Case Report
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Conservative Treatment of Bilaterally Femur Stress Fracture After Renal Transplantation

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Abstract

Renal transplantation is accepted as the gold standard treatment for end stage kidney disease. With the advancement of transplantation techniques and immunosuppressive treatments, a great increase in patient and graft survival has been achieved in recent years. But this has also lead to longer use of immunosuppressive drugs and corticosteroids which resulted in other complications. Stress fractures that are usually seen in femur and tibia, most commonly occur at the femoral neck. The aim of this article is to report the recovery of a patient with conservative and non-operative treatment who had bilateral non-displaced femoral neck fractures. Fifty nine year old male patient had a renal transplantation in May 2014 due to end-stage kidney disease and received methylprednisolone and immunosuppressive treatments. In the postoperative 4th month, the patient developed a sudden onset pain and difficulty to walk without a trauma history. In the MRI scan of the patient, non-displaced fracture lines were spotted at the femoral necks bilaterally. Patient's biochemical parameters were non-conclusive and osteopenia was seen in his bone density measurement which was done additionally. As an early diagnosis can be achieved by this way, we think that it is possible to cure these patients conservatively with bed rest and medical treatments.

Keywords: fracture, hip, insufficiency, transplantation

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Conflict of Interest. None

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Introduction

Stress fractures that are usually seen in femur and tibia, most commonly occur at the femoral neck (1). There are two types of stress fractures which are named as fatigue and insufficiency fractures (2). These fractures usually happen after vigorous physical activity or occur due to renal osteodystrophy, treatments with fluoride, long term corticosteroid use, amenorrhea, abnormal anatomy or osteopeny resulting from hormonal disorders (1).

Renal transplantation is accepted as the gold standard treatment for end stage kidney disease. By the advances in transplantation techniques and immunosuppressive treatments, a great increase in patient and graft survival has been achieved in recent years. But this has also lead to longer use of immunosuppressive drugs and corticosteroids which resulted in other complications (3). Hip fractures are one of the most important skeletal complications encountered in patients who have had renal transplantations (4). In addition, displaced femur fractures are seen 7 times more in kidney failure patients than the normal population (5).

The aim of this article is to report the recovery of a patient with conservative and non-operative treatment who had bilateral non-displaced femoral neck fractures.

Case

Fifty-nine year old male patient had a renal transplantation in May 2014 due to end-stage kidney disease and received methylprednisolone and immunosuppressive treatments with a protocol that can be seen in Table 1.

Table 1. The protocol for methylprednisolone and immunosuppressive treatments

1st day	500 mg
2nd day	250 mg
3rd day	125 mg
4-5th days	50 mg
6-14th days	20 mg
14-21st days	15 mg
3rd week-3rd month	10 mg
After 4th month	5 mg

In the postoperative 4th month, the patient developed a sudden onset pain and difficulty to walk without a trauma history. In physical examination, bilateral hip joint range of motions were normal but internal and external rotations were painful, manual strength of the muscles around the hips were globally assessed as 4/5 because of pain. No differences were noted in length and diameter of the lower extremities. Physical examination of the lumbar area and knees were normal. As

hip joint and soft tissue pathologies were suspected, comparative magnetic resonance imaging (MRI) of the hip joints

was carried out in addition to routine blood biochemistry, complete blood count, C-reactive protein and rheumatoid factor tests.

In the MRI scan of the patient, non-displaced fracture lines were spotted at the femoral necks bilaterally. Patient's biochemical parameters were non-conclusive and osteopenia was seen in his bone density measurement which was done additionally (Figure 1 and Figure 2)

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Figure 1. Roentgenogram of the patient at admission

Figure 2. MRI findings of the patient at admission

The patient had to be kept on glucocorticoid and immunosuppressive treatments to prevent rejection of the allograft. A non-operative treatment was decided on taking into account the medical condition of the patient and bilaterality of the fracture. Paracetamol was prescribed for pain management.

Bed rest for 6 weeks was recommended and direct radiological evaluations were repeated every week for possible displacements of the fractures.

Mobilization with partial weight bearing was allowed until 12th week and the patient was allowed to move with full weight bearing at the 6th month. In the follow up, a decrease in hip pain was seen at the 3rd month and the patient showed a full recovery with no pain and a totally normal walking pattern. In the physical examination, bilateral hip joint range of motions were normal and painless, manual muscle strengths were 5/5. In the MRI scan of the patient, non-displaced fracture lines were disappeared at the femoral necks bilaterally (Figure 3).

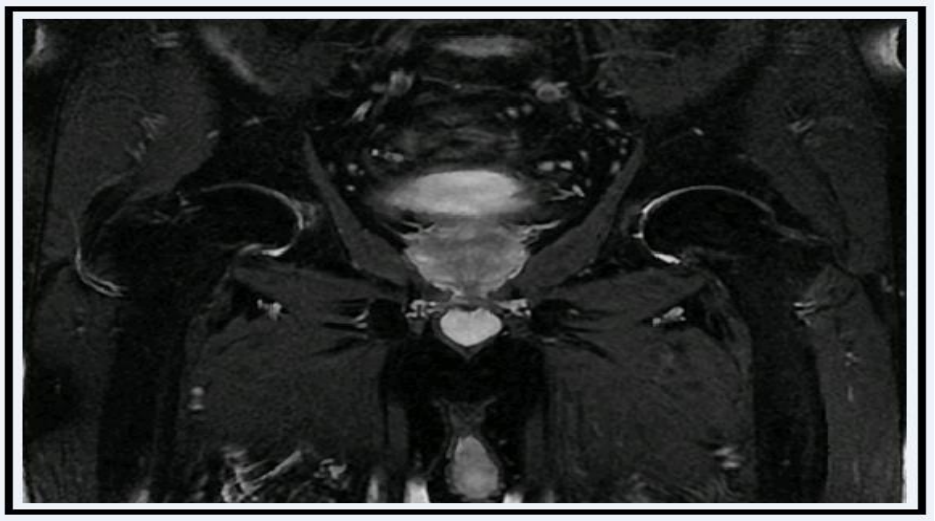

Figure 3. MRI findings of the patient at 6 th month follow-up.

Discussion

A greater risk of pathological fractures is encountered in renal transplant patients due to loss of bone density (6). These fractures are usually seen in appendicular bones where loss of cancellous bones mostly occurs (7). The most common site of these pathological fractures is the femoral neck (8).

Ramsey G. and colleagues have reported a 36-fold increase in risk of fractures in renal transplant patients compared to normal population (6). Ball and colleagues have found the risk of pelvic fractures to be 3.3 in 1000 transplant patients (8). This is the first and only patient to have a stress fracture in 300 renal transplant patients performed at our hospital.

Stress fractures seen in normal population usually occur after vigorous physical activity whereas insufficiency fractures following osteopenia in patients receiving

glucocorticoids and other immunosuppressive treatments occur after normal daily physical activity (9).

While the incidence of hip fractures following renal transplantations increase and are reported to be 0.5%, this number decreases to 0.3% at the 2nd postoperative year[8]. In our patient, the fracture was diagnosed at the 4th month postoperatively.

Immunosuppressive drugs lead to an increase in bone resorbtion by inhibition of osteoblastic activity and by excretion of calcium in urine. Also they lead to a decrease in intestinal calcium absorption. Eventually secondary hyperparathyroidism develops (9).

There are many factors to explain the decrease in risk of fractures on the long term use of immunosuppressive treatments. By the decrease in doses of glucocorticoids that result in enhanced osteoblastic activity, bone formation and bone remodeling activity gets better (10).

Patient history, physical examination and radiologic studies can have limitations in early and definite diagnosis of stress fractures. MRI is accepted as the most sensitive method compared to x-ray studies and bone scintigraphy (11). Hemiarthroplasty is the preferred treatment in elderly population due to the high risk

of nonunion in displaced femoral neck fractures, whereas percutaneous pinning is preferred in young patients (12). In our patient, immobilization and regular radiologic evaluation was chosen as the treatment as fracture was bilateral and non-displaced and a surgical intervention was not decided upon.

Patients who have pain in extremities following transplantation, insufficiency fractures must definitely be suspected, these patients must be evaluated by MRI and bone scintigraphy in addition to routine x-ray studies. As an early diagnosis can be achieved by this way, we think that it is possible to cure these patients conservatively with bed rest and medical treatments.

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