

# Sciatic Nerve Palsy due to a Superior Gluteal Artery Pseudoaneurysm Post Bone Marrow Biopsy: A Case Report and Review of the Literature

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## Learning Point for the Article:

Gluteal artery pseudoaneurysm post bone marrow biopsy is a rare extraspinal cause of sciatic nerve palsy and diagnosing this lesion is crucial to offer the patient the appropriate treatment and achieve a good outcome.

## Abstract

**Introduction:** Sciatic nerve radiculopathy can present as a result of intraspinal or extraspinal causes. Intraspinal disorders can be disk hernia, spinal trauma, tumors, or infection, whereas extraspinal cause represents a disorder outside the lumbar spine. A gluteal artery (GA) false aneurysm can potentially compress the sciatic nerve and causes radiculopathy, with subsequent motor and sensory deficits. This condition can result mainly from trauma or infection, but it can also be iatrogenic.

**Case Report:** We report a case of an 85-year-old male with a left sciatic nerve palsy as a result of a superior GA pseudoaneurysm post bone marrow biopsy (BMP). A short review of the literature regarding this topic is presented as well. Only a small number of similar cases are reported in the literature.

**Conclusion:** This case report emphasizes on the high suspicion index that the clinician should have managing a patient who suffers from sciatic nerve palsy with a history of a previous procedure around the pelvis' area, such as BMP.

**Keywords:** Pseudoaneurysm, bone marrow biopsy, sciatica.

## Introduction

Bone marrow biopsy (BMP) is considered to be a relatively safe procedure with a reported complication rate around 0.05–0.08% [1,2] including hematoma, infection, nerve damage, and gluteal artery (GA) pseudoaneurysm. GA false aneurysm can present as a painful, pulsatile mass on the buttock, and nerve compression symptoms such as leg radiating pain and sciatic nerve palsy [3,4,5]. It is common the fact that a patient with lower limb radiculopathy following an iatrogenic incident may present much later [6]. We report a case of an 85-year-old patient, who presented to our department with a left buttock excruciating pain and the left sciatic nerve palsy, 8 weeks after BMP. The patient was referred to a tertiary center, where he was treated successfully with an ultrasound-guided

thrombin injection (UGTI).

## Case Report

An 85-year-old patient presented to our department reporting pain over his left buttock, radiating to his left leg with concomitant left drop foot and gait disturbances for approximately 4-week time. The patient mentioned that 2 months ago he underwent a left-sided BMP, which was required because of a suspected plasmacytoma found in the nasopharyngeal area. Immediately after the BMP, the patient felt severe pain on the left buttock radiating to his left leg, which he was given oral painkillers for. 4 weeks later, the patient developed the left drop foot and significant gait disturbances

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## Author's Photo Gallery



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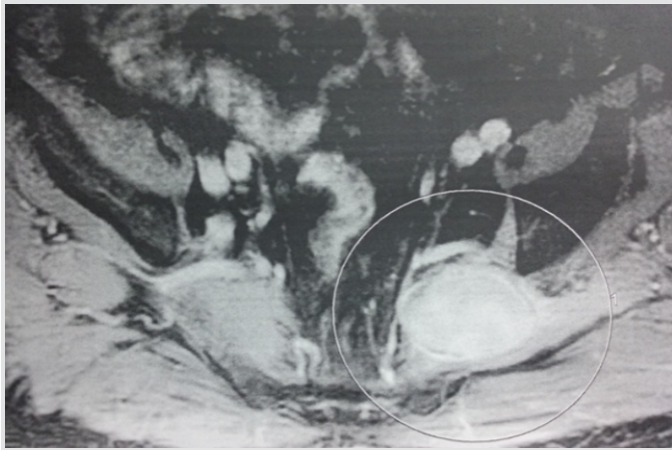


Figure 1: Magnetic resonance imaging scan.

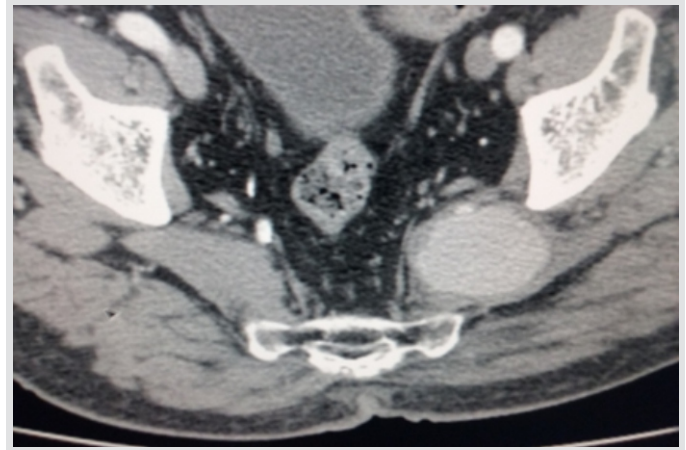


Figure 2: Computed tomography scan with contrast, arterial phase - transverse view.

along with the left buttock pain. For another 4 weeks, the patient was treated with medications for lumbar radiculopathy such as gamma-aminobutyric acid agonists, oral steroids, nonsteroidal anti-inflammatory drugs, and painkillers. As there was no improvement, the patient visited our department for further evaluation and management. He had a medical history of hypertension, hyperlipidemia, chronic obstructive pulmonary disease, diabetes mellitus type II, and coronary artery disease, which he was on aspirin for. On examination, there was tenderness palpating his left buttock as well as a mild swelling in the same area. Straight leg raising test was positive at 30°, and there was hypesthesia in the distribution area of the sciatic nerve. Severe muscle weakness on the left tibialis anterior, extensor hallucis longus, and peroneal tendons (0/5) was identified as well. The patient was systemically well, afebrile, with normal infection markers and hemoglobin 12.3. Given the history of the patient, a differential diagnosis between an intraspinal or extraspinal cause of sciatic nerve palsy was considered. Thus, a magnetic resonance imaging (MRI) scan of the lumbar spine and the pelvis, using intravenous contrast, was requested. Spine MRI revealed a moderate left L3-L4 intraforaminal disc hernia, which could hardly explain the symptoms of the patient. Pelvis MRI revealed a relatively large soft tissue mass (4.5cm × 3.2cm × 3cm) next to the left piriformis muscle, compressing the left sciatic nerve (Fig. 1). This mass could be either a hematoma or a pseudoaneurysm, considering the previous BMP. To distinguish those two entities, a computed tomography (CT) scan with intravenous contrast of the pelvis was performed, which revealed a left

superior gluteal artery (SGA) false aneurysm (Fig. 2 and 3). The patient was referred to the department of vascular surgery of a tertiary center for further evaluation and treatment. Initially, the patient underwent a left internal iliac artery selective angiography, which did not manage to identify the specific arterial branch from where the pseudoaneurysm originated. The next day a percutaneous UGTI was performed, which succeeded to exclude the aneurysm from circulation. The success of the procedure was confirmed by a Doppler ultrasound which showed no arterial flow inside the pseudoaneurysm. At present, 3-week post-procedure, the patient reports significant relief in terms of pain, but still, no improvement of the drop foot is noticed. His follow-up regarding the sciatic nerve function will continue.

Discussion

Vascular abnormalities of the pelvis are of a great interest as they can be potentially life threatening due to rupture and severe hemorrhage, or they can cause distal embolization or compression of adjacent structures, such as nerves, resulting in nerve palsy. Thus, diagnosis of these conditions is crucial, to offer the patient an effective treatment. They are distinguished



Figure 3: Computed tomography scan with contrast - coronal view.

| Author                      | Cause              | Injured artery          | Symptoms  | Time until treatment | Treatment method  | Outcome  |
|-----------------------------|--------------------|-------------------------|---|----------------------|---|--|
| Lowenthal et al. 2005[5]    | Bone marrow biopsy | Gluteal Artery          | Severe pain. Incomplete sciatic nerve innervated muscles' weakness (L5) | 6 weeks              | Selective left iliac artery angiogram and coils application         | Immediate pain relief. 18 months later patient pain free, moderate drop foot |
| Gridellier et al. 2016 [13] | Bone marrow biopsy | SGA                     | Buttock pain and swelling. No signs of nerve compression                | 1 month              | UGTI  | Immediate pain relief  |
| Ge et al. 2016 [1]          | Bone marrow biopsy | Superior Gluteal Artery | Sciatica, right drop foot, no palpable mass                             | 1 month              | Angiography and coil embolization plus hemostasis surgical drainage | Improvement of sciatic pain. 10 months later, persistent drop foot.          |
| Caldwell et al. 2015 [7]    | Bone marrow biopsy | SGA                     | Buttock pain and swelling, leg paresthesia, no motor deficit            | 1 day                | Selective angiogram and successful coil embolization                | Marked pain subsidence, improvement of leg paresthesia.                      |
| Phyu et al. 2017 [4]        | Bone marrow biopsy | SGA                     | Buttock pain, leg numbness, drop foot                                   | 12 months            | Selective angiogram and successful coil embolization                | Significantly improved pain; slight sensory and motor deficit improvement    |
| Vin and Jeffrey. 2016 [14]  | Bone marrow biopsy | SGA                     | Buttock swelling, mild pain, no sciatic neuropathy                      | 4 weeks              | UGTI  | Symptoms' improvement.   |
| Sullivan and Regi 2014 [15] | Bone marrow biopsy | SGA                     | Buttock pain, leg shooting pain, no neurologic deficit                  | 1-3post-biopsy       | Selective angiogram and coil embolization                           | Improvement of sciatica, mild buttock pain.                                  |



in true aneurysms and false aneurysms (pseudoaneurysm). True aneurysms have all three arterial walls intact, whereas pseudoaneurysms lack of a complete arterial wall [12]. GA pseudoaneurysms are rare conditions, which can develop as a result of trauma, infection, and iatrogenic. Fractures of the pelvis [7] or penetrating injuries [11] are the most common traumatic events prone to cause a GA pseudoaneurysm. It has been described though even after a blunt injury around the gluteal area [8]. Iatrogenic causes of pelvic pseudoaneurysm involve surgeries around the pelvis (such as total hip replacement [9], orthopedic internal fixation [4], lumbar disc surgery [6]), transvaginal ultrasound-guided follicle aspiration [3], radiation therapy [6], and BMP. A few number of cases of a pelvic false aneurysm due to iliac crest trephine biopsy are described in the literature (Table 1). To the best of our knowledge, only eight cases are reported in the English literature with seven of them involving the superior GA and in one is mentioned as GA pseudoaneurysm [5] (Table 1). In addition, this is the third reported case treated successfully with UGTI. Griselli et al. and Yap and Jeffrey described a successful treatment of GA pseudoaneurysm using UGTI [13,14]. Non-invasive imaging tools to detect pseudoaneurysms include ultrasonography (Doppler ultrasound scan), which is less effective for deep lesions, CT angiography, and MRI scan. MRI is a safer examination in terms of no radiation used. It is also less nephrotoxic than CT scan with contrast. High clinical suspicion index is required, as a simple CT scan, without contrast could diagnose falsely the lesion as a soft tissue tumor, guiding the management to an unnecessary biopsy, which can carry the risk of severe hemorrhage [4]. Diagnostic method of choice in such cases is selective internal iliac artery angiogram, during which a simultaneous coil embolization of the pseudoaneurysm is possible [12]. Goal of treatment is the exclusion of the pseudoaneurysm from the circulation.

Methods to achieve that are either endovascular (coil embolization and stent application) or ultrasound-guided percutaneous injection of cast-forming agents such as thrombin [12]. The last technique was successful in our case. The patient reported immediate pain relief and there was no arterial flow demonstrated on the Doppler ultrasound post-procedure. Drop foot remains though, we are expecting no more than partial sciatic nerve recovery, considering the outcome of similar cases described in the literature.

### Conclusion

Our case report tends to highlight an SGA pseudoaneurysm as a potential extraspinal cause of sciatica and sciatic nerve palsy, especially if a traumatic or iatrogenic incident is described around the buttock area. The clinician needs to be very careful, not to miss the diagnosis, as this condition can be life threatening, or it can lead to a significant disability due to permanent loss of nerve function. Thus, sciatica post-BMP, although rare, it can happen and requires thorough clinical examination and further imaging with Doppler ultrasound, MRI, or CT scan with contrast of the pelvis and selective angiography if necessary. Having the correct diagnosis, the appropriate treatment can be applied to the patient. In case endovascular coil embolization fails to treat the lesion, UGTI is a good alternative.

### Clinical Message

Diagnosing an extraspinal cause of sciatic nerve palsy can be very challenging. It is very important though to find the cause of nerve compression to offer the patient the appropriate treatment. History of previous medical intervention and thorough physical examination, as well as proper imaging examinations lead to correct diagnosis.

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