



## **Selected Topics: Neurological Emergencies**

### **SPONTANEOUS INTRACRANIAL AND LUMBAR SUBDURAL HEMATOMA PRESENTING AS VAGINAL PAIN**

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**Abstract—Background:** Spontaneous spinal and intracranial subdural hematomas are rarely reported, especially occurring simultaneously. Anticoagulation use has been associated with spontaneous hemorrhages. Prompt diagnosis is required to prevent permanent neurological sequelae. In this case report, we describe a spontaneous spinal and intracranial subdural hematoma in a woman taking warfarin and initially presenting with severe vaginal pain. **Case Report:** A 42-year-old woman who had a history of mechanical valve replacement and was therefore taking warfarin, came to an emergency department for relief of severe vaginal pain. Mild concurrent lumbar pain increased concern about spinal pathology, so magnetic resonance imaging of her spine was performed. It revealed a subdural hematoma extending from L1–S1 with arachnoiditis, which suggested intracranial pathology, though the patient had no complaint of a headache. Computed tomography of her brain demonstrated a large right subdural hemorrhage with midline shift. Subsequent imaging revealed no aneurysm or source of the intracranial bleeding. We concluded that the patient experienced spontaneous anticoagulation-related intracranial hemorrhage resulting in lumbar subdural hematoma and arachnoiditis with referred vaginal pain. **Why Should an Emergency Physician Be Aware of This?:** Pelvic, vaginal, or perineal pain may be the presenting symptom in patients with lower spinal pathology. It is important to consider causes other than gynecological ones in the differential diagnosis of these patients, as well as to be cognizant of the relationship between spinal and intracranial subdural hemorrhages. In patients with back pain or radiating lumbar pain, especially coupled with neurological

effects, clinicians should consider spinal subdural hemorrhage and arachnoiditis to expedite imaging studies and treatment of these rare entities. © 2018 Elsevier Inc. All rights reserved.

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#### **INTRODUCTION**

Subdural intracranial hemorrhages occur by several mechanisms and are relatively rare compared with traumatic subdural hematomas. As of 2014, only 22 cases had been reported in adults younger than 40 years of age (1). Similarly, spontaneous spinal subdural hematomas (sSDHs) are exceedingly rare and can be associated with coagulopathies or arteriovenous malformations; they also can have an iatrogenic cause (2). Both disease processes can result in significant morbidity and mortality, so expedient diagnosis is key.

Spontaneous spinal hematomas present initially as acute severe radicular back pain and neurological deficits. Motor deficits, spinal pain, radicular pain, and paresthesias are normally present, whereas rarer symptoms include headache and severe deficits such as paralysis (2,3). One review found that more than half of

spontaneous intraspinal hematomas were caused by coagulopathy, about a third of them associated with Coumadin (Bristol-Myers Squibb, New York, NY) use (4). Spontaneous intracranial subdural hematomas tend to present with the classic symptoms of headache, vomiting, and motor and sensory deficits. Once the diagnosis is made, treatment varies based on the neurological manifestations. Options include conservative management, percutaneous drainage, and surgical intervention. Typically, patients with more severe symptoms should undergo surgical evacuation. About a fourth of patients experience significant residual neurological deficits. Initial neurological status predicts their functional outcome (2).

In this case report, we describe a woman who was taking an anticoagulant and experienced sudden intense vaginal pain. She was found to have a spontaneous sSDH and lumbar arachnoiditis. Subsequent imaging studies found a concomitant large subdural hematoma that was likely spontaneous in nature given the lack of causative findings.

### CASE REPORT

A 42-year-old woman with a history of rheumatic heart disease, mitral valve prolapse, mechanical mitral valve replacement taking warfarin, atrial fibrillation, and cerebrovascular accident on aspirin came to an emergency department (ED) because she had been experiencing severe vaginal pain for 4 days. She described the pain as feeling as though there was a balloon in her vagina, expanding as if she was giving birth. Initial laboratory results and urinalysis reveal a mild urinary tract infection and a hemoglobin of 6.7 g/dL. Her international normalized ratio was subtherapeutic at 1.2, though the patient reported that she was compliant with her warfarin doses. She had no history of anemia and had not experienced recent vaginal bleeding, rectal bleeding, black stools, or any other obvious cause of blood loss. She was admitted to the hospital and received blood transfusions, which brought her hemoglobin to 8.7 g/dL. Transvaginal ultrasound revealed a fibroid uterus, which was thought to be the cause of her pain and anemia. She was discharged after spending 2 days in the hospital. Immediately upon discharge, she had difficulty walking due to continuing vaginal pain. She therefore sought treatment in a second ED on the day of discharge.

In addition to the 4 days of severe vaginal pain, the patient mentioned that she had 2 days of mild lumbar pain radiating down her right leg, as well as perceived left leg weakness, but she insisted that most of her pain was vaginal. She had not had recent trauma, spinal manipulation or lumbar puncture, fall, urinary retention, saddle anesthesia, incontinence, or fevers. She had a mild frontal headache several days earlier, which resolved with one

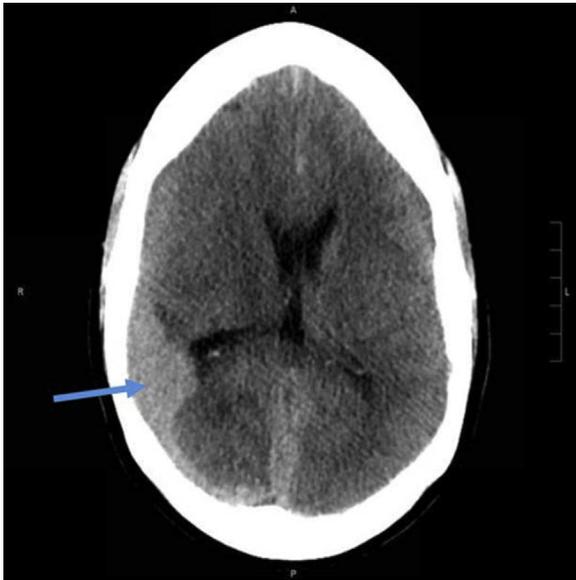
dose of acetaminophen. Her vital signs were unremarkable. Physical examination revealed mild tenderness of her midline lumbar spine. Neurological examination demonstrated intact cranial nerves, full strength in her upper and lower extremities, and no focal motor or sensory defects. She had a normal cerebellar function examination and her gait was intact, though limited due to pain. Pelvic examination elicited diffuse tenderness to palpation, but no vaginal bleeding or cervical motion tenderness. Repeat laboratory values revealed a hemoglobin of 9.2 g/dL and an international normalized ratio of 1.2.

Her mild lumbar pain in addition to severe vaginal pain prompted our request for magnetic resonance imaging (MRI) of the lumbar and thoracic spine. It revealed a subacute subdural hematoma with subarachnoid blood extending from L1 to S1 and causing significant spinal stenosis at L4–5 and L5–S1 (Figure 1). Abnormal clumping of the nerve roots of the cauda equina raised concern about arachnoiditis and possible intracranial hemorrhage. We consulted a neurosurgeon, whose repeat neurological examination yielded stable results. Computed tomography angiography of the brain showed a large-volume right subdural hemorrhage along the cerebral convexity, with associated mass effect causing 2 mm of leftward midline shift without herniation and with no arterial stenosis, occlusion, or aneurysm (Figure 2).

The patient was admitted to the neurosurgical intensive care unit under the care of the Neurosurgery Department. Digital subtraction angiography did not show any obvious source of the subdural hematoma. During this procedure, an iatrogenic right vertebral artery dissection



**Figure 1.** Sagittal magnetic resonance image of lumbar spine without contrast, indicating area of intensity at L1–S1 consistent with subdural hematoma. Arrows indicate the areas of greatest stenosis at L4–L5 and L5–S1.



**Figure 2. Axial head computed tomography with contrast, showing right subdural hematoma with leftward midline shift.**

was repaired with angioplasty, and a heparin drip was initiated. The patient then required serial digital subtraction angiography procedures, during which a spontaneous left vertebral artery dissection was discovered and repaired. Ten days after admission, the patient was weaned off heparin and underwent successful craniotomy and evacuation of the subdural hematoma. Postoperatively, she experienced a grand mal seizure, so levetiracetam prophylaxis was started. She experienced no lasting neurological deficits and was discharged from the hospital 1 month later, with instructions to take warfarin, clopidogrel, and aspirin as treatment for her atrial fibrillation, mechanical valve, and recent vertebral artery dissections. It was decided that the benefits of taking her anticoagulation medicine for her mechanical heart valve outweighed the risks of further intracranial hemorrhages. She had planned follow-up several times a week with the Coumadin clinic, as well as with Neurosurgery and Interventional Neurology.

## DISCUSSION

Our patient had an unusual presentation of a significant subdural hemorrhage with midline shift and associated lumbar spinal subdural hematoma and arachnoiditis presenting only as referred vaginal pain. Concurrent subdural intracranial hemorrhage and intraspinal hemorrhage is extremely rare, with only 18 reported cases in the literature (5). Even less frequent are spontaneous subdural hematomas associated with intraspinal hemorrhage (5–7).

Predisposing factors for sSDHs include trauma, coagulopathy, vascular malformation, cancer, and recent

lumbar instrumentation. They can also be spontaneous. Risk factors for intracranial hemorrhage are similar, with the addition of vasculitis and stroke. When both occur simultaneously, they could have a sequential relationship. For sSDH with concomitant subdural hematoma, one hypothesis is that intracranial blood redistributes to the dependent areas of the spinal subdural space (5,8,9). Alone, the mechanism of sSDH is unclear, as the subdural space is relatively avascular and lacks bridging veins (10). An additional theory is that rapid changes in intraabdominal and thoracic pressures create a pressure differential that causes subarachnoid vessels to rupture and extend into the subdural space (7).

Subdural intracranial and spinal hematomas commonly present with headache and back pain. However, the patient in this report had severe, referred vaginal pain as her only symptom. Spinal subdural hematomas normally present as acute, localized pain that is severe, followed by radicular pain. Concurrent neurological symptoms can include weakness, cauda equina, paraplegics, and sensory loss. In case reports of intracranial hemorrhage with associated sSDHs, the development of symptoms is usually delayed 1 to 2 weeks, consistent with the theory of intracranial blood redistribution (7,11).

MRI is central to the diagnosis of lumbar pathology and should be ordered in patients with back pain of acute onset accompanied by neurological symptoms. In the ED, it can be difficult to decide to order advanced imaging, especially in a patient presenting with back pain without obvious neurological sequelae. It is important to obtain MRI in patients that have new-onset acute severe radiating back pain, motor or sensory deficits, or have red flag symptoms such as saddle anesthesia, urinary retention, bowel or bladder incontinence, worsening night pain, fever, or a history of cancer or intravenous drug abuse. Specifically, MRI to identify sSDH should be considered in patients with nontraumatic acute back pain who are on anticoagulation or have had recent spinal or intracranial procedures. Clinical gestalt also plays an important role, as demonstrated in this case where the patient received an MRI despite having an atypical presentation with a subtherapeutic international normalized ratio.

In our patient, the MRI finding of a spinal subdural hematoma led, in part, to the diagnosis of intracranial hemorrhage. Expedient diagnosis will lead to prompt treatment of this condition. When a spontaneous spinal subdural hematoma is found on imaging, a cranial origin should be considered (6). The idea of imaging the head after discovering an sSDH is emphasized by several case reports of intracranial pathology discovered on screening imaging of a patient with an sSDH (12,13). Further case reports on patients with chronic subdural hematomas, traumatic subdural hematomas, and recent intracranial surgery presenting with back pain also

support the use of MRI to investigate spinal subdural hematoma (14–17). Conversely, in patients who present with back pain after recent intracranial hemorrhage, MRI should be ordered to rule out spinal subdural hematoma and arachnoiditis, based on the theory of redistribution of blood from the brain to the spine (18).

Treatment of spontaneous intracranial and sSDHs is usually conservative. Occasionally, surgical intervention is warranted for significant intracranial hemorrhage volumes. Matsumoto et al. defined a new MRI classification of spinal hemorrhages, noting that ventral and dorsal sSDH tend to require surgical evacuation (19). The majority of patients who undergo conservative therapy for sSDHs have a good functional outcome compared with those who undergo surgical intervention (20). However, patients who initially present with more severe neurological symptoms have a high likelihood of undergoing surgical decompression, creating bias due to patient selection. Neurological status at presentation is the best predictor of outcome; patients who had deficits on presentation tend to have a less favorable recovery (20). Patients without coagulopathy or recent spinal instrumentation or lumbar puncture had a better prognosis, although there was no association with hematoma extension and functional outcome (2). The presence of concurrent subarachnoid hemorrhage has not been found to be associated with outcome (20).

### WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?

This is a report of an interesting and rare diagnosis of intracranial and lumbar subdural hematoma presenting as vaginal and perineal pain. It is important for health care providers to suspect spontaneous intraspinal hematoma as a cause of acute back or radiating perineal pain. The risk of spontaneous intraspinal hematoma resulting from possible intracranial pathology is increased in patients taking anticoagulant medications. A diagnosis of lumbar subdural hematoma should prompt the provider to inquire about symptoms of intracranial pathology and to consider head imaging. However, a broad differential diagnosis should still be considered for nontraumatic headache and backaches, given the rarity of spontaneous intracranial and intraspinal hemorrhages. What signals inclusion of this combination in the differential diagnosis, compared with less worrisome pathology, is an acute neurological change with no readily identifiable cause.

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