CASE REPORT

EROSIVE AMYLOIDOSIS OF THE WRIST AND KNEE ASSOCIATED WITH OLIGOCLONAL BANDS

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SUMMARY

We report on a patient who presented with an inflammatory arthropathy clinically, though without a raised erythrocyte sedimentation rate, and in whom investigation subsequently showed erosive amyloidosis with an oligoclonal band. There was no evidence of rheumatoid disease and she has not developed any haematological malignancy. The only other case reported in the literature had an elevated erythrocyte sedimentation rate and went on to develop a lymphoplasmacytoid lymphoma.

KEY WORDS: Erosive arthritis, Amyloidosis, Oligoclonal bands, Monoclonal bands.

CASE REPORT

A 53-yr-old female patient presented in 1980 with left wrist extensor tenosynovitis. There was a past medical history of swelling on the backs of both wrists, fingers and toes, in addition to hip and knee stiffening and pain. There was no other significant medical history and no other significant past or family history.

On examination, she had flexion deformities of the proximal interphalangeal joints bilaterally with dorsal tenosynovitis in the left wrist and metatarsophalangeal subluxation. Both knees exhibited crepitus and a decreased range of movement. Radiographs showed erosive changes in the wrists.

Other investigations revealed a raised IgG (19.5) with normal IgM and IgA, and a monoclonal band. Her rheumatoid and antinuclear factors were negative. Antimitochondrial, antismooth muscle and antiparietal cell antibodies were all negative. The lipid profile was normal.

Initially, an uneventful extensor tenosynovectomy of the right wrist was performed. Operative findings were large amounts of homogeneous yellow material, histology of which showed synovial infiltrates with lymphocytes and plasma cells and subintimal fibrosis. The synovial villi were expanded by amorphous nodules of amyloid, which was recognized by staining with Congo Red (Fig. 1).

Consequent investigation established that she had a serum A protein (P component) of 23 μg (normal range 12–60), but serum AA was at the upper limit of the normal range.

In 1988, she presented with a respiratory tract infection. Investigations showed a complement C4 level of 0.15 (normal levels 0.2–0.52), C3 of 0.98 (normal levels 0.83–1.46) and immunoglobulin levels showed a raised IgG (monoclonal band still present), with negative Bence Jones protein in the urine and a negative antinuclear cytoplasmic antibody (ANCA).

In 1989, she developed a rash on her cheeks and still showed a raised IgG level with a monoclonal band. She also developed carpal tunnel syndrome. She underwent surgical decompression with flexor tenosynovectomy. Again large amounts of material were removed from the tendon sheaths. The biopsy showed heavy staining for amyloid. A rectal biopsy did not reveal any evidence of amyloid (Fig. 2). In 1992, in addition to the IgG, she developed a raised IgM with no monoclonal band, but this returned to normal in 1993. In that same year, she had a bone marrow examination, which showed increased granulocytes and megakaryocytes, with no evidence of lymphoproliferative disease. In 1994, she underwent magnetic resonance imaging of the knees which revealed evidence of bony infiltration with amorphous material (Fig. 3a–c). Following this, she underwent a successful arthroscopic synovectomy of the right knee.

Immunohistochemical stains for the common amyloid proteins (A, P and all the light and heavy chains) have been performed on all the biopsies. Protein P, λ heavy, κ and λ light chains were found in the tissues, the other proteins all being negative. No plasma cell restriction was found and electron microscopy confirmed the fibrillar structure of amyloid.

In November, 1995, the patient underwent a total knee replacement with the same amounts of material found operatively. Her disease is still active with pain in the knees and wrists. She has subsequently been shown to have persistent oligoclonal bands with a raised IgG.

Throughout these 16 yr, with the exception of the rash, which ran a self-limiting course, all symptoms were restricted to synovial surfaces.

DISCUSSION

The term amyloidosis refers to a spectrum of diseases which are characterized by the deposition in the tissues of fibrillar proteinaceous material with a β-pleated sheet molecular structure.

Amyloid is classified according to the protein involved [1]. The proteins are either systemic or produced within the tissue. The most common proteins are the systemic immunoglobulin light chains (κ or λ) and amyloid A protein. Other types include PreAlbumin, hormones, microglobulin and Apo A-II [4, 7]. Idiopathic forms also occur [2].

In systemic amyloid, there is a characteristic organ involvement: lung and skin infiltration, peripheral neuropathy, carpal tunnel syndrome, macroglossia and...
amyloid arthropathy [3]. Amyloid in joints is usually found either as part of the systemic involvement in systemic amyloidosis or localized to the joints [4]. Local involvement is most common in osteoarthritis, but its significance is unclear [5].

Other forms of localized amyloid in the joints are (a) that associated with dialysing β2 microglobulin deposition in haemodialysis patients, especially in those against cellophane membranes, and (b) an erosive ‘primary’ articular amyloid.

Immunoglobulin light chain amyloid deposition in joints may occur in systemic immune dyscrasias or as part of an apparently idiopathic disorder.

AL amyloid joint disease without the presence of myelomatosis is rare and usually seen in patients above the age of 50. It is more common in men than women [2]. The incidence in monoclonal gammopathy of unknown significance (MGUS) is estimated to be between 3 and 10% [3]. AL amyloid in joints is usually monoclonal (i.e. exhibits light chain restriction) [8].

Fig. 1.—Histology of synovium from wrist showing inflammatory infiltrates consisting of lymphocytes and plasma cells (left), and surface of synovium with inflammatory infiltrate and an amyloid deposit being phagocytosed by a multinucleate giant cell on the right (H & E ×150).

Fig. 2.—Histology of the synovium showing extensive amyloid infiltrate and perivascular inflammatory cell infiltrate.
Fig. 3—(a) Axial section of the knee joint on magnetic resonance imaging showing infiltration of the distal femur with the amyloid process. (b) Sagittal section showing the same infiltrate on T1 weighting. (c) T2 weighting with a small joint effusion.
An erosive amyloid arthritis associated with a monoclonal band has been reported, but is very rare. In a literature search, there was only one patient in whom this picture has been reported and she subsequently went on to develop a lymphoplasmacytoid lymphoma [6] after 16 yr. This patient had a persistently elevated erythrocyte sedimentation rate.

Our patient does not conform to previously published patterns, she does not have an elevated erythrocyte sedimentation rate, she has oligoclonal rather than monoclonal bands which have been found in blood and synovium, and has erosive, histologically proven polyclonal amyloid. We therefore think that this is a novel form of disease.

A variety of mechanisms have been postulated to explain the amyloid deposits, and the most feasible appears to be amyloid precipitation and deposition in the synovium. In our case, we postulate that the very extensive amyloid deposition is a consequence of abnormal handling of polyclonal IgG immunoglobulin produced in the synovium.

Treatment options are limited and anecdotal, but there have been reports on the use of methotrexate [9] and vitamin D in rheumatoid arthritis-associated amyloid arthropathy, and this is thought to be the next therapeutic option.

The patient's written consent was obtained.

REFERENCES