Salmonella Osteomyelitis

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SUMMARY

An unusual case of disseminated *Salmonella dublin* infection in an infant is reported. The dominant localisation in metacarpals and metatarsals is regarded as an uncommon complication.

S. Afr. Med. J., **48**, 591 (1974).

Infection of the bone is a rare complication of *Salmonella* disease in children. In an analysis of 95 cases of osteomyelitis in children, Green and Shannon[1] found that *Staphylococcus aureus* was the most common causative organism in older patients, whereas in infants it was β-haemolytic streptococcus. Not a single case was due to *Salmonella*.

Between 1926 and 1965 only 6 cases of osteomyelitis due to *Salmonella typhi* had been reported.[2] Black *et al.*[3] reported an incidence of bone infection of 0,85% in typhoid fever and 0,2% with *Salmonella paratyphi* infections. Other *Salmonella* strains were even less frequently a cause of osteomyelitis and among these *Salmonella cholerae-suis* was the most common.

We report an unusual case of disseminated *Salmonella dublin* infection in an infant, with dominant localisation in the metacarpal and metatarsal bones.

CASE REPORT

A 3-month-old Black male infant was admitted to King Edward VIII Hospital with swelling of the dorsa of both hands and feet of a week's duration. The infant had a mild cough, but was not in distress, and had no diarrhoea or vomiting. The child, who was bottle fed, had an uneventful perinatal history. The family history was noncontributory; the mother had, however, suffered 2 miscarriages, each at about 3 months.

On examination, the infant was well nourished, pyrexial, but not in distress. The pulse was 150/min and a 1,5-cm soft hepatosplenomegaly was present. The dorsa of both hands and feet were hyperpigmented, tender, with indurated swellings and underlying bony irregularity. The lesion of the left foot, which was fluctuant, was incised and the pus cultured. The Heaf test was negative.

Radiographs of the hands showed multiple lytic areas in the right second, fourth and fifth metacarpal shafts, with a little shortening of the fourth and fifth metacarpals.

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Date received: 25 September 1973.

Fig. 1. Radiographs of the hands before treatment.

Lytic areas were also present in the left 4th and 5th metacarpals (Fig. 1). Extensive lytic areas were present in the metatarsals of the left foot, with less marked change on the right. A skeletal survey showed periosteal reactions along the femoral and tibial shafts, with alternating translucent and dense metaphyseal bands in the proximal humeri, distal femora and proximal tibiae (Fig. 2).

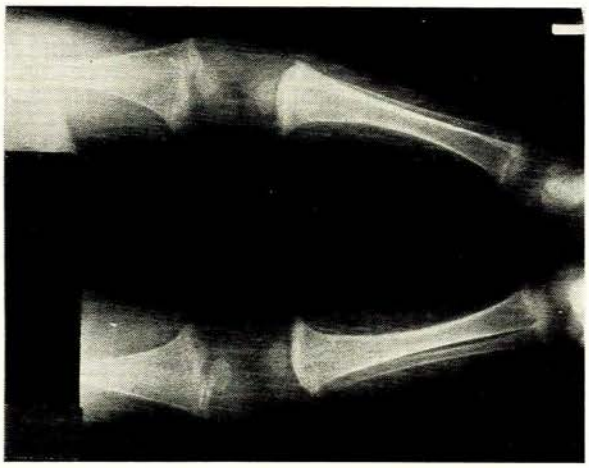

Fig. 2. Radiographs of long bones of lower limbs before treatment.

The full blood count showed a haemoglobin level of 10,5 g, erythrocyte sedimentation rate of 36 mm/hour and a white cell count of 11 000 with 21% neutrophils, 72% lymphocytes, 6% monocytes and 1% eosinophils.

The Wassermann reaction and the fluorescent treponema antibody absorption test were negative. The urine, stool and initial blood culture were negative. The alkaline phosphatase was 38 KA units, and serum calcium and serum phosphorus were 9,2 mg/100 ml and 6,5 mg/100 ml, respectively. The bone marrow had normal cytology and the haemolytic studies showed no abnormalities of the red blood cells. Pus from the abscess on the left foot and a subsequent blood culture grew *Salmonella dublin*.

The patient was treated with Chloromycetin 125 mg every 6 hours for 21 days. The clinical condition improved and the temperature settled.

Radiographs after treatment showed complete healing of the metacarpals and metatarsals. There was, however, residual deformity of the most severely involved metacarpals and metatarsals, which were broad and short (Fig. 3).

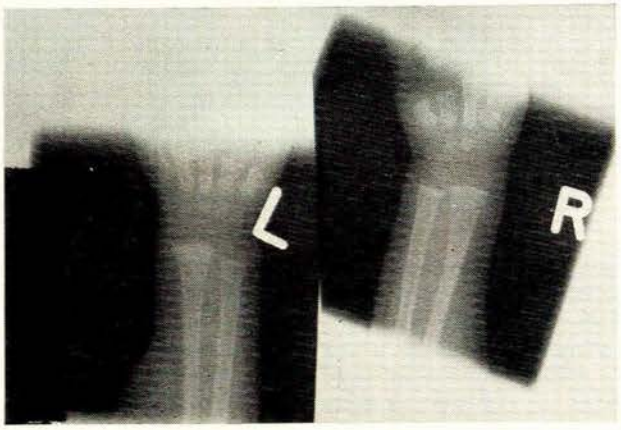

Fig. 3. Radiographs of hands after treatment.

DISCUSSION

Although, in retrospect, there is little doubt about the aetiology of the osteitis, the patient presented initially as a diagnostic problem. On clinical grounds and special investigations, tuberculosis, congenital syphilis, acute leukaemia and sickle-cell anaemia were excluded.

However, the radiological features, before treatment, mimicked those of congenital syphilis, with dactylitis and involvement of the long bones. The alternating translucent and dense metaphyseal bands in the long bones, often considered characteristic of syphilis, are, in fact, non-specific (Fig. 3), and may be due to any severe illness during the fetal period and early infancy. This appearance represents a disturbance of endochondral bone formation, with thickening of the epiphyseal plate and atrophy of the juxta epiphyseal spongiosa.[4]

Any bony structure can be involved in *Salmonella* infection. Those most frequently infected are the proximal humerus, distal femur, chondrosternal joints and vertebral bodies. *Salmonella* osteitis is reported to be multifocal in 15% of cases. Usually it is not as destructive as pyogenic osteomyelitis. The diaphysis and epiphysis are more frequently affected and the infection can spread to joints, especially in infants. Repair of destroyed bone is rapid, with little residual deformity or sequestration.[3] These features were well demonstrated in this patient, who had severe infection of the diaphyses of the small bones of the hands and feet, which resolved within 3 weeks of treatment, with minimal residual deformity of the more severely involved small bones.

Salmonella dactylitis has not been frequently reported in the literature. In their series of 26 cases Black *et al.*[3] record 1 such case due to *Salmonella paratyphi* in a 20-month-old child, in whom the infection was localised in the third metatarsal, and who rapidly responded to treatment.

The course of the disease in this patient typifies the pattern of osteitis in children in its brief duration, rapid healing, infrequent sequestration and rare recurrences.[1].

This case has been reported as it documents multifocal bone lesions with dominant localisation in metacarpals and metatarsals, which is an uncommon complication of *Salmonella* infection in children.

REFERENCES

1. Green, W. T. and Shannon, J. G. (1936): Arch. Surg., **32**, 462.
2. Groll, A. (1965): S. Afr. Med. J., **39**, 417.
3. Black, P. H., Kunz, L. J. and Swartz, M. N. (1960): New Engl. J. Med., **262**, pp. 811, 864, 921.
4. Caffey, J. (1967): *Paediatric X-Ray Diagnosis*, 5th ed. Chicago: Year Book Publishers.