Original Research Paper

Volume : 5 | Issue : 9 | September 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

Bilateral Femoral Neck Fracture Secondary to Renal Osteodystrophy

Medical Science

KEYWORDS : Bilateral Femoral Neck fracture, Renal Osteodystrophy

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ABSTRACT

We here by present a case of bilateral femoral neck fracture in a 60 years aged male patient already diagnosed with renal osteodystrophy. He underwent bilateral cemented hemiarthroplasty and is receiving treatment for renal osteodystrophy and other deficiencies caused by chronic renal disease. Our aim is to present a rare case of bilateral fracture of the neck of femur secondary to renal osteodystrophy with an atypical presentation, simulating bilateral osteoarthritis of the hip. We also want to stress upon the importance of evaluation of serum Calcium, Phosphorous, Vitamin D, Parathyroid hormone and Alkaline Phosphatase levels in patients with chronic renal disease, even though the patient is not in the End stage renal disease.

INTRODUCTION:

Spontaneous bilateral femoral neck fractures are very rare. We present a case of non-traumatic spontaneous bilateral femoral neck fracture in a 60 year old male patient, secondary to renal osteodystrophy. Our aim is to present a rare case that we came across. He was duly informed in his language regarding the publication and his consent was taken.

CASE REPORT:

A 60 yr old male patient was brought to orthopedic OPD in our hospital with chief complaints of pain in both groins of one month duration. The pain started 1 month back when the patient started having pain in left groin but he was able to walk with the help of a stick, pain was dull aching type without any radiation. It was not preceded by trauma or fever and was aggravated by activities and relieved by rest and analgesic medications. After 1 month, pain started having pain in right groin also and he was not able to bear weight on both legs. The pain gradually progressed to its present severity where it is unbearable and uncontrollable and is not relieved even with high doses of analgesics and is affecting his daily activities like squatting, sitting cross legged, cannot stand and walk. There is no loss of weight and appetite or other constitutional symptoms at the time of presentation. In the past, the patient had increased level of creatinine for which he was on treatment with dialysis and bilateral renal calculi for which he underwent lithotripsy. The patient was moderately built and nourished and was pale on inspection. Gait cannot be iliciated as patient is not able to walk due to pain. On inspection of both hips, there were no significant findings. There was no apparent discrepancy in limb length or obvious deformities. There was bilateral anterior joint line tenderness and pain on passive range of movement of both hips. The movements of both hips were not restricted. Trendelenberg test could not be done as the patient was not able to stand even for few minutes and telescopy was present on both sides. Patient was not able to do SLR (Straight Leg Raise) His spine and both sacroiliac joints were clinically normal. With the given history and clinical findings, we arrived at a provisional diagnosis of secondaries in bilateral hips most probably due to renal tumour. Hence, we admitted the case for further evaluation.

We admitted the patient and started with the baseline investigations. We completed the routine blood work and a plain radiograph of pelvis including both hips was taken. The blood tests included Hemoglobin (9.0 mg/dl), Blood urea (39 mg/dl), Serum creatinine (2.79 mg/dl), and Random blood sugar (82mg/dl). Radiographs of pelvis with both hips showed bilateral Garden's type 4 femoral neck fractures. Now considering the previous history of his blood urea, serum creatinine values and the features of osteoporosis (which is usually secondary in this age group) in the radiographs, we felt that further evaluation of the patient was necessary to rule out chronic renal disease.

For renal evaluation, the patient was referred to the Nephrology department, who conducted various investigations including Complete Urine examination [Urine Potassium 28.4 mEq (<15 mEq)], Complete Blood Series, Serum Electrolytes (Serum potassium 2.8 mEq/litre), Arterial blood gas analysis and Ultrasound abdomen. USG shows bilateral renal parenchymal disease with hepatic cyst. After they examined the reports thoroughly and calculated the Glomerular Filtration Rate [(140-age) x Body weight/ (Serum creatinine x 72)], they confirmed that the patient has Grade 2 Renal Failure (according to GFRs)



FIG.1: PLAIN X-RAY SHOWING BILATERAL FEMORAL NECK



FIG. 2: 3 D CT SHOWING BILATERAL FEMORAL NECK FRACTURE

Apart from fractures the radiographs also show areas of osteoporosis. Biochemical serum studies showed that Vitamin D was 11.5 ng/dl(normal 25- 75 ng/ml), Calcium was 6.9 mg/dl(8.5-10.5mg/dl), Phosphorous 8.6 mg/dl (2.8-5 mg/dl) , Alkaline phosphatase 769 U/lt (30-135 IU/lt) and Parathyroid Hormone 46.2 pg/ml(8.8-76.6 pg/ml), Urine Potassium 28.4 mEq (normal <15 mEq) and finally arrived at the conclusion that the patient was a case of Renal Osteodystrophy (high turn over). After complete work up, we planned to do a Two Staged Bilateral cemented Hemi arthroplasty, Staged two week apart.



FIG 1:



FIG 2:

STAGE 1: PATIENT WENT UNDER CEMENTED BIPOLAR HEMIARTHROPLASTY ON LEFT SIDE



FIG 3:



FIG 4:

STAGE 2: PATIENT WENT UNDER CEMENTED BIPOLAR HEMIARTHROPLASTY ON RIGHT SIDE AFTER 2 WEEKS.



FIGURE 5: POST OPERATIVE PATIENT SITTING ON THE SIDE OF BED COMFORTABLY.

He had an uneventful postoperative course with complete pain relief following surgeries. He was started on an intensive rehabilitation program. At the 6 week follow up, the patient recovered completely and could walk without assistance. He was given Vitamin D and Calcium supplements along with treatment as per suggested by nephrology consultation. At the 6 month follow up repeat biochemical serum studies showed values within normal limits.

DISCUSSION:

Spontaneous bilateral femoral neck fractures are rarely reported. They have been associated with chronic conditions

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causing osteoporosis such as hyperparathyroidism, vitamin D metabolism defects, multiple myeloma, post organ transplantation; narcotic drug abuse, long term bisphosphonates usage, steroid induced osteoporosis and pregnancy induced transient osteoporosis. Additionally, it is noted that few cases were reported on bilateral hip fractures associated with osteomalacia in adult patients.

However, there are some differences regarding clinical and biochemical presentation of these cases. David Schnadower1 et al stressed that pediatric patients should be evaluated for bilateral femoral neck fractures immediately after severe hypocalcemic seizures. Ruben Depasqale2 et al found that, though bisphosphonates have a well-established therapeutic role in prevention of osteoporosis, long term use of bisphosphontes showed direct relationship to subtrochanteric and femoral diaphyseal fractures.

S Lidder3 et al reported bilateral femoral neck fractures secondary to transient osteoporosis during pregnancy. Alireza Hootkani4 et al attributed bilateral femoral neck fracture to narcotic drug abuse. Raphael Omatayo Ayorinde and Clement Abu Okolo5 reported concurrent femoral neck fracture following pelvic irradiation. H.D.W. Powell6 published three different cases of bilateral femoral neck fractures with convulsions as common history. Asheesh Sood7 et al discovered that in elderly, even in absence of primary and secondary bone disease, bilateral neck of femur fractures can occur after relatively minor trauma. Chirurgische8 et al described bilateral femoral neck fractures with Osteogenesis Imperfecta tarda. Pankaj9et al described bilateral femoral neck fractures in post-knee arthroplasty subject. Sivas10 et al reported simultaneous bilateral femoral neck fractures in young patients with osteomalacia associated with hypermagnesemia secondary to overuse of magnesium containing antacids.

Renal Osteodystrophy is usually a diagnosis of end stage renal disease. However, it can be brought into light with high suspicion in a patient with chronic muscle pain and localized groin discomfort, in spite of not having history of trauma, as in this case. It might also be an incidental finding with chest and pelvis X-ray showing Looser's zones or spine showing Rugger Jersey spine along with serum studies. It might present as bone pain, joint pain or bone deformation and bone fractures.

Renal Osteodystrophy can be of two types. High turnover renal bone disease and low turnover renal bone disease. High turnover type(as seen in this case) is associated with raised parathyroid hormone levels. Low turnover type with low or normal levels of parathyroid hormone is uncommon. Chronic renal disease results in deficiency of vitamin D and thereby reduces the intestinal absorption of calcium, phosphorous and magnesium. Low levels of calcium leads to secondary hyperparathyroidism with bone resorption. Alternatively, in low turnover state the parathyroid hormone levels are within normal range but pathology is due to excess deposition of aluminum into bones, which again ultimately lead to bone resorption and weakness along with inadequate mineralization.

David Schnadower1 et al performed open reduction and internal fixation of both femoral heads in his pediatric subject. Ruben Depasquale2 et al stopped the subject from taking Alendronate and started him on vitamin D and calcium supplements since their subject had history of multiple fractures and was uneventful. S Lidder3 et al conservatively treated the subject until delivery and then operated on the subject. Alirezia Hootkani4 et al treated the subject with bilateral single staged hemiarthroplasty. Raphael Omatayo Ayorinde5 and Clement Abu Okolo concluded that African blacks are predisposed to hip fractures following pelvic irradiation and treated with bilateral hemiarthroplasty with uncemented Austin Moore stems at 8 weeks interval.

Asheed Sood7 et al treated the elderly with cemented hemiarthroplasty using Thompson stem. Chirurgische8 et al implanted a cemented total endoprothesis bilaterally in a single stage operation. Although Mcbryde11 et al recommended single stage procedure in elective surgery; Tsiridis12 et al noticed the need for more blood transfusions in single staged procedures than in staged procedure. Whatsoever is the method, Orthopedic surgeons should concentrate on restoring the normal anatomy apart from therapeutic vitamin D, calcium supplements and bisphosphonates.

CONCLUSION:

This case highlights that in chronic renal disease subjects, even though there is an absence of secondary hyperparathyroidism, decreased bone mineralization can lead to bilateral femoral neck fractures , in spite of the fact that the patient claiming that he did not sustain a trivial trauma. Consequently the orthopedic surgeon, emergency physician and general practitioner should be aware of this condition and should treat the subject of chronic renal disease with groin discomfort with high index of suspicion, though the subject is not in end stage renal failure and they do not present clinically as a typical fracture.

CONSENT:

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

REFERENCES:

1. David Schnadower, Chhavi Agarwal, Sharon E. Oberfield, Ilene Fennoy and Martin. Hypocalcemic Seizures and Secondary Bilateral Femoral Fractures in an Adolescent with Primary Vitamin D Deficiency. Official Journal of American Academy of Paediatrics 2006 Nov;118(5):2226-30
2. Ruben Depasquale, Claire Matthews, Victor N. Cassar-Pullicino. Bisphosphonate-related bilateral atypical femoral fractures – be aware and beware. Malta Medical Journal Volume 23 Issue 02 2011
3. S Lidder, K J Lang, H-J Lee, S Masterson, R K Kankate. Bilateral hip fractures associated with transient osteoporosis of pregnancy. The Royal London Hospital, Whitechapel, London. surjitlidder@doctors.org.uk. J Orthop Surg Res. 2010; 5: 41.Published online 2010 June 25. doi: 10.1186/1749-799X-5-41
4. Alireza Hootkani, Ali Moradi, Ehsan Vahedi. Neglected simultaneous bilateral femoral neck fractures secondary to narcotic drug abuse treated by bilateral one-staged hemiarthroplasty: a case report. J Ortho Surg Res 5:41.doi:10.1186/1749-799X-5-41.
5. Raphael O Ayorinde, Clement A Okolo. Concurrent femoral neck fractures following pelvic irradiation: a case report. Journal of Medical Case Reports 2009, 3:9332 doi: 10.1186/1752-1947-3-9332.
6. h. d. w. Powell. Simultaneous bilateral fractures of the neck of the femur. The Journal of Bone and Joint Surgery. Vol. 42b, No. 2, May 1960.
7. Asheesh Sood, Christopher Rao, Ian Holloway. Bilateral femoral neck fractures in an adult male following minimal trauma after a simple mechanical fall: a case report. Cases J. 2009; 2: 92.Published online Jan 28, 2009. doi: 10.1186/1757-1626-2-92.
8. Templin F, Schoppmeier K. Combined total endoprosthesis implantation in bilateral femoral neck fracture with osteogenesis imperfecta tarda. [Article in German]. Source: Chirurgische Abteilung, Johanniter-Krankenhaus Geesthacht. Unfallchirurg. 1996 Jun; 99(6):454-6.
9. Pankaj A, Malhotra R, Logani V, Bhan S. Bilateral femoral neck fractures following total knee arthroplasty: a case report and review of literature. Arch Orthop Trauma Surg 2007; 127:549-52.
10. Sivas F, Gunsen O, Ozoran K, Alemdaroglu E. Osteomalacia from Mg-containing antacid: a case report of bilateral hip fracture. Rheumatol Int. 2007; 27:679–681.

11. McBryde CW, Dehne K, Pearson AM, Treacy RB, Pynsent PB. One or two-stage bilateral metal-on-metal hip resurfacing arthroplasty. Source Research and Teaching Centre, Royal Orthopaedic Hospital, Bristol Road South, Northfield, Birmingham B312AP, UK. cwmcbryde@hotmail.com. J Bone Joint Surg Br. 2007 Sep; 89(9):1144-8.
12. Tsiridis E, Pavlou G, Charity J, Tsiridis E, et al.(2008). The safety and efficacy of bilateral simultaneous total hip replacement: An analysis of 2063 cases. Journal of Bone and Joint Surgery: British Volume90(8):1005-1012.
13. Heetveld MJ, Raaymakers EL, van Eck-Smit BL, van Walsum AD, Luitse JS. Internal fixation for displaced fractures of the femoral neck. Does bone density affect clinical outcome? Source Trauma Unit, Department of Surgery Academic Medical Center, Amsterdam, The Netherlands. m.heetveld@erasmusmc.nl. J Bone Joint Surg Br. 2005 Mar;87(3):367-73.
14. Ali H. Chamseddine, Abdullah A. Alasiry, Hadi K. Zein. Spontaneous simultaneous bilateral femoral neck fractures secondary to osteomalacia: a case report and review of the literature. European Journal of Orthopaedic Surgery & Traumatology Volume 22, Issue 1 Supplement, pp 139-143. DOI 10.1007/s00590-012-0979-yPrint ISSN 1633-8065 Online ISSN1432-106 Publisher Springer-Verlag.