

Stress Fracture of the Femoral Neck: Atypical Cause of Hip Pain

Femur Boynu Stres Kırığı: Kalça Ağrısının Atipik Sebebi

Nur Ayuni KHIRUL ASHAR¹, Paisal HUSSIN¹, Maliza MAWARDI¹, Raymond DK YEAK¹, Philemon Paul PONNIDURAI²

ABSTRACT

As femoral neck stress fracture is a rare condition, it is often initially missed diagnose. This case report describes it in a lady with sedentary lifestyle following sudden strenuous exercise which presented with acute hip pain. Without high index of suspicion, fracture can be displaced further and its sequelae such as non-union, malunion and avascular necrosis are often disabling.

Keywords: Stress fracture, hip injuries, athletes

ÖZET

Femur boynu stres kırığı nadir bir durum olduğundan, tanısı sıklıkla atlanabilir. Bu olgu sunumunda sedanter hayat tarzı olan bir kadında zorlu egzersizi takiben gelişen ve akut kalça ağrısı ile başvuran bir femoral boyun stres kırığı anlatılmıştır. Eğer şüphe edilmez ve tanı konulmaz ise femur boynu stres kırığı daha da yer değiştirebilir ve kaynamama, yanlış kaynama, ve avasküler nekroz gibi engellilik durumuna yol açan sekeller gelişebilir.

Anahtar Sözcükler: Stres kırığı, kalça yaralanmaları, atlet

Received: December 13, 2018 Accepted: February 27, 2019

¹ Department of Orthopaedic, Faculty of Medicine and Health Sciences, University Putra Malaysia, Selangor, Malaysia.

² Hospital Shah Alam, Selangor, Malaysia.

Atif için/Cited as: Khirul Ashar NA, Hussin P, Mawardi M et al. Stress Fracture of the Femoral Neck: Atypical Cause of Hip Pain. Anatolian J Emerg Med 2019;2(1); 24-26

Introduction:

Stress fracture is a rare condition. It is more common in the tibia, navicular, metatarsal and fibula while femoral neck only occupies 5% from the total cases. Hence, it is uncommon and may pose as a diagnostic challenge.

It occurs in individuals that exert force or repetitively apply force to the healthy bone, commonly in athletes and military recruits with repetitive high intensity exercises and training. Due to this load, the bone undergoes a surge amount of bone resorption, however with strenuous activity and lack of rest in between, bone formation is unable to compensate the loss thus leading to microfracture. A break in the cortex may occur with the continuous stress.

Case Presentation:

We describe a case of a 33-year-old sedentary piano teacher who presented with two weeks history of dull aching right hip pain that began prior to 21-kilometer marathon. She had undergone a month of intense training that include walking for five kilometers within one hour twice a week for two weeks. The regime was further intensified in the remaining two weeks where she walked ten kilometers for two hours, twice a week. The pain was mild initially after the marathon but progressively worsened especially on weight bearing. She had no prior marathon experience or any history of trauma especially to the hip. She attained menarche at the age of 12 and her menses were regular since then. She does not have eating disorders or on any special diet. The patient also denies history of bone or joint pain prior the presentation.

Clinical assessment revealed a normal build lady with a body mass index of 23kg/m². She had an antalgic gait with pain around the right groin region on ambulation and palpation. However, there was no muscle wasting over the thigh and gluteal region. Plain radiography revealed an incomplete fracture of the right neck of femur over the tension side with no osteopenia changes (Figure1). She was then treated with percutaneous screw fixation. At oneyear post-operative follow up, patient was well and repeated pelvis plain radiograph showed no signs of osteonecrosis.

Discussions:

Bone is anisotropic and to maintain normal bone growth, the amount of bone resorption must equalize with the rate of bone formation. In strenuous activity of exercise, this normal biological process of bone turnover is interrupted and the rate of osteoblastic replacement in osteonal bone unable to cope with the higher amount of osteoclastic activity in bone turnover¹. In person with a drastic increase in physical activity and repeated high

intensity exercise, higher suspicion must be given especially for the one with limited rest.

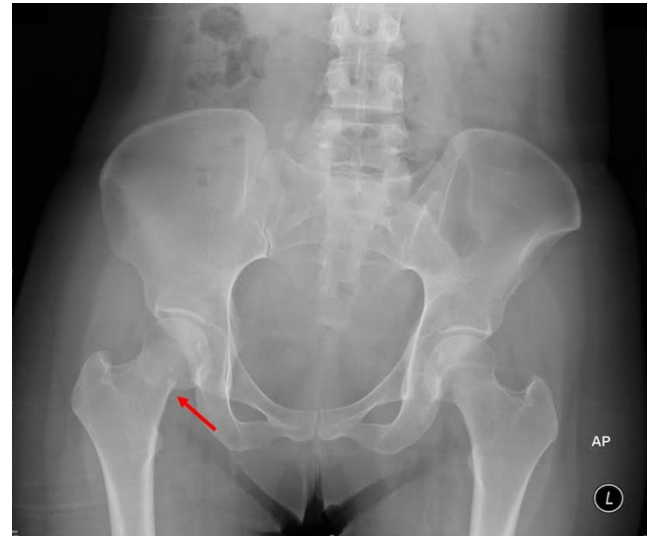


Figure 1: Plain radiograph pelvis (AP view) revealed right femoral neck fracture over the tension side (as shown by the red arrow) with otherwise good bone quality.

The understanding of this basis will help in understanding the process that is happening behind stress fracture in contrast to pathological fracture where even with normal amount of stress, bone breakage can occur in abnormal bone; be it tumour or diseased bone.

Thorough history taking is vital as clinical examination might be vague. Menstrual and dietary history plays a role in directing us to the right diagnosis. The athletic triad of amenorrhea, anorexia and osteoporosis are the predisposing factors but may not be there all the time. Examination wise, patient may present with hip or groin tenderness but antalgic gait is usually observed. Otherwise, range of motion might not be much affected except in advanced disease or in cases where fracture displaced, shortening and internal rotation of lower limb could be seen.

Imaging will aid in confirming the diagnosis. Plain radiograph is the first option as it is 100% specific but less sensitive in comparison to magnetic resonance image (MRI) or bone scintigraphy where even an occult undisplaced fracture can be diagnosed. Plain film radiography is frequently negative in the early phase and may only be positive two to four weeks after the onset of pain, hence pelvis plain radiograph should be repeated if there is high clinical suspicion. Bone scans are highly sensitive and provide early confirmation of the diagnosis as early as 1 to 3 weeks before plain radiographic changes appear². Occasionally, radionuclide imaging may be needed to make the diagnosis if radiographs were not apparent.

The first case of femoral neck stress fracture was reported in 1963 by Asal³. In the subsequent years, more cases were reported and it was then found out that there are two types of femoral neck stress fracture namely compression and tension type⁴. The compression type is characterized by a "haze" of internal callus (sclerosis) or a crack at the inferomedial border of the femoral neck while the tension type begins as a crack in the superolateral cortex of the femoral neck. It is believed that the compression type occurs more commonly in the young patient and the later in the older patient. In compression type, conservative treatment can be offered as it is hardly displaced as reported by Hayek et al and in contrast to tension type where there is higher chances for unicortical fracture to complete the bone breakage and lead to displacement⁵. However, in bilateral compression type femoral neck stress fracture, fixation should be done for early mobilization.

Conclusion:

This case report emphasizes the importance of high clinical suspicion in patients who present with post-exercise groin or thigh pain to prevent potentially disabling sequelae. It should be suspected in both physically active and sedentary patients especially in the absence of injury and if patient reported a recent change in activity levels.

With an understanding of the anatomy, etiology, pathomechanics, the characteristic history and examination findings of a femoral neck stress fracture will usually lead the clinician to the correct diagnosis.

Funding:

None declared.

References

1. Janusch M, Fisher M, Marsch W, Holzhausen HJ, Kegel T, Exerc Sport Sci Rev 17(1):379-422. Exercise-induced stress fractures and stress reactions of bone: epidemiology, etiology, and classification.
2. J Bone Joint Surg 59A(7): 869-874. Scintigraphic findings in stress fractures.
3. Arch für Klinische Chirurgie 186: 511-522. Überlastungsschaden am Knochensystem bei Soldaten.
4. Am Fam Phys. 2001;83(1):39-46. Stress fractures: diagnosis, treatment, and prevention.
5. Am J Sports Med 10(2):112-116. Stress fracture of the femoral neck in joggers: case reports and review of literature.