



## Clinical case

### Fatigue fracture of the femoral neck: case report

Fracture de fatigue du col fémoral : à propos d'un cas

CS Djiba\*<sup>1</sup>, AA Dione<sup>1</sup>, ML Diagne<sup>2</sup>, HOGIP; PA Ba<sup>3</sup>, I Diarra<sup>4</sup>, MM Niane<sup>5</sup>

#### Résumé

Les fractures de fatigue du col fémoral sont relativement rares, et surviennent le plus souvent dans le cadre de la pratique sportive. Le tableau clinique est variable et un diagnostic précoce facilite la prise en charge et minimise la survenue de complications telles qu'une pseudarthrose du col fémoral ou une nécrose avasculaire, conduisant à une altération de la fonction de la hanche. Nous présentons le cas d'une fracture de fatigue basicervicale du col fémoral chez une femme au foyer de 26 ans, en surpoids avec un IMC de 28,73 Kg/m<sup>2</sup>, sous contraception injectable à l'acétate de médroxyprogestérone depuis 2 ans.

L'indice de suspicion de fracture de fatigue du col du fémur chez l'adulte jeune présentant une douleur atypique de hanche doit être élevé, notamment en cas de patient en surpoids ou sportif. Dans nos régions, cela pourrait passer par une sensibilisation des médecins.

Mots-clés : Fracture de fatigue, Surpoids, Fracture basique cervicale, Contraception.

#### Abstract

Fatigue fractures of the femoral neck are relatively

rare, and most often occur in the context of sport. The clinical picture is variable, and early diagnosis facilitates management and minimizes the occurrence of complications such as femoral neck pseudarthrosis or avascular necrosis, leading to impaired hip function. We present the case of a basicervical fatigue fracture of the femoral neck in a 26-year-old housewife, overweight with a BMI of 28.73 Kg/m<sup>2</sup>, on injectable medroxyprogesterone acetate contraception for 2 years.

The index of suspicion of femoral neck stress fractures in young adults presenting with atypical hip pain should be high, especially in the case of overweight or sporty patients. In our regions, this could be achieved by raising doctors' awareness.

Keywords: Fatigue fracture, Overweight, Basicervical fracture, Contraception.

#### Introduction

Fatigue or stress fractures were described for the 1ère first time by Briethaupt in 1855 in soldiers on long marches. [1,2]. It can be defined as a complete

or incomplete fracture, caused by the repeated application of forces that are not strong enough to produce a fracture in a single step. It may occur on a healthy skeleton or on weakened bone tissue [3-6]. Fatigue fracture of the femoral neck is a rare injury, accounting for around 1% of all fatigue fractures [7]. It occurs most frequently in athletes such as long-distance walkers and runners (marathons), or in the context of pregnancy, osteoporosis, rapid and significant weight gain, etc. [5-7].

We report a rare case of a fatigue fracture of the femoral neck in a 26-year-old woman.

### Clinical case

She was a 26-year-old housewife, overweight (BMI 28.73 kg/m<sup>2</sup>) with no previous pathological history, and had been on injectable medroxyprogesterone acetate contraception for 2 years. She does not practise sport, but reports long-distance walking (between 3 and 5 km per day) and carrying heavy loads as part of her activities of daily living.

She was seen for hip pain of abrupt onset, evolving for 3 months, occurring at the end of the day after a long walk. She had consulted a health center where an X-ray of the pelvis had been taken and was normal (Figure 1).

Treatment with analgesics and non-steroidal anti-inflammatory drugs was initiated. As the pain worsened, she was referred again to another facility, where a CT scan of the right hip was performed, revealing a minimally displaced fracture of the right femoral neck (Figure 2). The option of functional treatment with a pair of walking sticks was adopted. Given the persistence of her pain, she is now consulting our facility for further treatment.

On examination, the patient walked with the aid of a cane, with a right limp. There was no vicious attitude or limb deformity. Physical examination revealed exquisite pain on palpation of the groin crease. Joint amplitudes were normal on passive mobilization of the right hip. A frontal radiograph of the pelvis revealed a basicervical fracture of the neck of the right

femur, displaced coxa-vara with a cervicodiaphyseal angle of 115°. Computed tomography confirmed the fracture with a sclerotic appearance of the fracture margins (Figure 2 and 3).

Magnetic resonance imaging (MRI) of the right hip showed no evidence of an underlying tumor process. Surgical treatment with a 135° DHS dynamic screw-plate osteosynthesis was performed (Figure 4). A bone biopsy, performed at the same time, revealed bone tissue with chronic, non-specific inflammatory remodelling, with no objectified sign of malignancy. Immediate post-operative follow-up was straightforward. Support was partial for 45 days with a pair of walking sticks, then total.

At 6 months post-op, the patient was walking independently, without limping, and there was no lower-limb length inequality. X-rays of the pelvis showed fracture consolidation with no evidence of aseptic osteonecrosis of the femoral head or coxarthrosis (Figure 5).

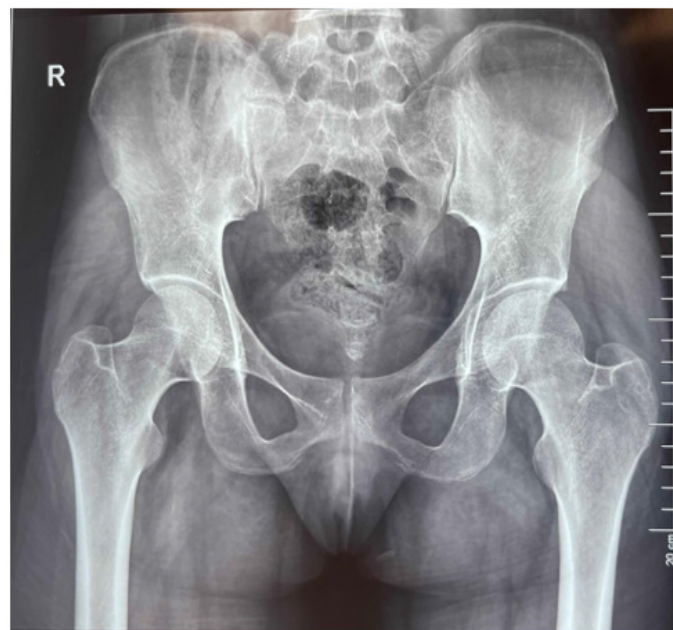


Figure 1: Front radiograph of the pelvis taken 1 month after the onset of symptoms



Figure 2: CT image of the fracture with a sclerotic appearance of the edges and minimal coxa- valga displacement.

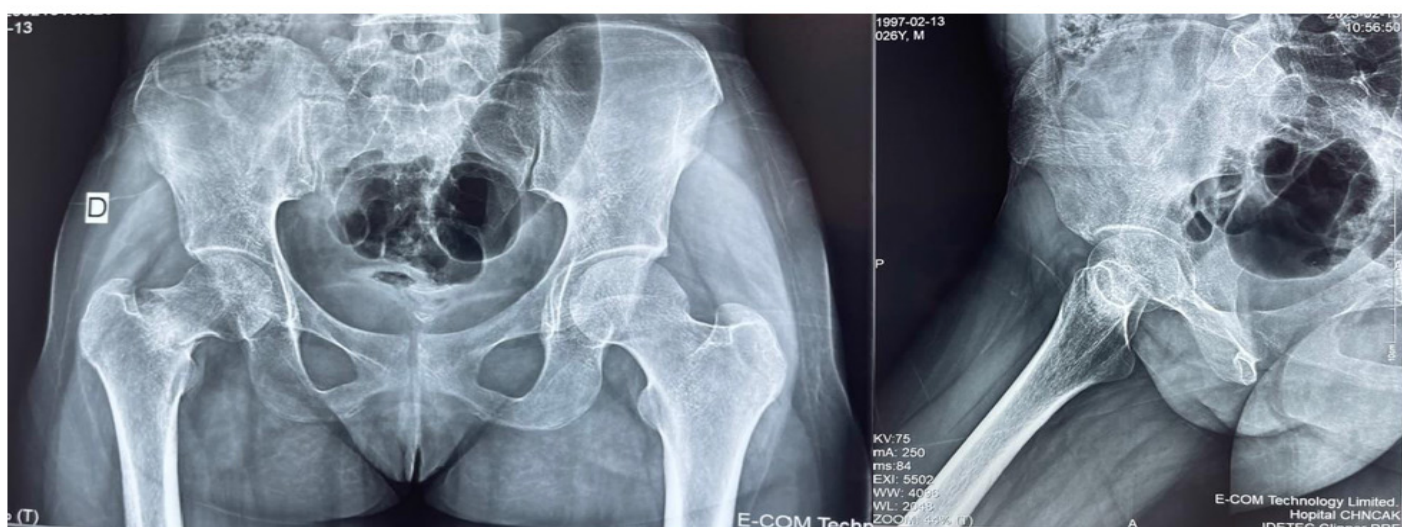


Figure 3: X-ray showing a coxa-vara displaced fracture of the right femoral neck with a cervico-diaphyseal angle measured at  $113^{\circ}$  and a sclerotic appearance of the edges.



Figure 4: Frontal radiograph of the pelvis showing postoperative  $135^{\circ}$  DHS screw-plate osteosynthesis.



Figure 5: X-ray at 5 months postoperative and 8 months posttraumatic, showing consolidation of the neck fracture with a cervicodiaphyseal angle of  $125^\circ$  with no signs in favor of osteonecrosis or coxarthrosis, despite dismantling of the plate.

## Discussion

This patient's clinical picture is typical of a fatigue fracture of the femoral neck, as described by several authors such as Daffé et al. [8] as well as Fullerton [7-10]. It is characterized by insidious hip pain, exacerbated by walking and exercise, and calmed by rest. This pain may persist for several weeks to several months. Diagnosis is often delayed, as patients tend to carry on with their activities, and X-rays at the onset of symptoms are strictly normal [6,7].

Fatigue fracture of the femoral neck is a relatively rare injury, accounting for less than 5% of all fatigue fractures [9,11]. It is most frequently reported in athletes such as marathon runners and walkers, and in cases of rapid weight gain such as during pregnancy [5,6,10]. The exact etiology is often poorly elucidated. In our case, the patient was overweight (BMI 28.73 kg/m<sup>2</sup>) and reported chronic use of medroxyprogesterone acetate, which is associated with a reduction in bone mineral density [12,13]. These two phenomena combined may explain the occurrence of this fracture in our patient.

The standard frontal pelvic X-ray, supported by

the clinic, was sufficient to make the diagnosis of fatigue fracture, and magnetic resonance imaging enabled us to make the differential diagnosis with other etiologies such as tumours.

In femoral neck fractures, the type of displacement, the delay in management and the quality of reduction are the determining factors in the risk of occurrence of avascular osteonecrosis of the femoral head. [14,15]. In our case, the patient presented with a displaced coxa vara fracture with a 3-month delay in management; despite this, over a 6-month follow-up, no clinical or radiographic signs of osteonecrosis of the femoral head were observed.

Displaced femoral neck fractures in young active subjects are treated surgically [6,7,9,11,14,15]. This reduces the risk of osteonecrosis of the femoral head, pseudarthrosis of the neck and chronic hip pain.

## Conclusion

Fatigue fractures of the femoral neck should be suspected in the event of atypical hip pain in a healthy, active adult with no known trauma. Early diagnosis and appropriate management can significantly reduce the risk of complications.

**\*Correspondence**

Cherif Sadibou Djiba

[djsadi2h@gmail.com](mailto:djsadi2h@gmail.com)**Available online** : January 4, 2024

1 : Orthopedics Department, Centre Hospitalier National Cheikh Ahmadou Khadim de Touba

2 : Idrissa Pouye General Hospital, Dakar

3 : Hôpital Principal de Dakar

4 : Kaffrine Regional Hospital

5 : Thiès Regional Hospital

© Journal of African Clinical Cases and Reviews 2024

**Conflict of interest** : None**References**

- [1] Katsougrakis I, Apostolopoulos AP, Tross SZ. Conservative Management of a Femoral Neck Stress Fracture in a Female Athlete. A Case Report and Review of the Literature. *J Long Term Eff Med Implants* 2016;26:7–12. <https://doi.org/10.1615/JLongTermEffMedImplants.2016011991>.
- [2] Defoort S, Mertens P. Multiple Tibial Insufficiency Fractures in the Same Tibia: A Case Report. *Geriatr Orthop Surg Rehabil* 2011;2:69–72. <https://doi.org/10.1177/2151458510391986>.
- [3] Pentecost RL, Murray RA, Brindley HH. Fatigue, Insufficiency, and Pathologic Fractures. *JAMA* 1964;187. <https://doi.org/10.1001/jama.1964.03060260029006>.
- [4] Ziesler C, Engebretsen L. Stressfraktur i lårhalsen. *Tidsskr Den Nor Legeforening* 2020. <https://doi.org/10.4045/tidsskr.19.0201>.
- [5] Le Hegarat M, Braig S, Gay E, Belvisi B, Harmouchi OE, Préaubert L, et al. Fracture de fatigue du col du fémur en cours de grossesse : situation clinique rare. *Gynécologie Obstétrique Fertil Sénologie* 2022;50:276–9. <https://doi.org/10.1016/j.gofs.2021.12.010>.
- [6] Cichy B, Roche SJ, Wozniak A. Atypical femoral neck stress fracture in a marathon runner: a case report and literature review. *Ir J Med Sci* 2012;181:427–9. <https://doi.org/10.1007/s11845-010-0599-7>.
- [7] Clough TM. Femoral neck stress fracture: the importance of clinical suspicion and early review. *Br J Sports Med* 2002;36:308–9. <https://doi.org/10.1136/bjism.36.4.308>.
- [8] Daffé M, Kinkpé CVA, Niane MM, Gueye AB, Sarr L, Dembélé B, et al. Femoral neck fatigue fracture on morbid obesity: A case report. *Int J Orthop Sci* 2017;3:618–20. <https://doi.org/10.22271/ortho.2017.v3.i4i.86>.
- [9] Fullerton LR. Femoral Neck Stress Fractures: *Sports Med* 1990;9:192–7. <https://doi.org/10.2165/00007256-199009030-00006>.
- [10] Haddad FS, Bann S, Hill RA, Jones DH. Displaced stress fracture of the femoral neck in an active amenorrhoeic adolescent. *Br J Sports Med* 1997;31:70–2. <https://doi.org/10.1136/bjism.31.1.70>.
- [11] Polacek M, Smabrekke A. Displaced stress fracture of the femoral neck in young active adults. *Case Rep* 2010;2010:bcr0220102749–bcr0220102749. <https://doi.org/10.1136/bcr.02.2010.2749>.
- [12] Rocca ML, Palumbo AR, Bitonti G, Brisinda C, Di Carlo C. Bone health and hormonal contraception. *Minerva Obstet Gynecol* 2021;73. <https://doi.org/10.23736/S2724-606X.20.04688-2>.
- [13] Watts NB, Binkley N, Owens CD, Al-Hendy A, Puschek EE, Shebley M, et al. Bone Mineral Density Changes Associated With Pregnancy, Lactation, and Medical Treatments in Premenopausal Women and Effects Later in Life. *J Womens Health* 2021;30:1416–30. <https://doi.org/10.1089/jwh.2020.8989>.
- [14] Konarski W, Poboży T, Śliwczyński A, Kotela I, Krakowiak J, Hordowicz M, et al. Avascular

Necrosis of Femoral Head—Overview and Current State of the Art. *Int J Environ Res Public Health* 2022;19:7348. <https://doi.org/10.3390/ijerph19127348>.

[15] Wang Y, Ma J, Yin T, Han Z, Cui S, Liu Z, et al. Correlation Between Reduction Quality of Femoral Neck Fracture and Femoral Head Necrosis Based on Biomechanics. *Orthop Surg* 2019;11:318–24. <https://doi.org/10.1111/os.12458>.

**To cite this article :**

CS Djiba, AA Dione, ML Diagne, HOGIP; PA Ba, I Diarra et al. Fatigue fracture of the femoral neck: case report. *Jaccr Africa* 2024; 8(1): 70-75