

Hemodialysis Induced Amyloid Arthropathy of Hip Presenting as Pathological Fracture-A Case Report and Literature Review

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ABSTRACT

Amyloid arthropathy is a recognized complication of chronic renal failure with long term dialysis. The amyloid, a beta 2microglobulin is not filtered by dialysis membrane and remains in the circulation, gets deposited over the synovium, articular bones and cartilage. As a result the large joints like shoulder, hips and knees show cystic bone lesions. The radiological features precede the clinical symptoms. The majority of the patients remain asymptomatic till the advanced stage or may present with pathological fracture. The patient in this case report had a long history of dialysis due to renal failure and presented with pain, limping and difficult to walk after the history of fall in bathroom. The radiological investigations, particularly MRI hip had typical signs of amyloid arthropathy; later on confirmed by biopsy. This case report is presented to call attention of clinicians and radiologists for the early and prompt diagnosis of amyloid arthropathy, avoiding false/delayed diagnosis which can increase morbidity and mortality.

Keywords: Amyloid deposition, Pathological fracture

CASE REPORT

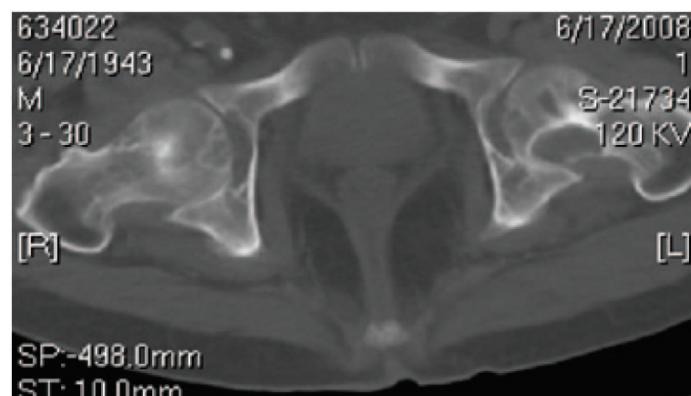
A 56-year-old man with the past medical history of chronic renal failure and long term haemodialysis since 10 year presented to the emergency room (ER) in Dr Erfan Hospital, Jeddah, Saudi Arabia with recent history of fall down in the bathroom 2 hour before. After fall, he was limping, had moderate degree pain at the left hip during rest and aggravated on walking. The general physical examination was unremarkable. However, local examination at the left hip showed mild tenderness and limited range of movement. Slight swelling on anterior and lateral aspect of left hip was also noted. The laboratory investigations showed high level of serum creatinine of 512 micromole/Litre. The Blood counts were within normal limits. An immediate portable X-ray of the pelvis including hips was obtained for the provisional clinical diagnosis of left hip neck fracture line. The X-ray pelvis and hips showed a subtle lytic area at the left femoral head / neck without obvious fracture. Further evaluation of the left hip was done with CT scan, which confirmed the X ray finding of lytic bone lesion at the left femoral head and neck, associated with cortical erosion and soft tissue involvement; however, no fracture was seen [Table/Fig-1]. The differential diagnosis based on CT scan was made including multiple metastases, geode cyst related to osteoarthritis and amyloid arthropathy. The patient was admitted for further investigations. The bone scan was done using Tc99m-MDP using triphasic protocol showed increased activity at the left femoral neck [Table/Fig-2]. As MRI is more sensitive for the diagnosis of amyloid arthropathy, further evaluation with MRI hip was done. The MRI showed the typical signal pattern of amyloid arthropathy, decreased signal on T1 weighted and T2 weighted images, due to amyloid deposition depositions at both hips, particularly at the left hip [Table/Fig-3a&b]. A lucent low signal line at the left femoral neck was consistent for the pathological fracture. The adjacent soft tissues were infiltrated with amyloid. Post-gadolinium enhanced images showed enhancement of the amyloid deposits at the bone and soft tissues. Based on typical MR findings, a diagnosis of amyloid arthropathy involving the hips was made and biopsy was advised for confirmation. CT-guided biopsy of the left hip was subsequently performed. Histology revealed irregular bands of Congo red stain-positive fibrous material, which exhibited

pale apple green birefringence to light, confirming the diagnosis of β_2 microglobulin amyloid arthropathy. Patient was treated symptomatically with Tablet Acetaminophen 500 mg, three times a day as long as compliant of pain. Additionally, curettage and bone grafting of amyloid bone defects was done in left femoral head and neck. Patient was discharged and followed for two months. Final X-rays of left hip showed no complications. Patient was also advised for the renal transplantation, an ultimate treatment to prevent further deposition of amyloid.

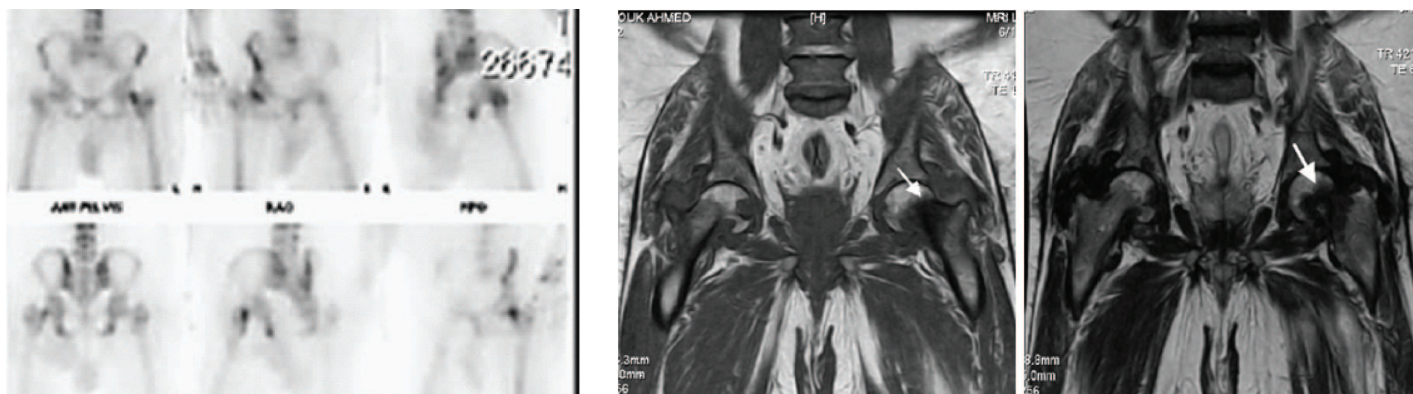
DISCUSSION

In 1985, Geijo et al., first described the association between amyloid arthropathy (AA) with beta 2 microglobulin [1]. The incidence of AA increases with duration of dialysis and age of patient at which dialysis was started. Almost all patients to a certain extent develop AA after 7-8 years of dialysis [2,3]

S Otake et al., published a study on haemodialysis induced amyloid arthropathy of the hip joint with MRI demonstration of amyloid deposition in 152 patients [4]. This is the largest prospective study on MRI demonstration of AA. According to this study, MRI demonstrated 39% (60 out of 152) of bone lesions, most commonly affecting acetabulum (25 out of 60) and femoral head (21 out of 60).



[Table/Fig-1]: CT both hips bone window image showing lytic areas at the right femoral head and left femoral head and neck



[Table/Fig-2]: Bone scan showing slight increased activity at the left femoral neck., **[Table/Fig-3a & b]:** MRI T1W and T2W images showing focal decreased signal at the right femoral head and left femoral head & neck due to amyloid

All bone lesions showed decreased signal intensity on T1-weighted images and variable signal patterns in T2-weighted images (increased signal in 32 patients' decreased signal in 11 patients and mixed in 17 patients). This case report showed decreased signal on both T1 weighted and T2 weighted images and the lesions were present in the right femoral head and left femoral head & neck.

Eva M. Escobedo et al., published a study on MRI of dialysis related amyloidosis of the shoulder and hip [5]. The interesting fact of this study was that bony lesions were detected in the absence of plain film findings. This is also seen in this case report. This study also demonstrated capsular thickening, joint and bursal fluid in symptomatic groups. Adjacent soft tissue infiltration was also present in this case report.

O Karakida et al., in a study concluded low signal areas on MRI in haemodialysis-induced arthropathy in 27 joints, out of which hips were involved in 19 cases [6]. This is correlating with the involvement of hips only in this case report.

JM Campistol et al., reported the cases of five patients in whom a pathological fracture of the femoral neck developed secondary to massive deposition of amyloid while they were receiving maintenance hemodialysis [7]. Our case report also presented with pathological fracture of left femoral neck with background of amyloid deposition at left femoral head & neck and right femoral head.

CONCLUSION

In conclusion, MRI is helpful in detecting the extent & distribution of dialysis induced amyloid arthropathy, especially in patients with long term dialysis. MRI may predict the risk of pathological fracture in asymptomatic dialysis patients.

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