



Bilateral Avascular Necrosis of Hip in Young Malaysian Female with SLE

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Avascular necrosis is a noteworthy reason of morbidity in SLE. There are many risk factors associated with osteonecrosis development but among them, corticosteroid treatment is the most common causes. Other factors, for example, fat embolism, thromboembolism, thrombophilia, hypofibrinolysis, vasculitis, increased bone marrow pressure and intramedullary haemorrhage are also associated with steroid-induced therapy [1]. SLE is the chronic inflammatory disease which 90% of cases commonly occur in women with reproductive age group [2].

We would like to report a case of AVN in SLE patient. A 24-year-old lady presented with the history of both hips pain for one year and limitation of hip movement for seven months. Left hip pain was more severe than the right hip. She was diagnosed with SLE four years ago and steroid therapy was initiated for three years.

This case is selected for reporting due to its relatively rare incidence in Malaysia and unusual presentation.

Keywords: Avascular necrosis; systemic lupus erythematosus; reproductive age.

1. INTRODUCTION

Avascular necrosis (AVN), also known as osteonecrosis, aseptic necrosis, is defined as a cellular death of bone component because of interruption in blood supply of the bone and causing collapse of bone structure and leading to pain, loss of joint movement and long-term damage in joint [3]. AVN commonly occur in the epiphysis of the long bone, for example, femoral head, humeral head, femoral condyles. The hip is the most common site for AVN.

AVN is the type of condition that can occur in a hip of 20 to 50 years old female. The risk is lesser in the healthy people and most of AVN cases are due to existence of underlying cases such as fracture or dislocation of head of femur, long term corticosteroid therapy, and chronic alcoholic.

The incidence of AVN in patient with SLE on steroid therapy is 22-44% [4]. The prevalence rate of osteonecrosis in SLE ranges from 2.8% to 40% [5]. The previous study shows that thromboembolism, fat embolism, thrombophilia, hypofibrinolysis, intramedullary haemorrhage, vasculitis and increased marrow pressure are also caused by long term corticosteroid induced avascular necrosis [6]. 80% of the cases involve bilateral hip [7].

Initially, AVN may not have any symptom. The very first symptom in AVN is pain which is insidious onset in the weight bearing joint. Initially only one movement and gradually developed into pain which cannot reduced at rest. As stated above, AVN is most common in hip joint. When bilateral hip joints are involved, patient may not be able to walk and reduce range of movement in the joint as well [8]. The risk factors that developed into this condition include direct causes such as trauma, haematological disease (leukaemia, lymphoma), marrow-replacing disease (Gaucher's disease) and indirect causes such as alcohol, hypercoagulability, exogenous or endogenous steroids, and SLE [7].

Risk of femoral head osteonecrosis can be divided into three group bases on Kerboul angle or Kerboul combined necrotic angle which is a measuring system used to quantify the size of a lesion. To calculate the angle, identify the centre of femoral head primarily and marked it as a point. Then, two lines are drawn from the point to the borders of the lesion on both AP and lateral

view X-ray. The total of the angles on AP and lateral radiographs is the Kerboul angle. 160 degrees or less is consider small lesion, medium lesion is between 161 to 199 degrees and large lesion is 200 or more degrees [9].

If left untreated, AVN will worsen with time and eventually leading to collapse of bone, loss of bone structure and most serious complication, severe arthritis [10].

2. CASE REPORT

A 24-year-old single lady came to the hospital presented with the history of both hips pain for one year and limitation of hip movement for seven months. Left hip pain was more severe than the right hip. The pain was insidious onset, occur simultaneously in both hips. The pain was intermittent and sharp pain in nature, which is bearable initially with pain score of 3 out of 10 in both hips. Throughout last five months, the pain increase in frequency with lesser exertion and pain score 8/10 for right hip and 9/10 for left hip. As the pain become worsen, she eventually resigned from her job as cashier. The pain was aggravated on walking or sitting on the floor and relieved by resting. There was no radiation of the pain and swelling.

She also complaint of the limitation of hip movements and stiffness which became worse in last five months. There were no history of other joints pain and swelling, deformity, fever, trauma or fall and no history of lower limb tingling and numbness. There are no changes in her appetite and body weight. She was diagnosis with SLE 4 years ago and she was on long term corticosteroid therapy for 4 years. As the pain worsen, she decided to tell her doctor and she was given painkiller and referred to orthopaedic specialist after 2 – 3 days. X ray was taken and found out that both of her hips were defective with the bones close contact with each other at her hip joints. She had undergone left hip replacement surgery as left hip was more painful and she was scheduled for another surgery for her right hip when she went for appointment with the specialist last 3 months ago. The pain at the left hip was relieved after surgery. Currently the pain of her right hip still persist but reduce in severity with pain score of 5/10. At present, she was admitted for elective total right hip replacement and daily monitoring of her condition was done. She has no known drug or food allergy.

Table 1. Range of movement of both right and left hip

Joint	Right		Left	
	Active	Passive	Active	Passive
Hip Joint				
Flexion	0-90°	0-90°	0-90°	0-90°
Extension	0-10°	0-10°	0-20°	0-20°
Adduction	0-15°	0-15°	0-20°	0-20°
Abduction	0-20°	0-20°	0-35°	0-35°
External Rotation	0-20°	0-20°	0-30°	0-30°
Internal Rotation	0-5°	0-5°	0-10°	0-10°

Regarding drug history, currently she is on calcitriol, azathioprine, Prednisolone, Hydroxychloroquine, and Calcium Carbonate and Prednisolone was tapered its dose.

In review of her menstrual history, she attains menarche at the age of 15 years old and currently having 28-30 days regular menstrual cycle with 3-7 days of moderate flow with no dysmenorrhea.

In family history, both of her parents are apparently well, and she is the second child with 3 siblings and there is no family history of SLE or autoimmune disorder. Her aunty is the known case of breast cancer.

She was working as cashier and now she is unemployed due to her illness. For personal history, her appetite and sleep are normal, her bowel and bladder habit are regular with no history of smoking, alcohol consumption or drug abuse. She has no other history of chest pain, palpitation and shortness of breath.

On general examination, patient has no pallor, no jaundice, no clubbing, no pedal oedema, no lymphadenopathy and malar rashes. Her BP was 116/80 mmHg, Pulse rate: 84 beats per minute, Respiratory rate: 19 breaths per minute, Temp: 37°C, her height is 153 cm and her weight is 52 kg and her BMI is 22.2 kg/m² which is within normal range.

On local examination, antalgic gait of right side was seen on walking. On supine position inspection, attitude of the limb was neutral position in the both hip joints and ankles are in neutral position, but right lower limb had slight apparent shortening compare to left side. There is an oblique scar on left gluteus extending to lateral part of the left thigh approximately 15 cm

and the scar is well healed and there is no obvious hip deformity, there was no swelling, no discharge, no sinus over the area. On palpation, there was no local rise of temperature, no tenderness in left hip area and both left and right greater trochanteric area, but there was slight tenderness at right anterior hip joint. There was no tenderness over the scar. Range of movement is mentioned in the Table 1.

On measurement, apparent length of left limb is 103 cm and right limb is 101 cm. Upon measuring true length, right limb is 80 cm and left limb is 82 cm. In segmental length measurement, upper segment of right limb is 45 cm and of left limb is 47 cm respectively and for lower segment both right and left limb is 35 cm. Right femur is 2 cm shorten than left femur. Right Bryant triangle is 2 cm shorter than left side. Trendelenburg's test is positive in hip of this patient.

Investigation reveals, haemoglobin and blood complete picture, urine RE, renal profile, liver function test were all within normal range.

The patient underwent total hip replacement of left hip initially. After three-month operation, there was no pain, scar was healed properly and no complications after then the right hip were replaced by total hip arthroplasty. The patient was treated successfully by both hips arthroplasty. Patient was given follow-up appointment one month after surgery. There was well healed surgical wound, no pain on both hip joints movement and no complications after seven months of both hips surgery. Patient was asked to follow-up six monthly.

3. BEFORE SURGERY

X-ray pelvic (AP view) including both hip



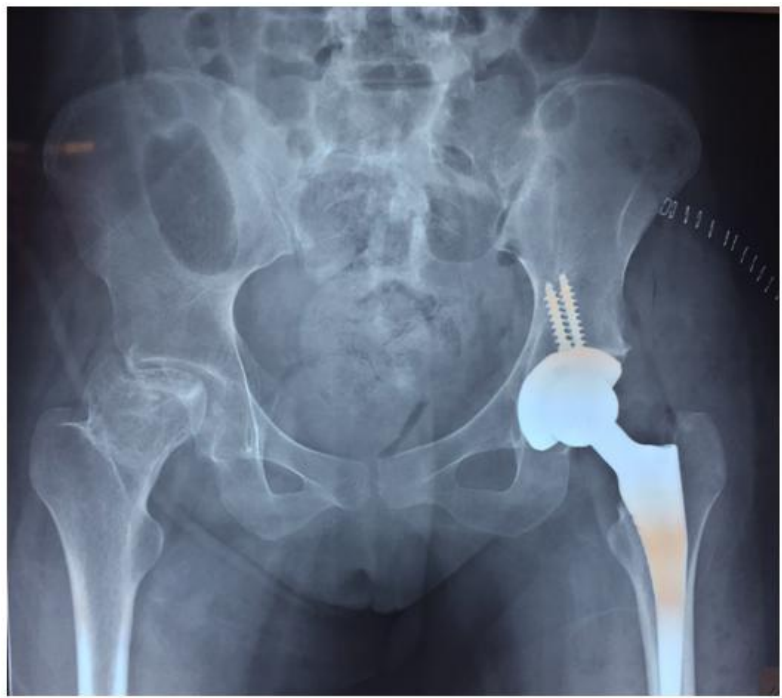
X-ray of Right Hip Lateral View

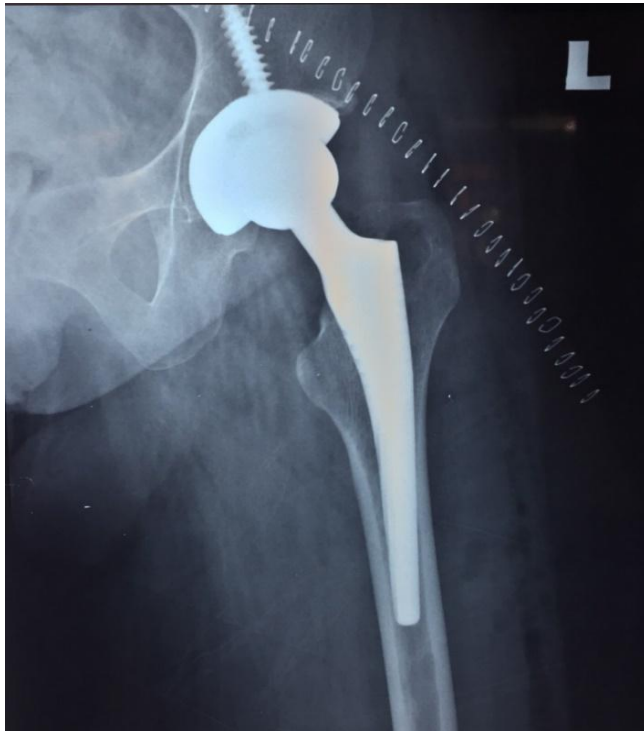


X-ray of Left Hip Lateral View

Kerboul Angle of Right Hip = (AP+ Lateral) = (120°+110°) = 230°
Kerboul Angle of Left Hip = (AP+ Lateral) = (135°+ 105°) = 240°

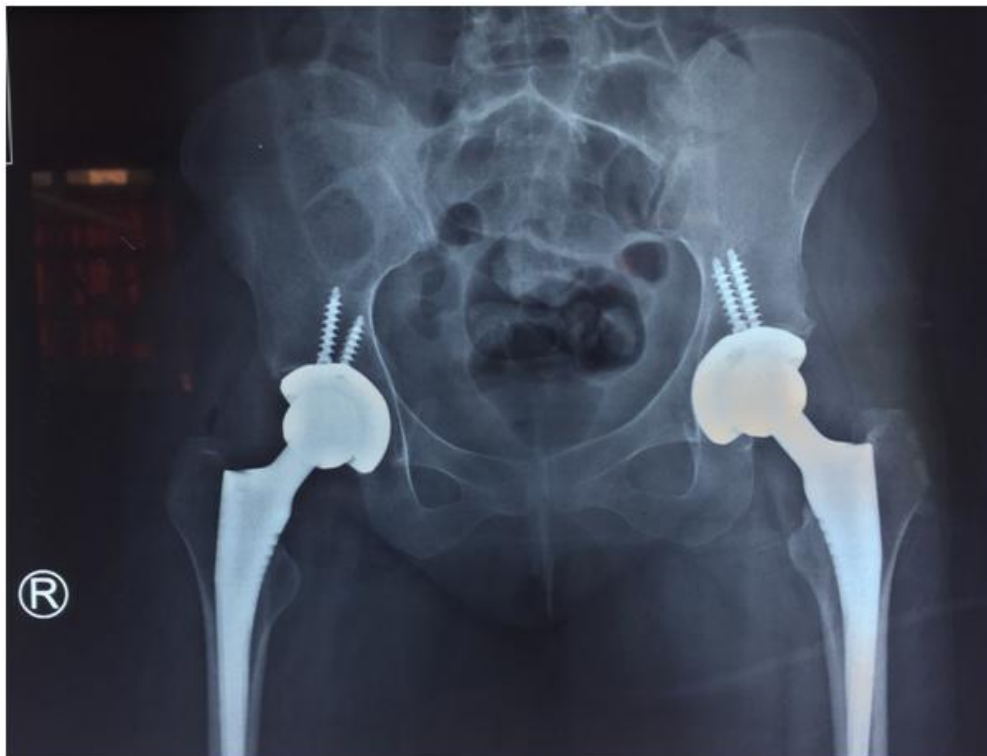
After Left Hip Arthroplasty X-ray Pelvic (AP View)





X-ray Left Hip (AP View)

After both hips replacement X-ray pelvis (AP view)



4. DISCUSSION

There are two types of treatment options currently available for the management of AVN. It can be either conservative treatment or definitive

surgical treatment. For non-surgical treatment, medication such as NSAID, blood thinners, osteoporosis drug such as (Binosto, Fosamax) and simvastatin can be used. Ensure patient has adequate rest and less pressure on the affected

bone followed by physiotherapy to maintain the range of motion in affected joint [9]. Under surgical treatment, joint replacement with plastic or metal parts, core decompression which involve removing inner layer of the bones, Bone rotational Osteotomy involve removing of piece of bone from the weight bearing joint, Bone graft which is a type of procedure that took section of healthy bone from any part of the patient body and grafting to the affected bone and newest treatment is regenerative medicine which involve harvesting stem cells from patient's own bone marrow. All these surgical options encouraged removing the death bone and strengthening of the affected bone area [9].

Core decompression with or without bone grafting is normally indicated in early AVN before subchondral collapse occurs or patient with reversible aetiology. This is done by drilling 8- 10 mm hole through the subchondral necrosis and this will relieve intraosseous hypertension and will lessen the pain and also stimulates healing by angiogenesis. Rotational Osteotomy is more preferred in small lesion which can be rotated away from the weight bearing surface. Technique is performed through intertrochanteric region and research stated that this has success rate of 60% to 90%. Bone grafting surgery is more prefer in pre-collapse stage and collapsed AVN in young patient with reversible aetiology.

Total hip replacement is done in young patient with more advanced femoral head collapse with or without acetabular involvement, irreversible aetiology such as chronic steroid use, age more than 40 years old with large lesion [7].

In this case, patient is 24-year-old lady with advanced degenerative changes. Her Kerboul combined necrotic angle was too large on both hips. Right hip was 230° and left hip was 240°. Therefore, both hips had large lesion of AVN and left hip was more severe. She had more pain in left then right hip. Thus, she is not fit for conservative and other surgical treatments such as rotational surgery or decompression and bone graft. After three years of corticosteroid treatment for SLE, hips pain was noted but she did not take any orthopaedic suggestion and treatment. At that time, conservative treatment can prevent the massive destruction of femoral head [11]. One year after hip pain, both hips had large lesion of AVN. This is late presentation and therefore conservative treatment is not suitable for treatment anymore. The most preferable method is total hip replacement since she has bilateral hip involvement and she has an irreversible

aetiology which is the long term use of corticosteroid due to her underlying SLE treatment.

5. CONCLUSION

Avascular necrosis is common in patient with long term corticosteroid therapy especially in patient with SLE which require long term high dose treatment of corticosteroid. The classic symptoms of AVN include insidious onset of pain where bilateral hip joint involvement are common. As presented in this case report, patient was detected as AVN of bilateral hip in our orthopaedic clinic through proper clinical examination and radiographic evaluation. If patient could have come early for diagnosis, it could be managed with conservative treatment. But the patient presented to the ward only after one year with pain, osteonecrosis of the hip became extensive damage with wide Kerboul combined necrotic angle. Therefore, the patient was treated successfully bilateral total hip replacement. We have a plan to follow up the patient every 6 monthly up to 2 years.

CONSENT AND ETHICAL APPROVAL

Informed consent was taken from the patient and no ethical clearance is required.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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