Case of Shoulder Pain

History

A 29-year-old male complained of shoulder pain. He has no history of recent trauma. Pain is gradually increasing with activity.

He is known to have sickle cell disease.

- What are your findings?
- What is the differential diagnosis?
- What are the causes?

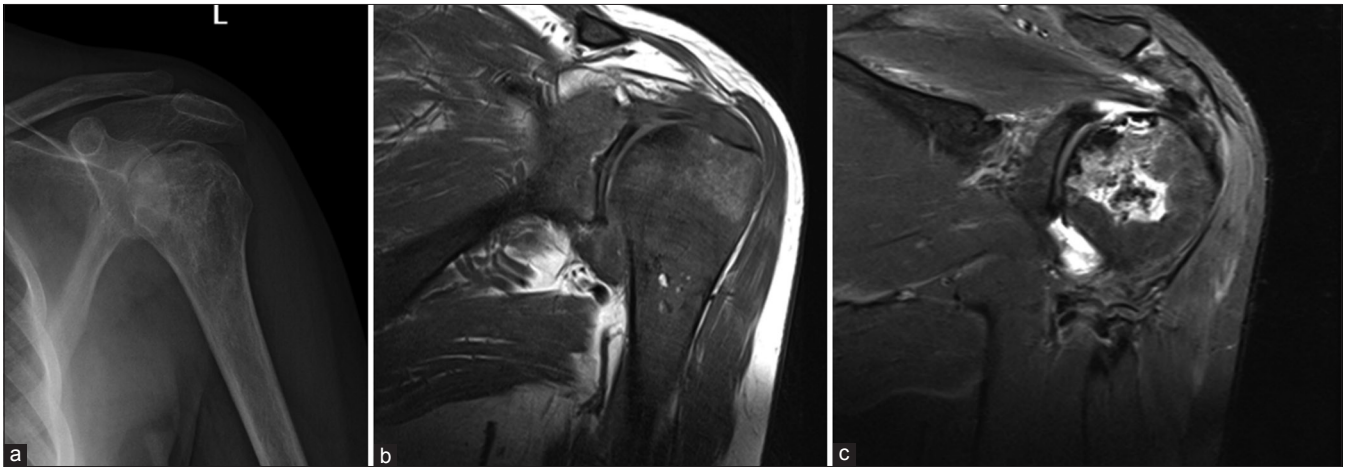

Figure 1

Findings

Plain radiograph of the left shoulder [Figure 1a] demonstrates periarticular osteopenia. In addition, subchondral lucency is seen in the humeral head (a crescent sign of avascular necrosis [AVN]).

Coronal T1-weighted [Figure 1b] image shows diffuse low signal changes involving the whole left shoulder consistent with edema.

Coronal T2-weighted [Figure 1c] image shows a mixture of low and high signal changes in the humeral head representing the double line sign, which is the serpiginous outer dark signal and bright inner signal (granulation tissue). In addition, the crescent sign that was seen on the plain radiograph becomes the rim sign on T2WI, which is the result of osteochondral fragmentation.

Differential Diagnosis

- AVN
- Infection (osteomyelitis with or without septic arthritis)
- Neoplasm - less likely.

Diagnosis

The patient underwent Stage III b AVN of the left shoulder.

Causes of Avascular Necrosis

There are many mnemonics; I discourage you from using them unless you are stuck. The reason is you may mention the least cause first in your region, such as Caisson disease (divers' disease) in a desert country, which will make you look strange in front of the examiner. The way I remember it is by imaging a blood vessel, so in the vessel is red blood cell if defected then – sickle cell disease, medications – exogenous steroids, indigenous steroids (Cushing's disease), and finally in the blood alcohol can run. Vessel wall – vasculitis. Outside vessel – trauma, and radiotherapy.

There are other causes such as pregnancy-related AVN, pancreatitis, Gout, and Gaucher's disease, but if you mention them before mentioning sickle cell disease, the examiner will not be pleased.

Discussion and Pearls

Remember that examiners like testing a common disease in an uncommon location. Hence be aware that AVN usually affecting the hips can also involve the shoulders.

In cases of nontraumatic AVN, bilateral involvement is common.

Always screen the other side on magnetic resonance imaging.

Stage 0	Patient is asymptomatic
	Radiography findings are normal
	Histology findings demonstrate osteonecrosis
Stage I	Patient may or may not be symptomatic
	Radiography and CT scan findings are unremarkable
	AVN is considered likely based on MRI and bone scan results
Stage II	Patient is symptomatic
	Plain radiography findings are abnormal and include osteopenia, osteosclerosis, or cysts
	Subchondral radiolucency is absent. MRI findings are diagnostic
Stage III	Patient is symptomatic
	Radiographic findings include subchondral lucency (crescent sign) and subchondral collapse
	The shape of the femoral head is generally preserved on radiographs and CT scans
	Subclassification depends on the extent of the crescent, as follows
	Stage IIIa: Crescent is <15% of the articular surface
	Stage IIIb: Crescent is 15%-30% of the articular surface
	Stage IIIc: Crescent is >30% of the articular surface
Stage IV	Flattening or collapse of the femoral head is present
	The joint space may be irregular
	CT scanning is more sensitive than radiography
	Subclassification depends on the extent of collapsed surface, as follows
	Stage IVa: <15% of the surface is collapsed
	Stage IVb: Approximately 15%-30% of the surface is collapsed
	Stage IVc: >30% of the surface is collapsed
Stage V	Radiography findings include narrowing of the joint space, osteoarthritis with sclerosis of the acetabulum, and marginal osteophytes
Stage VI	Findings include extensive destruction of the femoral head and joint

CT: Computed tomography, AVN: Avascular necrosis, MRI: Magnetic resonance imaging

Many staging systems used, the most comprehensive is the Association Research Circulation Osseous staging system is used to grade AVN.

Declaration of patient consent

The author certifies that he has obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Nizar A. Al-Nakshabandi

Department of Radiology, College of Medicine, King Saud University, Riyadh, Saudi Arabia

Address for correspondence: Dr. Nizar A. Al-Nakshabandi, Department of Radiology, College of Medicine, King Saud University, Riyadh, Saudi Arabia.
E-mail: nizar97@hotmail.com

Further Reading

- Bonakdarpour A, Reinus WR. Diagnostic Imaging of Musculoskeletal Diseases: A Systematic Approach. Springer; 2010.
- Resnick D, Kransdorf MJ. Bone and joint imaging. WB Saunders Co.; 2005.
- Kaplan P. Musculoskeletal MRI. WB Saunders Co.; 2001.

Access this article online

Quick Response Code:

Website: www.journalmsr.com

DOI: 10.4103/jmsr.jmsr_112_19

How to cite this article: Al-Nakshabandi NA. Case of shoulder pain. J Musculoskelet Surg Res 2020;4:61-2.