mobile mass is often palpable, but diagnosis is usually made at laparotomy. Other clinical features and radiology are non-specific. Cysts have been treated by aspiration and marsupialization. Cavernous lymphangiomata necessitate resection, together with the bowel if the blood supply is prejudiced by the tumour or subsequent dissection.

Only one cavernous lymphangioma has been reported in the British literature (Walker and Cooper, 1959), but this was not chylous. Blecher (1966) reported the case of a 33-year-old patient with a cavernous chylangioma of the ileocaecal region, and his paper briefly reviews the subject.

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Osteomyelitis after Exchange Transfusion

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Gangrene of the big toe after exchange transfusion has been described but not to our knowledge osteomyelitis. We report osteomyelitis and gangrene in the big toe occurring in two out of 406 babies given exchange transfusions.

Case 1

A male infant, born by induced labour at 36 weeks' gestation because of rhesus isoimmunization, was clinically normal at birth with an Apgar score of 9/10 at three minutes. His weight was 2,480 g. Cord blood results were: direct Coombs test positive; haemoglobin 108%; bilirubin 3.4 mg/100 ml; blood group A Rh-positive. Because of increasing jaundice, 86 hours after birth exchange transfusion was carried out with the two-catheter continuous technique (Saling, 1959; Ata and Holman, 1966) employing intravenous infant-feeding tubes (Warne Surgical Products)—a 4.5 F.G. size catheter for the umbilical artery and a 6 F.G. size for the umbilical vein. After 530 ml of 1-day-old acid citrate dextrose whole blood, group AB Rh-negative, had been exchanged uneventfully within two hours and 45 minutes, the catheters were left in situ for 60 hours filled with dilute heparinized saline solution and stoppered with three-way taps. Prophylactic antibiotics were not given.

About 24 hours after removal of the catheters the baby became lethargic and slow to feed, resented handling, looked ill, and had a rectal temperature of 38° C. The whole of the right lower limb was swollen, with pre-gangrene discoloration on the middle of the sole, dorsum of foot, and lower third of shin. The right femoral artery was weakly palpable as compared with the left, but the microcirculation in the leg was satisfactory. The leg was held immobile in a position of slight flexion and abduction at the hip and slight flexion at the knee. Thromboembolism of the arterial tree of right lower limb was diagnosed, but as bone infection could not be ruled out blood culture was done and antibiotic cover with Ampiclox (sodium salts of ampicillin and cloxacillin) was started. Radiological examination of the leg was normal at

this stage. To improve the microcirculation the baby was transfused with 45 ml of Rheomacrodex on three occasions (Gruber *et al.*, 1965), and since the haemoglobin was only 50% a packed cell transfusion was given.

After 48 hours the general condition improved. The discoloured patches disappeared except on the tip of the big toe. *Staphylococcus aureus* grown from the blood culture was resistant to penicillin but sensitive to cloxacillin. After a week the swelling of the limb disappeared, except at the lower end of the femur. Repeat x-ray examination showed decalcification of the lower end of the femur and erosion of the metaphyseal area indicative of osteomyelitis. The tip of the right big toe developed dry gangrene, which gradually separated in about 19 days. The antibiotics were continued for six weeks. Repeat x-ray examination of the lower limb four weeks later showed improvement in bone texture and periosteal reaction in the metaphyseal area. The baby was discharged home, aged 10 weeks, with normal movement of the hip and knee joints.

Case 2

A female baby was born on 3 March 1970 to an Rh-negative mother who had received intrauterine transfusions for rhesus incompatibility, the last one four days before spontaneous delivery at the 32nd week. The baby weighed 1,906 g, had an Apgar score of 9/10 at five minutes, appeared to be hydropic, and had a palpable liver (four fingerbreadths) and a palpable spleen (three fingerbreadths). Cord blood results were: haemoglobin 37%; bilirubin 5.0 mg/100 ml; direct Coombs test positive; blood group O rhesus-positive. The first exchange transfusion was begun five hours after birth with rhesus-negative acid citrate dextrose partially packed blood by the two-catheter continuous technique. Altogether 360 ml of blood was transfused, while 326 ml was taken out. During the exchange 1 ml of 10% calcium gluconate was given after every 100 ml of blood; 8.4% sodium bicarbonate was given according to the Astrup results. A course of cephaloridine was started.

Another exchange transfusion was carried out on 5 March and a third on the next day because of a rising serum bilirubin. On 7 March 80 ml of packed cells was transfused because the haemoglobin had fallen to 53%. Next day the baby showed signs of paralytic ileus, and for five days was treated with intravenous fluids (including 10% dextrose) through the umbilical vein catheter and nasogastric suction. Two days later she developed sclerema neonatorum and was given a five-day course of corticosteroids. During the last 48 hours the fluid therapy was given through the arterial umbilical catheter because the venous catheter became dislodged. The arterial catheter was removed after 10 days. On the same day petechial haemorrhages were seen over the body and the baby passed blood-stained stools. The right leg was swollen, the tip of the right big toe was blue, and there was a patch of bruising on the little toe and right knee, with the skin bruising easily. X-ray examination of the right leg showed nothing abnormal. After a transfusion of 80 ml of fresh whole blood no fresh bleeding occurred and the petechial haemorrhages faded away.

Six days later the tip of the big toe became gangrenous. Signs of an infection in the right knee joint developed, and one week later pus was aspirated from which *Escherichia coli* was grown. This was found resistant to cephaloridine and sensitive to gen-

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tamicin and kanamycin. Blood culture also grew *E. coli* and *Staph. aureus*. Treatment with gentamicin and cloxacillin was started and within a few days the swelling of the knee abated and the baby started to move the leg. The tip of the big toe demarcated into dry gangrene, which separated on 9 May.

The antibiotics were stopped after four weeks when the leg appeared normal and x-ray examination showed that the infection had settled. The baby was discharged home on 18 May when 11 weeks old and weighing 3,410 g.

Comment

Prolonged umbilical vein catheterization may cause local thrombosis, umbilical vein phlebitis and pyaemia, liver necrosis, and pulmonary embolism (Scott, 1965). Portal hypertension (Thompson and Sherlock, 1964), bowel perforation (Corkery *et al.*, 1968; Orme and Eades, 1968), and myocardial infarction have also been documented (Van Der Hauwaert *et al.*, 1967). Umbilical artery catheterization has also been associated with a few complications. Gupta *et al.* (1968) reported complications in 10% of 335 babies, which included bleeding, clinical signs of arterial obstruction, and arterial thrombosis detected at necropsy. Only one baby lost the tip of the big toe. Cochran *et al.* (1968) reported complications in 8% of 387 babies. Gluteal muscle necrosis has been described (Ulan and Swyer, 1968).

The clinical picture in our two cases can be explained only by thrombosis induced by the catheter in the arterial tree with superimposed infection. When the catheters were removed multiple embolization must have occurred, affecting

the skin, the big toe, and lower end of the femur. In the second case the infection was not controlled so suppuration became widespread. These are the only two cases with permanent sequelae in the 406 babies we have exchanged transfused in the past four years.

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Hepatorenal Damage from Toluene in a "Glue Sniffer"

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"Glue sniffing" is generally regarded as a relatively harmless practice and consequently little attention has been paid to the isolation of a toxic agent from the variety of substances used. The following report shows that "glue sniffing" may cause serious organ dysfunction and describes the isolation of the offending substance from the patient's blood.

Case Report

A 19-year-old boy arrived home in an emotional state and was brought to the casualty department by his mother. He had spent six hours that evening sniffing a proprietary brand of liquid

cleaner from a rag. He had also had 3 pints (1.7 litres) of beer. He had begun the practice of "glue sniffing" three years earlier while employed as an apprentice in the sign-writing trade. He came from a reasonably happy home but did not get on very well with his father. There was no history of previous illness but he had noticed a reduced urinary output after sniffing episodes and

FIG. 1—Renal function tests.

on occasions he had not passed urine for two and a half days. He had received psychiatric attention for one year.

On examination he was a thin, intelligent, co-operative youth who appeared alert and orientated. There was a strong smell of "cleaner" from his breath. He was vomiting dark brown fluid. Blood pressure was 140/90 mm Hg, pulse 110 per minute, and temperature 100°F (37.8°C). General physical examination was otherwise normal. Eight hours after admission he developed

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