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Case Report

Incidentally detected abnormal finding of femoral bone density image due to treatment of postoperative lymphatic leakage

Han-Kyung Seo, Do-Cheol Choi, Jae-Yung Jeong, Cheol-Min Shim, Yung-Hwan Jeong
Department of Nuclear Medicine, Jeonbuk National University Hospital, Jeonju, Korea

*Corresponding Author : **Han-Kyung Seo,** Department of Nuclear Medicine, Jeonbuk National University Hospital, 20, Geonji-ro, Deokjin-gu, Jeonju, 03080, Republic of Korea, Tel:+82-63-250-2321, E-mail : shg@jbuh.co.kr

ABSTRACT

Bone Mineral Densitometry (BMD) values is determined numerically with T or Z-score while the image is not considered in the interpretation. Abnormal finding was observed in the left femoral bone density image of a 64-year-old female patient who underwent a left kidney transplantation. This was due to the ethiodized oil used for embolization in the treatment of lymphatic leakage. Radiologic technologists should not only monitor changes of BMD values, but keep in mind to assess the changes in the image to provide accurate information to the patient.

Key words: Bone Mineral Densitometry, Lymphatic Leakage, Ethiodized Oil

INTRODUCTION

BMD is a valuable method for early diagnosis of metabolic bone diseases and for assessing the effectiveness of osteoporosis drug treatments. It is widely employed in osteoporosis diagnosis.

The images obtained from BMD can provide additional information about the patient's condition and can be beneficial for diagnosis and treatment [1-3]. Radiologic technologists conducting BMD should not underestimate this potential to provide more information about patients.

We present a femoral bone density image with high-density lesions, affected by the ethiodized oil used to treat lymphatic leakage following the left kidney transplantation.

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CASE REPORT

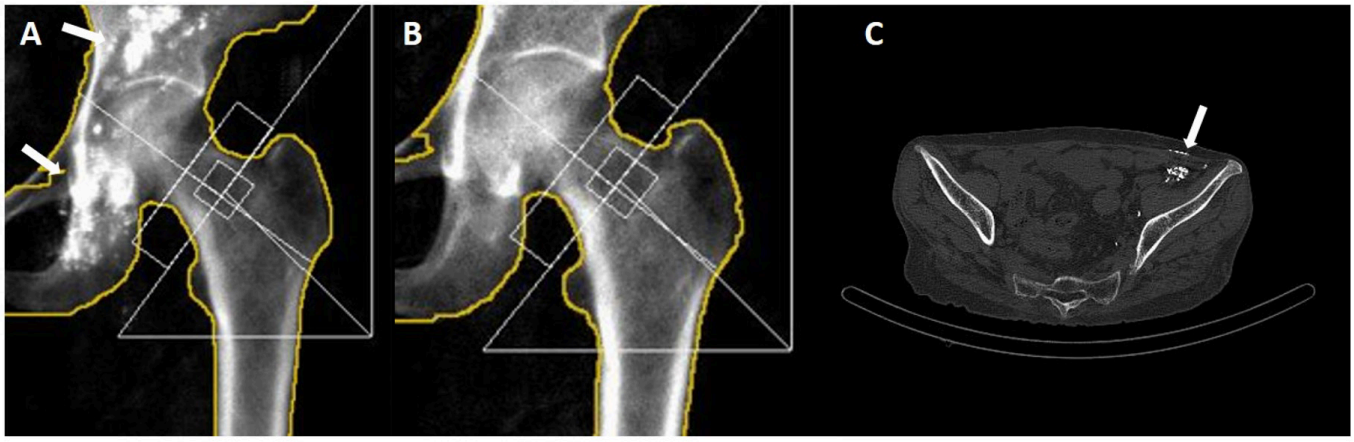

Fig. 1. A 64-year-old woman who had performed left kidney transplantation underwent a BMD. High-density lesions (arrows) were observed in her left pelvic bone image (A). However, they were not presented in the BMD conducted approximately about one and half year ago (B). A CT examination using SPECT/CT confirmed the presence of high-density materials (arrow) in the abdominal cavity, rather than within the bone (C).

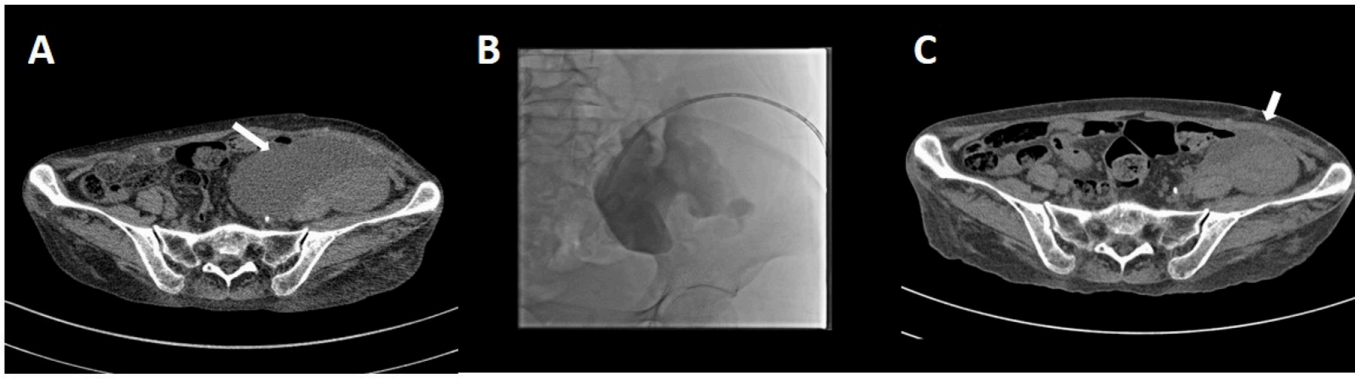

Fig. 2. The patient underwent an abdominal CT scan after a kidney transplantation about 1 year ago, which revealed a large fluid collection around transplanted kidney in left iliac fossa (arrow) (A). Ultrasound-guided drainage tube insertion was performed to evacuate the fluid and tubography was conducted (B). Subsequently, additional abdominal CT scan showed a significant fluid reduction (arrow) (C).

Fig. 3. Lymphangiography using ethiodized oil was performed to detect lymphatic fluid leakage for its treatment. Lymphatic fluid leakage in the left iliac area (arrows) was confirmed.

An abnormal finding was identified in the left femoral bone density image of a 64-year-old female patient who had undergone a left kidney transplantation about I year ago (Fig. 1A). However, this finding was absent in a BMD conducted approximately about one and half year ago (Fig. 1B). To precisely locate the lesion, a CT scan was performed using SPECT/CT (Intevo, Siemens, Germany) with the patient's consent. The examination confirmed that the abnormal finding was located in the abdominal cavity, not within the bone (Fig. 1C).

The patient experienced a weight gain of 3 kg with abdominal pain and distension after the kidney transplantation about 1 year ago , prompting an abdominal CT scan. The scan revealed a significant accumulation of fluid in the left abdominal cavity (Fig. 2A). Subsequently, an ultrasound-guided drainage tube was inserted (Fig. 2B), and after draining the iliac fluid, a follow-up abdominal CT showed a notable reduction of the fluid (Fig. 2C).

Following these procedures, a lymphangiography was performed to diagnose and treat lymphatic fluid leakage. The lymphangiography confirmed the lymphatic fluid leakage in the left external iliac area (Fig. 3).

DISCUSSION

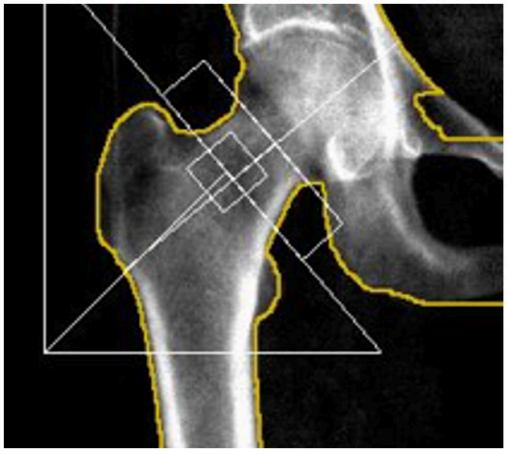

Fig. 4. This demonstrate an image of the right femoral bone density. Because the left femoral bone density values could be measured inaccurately due to the contrast agent's influence, the examiner should measure the right femoral bone density value to provide more accurate information.

Seo et al. reported studies of femur metastasis, a mass, and a cyst in the femur BMD images in their intriguing study [1-3]. Surgical intramedullary nailing was performed to address the identified femur metastasis and mass. Their study underscored the significance of BMD images.

The factors that cause errors in the BMD values are degenerative changes in the skeleton, compression fractures, aortic calcification, artificial products, and intestinal contrast agents [4]. Radioisotopes can also cause changes in test values [5]. Errors commonly caused by examiner are incorrect inspection posture or errors in the setting of femoral region of interest [6].

The patient had lymphatic leakage after kidney transplantation and a ethiodized oil was used for diagnosis and its treatment. Due to the contrast agent, there were abnormal findings on bone density imaging. Many surgical procedures may injure lymphatic channels such as lymph node dissections, tranplantations and vessels reconstruction, which will lead to iatrogenic lymphatic leakage [7].

There are a few methods to treat lympatic leakage. Abdominal drainage can lead to clinical diagnosis and alleviate a series of clinical symptom such as abdominal pain and distention [8]. Mid-chain triglyceride (MCT) diet leads to decreasing the bowel absorption of fat. It is the basic theory of lymphatic leakage treatment[8]. Some people insisted that MCT diet is more efficacious to chylous leakage than to lymph

leakage due to the high cholesterol content in chylous fluid [9-12]. However, Frey et al. show the improved lymphatic ascites after using MCT diet [13]. It has been reported that the addition of octreotide in food exerts a significantly early scavenging effect on postoperative lymphatic drainage to prevent the conversion of triglycerides in the diet into free fatty acids in the intestinal tract[14]. Surgical intervention has been reported to be guided by near infrared fluorescence imaging technology providing high sensitivity and real time imaging to help surgeons perform preventive ligation [15]. This technique may have the potential to more accurately diagnosis and treat lymphatic leakage during surgery [16]. Lymphangiography with injection of ethiodized oil can be used both in diagnosis and therapy to close the leakage [17,18]. The reason may be that the inflammatory reaction caused by the contrast agent leads to the fibrosis and obliteration of leakage.

This case demonstrated lymphatic leakage after kidney transplantation. To manage this, lymphangiography with the injection of ethiodized oil was performed, which resulted in abnormal femoral image and could change in the values of BMD. In this case, to obtain an accurate BMD values, the BMD of the opposite femur must be measured (Fig. 4). Radiologic technologists should closely examine the images during BMD to provide a more comprehensive assessment of the patient's condition.

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