

Giant Geode Treated with Calcium Phosphate Cement in a Rheumatoid Knee

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Subarticular cystic lesions, known as geodes¹, are often seen in the course of rheumatoid arthritis (RA), but giant geodes raise the risk of spontaneous fracture^{2,3}. We describe a case of a geode at the tibia, for which curettage was performed, with injection of calcium phosphate cement after arthroscopic synovectomy of the knee joint.

In March 1998, a 46-year-old Japanese woman presented with polyarthritis in her wrists, knee, and ankle joints. She had been treated with 2.5 mg of prednisolone per day and 6 mg of methotrexate per week for RA before she came to our outpatient clinic in May 2000 complaining of left knee joint pain. On physical examination, significant swelling and tenderness at the left knee joint were found. The range of motion was 110°. She walked with the aid of crutches. Laboratory tests showed an elevated white blood cell count of 14,500/ μ l, C-reactive protein (CRP) 3.6 mg/dl, rheumatoid factor 74 IU/dl (< 10 IU/dl), and erythrocyte sedimentation rate 52 mm/h.

Plain radiographs showed a giant area of lucency in the tibial condyle (Figure 1). Magnetic resonance imaging (MRI) showed a 3.5 × 3.6 × 4.5 cm cystic lesion with homogenous signal intensity, and proliferation of synovium within the knee joint. Sequential MRI indicated that the giant cyst was connected to the joint space, and we diagnosed this lesion as a geode (Figure 1).

We chose arthroscopic synovectomy and curettage of the geode as a time-saving operation. After arthroscopic synovectomy, the plane between pes anserius and biceps femoris was developed, and the cortical bone (10 mm × 15 mm) was removed for fenestration at the posteromedial aspect of the tibia. Careful curettage of the geode was performed (Figure 2). Twenty-four milliliters of calcium phos-

phate cement⁴ with a powder-liquid ratio of 1.7 (Biopex, Mitsubishi Material Inc., Tokyo, Japan) was injected into the geode to prevent collapse of the tibial condyle. The cortical bone was restored to the window of fenestration using calcium phosphate cement.

After the operation, she was treated with 2.5 mg prednisolone per day and 6 mg methotrexate per week. Her CRP level has been within 2.0 mg/dl for 4.5 years. At followup the range of motion of her left knee joint was 115°, and she walked with a cane. The injected calcium phosphate cement filled over 90% of the geode, and there has been no enlargement of the geode 4.5 years after operation (Figure 3). At followup, a coronal reconstructed computerized tomographic image showed an increase in erosive areas and a narrowing of joint space, but consolidation of the subchondral bone suggested that the injected calcium phosphate cement could shore up the tibial condyle and support transmission of load (Figure 3). This method is an option for treating giant geodes.

REFERENCES

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Figure 1. A and B. Radiographs at the first medical examination at our clinic. Radiograph shows a giant area of lucency at the tibia. C and D. MRI reveals a cyst at the tibia and proliferation of synovium in the joint (SE, TR350, TE15).

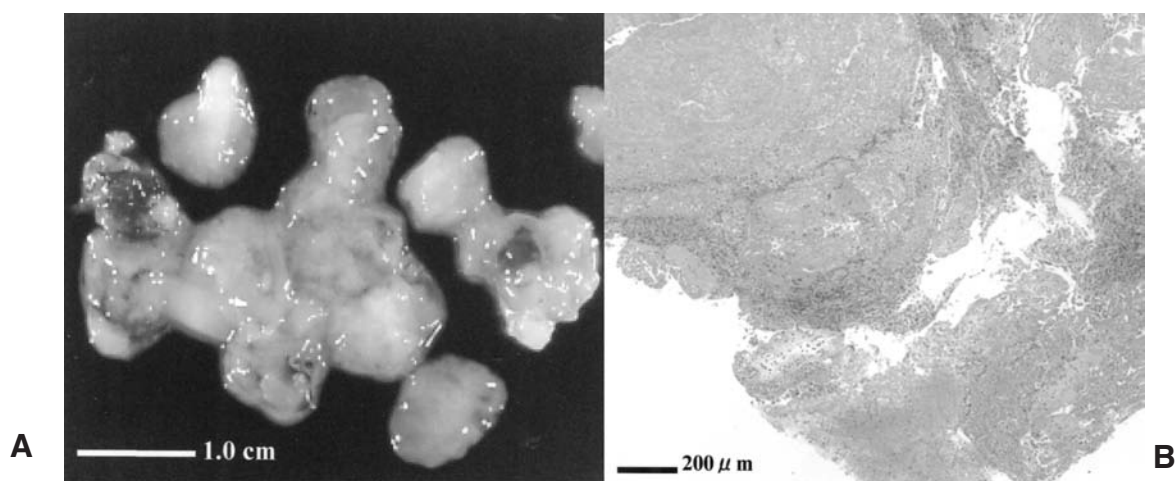


Figure 2. A. Granulated tissues in a geode. B. Histological examination revealed fibrinoid necrosis and mild chronic inflammation (magnification 40×).

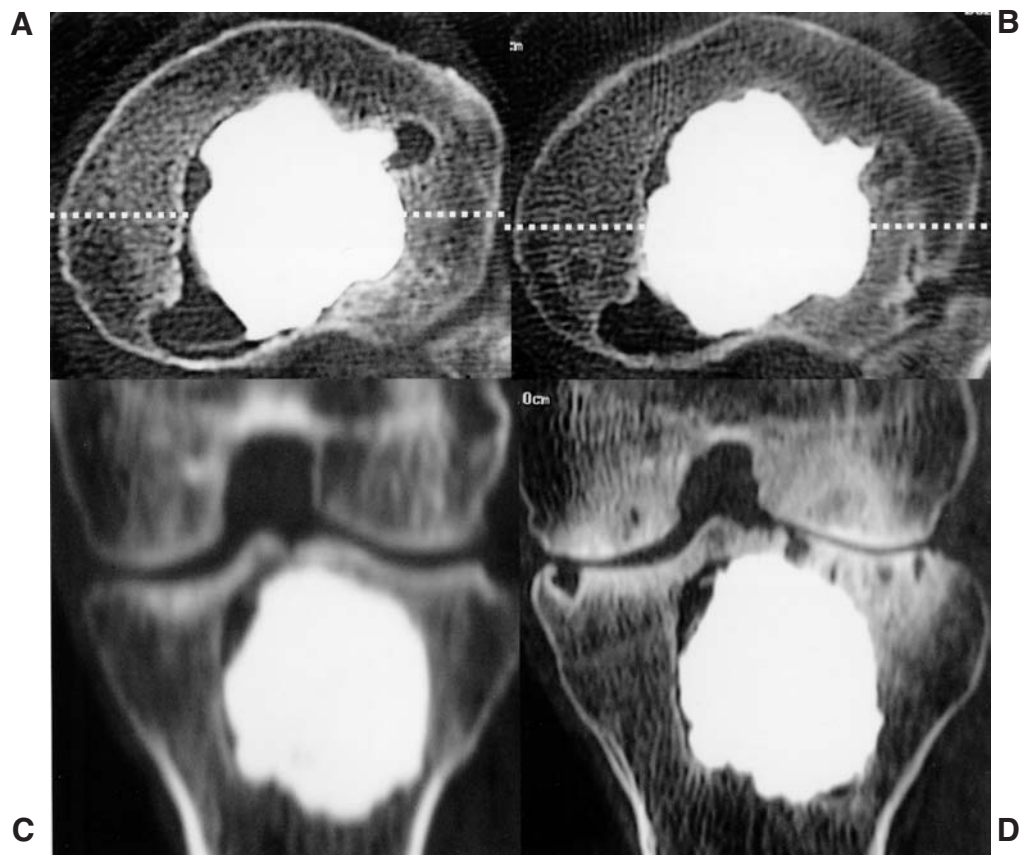


Figure 3. A and C. Axial and coronal views of single-helical CT scan one month after surgery. B and D. Axial and coronal views of 16 multidetector CT 4.5 years after surgery.