Discussion

Osteoid osteoma of the proximal femur is most typically found in the femoral neck (Dahlin 1978). An epiphyseally-located osteoid osteoma is extremely rare and in only 2 cases (4 and 9-year-old children) an osteoid osteoma has been reported in the femoral head (Dunlap and Martin 1985, Fassier et al. 1986).

Epiphyseal osteoid osteomas are difficult to diagnose because they are located subperiosteally or in cancellous bone with less sclerotic reaction around the nidus than cortical osteoid osteomas have (Kumar et al. 1984, Alani and Bartal 1987, Schlesinger and Hernandez 1990). Intraarticular osteoid osteomas are reported to mimic the symptoms of inflammatory arthritis with joint effusion and widening of the joint space radiographically (Kumar et al. 1984, Alani and Bartal 1987). Delay in diagnosis is common (Kumar et al. 1984, Alani and Bartal 1987) and secondary changes, such as widening and shortening of the femoral neck, as well as a decrease in the height of the femoral epiphysis have been described in adolescents presenting with symptoms of more than 3 months' duration (Kumar et al. 1984). Norman and Dorfman (1975) described pronounced deformities and overgrowth in children up to the age of 8 years. Arthrotic changes in conjunction with intracapsular osteoid osteomas of the femoral neck have been reported (Sherman 1947, Clark et al. 1981). In our case 3, we found narrowing of the joint space and osteophytes after 5 years.

Surgical resection is the recommended treatment, but it poses technical difficulties when the tumor is adjacent to the physis (Alani and Bartal 1987). Exact localization by radiographic imaging is a prerequisite. Preoperative tumor localization under CT guidance, using guide wires placed in the tumor or pins which are used to make drill holes at the tumor site are useful (Muscoli et al. 1995). Successful percutaneous resection guided by CT has been described by Muscoli et al. (1995). In our 2 adult cases, the osteoid osteoma could be seen after capsulotomy and rotation of the femoral head and was technically easy to resect.

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Transmission of human T-cell lymphotrophic virus type 1 by a deep-frozen bone allograft

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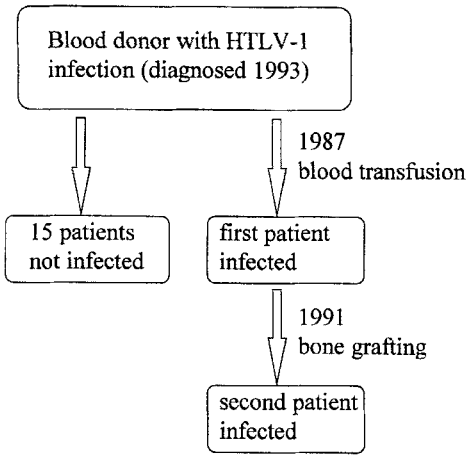
Transplantation of bone using frozen allografts implies a risk of transmitting viral infections like human immunodeficiency virus type 1 (HIV-1) and hepatitis C (Simonds et al. 1992, Conrad et al. 1995). Human T-cell lymphotrophic virus type 1 (HTLV-1) infections are endemic in some parts of the world—for example, Japan and the Caribbean—but have also been observed occasionally in many other countries. Breastfeeding is a major mode of transmission in endemic areas (Goldfarb 1993). This virus is associat-



Flow chart illustrating the transmission of HTLV-1 virus from a blood donor to a bone graft recipient.

ed with adult T-cell leukemia and myelopathy, tropical spastic paraparesis, and it has an incubation period of up to 3 or 4 decades. However, the virus can also spread by blood transfusions from HTLV-1 positive donors (Weber et al. 1992). We describe a case of HTLV-1 transmission through transplantation of a fresh-frozen unprocessed femoral head allograft.

Case history (Figure)

During 1993, a retrospective analysis was performed on 16,000 sera from blood donors in the south of Sweden. One blood donor was found to be seropositive for HTLV-1. All 16 recipients of his blood were traced and tested for HTLV-1 antibodies and only one had seroconverted. This blood transfusion was performed in 1987 when the recipient was operated on with revision of a total hip prosthesis at the age of 62 years. The prosthesis had been inserted 10 years earlier for arthrosis. 1.3 L of banked concentrated erythrocytes were transfused during surgery and a further 1.3 L postoperatively.

After confirmation of HTLV-1 transmission from this blood donor, the patient record showed that the recipient 4 years later, in 1991, had his left arthrotic hip joint replaced by a total hip prosthesis. The femoral head was donated to the bone bank, where it was kept deep-frozen at –80 °C. Blood tests for hepatitis B and C and HIV-1 were negative. 1 month later, the femoral head was used.

From the bone bank records the recipient of the bone allograft was identified. He was a 76-year-old man with a severe socket loosening of a hip prosthesis. The banked femoral head was used as a block graft and fixated with screws to reinforce the acetabular wall. At a 4-year follow-up, the graft had healed to the iliac bone and the hip was functioning well. There were no signs of any HTLV-1-associated disease, but blood tests were seropositive for HTLV-1 antibodies. During surgery, he received 0.7 L of banked erythrocyte concentrate. His 2 blood donors, also tested, were both seronegative for HTLV-1.

Further studies of the records of the femoral head donor showed that he had been admitted to the department of infectious diseases in Malmö 1 month after the blood transfusions in 1987 because of fever, a rash and a transient right-sided radial nerve palsy. An analysis of frozen sera collected during this postoperative febrile disease showed HTLV-1 seroconversion during that period. At a recent follow-up, there were no signs of any HTLV-1-associated disease.

Discussion

This case shows that HTLV-1 virus can also be transmitted by transplantation of a solid bone allograft that has been deep-frozen. Although blood from the seropositive blood donor infected only 1 of 16 patients, a deep-frozen bone graft, collected 4 years after a primary HTLV-1 infection in a secondary case, contained enough viable virus particles to induce the development of HTLV-1 antibodies. It is known from 2 reports on HIV-1 and 3 reports on hepatitis-C virus transmissions with bone grafts that deep-freezing alone does not inactivate virus (Tomford 1995). Processing of bone by irradiation and freeze-drying reduces or eliminates the risk of viral transmission, but it also reduces new bone formation and the strength of bone allografts (Tomford 1995). Donor selection and appropriate testing are important factors to reduce a small risk of spreading viral diseases by bone allografts. However, as in this case, there is always a risk of spreading a virus, for which no test method is available. In these 2 elderly patients, the risk of a clinical disease caused by HTLV-1 is small. In younger patients, this risk is much larger and the possibility of transmitting a HTLV-1 infection should be considered. Whether processed bone can be used instead of fresh frozen allograft depends on the demands made on the graft. To reduce the risk of viral transmission during surgical correction of bone defects in the future, it will be important to find alternatives to human unprocessed bone grafts.

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

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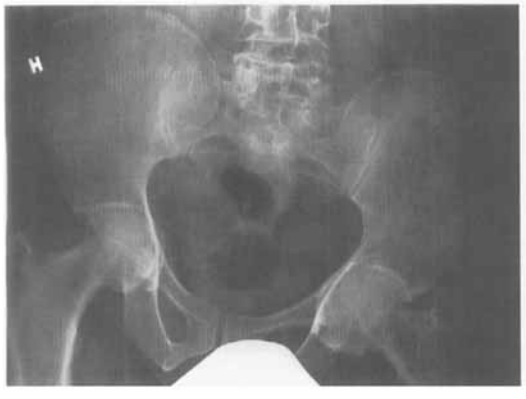
In 1938, a now 75-year-old man was treated for tuberculous infection in his left knee. An arthrodesis was successfully performed in 1940 and the knee has been pain-free and the infection has not recurred. The records from 1940 contain no evidence of infection of the hips and the patient recollects no 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



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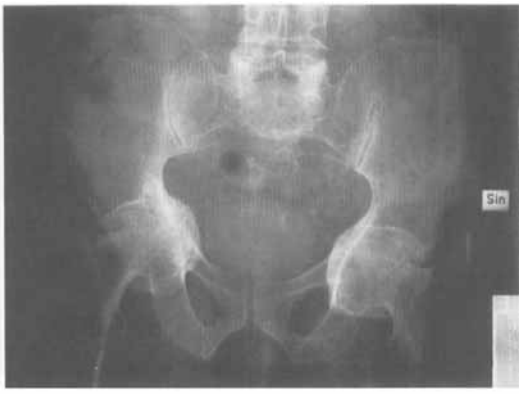

September 1992 before surgery.