

## Bilateral Spontaneous Fractures of the Acromion Associated with Amyloid Arthropathy

TETSUJI YAMAMOTO, MD, Associate Professor; KOICHI TANAKA, MD, Resident; MASAHIRO KUROSAKA, MD, Associate Professor; KOSAKU MIZUNO, MD, Director, Department of Orthopaedic Surgery, Kobe University School of Medicine, 7-5-1 Kusunoki-cho, Chuo-ku, Kobe 650-0017, Japan. Address reprint requests to Dr. Yamamoto. E-mail: yamatetu@med.kobe-u.ac.jp

Hemodialysis related amyloid arthropathy (HRAA) is a common complication associated with longterm hemodialysis. Patients treated using a cellulosic dialysis membrane have high serum  $\beta_2$ -microglobulin levels. Amyloid derived from circulating  $\beta_2$ -microglobulin is often deposited in and around joints<sup>1-5</sup>. We describe a patient with HRAA who spontaneously developed bilateral acromion fractures.

A 68-year-old man presented with an 8 month history of bilateral shoulder pain. He had been receiving hemodialysis since age 39 due to chronic renal failure. He had no history of trauma in either shoulder. Examination revealed marked swelling in the right shoulder and bilateral prominence at the acromioclavicular joints. Plain radiographs of both shoulders showed bilateral acromion fractures and superior displacement of the acromioclavicular joints (Figure 1). There were erosive changes in both humeral heads. Computed tomography revealed cortical erosion in the right humeral head. Magnetic resonance (MR) images of the right shoulder revealed a fracture of the acromion, and distended

subacromial and subdeltoid bursae (Figure 2). He underwent a synovectomy of the right shoulder. Histological examination showed marked synovial proliferation with a large amount of amyloid deposits in the sublining layers (Figure 3).

HRAA has a predilection for the shoulder. The pathological changes seen in shoulders include glenohumeral synovitis, subacromial subdeltoid bursitis, thickened and torn rotator cuffs, erosions in the humeral head and acromioclavicular joint, juxtaarticular bone cysts, and biceps tendon synovitis<sup>1-3</sup>. The most useful diagnostic technique for detecting these lesions is MR imaging. Amyloid-containing hypocellular tissues exhibit hypointensity on both T1 and T2 weighted spin echo images<sup>2,4</sup>. Pathological fractures through amyloid bone cysts after bland trauma have been reported to occur in association with HRAA, usually in the femoral neck<sup>5</sup>. Bilateral spontaneous acromion fractures with no history of trauma are extremely uncommon in HRAA.

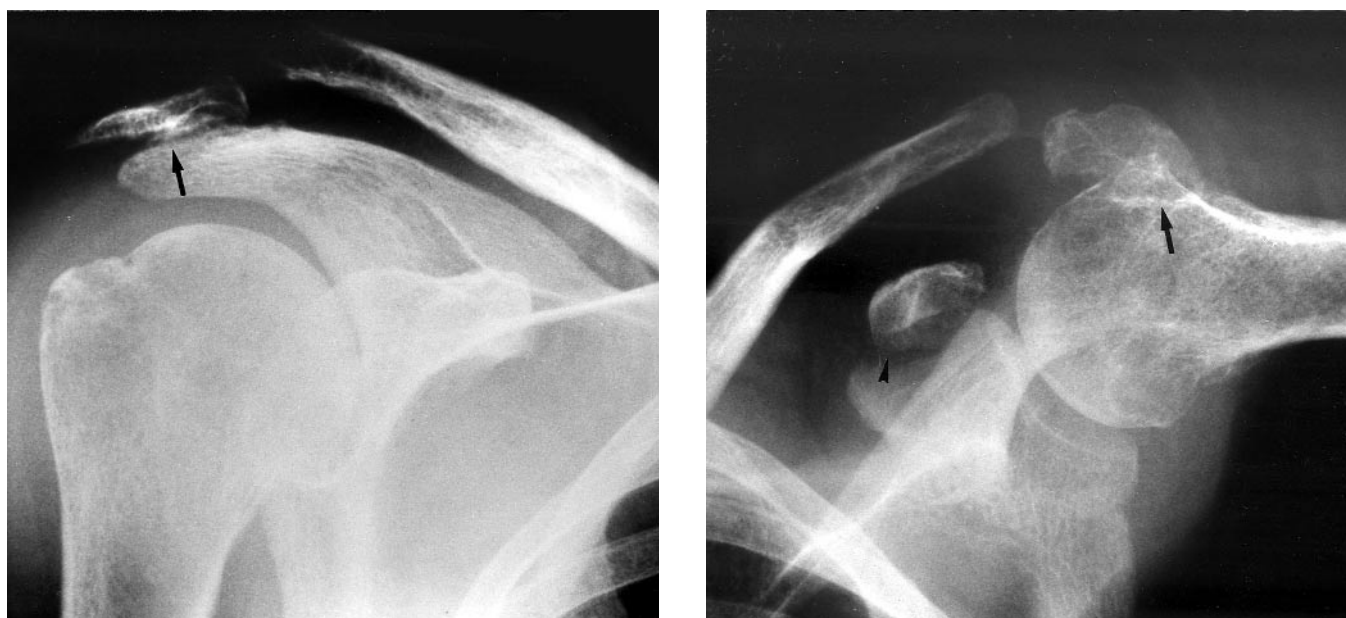


Figure 1. Anteroposterior plain radiographs of both shoulders show bilateral acromion fractures (arrows) and superior displacement of the acromioclavicular joints. A. The right shoulder shows increased soft tissue density in the subacromial and subdeltoid bursae areas. No ossification or calcification is visible within the lesions. There is an erosive change where the rotator cuff is inserted. B. Radiograph of the left shoulder reveals another bony fragment that appears to originate from the scapular spine (arrowhead). The humeral head also shows erosive changes.

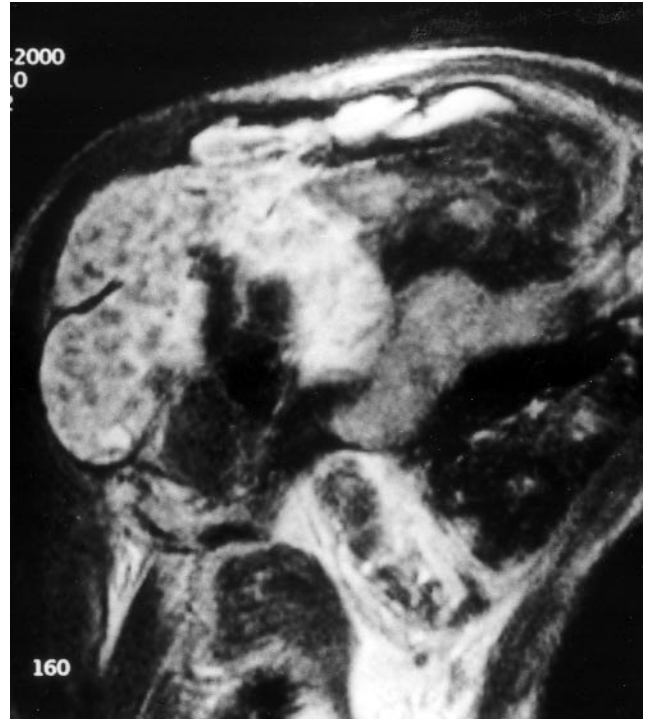


Figure 2. MR images of the right shoulder. A. Sagittal T2 weighted image shows a displaced bony fragment of the acromion (arrow). B. Coronal T2 weighted image shows distended subacromial and subdeltoid bursae with marked hyperintensity, containing multiple areas with hypointensity.

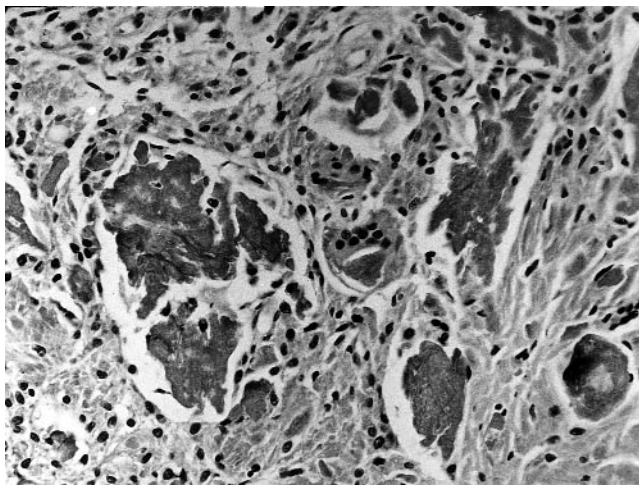


Figure 3. Histologically, the synovia show marked proliferation with numerous inflammatory cells and hemosiderin laden histiocytes. A large amount of amorphous materials are visible in the sublining layers. In direct fast scarlet stain, the materials stained positively, which confirmed them to be amyloid (original magnification  $\times 200$ ).

## REFERENCES

1. Goodman TRE, McNally E. Shoulder pain in a patient on haemodialysis. *Ann Rheum Dis* 1994;53:497-500.
2. Bernageau J, Bardin T, Goutallier D, Voisin MC, Bard M. Magnetic resonance imaging findings in shoulders of hemodialyzed patients. *Clin Orthop* 1994;304:91-6.
3. Konishiike T, Hashizume H, Nishida K, Inoue H, Nagoshi M. Shoulder pain in long-term haemodialysis patients. A clinical study of 166 patients. *J Bone Joint Surg* 1996;78B:601-5.
4. Karakida O, Aoki J, Kanno Y, et al. Hemodialysis related arthropathy. A prospective MR study with SE and GRE sequences. *Acta Radiol* 1997;38:158-64.
5. Kurer MHJ, Baillod RA, Madgwick JCA. Musculoskeletal manifestations of amyloidosis. A review of 83 patients on haemodialysis for at least 10 years. *J Bone Joint Surg* 1991;73B:271-6.