These results show that periarticular calcification of the shoulder, often clinically silent, is common among patients with articular chondrocalcinosis. It is found mainly at the insertion of the supraspinatus tendon.

Eight patients in the study group had fine linear tendon calcification. This calcification is supposed to be made of calcium pyrophosphate dihydrate crystal deposits, inasmuch as their morphology is similar to that observed in other tendons with typical CPPD crystal deposits. However, the prevalence in the supraspinatus tendon is twice that in the Achilles or quadriceps tendons; this could be because of repeated strains due to the great mobility of the shoulder joints.

Dense homogeneous tendon calcification may be considered to result from apatite deposits, which are the most common cause of calcifying tendinitis of the shoulder. This was more frequent, but not significantly so, in the study group than in the control group; further radiological studies are needed to see whether apatite deposition disease could be associated with articular chondrocalcinosis. In three cases both linear and dense tendon deposits were present; these findings have to be compared with those of a triceps tendon where both CPPD and hydroxyapatite crystals could be demonstrated by radiocystallography, suggesting that mixed crystal deposition disease may occur in certain tendons. There is an analogy with what occurs in some osteoarthritic joints where the two kinds of crystals can coexist.

Articular chondrocalcinosis, quadriceps calcification, and patellofemoral degeneration in the elderly

EDWARD WILKINS, AND GORDON EIVISON

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Linear calcific deposits in the quadriceps tendon and ‘isolated’ patellofemoral degeneration have been described as radiographic features seen in association with intra-articular chondrocalcinosis. It has been suggested that their presence may be of value in distinguishing between pyrophosphate arthropathy and other forms of degenerative joint disease.

We assessed the influence of aging on this interrelationship by analysing radiographs taken on consecutive admissions to an acute geriatric unit. We documented the prevalence of intra-articular chondrocalcinosis, patellofemoral degeneration, and quadriceps calcification and defined their interrelationship.

METHODS AND RESULTS

A total of 120 consecutive x-ray films of the knee (anteroposterior and lateral), pelvis, and wrists were analysed by four independent observers, using light intensification and magnification. Articular chondrocalcinosis was defined as the finding of dense, hazy, linear, or stippled intra-articular calcification. Quadriceps calcification as seen on lateral views of the knee was defined as either in the muscle belly or in the tendinous insertion. Formation of osteophyte on the upper margin of the articular surface of the patella, loss of articular cartilage in the patellofemoral joint, and subchondral sclerosis was used to assess the presence of patellofemoral degeneration, classified as mild, moderate, or severe.

To achieve maximum sensitivity and to avoid excessive radiation exposure, Ifford rapid R film was used for the knee x-ray examinations, and X-6-Mat RP-X-RPI for the pelvis. Data were available on 100 patients (31 men, 69 women) aged from 65 to 97 years (mean (SD) 79±4 years (6±6)). None of the patients had haemochromatosis or hypercalcaemia. Thirty-four patients had intra-articular chondrocalcinosis; 25 had changes at the knee. The prevalence rose from 15% (3 out of 20) in those aged 65 to 74 to 36% (20 out of 55) in those aged 75 to 84, and to 44% (11 out of 25) in patients aged from 85 to 97 years.

Quadriceps calcification at the tendinous insertion was seen in 54 patients. The prevalence increased from 20% in patients aged 65 to 74 years to 60% in those aged 75 to 84, to 64% in those aged 84 to 97. Fifty patients had evidence of patellofemoral degeneration. In 13 patients the changes were mild, in 27 patients moderate, and in 10 severe. In 17 cases radiographs showed no other abnormality—that is, degeneration was isolated. The prevalence rose from 35% in patients aged 65 to 74 to 49% in those aged 75 to 84 years, and to 64% in patients above 84 years.

The table shows the...
interrelationship between articular chondrocalcinosis, patellofemoral degeneration, and quadriceps calcification. Articular chondrocalcinosis is subcategorised into present at the knee and in joints other than the knee.

Analysis of these figures shows that the prevalence of patellofemoral degeneration and quadriceps calcification is similar in patients with and without articular chondrocalcinosis.

**Conclusion**
Articular chondrocalcinosis, patellofemoral degeneration, and quadriceps calcification are common in the elderly and their prevalence increases in a linear fashion with aging. They are radiographic phenomena closely related to aging and caution must be exercised in postulating a relationship with a disease process in the elderly.

**References**

### Table 1  Relationship between articular chondrocalcinosis (ACC), quadriceps calcification, and patellofemoral degeneration

<table>
<thead>
<tr>
<th></th>
<th>In association with ACC at the knee (n=25)</th>
<th>In association with ACC elsewhere (n=9)</th>
<th>No evidence of ACC (n=66)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quadriceps calcification:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tendon (n=54)</td>
<td>14 (56%)</td>
<td>4 (44%)</td>
<td>37 (56%)</td>
</tr>
<tr>
<td>Muscle (n=10)</td>
<td>3 (12%)</td>
<td>2 (22%)</td>
<td>5 (8%)</td>
</tr>
<tr>
<td><strong>Patellofemoral degeneration:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall (n=37)</td>
<td>14 (56%)</td>
<td>5 (55%)</td>
<td>31 (46%)</td>
</tr>
<tr>
<td>Isolated (n=16) (mild, moderate and severe)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolated (moderate and severe only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 (12%)</td>
<td>1 (11%)</td>
<td>13 (20%)</td>
<td></td>
</tr>
<tr>
<td>2 (8%)</td>
<td>1 (11%)</td>
<td>8 (12%)</td>
<td></td>
</tr>
</tbody>
</table>

**Arthritis of idiopathic haemochromatosis**

**E. B. D. Hamilton, A. B. Bomford, J. W. Laws and R. Williams**

*From the Departments of Rheumatology and Radiology, and the Liver Research Unit, King's College Hospital, London*

We have previously described the arthritis of haemochromatosis,1,2 and have now re-examined 18 of these cases after a mean interval of 9-4 years. All patients underwent repeat x-ray examination.

Chondrocalcinosis was found in at least one joint in seven patients initially and in 13 patients at the second assessment. Despite adequate treatment of iron overload by venesection it increased in severity and spread to new joints.

Thirteen patients developed arthritis of the metacarpophalangeal joints, but none of them had associated chondrocalcinosis visible radiologically at this site or in the triangular ligament of the wrist.

It was not possible to show a correlation between the presence of chondrocalcinosis at the initial assessment and the extent of iron stores or the patient's age. The table shows the incidence of chondrocalcinosis.3

**References**