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METASTATIC OSTEOMYELITIS FOLLOWING BCG VACCINATION

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An 8-year-old girl, who had been vaccinated with BCG without subsequent regional reactions, developed osteomyelitis in the left calcaneus 7 months later. The process healed after surgical treatment and chemotherapy for 1 year. Culture from the bone abscess gave growth of mycobacteria which could not be distinguished from BCG.

Key words: metastatic osteomyelitis; BCG vaccination

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Metastatic osteomyelitis after BCG vaccination is a complication which has been reported only infrequently. Foucard & Hjelmstedt (1971) reported 13 cases, 9 of which were from Scandinavia. However, there has been much interest in this complication during recent years, particularly in Sweden and Finland, where it is taken into consideration in the discussions on vaccination policy. Only two such cases have been diagnosed previously in Denmark (Bang et al. 1960, Mørkbak 1954) and the third is reported in this work.

CASE REPORT

An 8-year-old girl, previously healthy, was referred as an outpatient to the Orthopaedic Surgical Department on October 24, 1969, because of progressive pain in the left heel on weight-bearing and swelling around the lateral malleolus. Four months prior to the commencement of symptoms, the girl had been vaccinated with BCG at the Chest Clinic, without any known reactions.

Physical examination revealed a pronounced limp in the left leg, marked swelling behind the lateral malleolus, and slight tenderness of the calcaneus. The sedimentation rate was 38–59 mm.

X-ray examination of the left foot showed slight halisteresis, and tomography a few weeks later showed a destructive process in the tuber calcanei extending to the surface of the joint. An operation was performed, and 3 ml pus and a sequester-like fragment were evacuated from an abscess in the tuber calcanei.

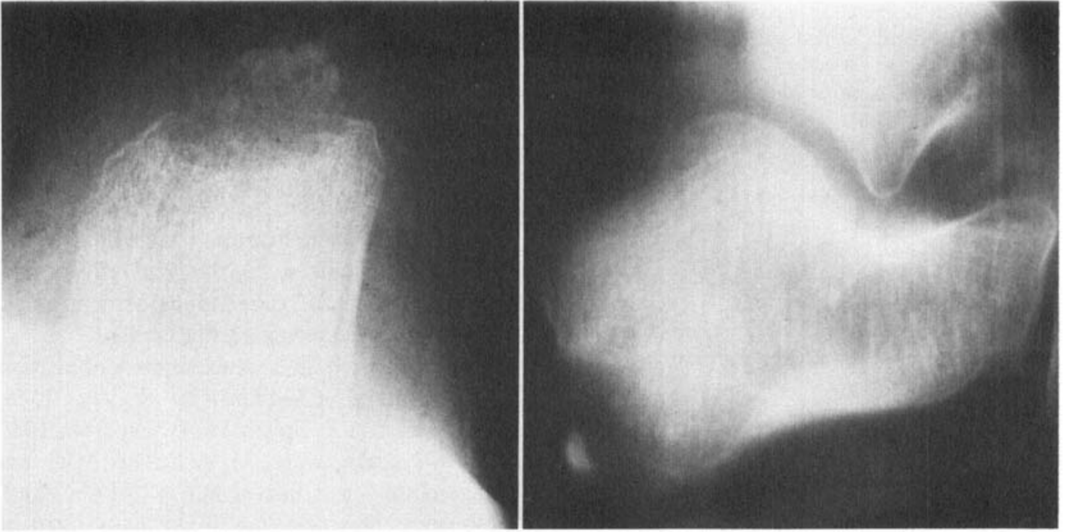
Microscopy of the pus (Ziehl-Neelsen staining) showed no acid and alcohol-fast rods, but culture gave growth of mycobacteria which could not be distinguished from BCG on the basis of colony morphology, biochemical tests and virulence determination on guinea pig (Engbæk et al. 1967).

Treatment was started with isoniazid (50 mg × 3) and neothebamin (4 mg × 3) 3 weeks after the operation. The bacteria isolated were highly sensitive to SM, PAS, INH, Rifampicin and Ethambutol.

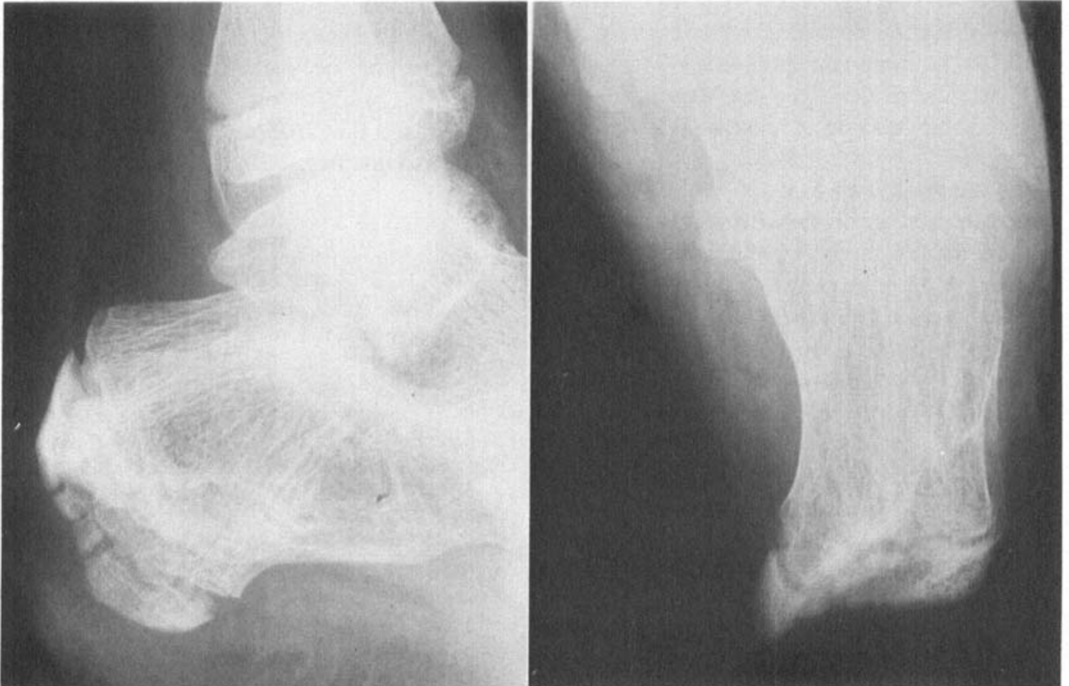
The patient was reoperated 4 months later because of continued secretion and fistulization. A cavity filled with purulent bone tissue and granulation tissue was found occupying almost the whole calcaneus. Microscopy revealed tuberculous granulation tissue with necrosis.

Ziehl-Neelsen staining showed no acid and alcohol-fast rods and PAS staining showed no fungi. Culture gave no growth of acid and alcohol-fast rods.

During the anti-tuberculous treatment with streptomycin (total 16.5 g) and erythromycin,



Figures 1 and 2. Tomography showing destructive process in the tuber calcanei extending to the surface of the joint (7.11.1969.).



Figures 3 and 4. X-ray performed about 13 months later (same case as in Figures 1 and 2) showing healing of the process in the left calcaneus (15.12.70.).

carried out because of secondary infection, the abscess and fistula healed within 3 months and the sedimentation rate became normal.

Two X-ray examinations of the thorax were normal.

At follow-up examination about 6 months after discharge from hospital, there was free mobility of the foot and the subtalar joint. X-ray examination showed healing of the process in the left calcaneus. The anti-tuberculous treatment was discontinued after 1 year. The duration of the disease from the time of the first symptoms was about 16 months, and the period from BCG vaccination to onset of first symptoms about 4 months.

At the last follow-up on November 30, 1976, the gait was normal and there was free mobility of the foot joint, the middle foot and the toes. On account of pain in the heel on prolonged weight-bearing, the patient was referred to a centre for occupational advice and assistance.

DISCUSSION

Since 1950 a number of reports have been published concerning complications after BCG vaccination. The complications have ranged in severity from regional adenitis, lupus vulgaris, metastatic osteomyelitis and arthritis, to fulminant fatal cases. Thirteen of the latter were described by Mande in 1968; six of these were from Scandinavia (cited in Foucard & Hjelmstedt 1971).

In Denmark, two cases of verified BCG osteomyelitis were published in 1954 and 1960 in infants vaccinated at the age of 1 and 2 months. The process was located in the ulna in both cases (Mørkbak 1954, Bang et al. 1960). The third case now reported is of a lesion in the calcaneus of a girl vaccinated with BCG on entering school at the age of 7 years.

As regards the incidence of BCG complications in Sweden, 23 cases of possible BCG osteomyelitis were found from 1950 to 1970, in addition to four bacteriologically verified cases (Foucard & Hjelmstedt 1971). During the period 1961 to 1974, Bergdahl et al. (1976) found 18 cases of tuberculous osteomyelitis in children aged 1 to 5 years in the Stockholm region (population about 1.5 million). Seven of these were verified as BCG infection. Ten of the other eleven cases were probably also BCG osteomyelitis, since, though the bacteriological examination was negative, histology showed tuberculosis. The last of the cases was considered doubtful. Furthermore, an increase in the number of cases of BCG osteomyelitis was demonstrated from 1963 to 1974. In the year 1974 there were five cases of tuberculous osteomyelitis, two of these bacteriologically verified.

It is reported in a preliminary publication from Finland (Rouillon & Waaler 1976, Wasz-Höckert & Spiess 1974) that from 1959 to 1972 there were 35 cases of BCG osteomyelitis in that country. This high frequency is still being investigated, but it does emphasize the necessity for registration of all cases of BCG complications in order to evalute the advantages and disadvantages of BCG vaccination and the most suitable age for vaccination. In Finland, and up to recently in Sweden, children have been vaccinated during infancy, while in Denmark vaccination has been carried out at the age of 6-7 years and only at an earlier age in cases where environmental conditions have indicated the necessity for it. The greater frequency of BCG osteomyelitis in Sweden and Finland than in Denmark must be seen in relation to that fact.

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