PARATYPHOID OSTEOMYELITIS

REPORT OF TWO CASES

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Paratyphoid osteomyelitis is uncommon. We found only 21 cases recorded in the literature at our disposal. The following two case reports present some interesting features: the first patient was an infant, and in the second case there was an unusually long period between the initial infection and the appearance of the osteomyelitis.

Case 1

A female infant aged 1 year was seen at the out-patient department on Feb. 19, 1947. The mother reported that the child had been feverish for three weeks, although the temperature had not been taken. On examination a tender swelling of the left shoulder was found and a preliminary diagnosis of osteomyelitis was made. The following day the child was admitted to the paediatric department. The past history was not significant.

Examination showed a well-developed child in a fair state of nutrition, with a temperature of 37.5°C . (99.6°F .) on admission. The liver was felt three fingerbreadths and the spleen one and a half fingerbreadths below the costal margins. Over the left acromio-clavicular region a soft swelling the size of a walnut was noted. The skin over the swollen area showed increased venous markings and fluctuated on palpation. The temperature of the affected area did not seem higher than that of the surrounding skin. No other abnormal findings were discovered on physical examination. The blood count on Feb. 21 was: 3,400,000 erythrocytes, 19,400 leucocytes (neutrophils 34%, monocytes 2%, lymphocytes 58%, band forms 6%, no eosinophils). Routine urine examination was negative.

The diagnosis of osteomyelitis was confirmed by radiograph, and penicillin treatment was started (60,000 units daily). Aspiration of the swelling on Feb. 21 yielded 2 ml. of red-streaked pus, a direct smear of which showed Gram-negative rods. Culture of the pus on MacConkey's medium produced a fine growth of non-lactose-fermenting colonies of a motile Gram-negative bacillus. By the usual routine sugar reactions and an agglutination test the organism was identified as *Salm. paratyphi B* (Schottmüller). A second aspiration five days later again yielded a pure culture of *Salm. paratyphi B*. This was also isolated from the urine and faeces. On Feb. 25 a blood culture was negative and a Widal test showed paratyphic B 1 in 500. Agglutination of the serum with own strain was positive at 1 in 5,000.

Penicillin treatment had no apparent influence on the course of the disease, and in view of the bacteriological findings it was discontinued. The further clinical course was uneventful; the swelling gradually decreased and 12 days after admission the child was discharged from hospital, but remained under observation. In a few weeks she made a complete recovery, confirmed by radiographs and by function of the affected shoulder.

Case 2

The patient was a 48-year-old man born in Turkey. At the age of 15 he fell from a height and injured his loin. One year later he suffered from enteric fever, which lasted about 10 weeks. During convalescence from this disease he began to suffer from pains in his thighs and loins, which became so severe that he was unable to move. His physician told him that he was suffering from "coaxalgia" and he was put in plaster for six months. After removal of the plaster he felt well and there was no restriction of movement in the affected joints. Since that time he had always been in good health,

except for pneumonia 12 years ago, from which he recovered without any complications.

The patient was operated upon for bilateral inguinal hernia in August, 1946. A few weeks later he began to feel pains in his thighs and loins. At the same time his temperature became subfebrile (37.5 – 38.5°C). The pain and fever lasted for three weeks, and he received penicillin treatment for 10 days in another hospital without result. On Oct. 18 he was admitted to the medical department of this hospital.

On examination he appeared pale and chronically ill. The only definite abnormal physical sign was a pronounced tenderness in the right loin and in the right hypogastric region. The temperature was 37.5°C ., the pulse 100, the blood pressure 110/60 mm. Hg. There were no other abnormal physical signs. Laboratory examination showed: urine, no sugar or albumin; deposit, nothing of importance; blood: urea, 21 mg. per 100 ml.; sugar, 89 mg. per 100 ml.; Kahn test, negative; erythrocytes, 4,550,000; Hb 75% (Sahli); leucocytes 17,000 (neutrophils 71%, monocytes 3%, lymphocytes 23%, band forms 2%, eosinophils 1%); E.S.R. (Linzenmeier), 40 minutes; Weltman coagulation band, 3. Radiographs of the gastrointestinal tract, chest, and urinary tract showed nothing abnormal. Blood culture and agglutination test for brucellosis were negative. Widal test showed 1 in 200 for *Salm. paratyphi B* only. A radiograph of the lumbar spine showed union of the bodies of the third and fourth lumbar vertebrae.

In view of the marked tenderness in the right loin, the persistent temperature (37.5 – 39°C .), the rapid sedimentation rate, and the shift of the Weltman band to the left the possibility of a perinephric abscess was considered. An exploration of the perirenal tissues was made by Dr. E. Joseph on Oct. 29, but no pus was found. After the operation the temperature

The intervertebral disk between the third and fourth lumbar vertebrae is almost destroyed. Synostosis between these two vertebrae. In the region of the intervertebral space a cavity is seen towards which a fistula leads from the right loin.

fell to normal and there was some improvement in the general condition, although the blood sedimentation rate remained high. A fortnight after the operation the patient was discharged.

The following day a sudden rise of temperature occurred and the pain in the right loin reappeared. Two days later he was readmitted to hospital. Examination then revealed a hot well-defined swelling below the scar of the recent operation. This swelling was tender to the slightest pressure. A superficial incision (Dr. E. Joseph) yielded a large amount of pus. On

microscopical examination Gram-negative rods were seen, and on culture the isolated organism proved to possess the biochemical and serological properties of *Salm. paratyphi B* (Schottmüller). The same organism was isolated from another specimen of pus taken a few days later. The patient's serum agglutinated the organism isolated from his pus at a titre as high as 1 in 5,000. Urine and faeces yielded no growth of *Salmonella*. After the operation the temperature dropped, the E.S.R. became less rapid, and the patient greatly improved. When he was discharged from hospital on Dec. 12 the incision wound had almost healed. He reported back to the out-patient department a few weeks later complaining of pain in the right loin and renewed fever in the evenings. Into a small opening which remained in the incision scar lipiodol was injected, and an x-ray film showed communication with a cavity which tomography revealed between the third and fourth lumbar vertebrae (see illustration). Since then the patient has been seen repeatedly. When the fistula stops discharging the pain and fever reappear, but cease when drainage is re-established.

Comment

According to various statistics, almost 1% of cases of typhoid are complicated by osteomyelitis: 0.82% according to Winslow (1923), 0.87% according to Keith and Keith (1926). The reported incidence of this complication in cases of paratyphoid is much lower. Webb-Johnson (1917) saw only two instances of bone involvement in 1,038 cases of paratyphoid. Winslow (1924) in 100 cases of paratyphoid observed no case of osteomyelitis. Ross Veal and McFetridge (1934) collected 16 cases from the literature and added two of their own. Their series does not include the cases of Reenstjerna (1910). Two additional cases have since been reported (Just, 1937; Jetter, 1938). Our two cases bring the total number recorded up to 23. From the historical point of view it is interesting to recall that *Salm. paratyphi B* was first isolated—even before its definite identification by Schottmüller—from an osteomyelitic lesion of the sternoclavicular region by Achard and Bensaude (1896).

Osteomyelitis, both typhoid and paratyphoid, is rare in children. Winslow (1923), who collected all bacteriologically proved cases, found only four cases between the ages of 2 and 10. A typhoid abscess of the spine in a 3-year-old child was reported by Abbassy (1946). We were unable to find in the literature an instance of typhoid or paratyphoid bone abscess in infants. Our case of paratyphoid osteomyelitis in a 1-year-old infant seems to be the youngest recorded.

In Case 2 the abscess presented itself clinically 32 years after an attack of enteric fever. The coxalgia for which the patient at that time was put in plaster was apparently a paratyphoid spondylitis. The localization in our patient was typical, as the lumbar spine is involved in about 70% of cases showing spine lesions (Ross Veal, 1939).

The affinity of the typhoid and paratyphoid bacilli for the bone marrow invites consideration. The bacillus is already found in the bone marrow at the beginning of the infection (Storti and Filippi (1937). There is also good clinical and experimental evidence to show that the bacillus may persist in the marrow for a very long time (Dmochowski and Janowski, 1895; Lüdke, 1909; Coplans, 1936; Ling *et al.*, 1940; MacDonald, 1941; Kernwein and Capps, 1943).

Ten cases of typhoid osteomyelitis have been reported in the literature in which the time interval between disease and the bone complication exceeded ten years. We found only one case of paratyphoid osteomyelitis reported in which the bone abscess appeared 20 years after the original disease (Jensen and Kock, 1913).

What are the factors involved in the sudden exacerbation of an infection after so long a latent period? Most

authors agree that trauma may upset the equilibrium between the bacilli and the defence mechanism of the body. The traumatic agent need not be a direct blow. Undue strain or fatigue, pyrexia, or anything likely to lower the body's capacity for defence may cause the latent infection to flare up and show itself clinically. In our case the herniotomy may well have acted as such a trigger mechanism.

Summary

Two cases of paratyphoid osteomyelitis are reported, one occurring in a 1-year-old infant and the other in an adult 32 years after the initial infection.

Factors contributing to abscess formation and the incidence of this complication are discussed.

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SALM. ORANIENBURG SEPTICAEMIA REPORT OF A FURTHER CASE

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In the first recorded case of *Salmonella oranienburg* blood infection in Britain the source of the infection was never discovered (Kerrin, Elder, and Smith, 1935). In the light of events in the recent war, when *Salm. oranienburg* contamination of transatlantic dried egg was shown to be common, this original infection may well have been imported, for in 1935 food flowed in plenty to this country from all over the world.

A subsequent case was reported by one of us (Cooper, 1944), but, although intestinal infections with this *Salmonella* are not uncommon, blood infection has rarely come to light. For this reason we venture to publish a further case met with in this laboratory. There were strong reasons for suspecting dried-egg infection as the cause of the 1944 case, but at that time it was ruled impolitic to say so. In our present case no history of dried-egg consumption could be obtained, but presumably this substance is an ingredient of a variety of creams and sauces which may be consumed in hotels and restaurants. The old view that the carrier state was rare in salmonella infections is no longer tenable. Our present patient was shown to be a convalescent carrier for over five weeks. Food-borne infections of human origin are therefore probable.