Clinical and radiological examinations on admission showed a large, left-sided pleural effusion. The abdomen was not tender and no mass could be felt. The serum amylase was 816 Somogyi U/100 ml, the urine amylase 237 Somogyi U/100 ml, and the pleural fluid, which was haemorrhagic, contained amylase 33,500 Somogyi U/100 ml. Radiography showed a large filling defect in the second part of the duodenum. Lipiodol 6 ml was injected into the pleural space and the progress of the contrast medium followed by fluoroscopy. When the examination table was inclined to about 45° Lipiodol flowed freely through a posterior breach in the left diaphragmatic dome into the supramesocolic space (see fig.).

A drainage tube was inserted into the seventh intercostal space and 1,500 ml of haemorrhagic fluid removed. A radiograph showed that the drainage tube had passed through the aperture in the diaphragm into the abdomen and was therefore draining both the pleural cavity and the supramesocolic space. The drainage tube was removed after three days. Recovery was uneventful and the patient has been symptomless for a year.

CASE 3

A 36-year-old man was admitted to hospital with haemoptysis, left pleural effusion, and pyrexia. He was a chronic alcoholic. He gave a history of bouts of epigastric pain for the past year, unrelated to food and radiating to the back. During this time he had lost 15 kg in weight. About 500 ml of haemorrhagic pleural fluid containing amylase 17,700 Somogyi U/100 ml was withdrawn. The serum amylase was 580 Somogyi U/100 ml, and the urine amylase 4,200 Somogyi U/100 ml. Injection of 10 ml of Lipiodol into the pleural cavity showed a large opening in the diaphragm communicating with a retrogastric cyst.

After repeated paracentcses the pleural effusion resolved and it had not recurred after six months. The amylase content of the pleural fluid gradually diminished and after 10 days it was 390 Somogyi U/100 ml.

Discussion

Pleural effusions associated with pancreatitis are usually haemorrhagic and have a high amylase content. The pleural fluid amylase was much higher than the serum amylase in 87·4% of the cases reported by Geffroy *et al.* (1968), and this was so in our three cases, notably in cases 2 and 3. Possibly in case 1, in which the effusion was purulent, the amylase was partly destroyed by the pyogenic organisms.

Abscesses of the pancreas are rare. Two cases accompanied by non-purulent pleural effusion were reported by Kune (1968). A fistula is seldom present, and the injection of contrast medium into the pleural cavity has been rarely reported. Witz *et al.* (1967) reported two cases in which this technique was unsuccessful. Geffroy *et al.* (1968), however, diagnosed a case of pancreaticopleural fistula by this method. We believe the contrast medium must be injected early in the illness before re-expansion of the lung closes the opening in the diaphragm. If this were done we think more cases of pancreaticopleural fistula might be found. It is also essential progressively to move the patient during the radiological examination from the supine to the upright position. In our last two cases the contrast substance did not begin to flow until the table was sloping at 45°.

In pleural effusion of pancreatic origin the route by which amylase passes into the pleura is generally thought to be the transdiaphragmatic lymphatic ducts (Cunningham, 1922; Mitchell, 1964). Our three cases show that there is another way. Rapid drainage of the pleural effusion is essential and may also lead to the drainage of the pseudocyst.

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MEDICAL MEMORANDA

Skin Ulceration Caused by Salmonella dublin

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Localized infection is a not infrequent complication of salmonella bacteraemia, and occurs particularly where there is an underlying predisposition such as in bartonellosis and sickle-cell anaemia. Often there is pre-existing local disease such as haematoma, an area of infarction, a cyst, or a neoplasm. Localized infection outside the gastrointestinal tract commonly occurs in bone and joints, although parotitis, orchitis (Huckstep, 1962), splenic (Sharr, 1972), intraperitoneal (Griffiths, 1961), and breast abscesses (Barrett and MacDermot, 1972) have been described. Subcutaneous abscess from which *Salmonella typhi* was grown occurred in 2·9% of patients in one series of 240 adult cases of typhoid fever (Huckstep, 1962), but in none of these did ulceration occur. Skin ulceration resulting from cutaneous localization of salmonellae appears to be a rare event and should be clearly differentiated from decubitus ulceration and furunculosis associated with secondary pathogens, which may occur in severely ill patients.

We report a case of cutaneous ulceration occurring as the sole clinical manifestation of infection with *Salm. dublin*.

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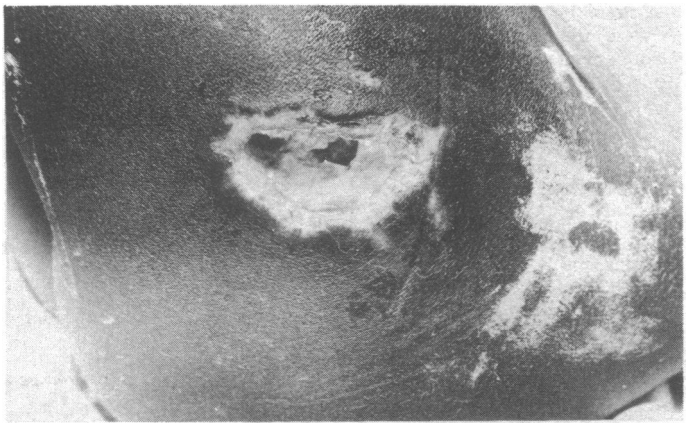
Case History

A 2-year-old girl of the Itesot tribe, from the Teso district of Uganda, was admitted to hospital on 8 May 1972. She had been in good health before the present illness. Two weeks previously

she had been non-specifically unwell, and was said by her parents to be "feverish." The day after the onset of her illness she developed raised pigmented lesions in the skin overlying the greater trochanters of both femurs. These gradually enlarged, and the parents applied hot water to the lesions. After a few days the lesions ruptured to discharge a thick creamy material, but failed to heal. They became painful, and the child, who had been able to walk for about a year, refused even to stand unless made to. On 7 May she was taken to the local dispensary where she was given an injection of penicillin, and was referred to Mulago Hospital.

On examination the child was well nourished and afebrile, but clinically anaemic and obviously in pain. She vigorously resisted any attempt to examine the ulcers and, though able, was unwilling to walk or even stand. There were two ulcers, one overlying each femoral trochanter. They were oval in outline, about 3 to 4 cm in diameter and 0·5 cm deep. The edges were slightly undermined. The ulcer on the left side (see Fig.) had a piece of necrotic skin at its centre, and each was surrounded by an area of induration. There was no inguinal adenopathy, and neurological examination revealed no abnormalities. There was a slightly fluctuant mass in the skin overlying the left chest wall some 2·5 cm in diameter which was neither hot nor tender, and was said by the father to resemble the initial stages of the lesions overlying the trochanters. The rest of the physical examination showed nothing abnormal.



Ulcer overlying left femoral trochanter.

Investigations were: haemoglobin 7·0 g/100 ml, W.B.C. 10,300 with 63% neutrophils and 36% lymphocytes. Haemoglobin electrophoresis was AA, and there was no glucose-6-phosphate dehydrogenase deficiency. Liver and renal function tests were normal, and x-ray pictures of the femurs showed no bony or periosteal abnormality. Bacteriological examination of swabs from both ulcers showed a pure growth of *Salm. dublin*. This organism was sensitive in vitro to ampicillin, chloramphenicol, and Septrin. Aspiration of the chest wall lesion produced no pus. Widal tests showed salmonella agglutinin titres of 1/50 H, and 1/400 O.

Eusol was applied locally to the ulcers, and when *Salm. dublin* was isolated oral ampicillin 250 mg 6-hourly was started. After a few days the pain began to subside and the child started to walk again. One week after admission, however, *Salm. dublin* was again isolated from the ulcers. The child had remained afebrile and repeat salmonella agglutinin titres were 1/50 H and 1/200 O. A biopsy performed at this time showed acute inflammatory changes in subcutaneous fat and muscle. After 10 days of ampicillin the child was given chloramphenicol 0·5 g for five days. The lesion on the chest wall resolved and the ulcers slowly healed, the right having been sutured at the time of biopsy. The child was discharged after a month in hospital, the lesions having healed completely.

Comment

Salm. dublin has a wide distribution, having been isolated from many animal species in many different countries (Lillengen, 1950). It is a relatively uncommon cause of enteric fever in Uganda, although four chronic gall bladder carriers have been detected (E. Nnochiri, 1972, personal communication). Purnell (1952) found in his series that *Salm. dublin* was the most frequently isolated organism from localized salmonella infection. Hendrickse and Gollard (1960) reported it in association with osteomyletitis in three children with sickle-cell anaemia, and it was recorded in a case of splenic abscess in a patient with myelosclerosis (Griffiths, 1961).

In the present patient there had been minimal systemic disturbance associated with the infection, and no predisposing cause so far as could be determined. Presumably there was a bacteraemia initially, but the reason for the localization of organisms to the subcutaneous tissue overlying the femoral trochanters is not known. Secondary infection by *Salm. dublin* of ulcers of another aetiology cannot be excluded but seems unlikely.

Cutaneous ulceration is common in Africa, and has a wide differential diagnosis. In some isolated areas bacterial culture is not always performed, and it is possible that salmonella ulcers are more frequent than suspected.

The absence of more serious manifestations of disease in this patient is in accord with some other reports of localized salmonella infection (Barrett and MacDermot, 1972), and may be related to the strain of organism. In any event, this syndrome is one which should be considered in areas where salmonella infection is common.

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