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# Bilateral tuberculous infection of replaced hips—reactivation 54 years after infection in one knee

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Submitted 96-09-12. Accepted 96-11-05

In 1938, a now 75-year-old man was treated for tuberculous infection in his left knee. An arthrodesis was successfully performed in 1940 and the knee has been pain-free and the infection has not recurred. The records from 1940 contain no evidence of infection of the hips and the patient recollects no pain or other symptoms in the hips until 1989. However, the pelvis was radiographed in 1961 and there was a moderate protrusion of both acetabuli.

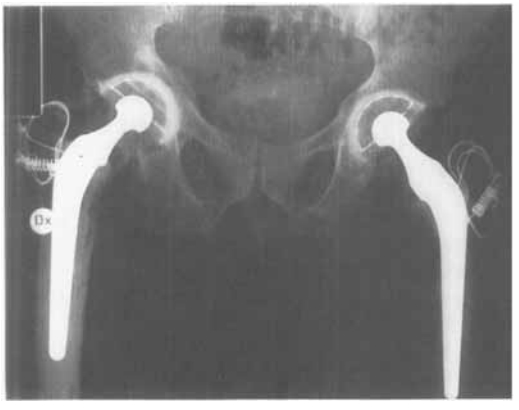
From 1989, pain became troublesome in both hips. In 1992, when he sought advice, the protrusion had progressed and degenerative changes were evident in both sides. Bilateral Charnley replacements were performed under a single anesthesia in October 1992, using his own femoral heads to graft the bottom of the acetabuli.

The operations and the immediate postoperative course were uneventful, but he never became completely pain-free, and after 4 months flexion was limited to about 30° in both hips. Radiographs revealed ectopic bone formation, grade 3–4, according to Brooker et al.'s (1973) classification, and in April 1993 both hips were operated on to remove the ectopic bone. Except for slight local swelling, nothing indicated an infection in the hips. Aerobic and anaerobic cultures of 5 tissue biopsies obtained at surgery from the right hip were all negative. No biopsies were taken from the left hip.

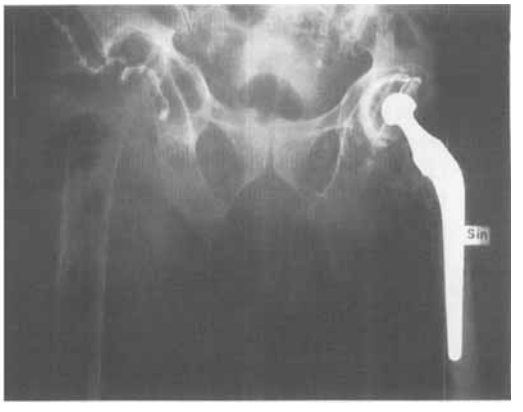
Removal of ectopic bone and postoperative irradiation by 10 Gy improved the range of motion considerably. However, the relief of pain was only temporary and by May 1995, pain and radiographic socket loosening made exchange of the right hip prosthesis necessary. ESR values ranged between 60 and 90 mm/h while CRP values ranged between 13 and 35 g/L repeatedly after primary surgery, compared to 10 mm/h and <9 g/L before. A deep infection in the right hip was then strongly suspected and about 6 mL of pus


1961.


September 1992 before surgery.



January 1993, 2 weeks after bilateral, simultaneous hip replacement.



March 1996. The right hip prosthesis has been removed. On the left side increasing lucencies in the femur and migration of the socket.

was obtained at puncture of the hip joint. The aerobic and anaerobic cultures were still negative. A one-stage exchange of both components was performed in June 1995, but aerobic and anaerobic cultures of 10 biopsies were again negative.

The exchange operation made the patient pain-free for about 5 months, during which time the ESR values decreased to about 30 mm/h. Thereafter, pain gradually recurred, the socket loosened and lucencies around the cement-mantle appeared in the femur. In March 1996, we decided to remove all foreign material from the right hip. The joint was distended by pus-like fluid and fragmented tissue masses, and both components were completely loose. Cultures from multiple biopsies were again, on this fourth occasion, negative. However, a biopsy from the joint was sent for histology and the pathologist suspected tuberculous infection, even though acid-fast rods were absent.

2 weeks after removal of the prosthesis, a core biopsy was obtained from the lateral part of the right proximal femur. On the same occasion, 5 mL opalescent fluid was collected from the painful contralateral hip around which radiographic changes similar to those around the right hip had been observed and in which the socket had migrated. DNA-amplification of material from both hips was positive for Mycobacterium tuberculosis and the diagnosis was later verified by Löwenstein-Jensen cultures. The resistance pattern demonstrated sensitivity to all relevant antibiotics. Quadruple treatment with rifampicin, isoniazid, pyridoxine hydrochloride and pyrazinamide was instituted and it will be continued for about 1 year, except for pyrazinamide treatment, which was discontinued after 2 months. No further surgery is planned on the right side, but a one-step exchange of both components was performed on the left side after 6 months of antibiotic treatment.

## Discussion

Tuberculous total hip infection is rare and can easily be overlooked. Excluding cases with a verified hip tuberculosis at the time of arthroplasty, only 11 cases have been reported in the English language literature up to 1995 (Tokumoto et al. 1995). As regards knee replacement and tuberculosis, we are aware of 12 published cases, in whom an unrecognized quiescent infection was reactivated by surgery (Bryan et al. 1982, Wolfgang 1985, Wray and Roy 1987, Eskola et al. 1988, Santavirta et al. 1989, Tokumoto et al. 1995, Spinner et al. 1996, Su et al. 1996). Today, tuberculosis appears again in the western industrialized countries, where the disease had been considered eradicated. It is also well-known that bacterial infection can recur after decades.

Although there are no radiographic signs pathognomonic for tuberculosis, the osteoporotic bone in the proximal femur and acetabular protrusion accords with 1 of the 6 radiographic types described by Shanmugasundaram (1983). He also reported that bilateral hip infection is extremely rare.

Today, the diagnosis can be made more easily and quicker with DNA amplification techniques. However, to verify the diagnosis and obtain the resistance pattern, Löwenstein-Jensen cultures are required. Conventional examination of tissue sections by an experienced pathologist and direct microscopy may reveal typical granulomas and acid-fast rods and should therefore not be forgotten.

The diagnosis of previous tuberculous arthritis may remain unrecognized at the time of arthroplasty. In our patient, joints other than the one previously affected were replaced. However, the fact that purulent joint fluid and tissue samples were negative on routine aerobic and anaerobic cultures in the absence of

antibiotic treatment should have warned us of possible tuberculosis at an earlier stage (Tokumoto et al. 1995).

Although replacement of a joint destroyed by old tuberculosis may be successful, reactivation of the infection is a threat, even after several years (Hardinge et al. 1979, Kim et al. 1988, Santavirta et al. 1988, Tokumoto et al. 1995). All patients with a history of a tuberculous infection of any part of the skeleton should be carefully examined for, inter alia, atypical radiographs (Shanmugasundaram 1983) and in connection with joint replacement surgery, should be given prophylactic treatment. It is recommended to give at least 2 antituberculous drugs for 3 weeks before surgery and 6–9 months after operation (Kim et al. 1986). Particular caution is needed concerning immunologically incompetent patients and during steroid treatment (Olsson 1981, Bryan et al. 1982, Spinner et al. 1996, Su et al. 1996). Finally, physicians wanting to refresh their knowledge of tuberculosis of bones and joints are advised to read the book edited by Martini (1988).

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