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CASE REPORT

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Who watches the WATCHMAN? A rare case of lower extremity paralysis

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Abstract

We present a case study involving an elderly patient who experienced dislodgement of a recently implanted WATCHMAN device. Initially, the patient exhibited multiple musculoskeletal symptoms, which raised concerns about alternative causes such as cauda equina syndrome or spinal epidural hematoma. Despite vascular surgery removing the device, the patient's condition deteriorated due to ischemia leading to multisystem organ failure. This case highlights the critical need for emergency physicians to promptly diagnose acute aortic obstruction caused by embolization, given the increasing use of the WATCHMAN device in the aging population to reduce the reliance on anticoagulation. The potential for significant ischemic consequences necessitates immediate intervention to mitigate complications.

KEYWORDS
aortic embolization, aortic occlusion, left atrial appendage closure device, lower extremity paralysis, watchman, watchman embolization

1 | INTRODUCTION

The differential for bilateral lower extremity paralysis is broad and can be divided into neuromuscular and non-neuromuscular causes. Several factors such as pain, physical exam findings, timing of onset, and vital signs can be used for differentiation. When evaluating back pain and hypertension accompanied by neurological dysfunction, clinicians often consider aortic dissection. However, less commonly considered is embolization within the aorta leading to occlusion. With the recent advent of the WATCHMAN device, which has emerged as an increasingly common tool used to remove the need for anticoagulation in atrial fibrillation, aortic embolization should become a consideration for emergency physicians.[1] The WATCHMAN is a left atrial appendage closure device, which has shown utility in patients who are poor candidates for lifelong anticoagulation use due to increased risk of bleeding with regard to stroke prevention.[2] What follows is discussion of a case of lower extremity paralysis in a patient with recent WATCHMAN device placement, who suffered embolization of the device to the abdominal aorta requiring emergent surgical retrieval.

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2 | CASE REPORT

A 72-year-old male presented to the emergency department (ED) via emergency medical services after experiencing sudden lower back pain and bilateral paralysis in his lower extremities. The symptoms occurred several minutes after he attempted to start a gas-powered leaf blower using a pull cord. He reported that he was able to walk approximately 20 feet following the incident but subsequently had been unable to ambulate or regain sensation in his bilateral lower extremities. Upon arrival to the ED, the patient complained of significant pain around the

level of L3/L4. He was hypertensive with an initial blood pressure of 194/82 and a heart rate of 75. He exhibited full strength of his bilateral upper extremities; however, he had complete loss of strength of bilateral lower extremities with loss of sensation to light touch up to the proximal thigh and loss of temperature and pain from the level of the midthigh down. Additionally, the patient had loss of rectal tone. Importantly, his lower extremities were observed to be mildly cool but without significantly decreased pulses or any display of pronounced temperature change or pallor. His past medical history was notable for atrial fibrillation, chronic kidney disease, and hypertension. Notably, he had recently undergone left atrial appendage closure device implantation 11 days before presentation, to assist in management of his long-standing atrial fibrillation.

Given his mechanism of injury and concerning neurologic examination, a magnetic resonance image (MRI) of the lumbar spine was obtained and revealed only mild chronic changes without spinal cord impingement. The orthopedic spine team was consulted and advised obtaining an MRI of the thoracic spine based on the patient's presentation. MRI of the thoracic spine exhibited only mild degenerative changes with no apparent explanation for the patient's significant neurologic symptoms.

Given the negative spinal imaging, a vascular etiology was explored. A chest/abdomen computed tomography (CT) angiography revealed an atypical foreign object within the distal aorta with an associated distal filling defect. The patient was adamant about his lack of any previous aortic surgeries. After review with radiology, it was deemed that the patient's recently implanted left atrial appendage closure device had likely become dislodged and had embolized to the midabdominal aorta at the level of the renal artery origins (Figure 1A and B). This was nearly occluding the abdominal aorta with severely diminished contrast flow into the bilateral kidneys. There was also occlusion of the proximal superior mesenteric artery and proximal left external iliac artery. Vascular surgery was consulted, and a heparin drip was initiated. He was emergently brought to the operating room for attempted endovascular removal of the left atrial appendage closure device. Given the location of the device, the procedure transitioned to a laparotomy in the operating room. Despite removal of the device, the patient's condition deteriorated over the next several days due to multisystem organ failure caused by ischemia resulting from the previous embolization. As a result, the family opted to transition the patient to comfort care measures.

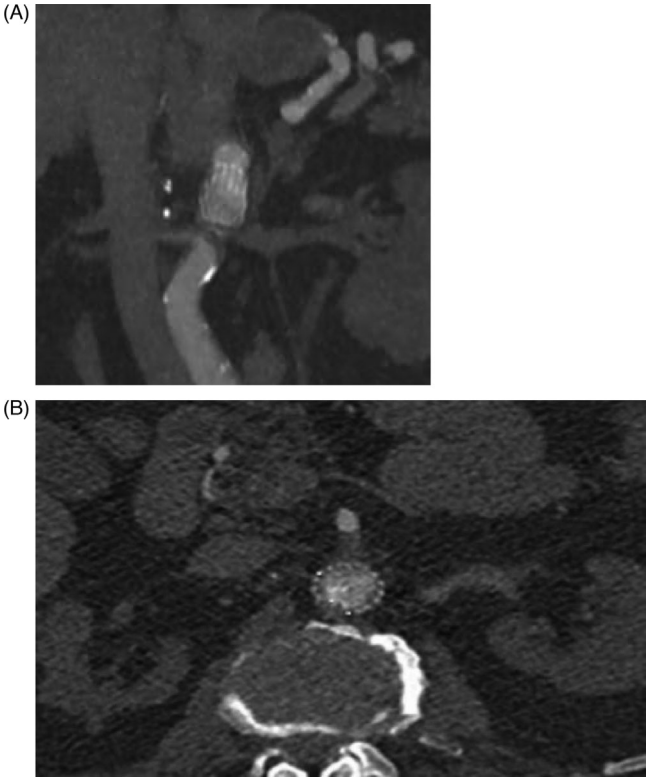

FIGURE 1 Images from the computed tomography angiogram of the chest and abdomen. (A) Coronal view and (B) Axial view.

3 | DISCUSSION

This case highlights the urgent need for prompt diagnosis and identification of an embolized left atrial appendage closure device, as demonstrated by the considerable ischemia resulting from the event. Several case reports have discussed dislodgement of a left atrial appendage closure device postoperatively with the left ventricle being the most common site of embolization.[3,4] The Manufacturer and User Facility Device Experience (MAUDE) is an online database of voluntarily reported adverse events involving medical devices sent to the Food and Drug Administration.[5] An analysis of the MAUDE database performed by Ledesma et al. showed that the overall adverse event rate of WATCHMAN placement is 7.3% with the incidence of device embolization at 0.3% and the most frequently cited locations being the descending aorta ($n = 35$), left ventricle ($n = 28$), and the mitral valve ($n = 18$). Further distal embolization has occurred and includes 1 case of embolization to the aorta below the level of the renal arteries, 1 case at the level of the mesentery, and 1 suprarenal displacement.[6] Device embolization has been found to occur initially in the periprocedural period with late embolism being less common.[2] Although less common, late embolism, defined as >24 hours post-op, carries a 2-fold higher risk of significant adverse events, as is the case of the previously described patient.[7] When rapid evaluation of a potentially dislodged device is necessary in the ED, a 2-view chest x-ray is likely to be the most efficient initial imaging modality for confirmation of continued proper placement.[8] On further review of the case, a 1-view chest x-ray had been obtained, but the left atrial appendage closure device was not visualized as it had embolized. Point-of-care transthoracic echocardiogram may prove challenging to view the left atrial appendage closure device, given the positioning within the left atrium, and transesophageal echocardiogram may be necessary.[9]

When individuals experience back pain accompanied by impaired function in their lower extremities, emergency physicians may tend to focus on a neurosurgical cause, particularly if there is a possibility of a traumatic injury. Nonetheless, specific symptoms like skin mottling,

reduced temperature in the distal extremities, weakened pedal pulses, and a previous surgical history involving a left atrial appendage closure device should raise concerns regarding a vascular cause. It should be noted, that even with the knowledge of the dislodged device into the aorta on CT imaging, the vascular surgery team did not note any evidence of mottling within the lower extremities. The lack of obvious exam findings, including mottling or diminished pulses represents a diagnostic challenge, as the presentation is likely to vary in comparison to acute limb ischemia, more commonly resulting from in situ thrombosis. To our knowledge, this is the first ever case of an embolized device leading to sudden onset bilateral lower extremity paralysis.

On review, the significant learning points include the importance of early consideration for aortic imaging in a patient who presents with new, sudden onset neurologic findings in association with back pain, as well as revisiting the differential when initial testing is inconclusive or otherwise reveals unexpected results. Although left atrial appendage closure devices can offer advantages to individuals who are unsuitable for anticoagulation therapy in cases of atrial fibrillation and has demonstrated its safety, it is crucial for emergency physicians to be aware of the occurrence of rare complications.

AUTHOR CONTRIBUTIONS

All authors contributed significantly to preparation of this report.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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