**CLINICAL VIGNETTE**

# A Rare Cause of Shoulder Pain

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***Introduction***

Shoulder pain is one the most frequent patient complaints in rheumatology practice. The most common causes are rotator cuff tendonitis, bursitis, and osteoarthritis. We present a case of refractory bilateral shoulder pain in a patient with end stage renal disease (ESRD) on dialysis therapy.

***Case***

A 75-year-old female with ESRD, on hemodialysis (HD) for 18 years, coronary artery disease, and osteoarthritis presented to the rheumatology for further evaluation of shoulder pain. Bilateral shoulder pain begun about 10 years after initiation of HD. Over the last two years, she noticed significant worsening of pain disturbing her sleep, limiting range of movement with swelling that failed to respond to topical analgesics, lidocaine patch, oral acetaminophens, and physical therapy. She also received multiple intra-articular steroid injections, but the fluid reaccumulated rapidly. Colchicine was also tried without success.

On examination, the shoulders were warm with reduced range of motion to 90 degrees. There was massive shoulder effusion, the right worse than the left. Aspiration removed 60 ml of bloody synovial fluid from the right shoulder.

Synovial fluid analysis was non-inflammatory with >300, 000 RBC/cmm, total neutrophil count 948/cmm and no crystals. Synovial fluid gram stain and culture were negative. Further investigation for rheumatologic conditions were negative; including -negative antinuclear antibody, rheumatoid factor and cyclic citrulline antibody. Uric acid was low at 1.4 mg/dl. X-rays of the shoulders demonstrated osteoarthritis. MRI revealed severe synovitis and multifocal periarticular erosions of humeral head. Gout was thought to be a diagnosis. Dual energy CT, however, did not reveal crystalline disease and finding of significant inflammation within subacromial and subdeltoid bursae with erosions in humeral heads are most consistent with erosive amyloid arthropathy. In addition, other testing confirmed monoclonal gammopathy with IgM, lambda, kappa in the serum.

Because the shoulder pain was refractory to supportive therapies and intra-articular steroid injection, she was referred to orthopedics for further intervention. Extensive debridement of the right subacromial spaces, and subacromial decompression gave her some improvement in shoulder pain. She also subsequently received intermittent short courses of oral steroids for flares.

***Discussion***

The etiology for amyloid arthropathy in this case is dialysis-related amyloidosis (DRA). Erosive arthropathy can also be found in AL amyloid of monoclonal gammopathy of uncertain significance.[1] Dialysis-related amyloidosis (DRA) is a late complication of ESRD, a disabling disease characterized by accumulation and tissue deposition of amyloid fibrils consisting of beta2-microglobulin (beta2-m) in the bone, periarticular structures, and viscera of patients with chronic kidney disease.[2] The clinical manifestations usually develop after several years of dialysis dependence and include carpal tunnel syndrome, destructive arthropathy and bone cysts and fractures.

The exact prevalence of DRA is unknown since biopsy is rarely performed. A postmortem study found joint amyloid deposition in 21 percent of patients receiving hemodialysis for <2 years, 50 percent at 4 to 7 years, 90 percent at 7 to 13 years, and 100 percent on dialysis is greater than 13 years.[3]

Features of amyloid arthropathy are those of an erosive and destructive osteoarthropathy, involving most commonly the hips, shoulders, and carpal bones. Distribution is often bilateral and progressive.[4,5]

In the large joints, amyloid arthropathy resembles inflammatory arthritis with juxta-articular soft tissue swelling, mild peri-articular osteoporosis, and juxta-articular and subchondral cystic lesions. Joint space is usually normal until late in the disease.[4,5]

Patients with amyloidoma of bone or with large subchondral lesions have a high prevalence of pathologic fractures.[4,5]

In the spine, the intervertebral discs are affected causing end-plate erosions.[6] Deposition of amyloid can also be found in the ligamentum flava, the synovium of facet joints, atlanto-occipital joints and atlantoaxial joints that can eventually result in erosions.[4,6]

Differential diagnoses of multiple lytic bone lesions include metastases, multiple myeloma, erosive osteoarthritis, and osteomyelitis.[6] Calcific periarthritis (hydroxyapatite crystal

deposition disease also known as Milwaukee shoulder), septic arthritis, bursitis and tendonitis, and renal osteodystrophy should be considered as other possible etiologies of shoulder pain in ESRD.[7]

Biopsy remains the "gold standard" for the diagnosis of amyloidosis.[8] However, biopsy is rarely performed. DRA is usually suspected in dialysis patients with characteristic clinical and/or radiographic features. The amyloid in the bone cysts and synovial tissue with Congo red, are seen as apple-green birefringence under polarized light.[7]

There is no specific medical treatment for DRA. Nonetheless, kidney transplants that remove significant amounts of beta2-microglobulin (beta2-m) may prevent or slow progression of the disease.[7] Modification of hemodialysis such as use of a biocompatible high-flux dialysis membrane, hemo-filtration, the use of ultrapure dialysate, or a beta2-m adsorbent column may also result in lowering the level of beta2-amyloid. Many ESRD patients are not appropriate candidates for trans-plantation, because of comorbid conditions or advanced age. Apart from renal transplantation and modification of dialysis strategies, treatment of DRA is otherwise palliative.[7]

Arthroscopic or open surgery of the shoulder with removal of amyloid infiltrated synovium often provides dramatic pain relief.[9] Joint replacement can be considered on an individual basis, and modality can relieve pain and restore lost mobility.[9]

***Conclusion***

This patient illustrates a rare cause of bilateral shoulder pain and recurrent hemorrhagic effusions due to dialysis related amyloid arthropathy, a late complication of dialysis therapy. It remains a disabling disease with significant pain and functional limitations. Treatment is supportive in most cases and surgical intervention can be useful in selective cases.

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