



Avascular Necrosis of Femoral Head Associated with Connective Tissue Disease in Nigerians: Case Series

La nécrose avasculaire de la tête fémorale associées à la maladie du tissu conjonctif dans les Nigériens: Case Series

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ABSTRACT

BACKGROUND: Avascular Necrosis (AVN) or osteonecrosis has been frequently reported among Nigerians with sickle cell disease. Other known aetiologies include connective tissue diseases, alcohol, fat embolism, juvenile arthritis and pregnancy. Connective tissue disease (CTD) are uncommonly reported among Nigerians.

OBJECTIVE: To report the cases of three Nigerian female patients with radiological evidence of AVN associated with connective tissue diseases and inflammatory arthritis who presented to a rheumatology hospital in Lagos, Nigeria.

METHODS: The first patient was a 36-year-old woman who was initially diagnosed as systemic lupus erythematosus (SLE). After four years of treatment, she presented with intense pain in the left hip, which on radiograph showed AVN. She was initially treated with NSAIDs and narcotic analgesics. She eventually had a left hip replacement. The second patient was a 44-year-old female, who had presented seven years earlier with features of SLE. She had attended the clinic irregularly. She later developed pain in both hips and shortening of left lower limb over the preceding three years. Radiographs confirmed AVN. She was treated with analgesics. The third patient was an 18-year-old female undergraduate who had rheumatoid arthritis (RA) and later developed bilateral hip pain which on radiograph showed bilateral AVN. She was placed on analgesics and then referred for orthopaedic surgery.

CONCLUSION: Osteonecrosis may be associated with connective tissue diseases. A high index of suspicion is needed for the diagnosis, especially in SLE and RA patients with prolonged hip pain not responding to immunosuppressive. *WAJM 2009; 28(4): 262–265.*

Keywords: Avascular Necrosis, Connective Tissue Diseases, Nigerians, femoral head, case series.

RÉSUMÉ

CONTEXTE: La nécrose avasculaire (AVN) ou d'ostéonécrose ont été fréquemment signalés chez les Nigériens atteints d'anémie falciforme. D'autres étiologies connues comprennent les maladies du tissu conjonctif, l'alcool, embolie graisseuse, l'arthrite juvénile et la grossesse. Une maladie du tissu conjonctif (MTC) sont peu fréquemment signalés chez les Nigériens.

OBJECTIF: Rapporter le cas de trois patients nigériens féminine avec des signes radiologiques de l'AVN associés aux maladies du tissu conjonctif et l'arthrite inflammatoire, qui a présenté dans un hôpital de rhumatologie à Lagos, au Nigeria.

MÉTHODES: Le premier patient était de 36 ans, vieille femme qui avait été initialement diagnostiqué comme le lupus érythémateux disséminé (LED). Après quatre ans de traitement, elle a présenté avec une douleur intense à la hanche gauche, ce qui sur la radiographie a montré AVN. Elle a été initialement traités par AINS et les analgésiques narcotiques. Elle a finalement eu un remplacement de la hanche gauche. Le second était de 44 ans, une femme âgée, qui avait présenté sept ans plus tôt, avec des traits d'EVS. Elle avait participé à la clinique de façon irrégulière. Elle a plus tard développé des douleurs aux hanches et le raccourcissement du membre inférieur gauche au cours des trois années précédentes. Les radiographies ont confirmé AVN. Elle a été traitée avec des analgésiques. Le troisième patient a été de 18 ans de premier cycle femme âgée qui avait la polyarthrite rhumatoïde (RA) et développée plus tard douleurs de hanche bilatérale qui sur la radiographie a montré AVN bilatéraux. Elle a été placée sur des analgésiques et a ensuite fait référence pour la chirurgie orthopédique.

CONCLUSION: Une ostéonécrose mai être associés aux maladies du tissu conjonctif. Un indice élevé de suspicion est nécessaire pour le diagnostic, surtout dans le LED et les patients PR avec des douleurs de hanche prolongée ne répondant pas aux immunosuppresseurs. *WAJM 2009; 28(4): 262–265.*

Mots-clés: nécrose avasculaire, Connective Tissue Diseases, les Nigériens, la tête fémorale, séries de cas.

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Abbreviations: ACR, America College of rheumatology; ANA, Antinuclear antibody; AVN, Avascular necrosis; CTO, Connective tissue disease; MRI, Magnetic resonance imaging; RA, Rheumatoid arthritis; SLE, Systemic lupus enytematosus.

INTRODUCTION

Osteonecrosis also referred to avascular necrosis (AVN), aseptic necrosis, Ischemic necrosis) is a bone condition resulting from impaired blood supply, with subsequent cellular death of components of the bone.¹ It affects mostly the femoral head but can affect other bones such as the head of the humerus, distal femur, small bones of the wrist and foot.

The pathophysiology is not fully known, but it is thought to result from disruption of blood supply affecting mainly bones that have a single terminal blood supply with poor collateral circulation. Other suggested pathogenetic mechanisms include mechanical interruption of blood supply, injury to the vessel wall, pressure on vessel wall and thrombotic or embolic occlusion of the blood vessels.² There is a particular predilection for black Africans and persons of the Mediterranean region. This is due to its high prevalence among patients with sickle cell disease.³

Other aetiological causes include trauma, prolonged steroid use, connective tissue diseases such as SLE, inflammatory arthritis such as rheumatoid arthritis, juvenile chronic arthritis, pregnancy, fat embolism, alcohol, hypercholesterolaemia, pancreatitis, anti phospholipid syndrome, and hyper-uricaemia. In some cases no underlying causative disorder can be detected like – Idiopathic osteonecrosis. Though sickle cell disease is the most common cause among Nigerians.⁴ Other causes include excessive alcohol consumption, pregnancy and hypercholesterolaemia. The most common presentation is the hip pain.. Physical examination reveals tenderness around the affected joint, limited joint movement, muscle wasting with eventual joint deformity in advanced cases.

The diagnosis is usually made when X-ray, though this may not be sensitive in the early stages. MRI is being increasingly recognized as the most sensitive investigation.⁶ Systemic lupus erythematosus and rheumatoid arthritis (RA) are uncommonly reported among Nigerians. AVN associated with these conditions has rarely been reported as well.

Two cases of SLE and one of RA

associated with AVN of the head of the femur are presented so as to highlight the clinical-radiological characteristics, as well as increase the awareness of these conditions.

CASE REPORTS

Case One

The patient was a 36-year old woman who presented at the rheumatology clinic with a five-year history of arthralgia of the hands; rashes on the face, neck, chest; recurrent mouth ulcers and sore throat; previous seizures; and pleuritic chest pain. Physical examination showed a cachectic lady who was pale, with enlarged submandibular glands. Chest auscultation showed pleural rub at the right basal region. Blood pressure was 110/70mmHg. Other systems were essentially normal. Laboratory tests showed haematocrit – 38%; white blood cells – 8,000 per cu.mm. (polymorphs – 73%; lymphocytes – 27%) are, erythrocyte sedimentation rate – 95mm/hour. Urine analysis and microscopy were normal other results were 22.5mg/

dl, creatinine 1.1mg/dl,ANA,1.1280 with speckled pattern, ENA positive anti-ds DNA positive, and IgG ACA, 48. Serum urea – 22.5mg (10–50).

The diagnosis was SLE, based on American College of Rheumatology (ACR) criteria⁷ She was placed on Intravenous pulse methylprednisolone 500mg daily for three days and followed up with Azathioprine 50mg BD, Prednisolone tablets 20mg initially and then reduced to 10mg daily after three months.

Four years after SLE was first diagnosed, she developed intense pain in the left hip joint. Physical examination showed tenderness over the left hip and a positive Faber sign on movement. Radiographic examination showed flattening of the head of femur deformity and sclerosis' in keeping with avascular necrosis head of the left femur (Fig 1). She was initially placed on Tramadol and Ibuprofen. The pains persisted and she had to have a left hip replacement surgery.

Case 2

This was a 44-year old laboratory technologist who had presented seven years earlier with photosensitive skin rashes, polyarthralgia of the hands, knees, shoulders; marked fatigue; malar rashes; mouth ulcers and recurrent sore throats. Physical examination showed macular rashes on the lower face, upper chest and limbs. There was tenderness in the knees, ankles, and hands.

Results of haematological and biochemical investigations were within normal limits. Serology showed antinuclear antibody (ANA) positive 1:320 (speckled pattern) ENA was positive while anti ds DNA was negative. The diagnosis was SLE based on ACR criteria.⁷ She developed increasingly worsening bilateral hip pain three years before presentation. She had been on oral prednisolone 20mg for the greater part of the preceding six years, most of the times self prescribed. She was also placed on hydroxychloroquine. Physical examination showed shortening of the left lower limb and tenderness over both hip joints. Faber sign was positive bilaterally. Radiographic examinations showed features of AVN both hip joints (Fig. 2).

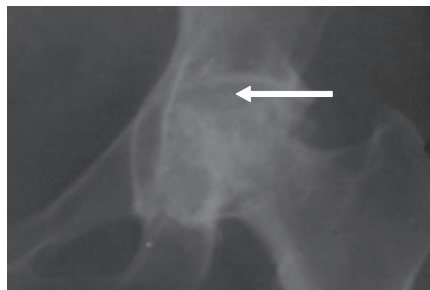


Fig 1. Osteonecrosis of the left femoral head in a 36-year-old with SLE showing flattening of the femoral head and patchy sclerosis of acetabular cap and femoral head.

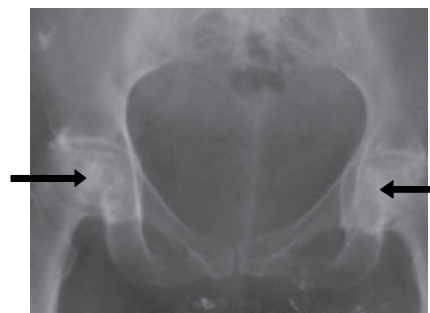


Fig 2: Bilateral hip osteonecrosis in a 44-year old with SLE showing flattening of the femoral heads and patchy sclerosis.

Biochemical tests were essentially normal, while, serology showed anti nuclear antibody, 1:640 (homogeneous staining pattern). ENA was positive while anti ds DNA was negative. Haemoglobin genotype was AS. She was placed on Azathioprine tablet 50mg BD, Prednisolone tablet –10mg daily; Ibuprofen –800mg BD and Tramadol capsule –50mg tid. Surgery was suggested to her, to which she refused. She has since been lost to follow-up.

Case 3

An 18-year-old University undergraduate presented with a four year history of recurrent fever; arthritis of joints of the hands, elbows, feet, ankles and shoulders; significant joint morning stiffness. Physical examination showed tenderness in virtually all the peripheral joints. The right elbow was ankylosed and there was ulnar deviation of the wrists. There were no subcutaneous nodules. All other systems were normal. Laboratory tests showed Haematocrit, 24%, normal white blood cells, total and differentials, ESR was 64mm/hr Rheumatoid factor and ANA were negative. All other laboratory tests were within normal limits. Radiographs of the hands showed peri-articular osteoporosis and erosions. Haemoglobin genotype was AA.

The diagnosis was rheumatoid arthritis, based on ACR criteria⁸ She was commenced on methotrexate tablet – 15mg weekly, prednisolone-10mg; Folic acid 10mg weekly and Naproxen tablets - 500mg BD. She attended the rheumatology clinic rather irregularly.

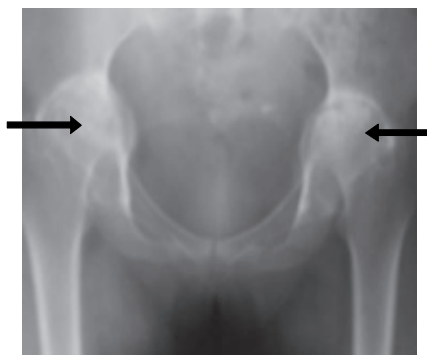


Fig 3. Bilateral hip osteonecrosis in an 18-year old woman with rheumatoid arthritis showing patchy sclerosis and irregularity of femoral heads.

About two years after the commencement of these medications, she complained of increasingly painful hip joints. Physical examination showed tenderness over both hip joints, with positive Faber sign bilaterally. X-rays showed flattening of the femoral head, sclerosis and bone deformity in keeping with osteonecrosis of head of femur (Fig 3). She was commenced on Ibuprofen- 400mg t.i.d, Tramadol –50mg t.i.d while physiotherapy was initiated. She was referred to the orthopaedic surgeon and is still being followed up.

The three cases reported are all females, presenting at ages 18, 36 and 44. Two of the subjects were diagnosed with SLE while one had rheumatoid arthritis. Two had bilateral hip involvement while the third subject had left hip involvement. None of the subjects had sickle cell disease.

ponderance of females in our report may be due to the documented higher frequency of SLE and RA among females.

Corticosteroid use has been frequently reported as causative factor in the development of AVN. A Japanese survey of non-traumatic AVN of femoral head estimated an annual occurrence in 2500–3000 persons with corticosteroids accounting for 34.7% cases; 21.8% due to alcohol; while 37.1% were idiopathic.¹⁴ High doses of corticosteroids have been implicated in most of the cases reported.¹⁵ Aranow *et al*¹² has suggested that a prednisolone dose of 30mg or more per day is most likely to be predispose to AVN. Other suggested risk factors are Afro-American origin, Raynaud's phenomenon and migraine headaches.¹⁶ Our three subjects were given doses of 20mg or less. Other studies have, however, not demonstrated a direct

Table: Findings in Three Patients with Osteonecrosis

	Patient 1	Patient 2	Patient 3
Age (Years)	36	44	18
Diagnosis	SLE	SLE	Rheumatoid Arthritis
Joints Involved	Left Hip	Both Hips	Both Hips
Serology	ANA-1:1280	ANA-1:320	ANA-negative RF negative
Radiographic Findings	Femoral head flattening Patchy Sclerosis	Flattening of articular surface	Collapse of articular surface Patchy sclerosis

DISCUSSION

Osteonecrosis has been well recognized in association with both connective tissue diseases such as SLE as well as inflammatory arthritis such as rheumatoid arthritis.^{9,10} The pathogenesis in these conditions has been attributed to thickening and necrosis of the vessel basement membrane leading to the occlusion of the blood vessels. Rascu *et al*¹¹ reported seven patients with AVN in a group of 280 SLE cases. Another report also showed a high incidence of clinically occult AVN among SLE patients on MRI of the hips.¹² All our three cases presented were below 50 years of age which is in keeping with reports elsewhere.¹³ The condition has been reported eight times more frequently in males compared to females, when all the aetiologies were considered.¹³ However the pre-

relationship between AVN and corticosteroids.^{17, 18}

Anatomic and functional deterioration often leads to surgical intervention within three years in more than 50% of the diagnosed cases.^{19, 20} However, conservative treatments such as physiotherapy – analgesics, discontinuation of weight bearing and vasoactive drugs have been used. Surgical treatments include core decompression, bone grafting, osteotomies, and joint replacement. Our patients were managed conservatively with physiotherapy, liberal NSAIDs, narcotic analgesics and avoidance of weight bearing and physiotherapy. Surgery was however indicated eventually although only one had hip replacement and this was done outside Nigeria. This is because of the non

availability of routine joint replacement surgeries in the country. Total hip arthroplasty surgeries have also shown comparable short and medium term results when compared with hip replacement in SLE patients.²¹

These three cases, are presented to highlight the clinical and radiological presentation of AVN among Nigerian subjects with SLE and rheumatoid arthritis.

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