Protective Effects of Popliteal Cysts in Rheumatoid Arthritis. By G. R. GENOVESE, M. I. V. JAYSON, and A. ST. J. DIXON (*Royal National Hospital for Rheumatic Diseases, Bath, and the Department of Medicine, University of Bristol*)

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Discussion

DR. J. K. VANDER KORST (*Holland*) When you found a popliteal cyst on arthrography and then re-examined the patient, did you then find the popliteal cyst?

DR. GENOVESE Yes, this was possible in one patient. The largest popliteal cyst in the series, however, remained clinically undetectable.

DR. J. K. VAN DER KORST (*Holland*) Would you prefer arthrography to radioactive labelled albumin to demonstrate popliteal cysts?

DR. GENOVESE No, I have no experience with that technique. We used arthrography because it is simple and safe.

DR. B. DE LEEUW (*Holland*) Regarding detection of these cysts, you can see them on plain x ray if you take a lateral view of the knee flexed to 90°, and if you use a rather soft film. A still better result is obtained by improving the details of the soft tissues by logotron. Not all popliteal cysts do communicate with the knee joint so that not all of them may be demonstrable on arthrography. Furthermore, these cysts may also extend proximally up to the thigh. I have seen one patient with a large mass due to tuberculosis of the knee extending up the lower third of the thigh; in another rheumatoid patient there was a still longer proximally meandering cyst which was removed with much difficulty at operation.

PROF. E. G. L. BYWATERS (*Taplow*) As far as I can see, you say that patients with severe x ray changes have no cysts and *vice versa*. Is there not a much simpler explanation for this? Those in whom x rays show severe disease have painful joints and they therefore have weak muscles because they do not use them, so they do not develop high pressures in their joints and therefore do not develop pressure cysts.

DR. JAYSON In our study of intra-articular pressure (Jayson and Dixon, 1970a), we found that frail and elderly patients with severe arthritis and marked quadriceps wasting developed extremely high intra-articular pressures. It is the tightness of the joint capsule that is primarily responsible for the magnitude of the intra-articular pressure and not muscle strength.

DR. J. T. SCOTT (*London*) The correlation between the total knee score and popliteal cysts was rather marginal. You have lumped together many different things in your total knee score and the factors leading to say, osteophyte formation, are very different from those that produce osteoporosis. What did you find when you tried to correlate popliteal cyst sizes against these separate factors?

DR. GENOVESE The only significant correlation was with geodes. At first sight one would have expected a direct correlation between geode score and cyst size. On the contrary, we found that knees with high geode scores were associated with small popliteal cysts. On the other hand, knees with low geode scores were associated with both small and large popliteal cysts. A low geode score and a small popliteal cyst in the same knee could simply be due to the arthritis being mild. On the other hand, in the remainder with large popliteal cysts, we feel that they provided protection against pressure damage and formation of geodes.

DR. J. A. MATHEWS (*London*) May I ask some practical advice? Occasionally one sees a patient with a popliteal cyst producing symptoms due to pressure on the popliteal nerve, and which can be relieved only by removal of the cyst. Have you ever seen cystectomy causing deterioration of the knee joint?

DR. GENOVESE Not personally. Recently Jayson, Kates, Pinder, and Coomes (1972) showed that the correct treatment of popliteal cysts was anterior synovectomy whereas, if the cyst is removed as described in the paper by Dr. Bennett, fluid is still produced in the knee joint and the cyst may recur or a fistula may develop.

MR. A. R. TAYLOR (*Aylesbury*) Did you find any difference between the knee joint pressure of patients who developed popliteal cysts and those that did not, and was the pressure directly related to the formation of cysts? I should like to agree with you that clinically it can be exceedingly difficult to detect these cysts. In a large series of arthrographies of the knee in rheumatoid arthritis we found cysts in approximately 40 per cent.

DR. GENOVESE In this particular series we did not measure the intra-articular pressures; this was simply an arthrographic study. We have looked at the pressures developed with simulated effusions (Jayson and Dixon, 1970b) and, as we have found that knees with cysts contain only very small volumes of effusion—an average of 3.6 ml. (Jayson and Dixon, 1970b), these knees with cysts must develop considerably lower pressures than knees with larger effusions.

DR. J. K. VANDER KORST (*Holland*) I have some difficulty in accepting that protection can be produced by popliteal cysts. I have the feeling that the quality of the synovial fluid may be an important factor. I can imagine that cysts could give protection against geodes, but I can't see how they can prevent destruction of cartilage. How do you imagine that cartilage destruction is inhibited?

DR. GENOVESE We took the total knee score in order to assess bone and joint damage. This was a radiological exercise using all the various factors seen on x ray.

PROF. H. A. VALKENBURG (*Holland*) I believe you included all 36 knees on your regression graph. However, on twelve occasions you used both knees from the same patient, and I wonder if this statistical approach is valid. If you only took one knee per person, is your result still significant?

DR. GENOVESE I cannot tell you what would happen because we did not, in fact, look for this.

DR. L. E. GLYNN (*Taplow*) May I make a rather far-fetched contribution to the explanation how popliteal cysts may conceivably protect against cartilage damage? The erosion of cartilage takes place by the growth of pannus both over the cartilage and under the cartilage into the bone. With an expanding popliteal cyst into which inflamed synovial membrane can grow, the membrane has an alternative pathway in which to move and therefore less tendency to grow over and under the cartilage. This would therefore be a protective mechanism.

DR. DIXON May I put a clinician's rather simpler explanation for that phenomenon. When you try to aspirate a rheumatoid cyst you have considerable difficulty and have to use a very large-bore needle as the material is thick and cheesy and contains the remains of vast populations of cells. I am sure that, if it is enzymatic degradation which damages the knee, then this source of enzymes is being continuously lost from the joint.

References

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Inheritance of Primary Articular Chondrocalcinosis. By J. GEERARDS and J. K. VAN DER KORST (*Division of Rheumatology, University of Nijmegen, Holland*)

Three brothers and one sister, as well as a maternal cousin, presented with multiple joint complaints of varying duration. All five showed characteristic x ray signs of multiple articular chondrocalcinosis. No abnormalities of calcium and phosphate metabolism were found. Haemochromatosis, gout, and diabetes mellitus were excluded by laboratory investigations.

Among 108 relatives above the age of 30 years who were interviewed and examined, sixteen additional cases of articular chondrocalcinosis were found. Seven of these persons denied any joint complaint, and six of the others had not sought help for their articular symptoms. In the three remaining cases, as in four of the *propositi*, bouts of acute arthritis had occurred, involving predominantly the larger joints, and especially the knees and the shoulders, after the age of 30 years. Degenerative polyarthropathy, also involving the spine, arose after the age of 60 years in—what seemed to be—the most severely affected cases. No conspicuous aggregation of other pathological features was found in this family.

Eleven females and ten males were affected in the two generations of the pedigree that were examined. In the younger generation articular chondrocalcinosis was observed only in children of affected parents, including sons of affected fathers. The pattern of occurrence of articular chondrocalcinosis in this family strongly suggests the involvement of a single dominant autosomal trait.

Discussion

DR. E. B. D. HAMILTON (*London*) I have two questions: First, were all these patients of Dutch stock, or were any of them of middle European or Jewish ancestry? Secondly,

you have mentioned that the spine was involved in one or two of the patients. Did any of the relatives have back symptoms? Siťaj and Žitňan (1967), whose patients also had a strong family history, found disc calcification by the third decade. They also noted gradual loss of mobility in the lumbar and cervical spine. This contrasts with the findings in the non-familial cases who usually present later in life.

DR. VAN DER KORST As far as we have seen, this pedigree was of pure Dutch origin. The earliest cartilages to calcify are the menisci in the knees, the triangular ligaments in the wrists, the symphysis pubis, and the intervertebral discs, but we have rarely found symptoms from the spine below the age of 60 years.

DR. A. ST. J. DIXON (*Bath*) In the x ray that you showed us there was calcification in the supraspinatous tendon as well as in the articular cartilage. To me tendinous calcification seems to be a different clinical condition. Thus it is non-familial in contrast to chondrocalcinosis, yet some people believe that these two diseases are the same. Did your family study produce any other instances in which there was extra-articular tendinous calcifications as well as intra-articular chondrocalcinosis?

DR. VAN DER KORST We only found extra-articular calcification in the shoulder, but this was not very frequent.

DR. P. H. N. WOOD (*Manchester*) If one looks at the so-called inborn errors of metabolism, they are all, at least so far, transmitted as recessive or as sex-linked traits. When one thinks one has found a dominant pattern of inheritance, this is likely to exclude an underlying enzyme defect.

DR. VAN DER KORST I completely agree with you.

References

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Vertical Subluxation of the Axis in Rheumatoid Arthritis.

By D. R. SWINSON, E. B. D. HAMILTON, J. A. MATHEWS, and D. A. H. YATES (*King's College Hospital and St. Thomas' Hospital, London*)

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Discussion

DR. J. K. VAN DER KORST (*Holland*) We still have only limited experience of prognosis of cervical involvement in rheumatoid arthritis, but the longer we know this complication, the more we realize that the prognosis can be good. The atlas can sublux either downwards or forwards. We studied a patient who died because of spinal cord involvement in whom forward subluxation occurred because bony outgrowth from the odontoid process pressed the anterior arch of the atlas forwards. I think this is one of the few occasions in cases of rheumatoid arthritis in which bony outgrowth can contribute to the symptomatology of the disease.