



Peroneal Mononeuropathy Resulting From Soft Knee Immobilizer Use After Arterial Embolization



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A B S T R A C T

Keywords:
Neuropathy
Peroneal
Immobilizer
Embolization
Complication

Soft knee-immobilizing devices are commonly used after radiologic procedures that require femoral access. They are used for patients who are deemed to be at a higher risk for complications (specifically, hematoma) because of an inability to keep their knee extended and their leg still after arteriography. We report a case of a 68-year-old female who presented with a pathologic subtrochanteric left hip fracture resulting from a highly vascularized lytic lesion necessitating transarterial embolization before surgical repair could be undertaken. Postprocedurally, the patient developed right peroneal neuropathy and right foot drop potentially as a result of a soft knee-immobilizing device placed on the right knee after the embolization procedure.

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Introduction

Pathologic subtrochanteric hip fractures are acute and potentially life-threatening medical emergencies that result from diseases of the bone, such as osteoporosis, cancer, or infection. These fractures can compromise vascular supply and necessitate decisive medical and surgical management. Current surgical treatments involve intramedullary nails or screw-plate fixation. We present a case of a 68-year-old female patient with a pathologic subtrochanteric left hip fracture resulting from a highly vascularized lytic lesion secondary to metastatic clear cell renal carcinoma. Because of the highly vascular nature of this lesion, cardiovascular and interventional radiology (CVIR) was consulted for preoperative embolization of the lesion's vascular supply before surgical repair by orthopedic surgery. Once arterial embolization was successfully completed, the patient was placed in a right (the side of the arterial access) knee immobilizer by CVIR. She developed right foot drop several days postoperatively. We were unable to identify a case of foot drop secondary to knee immobilizer placement documented in the literature.

Case report

A 68-year-old female with a history of known metastatic clear cell renal carcinoma undergoing chemotherapy presented to the emergency department (ED) with approximately 3 weeks of left hip pain. She was seen in an outside ED 5 days earlier where radiographs reportedly showed a subtrochanteric hairline fracture of her left femur. At the time of her visit to the outside ED, she was placed on non-weightbearing restrictions of her left leg, but worsening hip pain prompted her to present to our hospital's ED.

Vital signs showed an elevated blood pressure at 155/88 mm Hg with all other vital signs normal. Physical examination revealed suprapubic tenderness, a shortened left lower extremity, mild tenderness to palpation over the left hip, limited range of motion secondary to pain, 2+ pedal pulses, and intact sensation. Laboratory studies were remarkable for anemia (Hgb, 9.6 g/dL), baseline chronic renal insufficiency (Cr, 1.48 mg/dL), and an elevated but subtherapeutic international normalized ratio (1.6 on Coumadin taken for deep vein thrombosis diagnosed about 4 months earlier). Radiographs in the ED demonstrated a displaced left subtrochanteric femur fracture with varus angulation (Figures 1 and 2).

A compression fracture of her L2 vertebral body was also identified as noted initially 4 months earlier. A computed tomographic scan from 1 month earlier suggested the presence of a lytic lesion at the location of the current subtrochanteric fracture. Recognizing that the lytic lesion was likely to be of renal origin, CVIR was

Conflict of interest: None to report.

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<https://doi.org/10.1016/j.jradnu.2018.02.003>

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Figure 1. Frontal pelvis radiograph.

consulted for preoperative embolization of the highly vascular area to reduce intraoperative blood loss during fracture repair by orthopedic surgery.

For the embolization procedure, the patient was placed on the angiography suite table in the supine position. The right groin was prepared and draped, and 2% lidocaine was administered to the site of planned arterial access. The right common femoral artery was accessed using a micropuncture needle, single-wall access, and a modified Seldinger technique. A 5-French vascular sheath was ultimately placed. Over a wire, a 5-French Omniflush catheter (Merit Medical, South Jordan, UT) was advanced to the aortic bifurcation, and anteroposterior pelvic digital subtraction arteriography was performed. Next, a hydrophilic wire was used with the Omniflush catheter to gain up-and-over access to the contralateral (left) common iliac artery. The Omniflush catheter was withdrawn over the wire, and a 5-French glide Cobra catheter (Terumo Medical Corporation, Somerset, NJ) was advanced over the aortic bifurcation and down the left common and external iliac arteries. A selective left lower extremity angiogram was performed, followed by catheter advancement to the deep femoral artery and the lateral femoral circumflex artery at the junction of the ascending and transverse branches. Particulate embolization using 300-500 micron polyvinyl alcohol (Cook Medical, Bloomington, IN) was then performed to embolize these branches to stasis while leaving the descending

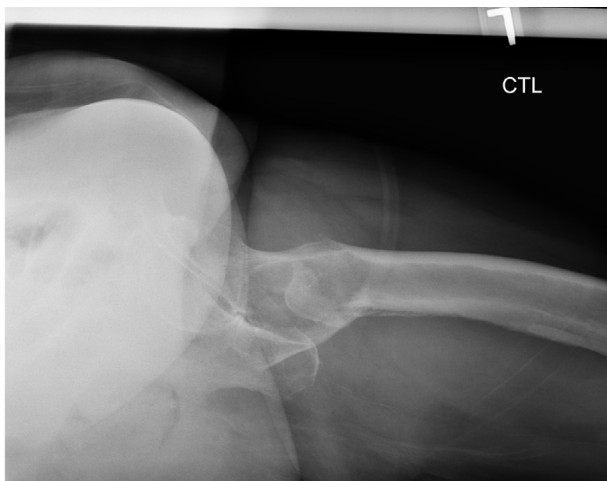


Figure 2. Lateral left hip radiograph.

branch intact. Additional branches contributing to the lesion were also engaged, injected, and then similarly embolized. The follow-up arteriogram showed successful embolization with markedly reduced flow to the femoral neck region (Figures 3–5).

On completion of the procedure, all devices were removed, and manual compression was applied at the right common femoral artery access site for 15 min. It was determined that the patient needed a soft knee immobilizer (for this case, we used a Foam Tri-Panel Knee Immobilizer; DeRoyal®, Knoxville, TN) (Figure 6) to limit the mobility of her right leg because the original plan was for her to go to the operating room (OR) that same evening (although she did not go to the OR until the next day). Knee immobilizers help maintain hemostasis at the arterial access site by preventing hip flexion. Using knee immobilizers has been our practice in patients who are uncooperative or likely to move or be moved around early in the perioperative period. She left the department in satisfactory condition.

The day after arteriography (May 21, 2016), she underwent surgical reconstruction of the left femoral neck and biopsy of the lytic lesion. Her left leg was then placed into an immobilizing device. One day after the surgical reconstruction (2 days after angiography and embolization), the patient first began reporting pain and discomfort at the site of the right knee immobilizer placed by CVIR. It was at this time that right foot drop was identified (and confirmed in physical therapy note of the same day; May 22, 2016), likely related to the knee immobilizer compressing the superficial peroneal nerve at the fibular head. Some slight signs of improvement were noted during an outpatient visit on June 8, 2016, where she had regained some minor motor and sensory function. The



Figure 3. Unsubtracted arteriogram showing arterial flow toward left hip fracture.

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