



Case Report

Psoas hematoma due to segmental vessel injury leads to paresis following CT-guided biopsy of lumbar vertebrae: A case report

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ABSTRACT

Background: Percutaneous bone biopsy is the first-line procedure for obtaining a tissue diagnosis to confirm focal, diffuse vertebral, and/or paravertebral metastatic lesions. Percutaneous bone biopsy to evaluate metastatic disease can be performed under fluoroscopy, ultrasonography, magnetic resonance (MR) imaging, and computed tomography (CT). Notably, CT-scans best direct and demonstrate the needle position for these procedures, decreasing the risk of injury to critical adjacent structures (e.g. major vessels, nerve roots). Hemorrhagic complication to lumbar segmental arteries following needle biopsy are uncommon; only a few cases have been reported. Although percutaneous bone biopsy is typically safe when performed utilizing computed tomography (CT) guidance, here we encountered a 60-year-old-female who developed a L4 lumbar segmental artery psoas hematoma following this procedure requiring emergent embolization.

Case Description: A 60-year-old female, with a history of breast cancer, underwent a CT-guided core needle biopsy of an L4 lytic lesion (e.g., likely a metastasis). This acutely resulted in the onset of radicular leg pain and weakness. When the postprocedural CT scan demonstrated a large psoas hematoma attributed to laceration of the left posterior L4 segmental artery, the patient required emergent embolization. Following this procedure, she exhibited a fully neurological recovery.

Conclusion: Following a CT-guided L4 vertebral biopsy to document metastatic breast carcinoma, a 60-year-old patient developed an immediate postprocedure CT-documented psoas hematoma due to laceration of the left posterior L4 segmental artery. Following emergent embolization, the patient recovered full neurological function.

Keywords: Angiography, Computed tomography-guided biopsy, Embolization, Lumbar segmental vessel injury, Psoas muscle hematoma

INTRODUCTION

Percutaneous bone biopsy is typically the first-line procedure for obtaining a tissue diagnosis for unifocal, diffuse vertebral, and/or paravertebral metastatic disease; the complication rate typically ranges from 0% to 10%.^[6,9,13] These procedures may be performed under fluoroscopy, ultrasonography, magnetic resonance imaging (MRI), or computed tomography (CT). Notably, CT scans provide for the most precise needle positioning and maximally reduce

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the risk of injury to major vessels, nerve roots, and/or lung/pleural structures.^[14] Few cases of hemorrhagic complications attributed to such procedures resulting in lumbar vertebral artery injuries have been reported.^[1,4] Here, we present a 60-year-old female who, following an L4 CT-guided bone biopsy for suspected metastatic breast carcinoma, developed an acute postprocedure psoas hematoma attributed to laceration of a left L4 lumbar segmental vessel. Following embolization, the patient's deficit resolved.

CASE PRESENTATION

A 60-year-old female, recently diagnosed with right-sided infiltrating pleomorphic lobular breast carcinoma, presented with back pain attributed to a positron emission tomography-CT documented L4 vertebral body lytic lesion. When the MRI showed a T1 hypointense/short-tau inversion recovery hyperintense lesion involving the L4 vertebral body (e.g., including the pedicles and lamina), a CT-guided core needle biopsy was performed to document whether this was a metastatic lesion [Figures 1a and b].

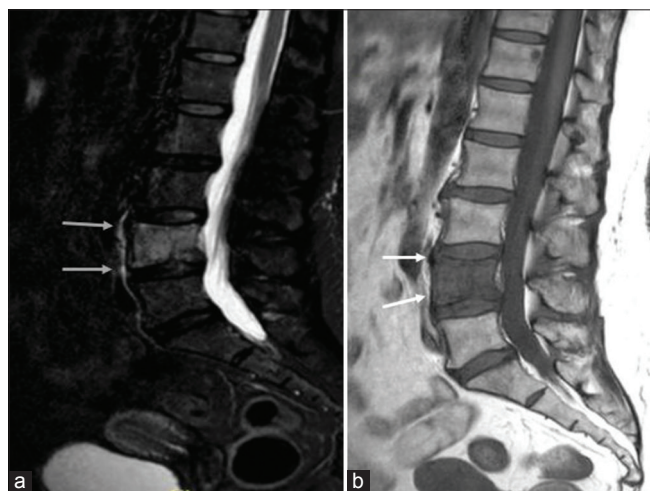


Figure 1: (a) Short-tau inversion recovery hyperintensity, (b) T1 hypointensity involving the L4 vertebral body including the pedicles and the lamina (arrow).



Figure 2: (a-c) Computed tomography-guided left sided transpedicular biopsy of L4 vertebral body.

CT-guided biopsy of L4

The CT-guided biopsy of the L4 vertebral body was performed under local anesthesia, and the histopathological examination was consistent with metastatic breast carcinoma [Figures 2a-c and 3a-d]. However, immediately following the procedure, the patient complained of acute worsening pain, paresthesia, and weakness in her left lower extremity (e.g., left dorsiflexion and extensor hallucis longus weakness [3/5]) that warranted emergent postprocedural CT (with/without contrast) assessment.

Diagnosis and treatment of psoas hematoma

The emergent postprocedure CT scan confirmed an acute left psoas hematoma [Figure 4]. When the CT angiography (e.g., CTA) suggested a laceration of the L4 left lumbar segmental artery, the patient underwent immediate transcatheter selective embolization [Figures 5a-d and 6]. She additionally received 1 g IV of methyl prednisolone sodium succinate. Notably, her neurological deficit completely resolved within 24 h without further surgical intervention being warranted. One year later, the patient had no residual pain or weakness and had returned to all previous activities.

DISCUSSION

The complication rate for spinal percutaneous vertebral body biopsies ranges from 0% to 10%.^[6,9,13] Most complications occur in the thoracic spine due to the proximity of the major blood vessels, pleura/lung, esophagus, and the posterior mediastinum.^[7,10] Neural injury, particularly to the spinal cord and nerve roots, is a serious acute complication that can result in deficits varying from a foot drop, to transient and/or permanent paralysis.^[12] Bleeding near the needle puncture site can also result in acute arterial hemorrhages or more chronic progressive venous bleeds.^[5,12]

Many case reports document how CT-guided spinal biopsies provide for more optimal/accurate needle position, thus reducing the risk of neural or vascular injuries.^[1,8,15] The lumbar arteries L1–L4 are particularly vulnerable to injury during these procedures as they are small paired vessels that

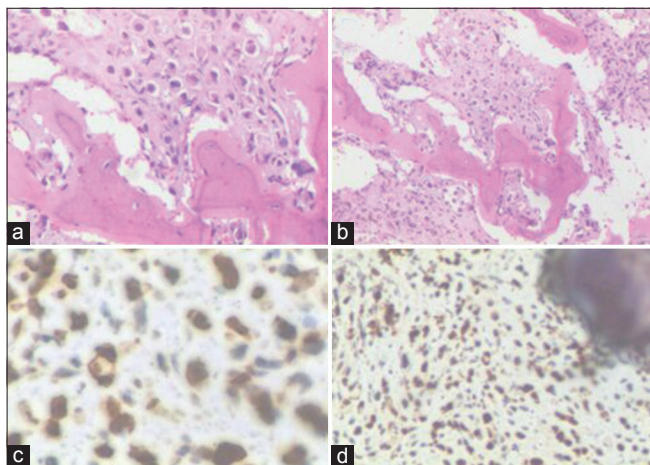


Figure 3: Histopathological images of the computed tomography-guided biopsy from L4 vertebrae, (a) ×40 and (b) ×20 H and E stained image – showing bony trabeculae infiltrated by neoplastic cells having hyperchromatic nuclei, (c) ×40 and (d) ×20 immunohistochemistry image – tumor cells show GATA 3 positivity.

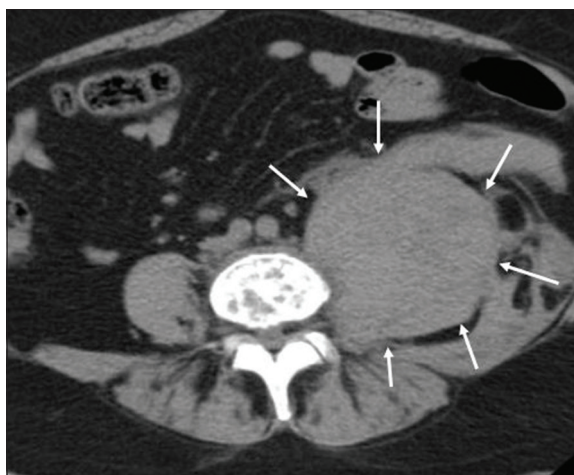


Figure 4: (Axial view) Computed tomography scan shows left side huge psoas hematoma (arrow).

originate from the dorsal aspect of the abdominal aorta at the level of the transverse processes, and run laterally along the bodies of the lumbar vertebrae where they divide along the medial border of the psoas muscle into anterior and posterior branches.^[4]

Monitoring of clinical symptoms and vital signs for patients undergoing such procedures is critical to rapidly diagnosing complications like the neurovascular injury seen in this case.

CTA is the diagnostic study of choice as it best defines the site of active bleeding following a CT-guided biopsy (e.g., resultant hemorrhage potentially attributed to traumatic laceration of lumbar vertebral arteries).^[2,3,6] If one suspects a retroperitoneal hematoma, immediate endovascular

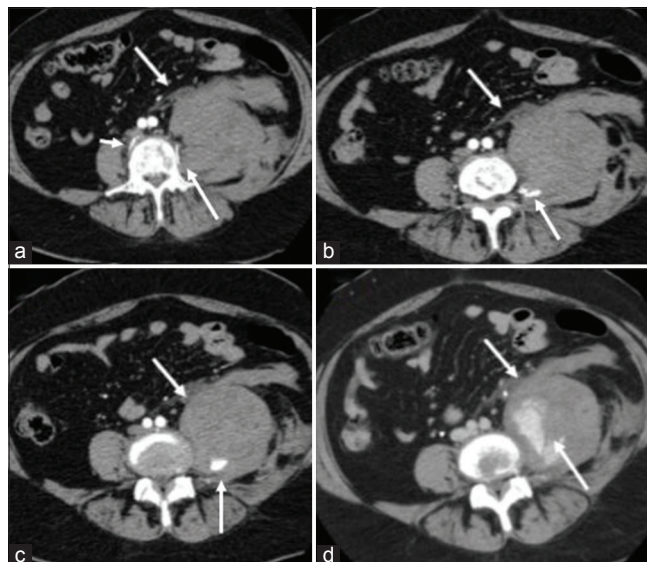


Figure 5: (a-d) Sequential images of computed tomography angiography were suggestive of breach in the left lumbar segmental vessel at L4 level (arrow).

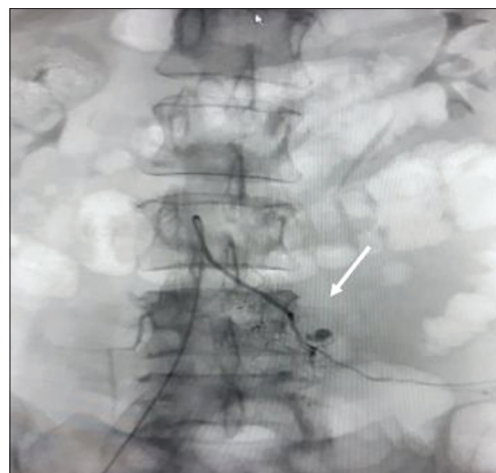


Figure 6: Transcatheter selective embolization at the left L4 segmental vessel (arrow).

embolization of the injured lumbar artery should be performed.^[2,4,11] Here, the patient suddenly developed left leg numbness and weakness attributed to a psoas hematoma readily identified on the immediate postprocedure CTA that was successfully embolized, resulting in stabilization of the patient's neurological status, and full neurological recovery within 24 h.

CONCLUSION

Following a CT-guided vertebral body biopsy, a psoas hematoma arising from a lacerated L4 lumbar vertebral artery injury was successfully treated with endovascular embolization.

Ethical approval

Not applicable. As this submission is a single case report an ethical approval is not necessary. However, written informed consents were obtained from the patient for publication of this case report and any accompanying images.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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