on the left side. Arterial pulsation could be felt above the inguinal ligament but not below this level; the left femoral artery could be felt pulsating for a short distance below the inguinal ligament. It was impossible to detect pulsation in either popliteal fossae or at any point below this level. The skin of the scrotum was also deeply cyanosed. The patient was conscious and quite rational. The heart seemed to be beating strongly: a systolic murmur could be heard at the apex. There were rales at both lung bases. The colour and temperature of the skin of the trunk were normal.

A diagnosis of multiple arterial embolism was made: the prognosis was very poor if not hopeless, but death occurred sooner than was anticipated. The patient suddenly developed Cheyne-Stokes respiration and died within a matter of minutes a few hours after being examined and before any pathological examinations had been carried out.

POST-MORTEM REPORT

A post-mortem examination was made the following day, about twenty hours after death. The body was that of an elderly male. Sordes was present on the mouth. An infarct, which appeared to be of fairly recent origin, was found in the wall of the left ventricle: it did not involve the endocardial surface of the ventricle, which was of normal appearance, and no intracardiac thrombus was seen. Careful examination of the heart valves showed them to be normal. The coronary arteries and their main branches were laid open, but the expected thrombus was not found.

Striking changes were present in the ascending aorta and aortic arch. Projecting into the vessel lumen were several large exuberant thrombi attached to the base of atheromatous ulcers. The adventitia was thickened, and subsequent histological examination showed focal collections of lymphocytes and ruptured elastic fibres, suggesting the coexistence of both aortic syphilis and atheroma. No aneurysm was present.

A detailed dissection of the right femoral artery revealed an embolus with propagated thrombus extending to within 5 in. (12.5 cm.) of the inguinal ligament. There were signs of a diffuse infection in both lungs and a considerable amount of purulent material in the main bronchi.

The right kidney was scarred as a result of previous pyelonephritis; the left was normal apart from a recent infarct at the upper pole. The right ureter was dilated; the bladder showed cystitis with periureteric diverticula. A stricture was present in the bulbous urethra.

Cirrhosis of a coarse nodular type was present in the liver. The brain was oedematous, but no gross vascular lesion was found. Examination of the gastro-intestinal tract, thyroid, and adrenals revealed no lesion of any significance.

DISCUSSION

Whereas the clinical picture left one in no doubt that emboli had lodged in all four main limb vessels, it was only at necropsy that the source of the emboli was revealed.

Aortic atheroma is a notoriously "silent" lesion, and in consequence is given far greater prominence in textbooks of pathology than in textbooks of medicine. Despite its frequency as a post-mortem finding, it is unusual for the swift arterial current to allow thrombi of any size to build up on the aortic wall even in advanced cases of atheromatous ulceration. Still less commonly do such thrombi become detached to block an artery farther down the vascular tree and cause clinical symptoms. Thus Kvale (1947), in an analysis of 100 cases of arterial occlusion studied at the Mayo Clinic, does not list it as an aetiological factor. It is possible, however, that cases do occur and masquerade under the diagnosis of arterial thrombosis. Learmonth (1948) describes cases in which an embolus has originated from a mural thrombus in a large artery.

In discussing the subject of multiple embolism a distinction must be drawn between multiple emboli occurring consecutively and multiple emboli occurring simultaneously. A succession of arterial emboli may punctuate the course of a number of diseased states, notably subacute infective endocarditis and auricular fibrillation.

On the other hand, multiple embolism occurring simultaneously has very rarely been recorded. Branch (1937) describes the case of a man aged 56 with a 10-years history of hypertension who developed simultaneous occlusion of both popliteal arteries. He lived for five days, during which time the occlusion spread proximally to both femoral arteries. Permission for a post-mortem examination was refused. Branch speculates on the cause, and observes that the literature mentions no previous case of simultaneous obstruction of the arteries of the lower extremities of sudden onset. Fiddian (1949) records the case of a man aged 69 who developed simultaneous embolism of both axillary arteries two and half months after a leg amputation. He does not suggest any source for the embolism, and no references are cited. I have been unable to trace any previously recorded cases of simultaneous occlusion of all four limb arteries.

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Contamination of Streptomycin Solutions with Resistant Bacteria

The recent coincidence of abscesses at the site of injection of streptomycin in three different patients under treatment for tuberculosis has drawn our attention to what is likely to be an increasing hazard of chemotherapy. Records of the hospital concerned showed that 10% of the patients given courses of streptomycin for tuberculosis in the previous five years had suffered from a similar abscess. Pus from the abscesses had been cultured in most instances, yielding growths of *Staphylococcus aureus*. The earlier cases of sepsis had appeared sporadically, so that their significance was overlooked, but it was now obvious that inquiry was necessary into the methods used for preparing and injecting the streptomycin.

Solutions of streptomycin were prepared the day before use by adding 2 ml. of sterile water to 1 g. of the base (as the calcium chloride compound). Samples of such solutions were taken for culture by inoculating 5-ml. volumes of broth with two or three drops from syringes charged ready for injection. The bottles of broth were then posted to the laboratory. After incubation for five days, 6 out of 27 such samples yielded a growth of *Staph. aureus*. Swabs of equipment and materials yielded no pathogenic staphylococci. Two nurses shared the task of dissolving and injecting the streptomycin. One of them, Nurse A, proved to be a heavy nasal and skin carrier of *Staph. aureus*, and the other, Nurse B, a nasal carrier. The strains isolated from the three most recent abscesses, the streptomycin solutions, and the two nurses were typed with bacteriophage and their sensitivity to five antibiotics determined. All except one belonged to phage-type 53/77 and were resistant to streptomycin and penicillin but sensitive to aureomycin, oxytetracycline, and chloramphenicol. The exception was the strain isolated from Nurse B, which belonged to type 52A and was sensitive to all five antibiotics.

The survival of two of the streptomycin-resistant strains was studied in streptomycin solutions of 300,000 units per ml. When 10^8 viable cocci were added to 1 ml. of solution 25% survived after 24 hours at room temperature in the dark. With 10^8 cocci per ml. approximately 1% survived in the same conditions. In contrast, similar tests on streptomycin-sensitive staphylococci with an inoculum of 10^8 per ml. showed that more than 99% were killed in 10 minutes, a finding consistent with the observations of

Garrod (1948). Streptomycin sulphate and the calcium chloride compound behaved similarly in these experiments.

Following improvements in the dispensing and injection technique, 75 samples of streptomycin solution proved sterile on culture. We attribute this result, however, not so much to any specific changes in technique as to greater care having been taken when the hazard was understood. It seems advisable to impress on novices and occasionally to remind experienced staff that antibiotic solutions may not be self-sterilizing and that therefore they always require a rigorously aseptic technique in their use. Stable ready-prepared solutions of streptomycin have recently become available commercially, and these should reduce the danger of contamination, besides saving labour and lessening the risk of drug sensitization of staff. Samples of such a solution containing 0.25% phenol were examined. Little bactericidal action was observed over a period of 10 minutes with inocula of 10^8 streptomycin-resistant cocci per ml. of solution, and care therefore should not be relaxed even when such products are used.

We are indebted to Dr. R. E. O. Williams, of the Central Public Health Laboratory, Colindale, for carrying out the bacteriophage typing.

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Torsion or Spontaneous Haemorrhagic Infarction of Testicle in Newborn Infant

In the newborn infant the scrotum is sometimes abnormally swollen or red, this occurring most commonly after breech deliveries. The condition is assumed to be bruising of the scrotum during delivery, and usually subsides satisfactorily. Swelling of the scrotum is also occasionally seen after normal deliveries, and may be due to syphilis, tumours, torsion of the testicle, or spontaneous haemorrhagic infarction of the testicle. Congenital syphilis is becoming rare owing to routine antenatal supervision and treatment; therefore syphilis of the testis in the newborn is also increasingly rare. Tumours seldom occur at this age: the literature is comprehensively reviewed by Campbell (1951). In a review of 95 cases of testicular tumour by Hickinbotham (1950) the youngest patient was 13 months old.

Attention has recently been drawn to the occurrence of torsion of the spermatic cord and spontaneous haemorrhagic infarction of the testicle in the newborn. Spontaneous haemorrhagic infarction of the testicle was first described as a separate entity by Campbell (1937) and later by MacLean (1943) and Ravich (1947). From the description given by Campbell it appears that there is no way of distinguishing between torsion and spontaneous haemorrhagic infarction of the testicle except by exploration at operation. Campbell assumed that as no torsion was found at operation the infarction had been spontaneous in his cases. On the other hand, it might be postulated that there had been a twist which had become undone while the gangrene remained. Against this theory is the fact that oedema and fixation of the testis occur very early when there is torsion, as shown by Ownby and Atkinson (1942). It may be assumed, therefore, that very occasionally infarction of the testicle does occur spontaneously, though most cases are secondary to torsion.

CLINICAL FEATURES

The clinical features of these two conditions appear from the published descriptions to be identical. The child is born with a red, swollen scrotum, the skin seems to be oedematous and is often adherent to one testicle, which appears to be the affected organ. In those cases in which torsion occurs in a fully descended testis it is reasonably easy to exclude the possibility of a strangulated inguinal hernia by finding that the tumour is circumscribed above.

Some authors (James, 1953) stress the fact that the child's general condition may not be disturbed at all: there may be no increase in the pulse rate, no rise of temperature, and no pain or tenderness. Further detailed examination of these cases does not seem to produce any useful information. After diagnosis the main problem is treatment.

We have traced four cases of spontaneous infarction of the testicle in the newborn as described by Campbell, Ravich, and MacLean. All were explored and in each case orchidectomy was performed. James, in a very complete analysis of the literature, traced six cases of torsion of the testis occurring in the neonatal period and added a seventh, one of the two cases reported in his paper. In all these cases the testicle was removed sooner or later within the first few weeks of life, and one of the babies died from gastro-enteritis while still in hospital.

Two cases seen recently by us fulfilled the clinical criteria of either torsion or spontaneous infarction of the testis in the newborn.

CASE REPORTS

Case 1.—Mother aged 28, healthy. First child. Pregnancy uneventful; full term. Labour normal, vertex presentation. Length of labour: first stage, 10 hours; second stage, 1 hour 5 minutes; third stage 20 minutes; total duration, 11 hours 25 minutes. Birth weight, 10 lb. 1 oz. (4,560 g.). At birth the child was found to have a swollen red mass in the left side of the scrotum. The diagnoses considered were syphilis, new growth, and torsion. The first was ruled out by serological tests, the second by subsequent progress. The third was regarded as a possibility in spite of the fact that there was no local tenderness, no rise in temperature, or any constitutional upset. The condition gradually subsided and the testicle became smaller, until now, at the age of 2 years, it is no larger than a split pea.

Case 2.—Mother aged 27, healthy. Two previous pregnancies, eight and four years earlier—birth weights, 7 lb. 6 oz. (3,345 g.) and 8 lb. 3 oz. (3,715 g.). Pregnancy of present case normal. Labour normal, vertex presentation. Length of labour: first stage, 4 hours 10 minutes; second stage, 25 minutes; third stage, 30 minutes; total duration, 5 hours 5 minutes. Birth weight: 8 lb. 13 oz. (4 kg.). At birth the right side of the scrotum was found to be red, swollen, and hard. It did not seem to be tender, and there was no rise of temperature. After two days the testicle was seen to be adherent to the scrotum. This adherence gradually disappeared, and no suppuration occurred. The baby made excellent general progress and has been followed up for eight months. The testicle has gradually become smaller, and is now about the size of a small pea.

COMMENT

We do not think that surgical treatment as reported in the published cases has brought any particular benefit to the patients. They have been submitted to a general anaesthetic in some cases, to a local analgesic in others, and in each case to an operation at an early age. All have lost their testes, anyhow; not one has been reported as saved. In our cases the condition was deliberately allowed to subside and no attempt at operation was made. It was assumed that by the time the child was delivered the condition had advanced beyond the stage when operative cure could be expected. Both the children have atrophied testes, but they are alive and otherwise well, and their postnatal progress has not been marred by any surgical trauma or unwise attack.

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