Rheumatoid Pseudocyst (Geode) of the Femoral Neck Without Apparent Joint Involvement

BERNARD F. MORREY, M.D., Department of Orthopedics

Typically, rheumatoid cysts are associated with obvious joint involvement and are located in the subchondral portion of the adjacent joint. Giant pseudocysts (geodes) are uncommon and are characteristically associated with extensive joint destruction. The patient described in this report had a giant pseudocyst of the femoral neck but no joint involvement. To the best of my knowledge, this is the first report of such a manifestation of a giant pseudocyst. As such, it posed a somewhat difficult diagnostic problem.

Subchondral erosions and cyst formation are common and, in fact, typical of rheumatoid arthritis.\textsuperscript{1-4} Dahlin\textsuperscript{5} made a useful distinction between cysts that occur incidentally in association with a disease, such as in pigmented villonodular synovitis, and those that are seen as a direct result of primary joint involvement with a disease, as in osteoarthritis,\textsuperscript{6-9} hemophilia,\textsuperscript{10} or rheumatoid arthritis.\textsuperscript{3,11,12}

Giant pseudocysts have also occurred in patients with rheumatoid arthritis, but only infrequently.\textsuperscript{2,13-17} A characteristic feature of this type of lesion is the invariable association with severe joint destruction.\textsuperscript{13,16,18} This report describes a patient with a giant rheumatoid pseudocyst of the femoral neck without joint involvement. Documentation of this rare manifestation is of value because the entity has not been recognized previously and the diagnosis may be difficult to determine.

REPORT OF CASE

A 66-year-old active man with seropositive (rheumatoid factor less than 1:20) rheumatoid arthritis had had typical involvement of the knees that necessitated bilateral knee replacement 2 and 3 years previously. At the time of operation, the pathologic appearance of the synovium was interpreted as "mild rheumatoid synovitis." In October 1984, he came to the Mayo Clinic because of pain in the left hip that intensified with activity. He had no stiffness or fibrocystic features. The patient indicated that he had had an increase of pain with activity during the past several weeks, which was relieved by rest but considerably limited his daily activities.

Examination showed that the patient had a Trendelenburg gait. The hip motion was normal. The erythrocyte sedimentation rate (Westergren method) was 76 mm in 1 hour (normal, 0 to 22 mm in 1 hour). Roentgenograms of the pelvis revealed extensive localized radiolucencies of both femoral necks, but the articular surfaces appeared to be intact (Fig. 1). No joint narrowing or subchondral erosion or cyst formation was noted on the plain films. The diagnosis of a pathologic fracture through a probable rheumatoid pseudocyst was considered, and a technetium-99m bone scan was obtained to exclude or demonstrate articular involvement. This study disclosed increased uptake in the femoral neck but not in the joint itself (Fig. 2). Because the patient had no signs or symptoms of arthritis, a bone grafting and internal fixation procedure was planned. The day

Address correspondence to Dr. B. F. Morrey, Department of Orthopedics, Mayo Clinic, Rochester, MN 55905.
before operation, the pain in the left hip increased abruptly after the patient twisted his hip while getting out of the shower.

At the time of operation, the presence of gross motion at the fracture site, the extent of the cyst, the age of the patient, and the diagnosis of rheumatoid arthritis prompted the decision to proceed with a conventional cemented hip replacement. The resected specimen confirmed the extensive involvement in the femoral neck and also of the femoral head. The articular cartilage, however, appeared normal (Fig. 3). No evidence was found of synovitis or ganglion formation. The lesion was thought to be entirely intraosseous although the process could have begun by synovial erosion initiated at the articular margin (Fig. 3). The specimen was lined by bone or slightly inflammatory fibrous tissue. Histologic examination of the content of the specimen revealed nonspecific inflammatory fibrous tissue (Fig. 4). The joint synovium was without evidence of rheumatoid arthritis.

One year postoperatively, the patient was free of pain in the left hip. Roentgenograms showed that the lesion in the right hip had not progressed.

DISCUSSION

Although subchondral cyst formation is typical in patients with rheumatoid arthritis, the development of large pseudocysts is uncommon, and the occurrence of a pseudocyst without adjacent joint involvement has not been reported previously to the best of my knowledge.

In the patient described in this article, the possibility of a benign bone tumor was considered, as has been previously reported. The bilateral involvement in this patient and also the underlying diagnosis of rheumatoid arthritis made the presence of a tumor unlikely. Furthermore, the site of the lesion and the age of the patient supported a nontumor cause of the pain.

Pigmented villonodular synovitis is rare in this age group and is typically associated with involve-
Fig. 2. Posteroanterior technetium-99m bone scan (image reversed from Figure 1), revealing increased uptake at inferior medial neck of left femur but not in the joint itself or in subchondral region of femoral head.

There seems little doubt that the lesions reported in this case are giant rheumatoid pseudocysts of the femoral head and neck. Such cysts (with joint involvement) have been previously reported and are found in active patients with rheumatoid arthritis, similar to the active 66-year-old man in this report. Although these large cystic lesions are well known to rheumatologists and radiologists, only a single report has been published in the orthopedic literature. Colton and Darby described two cases that involved the femoral neck and caused severe joint destruction that necessitated replacement with endoprostheses.

The pathologic characteristics of the lesion are not those of a true cyst. Thus, the term "pseudocyst" or geode has been recommended. The histologic features of a pseudocyst can be distinguished from those of the more typical...
subchondral erosion associated with rheumatoid arthritis. These smaller subchondral erosions are thought to occur from synovial invasion of the subchondral bone and to represent synovial or pannus invasion.\textsuperscript{21,22} Histologic analysis of a pseudocyst will disclose nonspecific fibrous tissue,\textsuperscript{13} as was demonstrated in the case described herein.

Because the histologic appearance is not diagnostic of the cause of a pseudocyst, the clinical course usually is the most important feature in establishing the diagnosis.\textsuperscript{17,21,22} In this setting, extensive joint involvement has generally been a consistent feature in patients with geode formation.\textsuperscript{1,12,13,17,18,21,22} Consequently, diagnosing a pseudocyst becomes difficult when joint or synovial involvement is minimal or absent.\textsuperscript{14} Recognition of the possibility of the occurrence of a pseudocyst without joint involvement will facilitate definitive treatment without the need for
extensive and expensive studies to verify the diagnosis.

CONCLUSION
This case is of interest because it is a well-documented instance of a patient with rheumatoid arthritis who had large pseudocysts in both femoral necks but no articular or synovial involvement. Knowledge of this manifestation of pseudocysts should be of value in distinguishing this condition from other entities and in avoiding extensive and unnecessary studies. Examination of the opposite hip for a similar process is appropriate in the consideration of a bone grafting and fixation procedure.

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REFERENCES