein and anaesthesia was maintained with 60% N₂O, 10% C₂H₆, and 30% O₂.

The right forearm and hand became blanched; this was particularly noticeable on the ulnar half. The right radial artery was barely palpable at the wrist. Shortly afterwards giant urticarial weals appeared, extending from the hand to the axilla. Immediately 100 mg. of procaine (5 ml. of 2% procaine) was injected into the aberrant artery at the site of the original puncture. The forearm and hand rapidly became pink, the radial pulse became full, and shortly afterwards the urticarial weals began to disappear. In view of this good response no anticoagulants were given and no block was performed. A further 100 mg. of procaine, however, was given intra-arterially at the end of the operation 20 minutes later. A careful watch was kept on the circulation in the ward, but no sequelae developed and the patient was discharged fit seven days later and has had no further trouble since.

Although intra-arterial procaine is reputed not to be effective in intense arterial spasm, it seems worthy of trial before resorting to more drastic methods of treatment. Furthermore, its antihistaminic action makes it a useful antidote to the inadvertent intra-arterial injection of curare.

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Delayed Haemorrhage after Traumatic Rupture of Spleen

The normal spleen is ruptured usually as a result of a severe injury. In most cases this leads to a severe internal haemorrhage, which is rapidly fatal unless immediate operation is performed. Delayed haemorrhage after traumatic rupture of the spleen is well known, but when the initial injury is so slight as to be almost ignored by the patient it may present as a diagnostic problem.

The following case is reported as a reminder that mild trauma may assume fatal proportions even after a week's delay.

CASE REPORT

A labourer aged 76 was admitted to hospital at 11.30 p.m. on February 9, 1949, as a case of acute abdominal emergency. He complained of an agonizing pain in the epigastrium and left hypochondrium, which had started suddenly six hours before, when he had just finished his afternoon tea. The pain came in spasms and radiated to the left shoulder-tip. He had vomited once, and his bowels, normally constipated, had been opened with enemata before admission. There were no urinary symptoms. He stated that he had had dyspepsia for some years but had had no treatment for it.

On examination he was seen to be gravely ill, his skin was pale and sweating, and he was in obvious pain. He lay completely still, and resisted movement. In fact, he was too ill to respond readily to questioning. All he wanted was relief. His temperature was 98° F. (36.7° C.), pulse 96, and respirations 24 (mainly costal). His tongue was furred. The abdomen showed generalized board-like rigidity with maximal tenderness in the epigastrium. No masses could be felt, and the bowel sounds were diminished. Rectal examination was painful but no mass was felt.

It was noticed that his left lower ribs were strapped. He had not mentioned this, but, on direct questioning, stated that he had fallen at work one week previously and hurt his left side. This was strapped at the casualty department and he was able to continue his work next day. When the strapping was removed the sixth and seventh ribs in the left axilla were found to be mildly tender but not obviously fractured.

The heart was enlarged, with sounds of poor tone. The vessels were sclerotic and there were occasional extrasystoles. His blood pressure was 120/90. The chest showed poor expansion, but there was a resonant percussion note with vesicular breath sounds and no rales.

The provisional diagnosis of a perforation of a hollow viscus was made, though the degree of shock was greater than would have been expected. However, immediate laparotomy was decided upon.

In the anaesthetic room the patient was noticed to have developed auricular fibrillation, so that operation was begun under local analgesia, using 1% procaine.

Operation.—The abdomen was opened by an upper midline incision, and blood was seen immediately inside the peritoneum. General anaesthesia was then induced by Dr. B. Humphries, using thiopentone, gas, oxygen, and ether sequence. Exploration revealed an enormous amount of blood clot in the region of the spleen. The incision was then extended transversely to the left, and the spleen delivered without difficulty. A small tear could be seen in the pulp of the convex surface in addition to an extensive subcapsular haematoma that had ruptured. Splenectomy was performed and the abdomen hurriedly closed, as the patient's condition was critical. He died 24 hours later, despite blood and plasma infusions.

Post-mortem Examination (Dr. J. Clark).—The sixth and seventh ribs were fractured in the left axillary line, with no deformity or tearing of the pleura. The peritoneum was full of blood clot, the main portion being in the left upper abdominal quadrant. The ligatures on the splenic pedicle were intact. No other intra-abdominal abnormality was detected. Section of the spleen revealed normal histology of the pulp.

COMMENT

The following points require emphasis with regard to delayed haemorrhage after traumatic rupture of the spleen (MacIndoe, 1932-3): (1) Fractured ribs are a common complication. (2) The pain often radiates to the left shoulder. (3) Cessation of bleeding after the initial injury depends mainly on the strength of the capsule—that is, continues until pressure exerted by the distended capsule equals that produced by the extravasating blood. The clotting of the blood in the vessel is another factor. (4) What determines the severity of the haemorrhage is not the depth of rupture but the importance of the vessels sectioned—for example, fissures in the neighbourhood of the hilum. (5) Most patients do not return to work entirely free from symptoms, but nevertheless they are often able to work. During the latent period, which is rarely more than 14 days, a dull persistent pain is often felt in the left hypochondrium, with some slight rigidity. (6) The shock varies in degree, and may be severe enough to suggest coronary thrombosis, mesenteric thrombosis, or pulmonary embolism. (7) "Ballance's sign":—There is a dull note in both flanks, but on the right side it can be made to shift, whereas on the left side it is constant. The interpretation of this sign is that there is blood in the peritoneal cavity, but the blood in the neighbourhood of the lacerated spleen has coagulated. In many cases it is not possible to demonstrate this sign clinically. (8) The mortality is 27% in operated cases and 90% in cases treated conservatively.

I wish to thank Dr. J. Clark, the medical superintendent, for permission to report this case, and Mr. J. T. Chesterman for his helpful criticism in preparing this report.

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The following changes have been made in the names of hospitals in the Liverpool region: City Hospital East, Liverpool, to Rathbone Hospital; Green Lane Isolation Hospital, Ormskirk, to Ormskirk Children's Hospital; Fazakerley Sanatorium to Aintree Hospital; and Borrowdale Sanatorium to Barrowmore Hospital.