Oncology

Lumbar Artery Pseudoaneurysm: A Complication of Percutaneous Nephrostomy

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A B S T R A C T

A 21-year-old male underwent nephrostomy tube insertion for hydronephrosis due to a large para-aortic adenopathy of a testicular tumor. In order to reduce infections during chemotherapy, a ureteral stent was placed. While removing the nephrostomy tube, a pulsatile bleeding was found and a renal angiography was done. A pseudoaneurysm of his first left lumbar (L1) artery communicating with the nephrostomy’s access site was found. An embolization was performed with coils in the left L1 artery and one of its subdivisions. Post-embolization controls revealed no bleeding. On the follow-up CT, there were no suspicious retroperitoneal mass.

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Introduction

Nephrostomy tube placement is a safe procedure, with relatively low complication rates. Complications include hemorrhage (from arteriovenous fistula, pseudoaneurysm or arterial lacerations), infection, lesions to adjacent organs. In cases of pseudoaneurysm, hemorrhage may be severe, making prompt diagnosis and management mandatory. We present a case of a lumbar artery pseudoaneurysm, which is a very rare complication with only a few cases documented in medical literature.

Case report

A 21-year-old Caucasian male, presented to the emergency department for abdominal pain. Computed tomography (CT) of the abdomen revealed left hydronephrosis due to a 13 cm para-aortic mass (Fig. 1). Serum hCG and LDH were elevated, and ultrasound revealed a left testicular mass. The orchidectomy specimen revealed fibrosis, compatible with a burnt-out primary testicular tumor, with immunohistochemical clues leading to probable non-seminomatous germ cell origin.

An 8-French (Fr) nephrostomy tube was installed initially to relieve pain caused by hydronephrosis. The procedure was performed by an interventional radiologist, under ultrasonographic and fluoroscopic guidance. Before initiation of chemotherapy, the nephrostomy tube was scheduled to be replaced by an antegrade ureteral stent, to reduce risk of upper urinary tract infection.

Under fluoroscopic guidance, the nephrostomy tube was removed over a guidewire, initiating a spontaneous arterial bleed at the orifice of the tract (Video Clip 1). A 9-Fr sheath was rapidly installed over the guidewire, compressing the hemorrhage. Through the sheath, the radiologist installed an 8-Fr ureteral stent. Then, while slowly retracting the sheath over the guidewire, contrast agent was injected through the side-arm to opacify the tract, revealing filling of a pseudoaneurysm originating from an unknown artery. Selective arteriography of the left renal artery was then performed via a femoral access, revealing normal vasculature. The capsular arteries were each individually catheterized, none of which revealing the pseudoaneurysm in question. Finally, a non-selective aortogram revealed pseudoaneurysm occurring from the first left lumbar artery, located along the nephrostomy tract (Fig. 2).

Using a microcatheter, three 0.018 IDC coils (Boston Scientific, Boston, MA) were deployed proximal and distal to the pseudoaneurysm, excluding it completely. A final control was done while removing the nephrostomy tract sheath, revealing complete resolution of the pseudoaneurysm (Video Clip 2, Fig. 3). The patient returned to the ward, and his clinical evolution was favorable.

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Access to the upper urinary tract collecting system is useful for drainage in case of obstruction or for instillation of therapeutic agents or for surgery. The access can be retrograde or antegrade. Each type comes with its complications that should be promptly recognized in order to reduce morbidity.

In this case a percutaneous (antegrade) access was preferred because of its accessibility. There are many complications described in the literature: hemorrhage (acute and delayed); injury to the collecting system, viscera or pleura; physiologic, metabolic, neurologic and musculoskeletal complications; postoperative fever and sepsis; venous thromboembolism; tube dislodgement; obstruction to collecting system; loss of renal function and death.

We will discuss about delayed hemorrhage which can be secondary to arteriovenous fistulas or arterial pseudoaneurysms or arterial lacerations. All the arteries on the access tract can be injured. Arterial pseudoaneurysms are intermittent bleeding and are more common than arteriovenous fistulas (AVF).

AVF occur when a paired set of artery and vein is injured leading to the entry of the arterial blood in the venous system. The pressure of the arterial system cannot be sustained by the venous system so the latter ruptures. AVF presents with a continuous bleeding. When an artery is injured, clots off at variable intervals and the intermittently ruptures; this is a classic picture of an arterial pseudoaneurysm.

There are five paired lumbar arteries supplying left and right sides of the body from the infrarenal abdominal aorta to the aorta bifurcation in common iliac arteries. They contribute to the vascular supply of the spinal cord and the abdominal wall posteriorly. Injuries to lumbar arteries and their ramifications are extremely rare complications of retroperitoneal surgeries like spinal or urologic surgeries.

There are many cases in the literature review that describe these injuries secondary to spinal fusion or instrumentation,\(^1\) to abdominal trauma,\(^2\) to invasive diagnostic and treatment procedures\(^3,4\) (ureteroscopy, vertebral biopsy, percutaneous nephrolithotomy). Delayed hemorrhage accounts for 1% of complications secondary to major percutaneous procedures. El Tayeb et al\(^5\) recently published a review of 3338 percutaneous nephrolithotomy (PNL) from 2792 patients. They reported 0.48% of kidneys requiring angiembolization, among which there were no lumbar artery injury. Srivastava et al retrospectively analyzed 1854 patients who underwent PNL and 27 of these patients (1.4%) underwent angiography and subsequent embolization. Among these 27, 1 had a lumbar artery injury and the others had pseudoaneurysms, arteriovenous fistulae and some even had both.

**Discussion**

**Figure 1.** Contrast-enhanced CT scan of the abdomen and pelvis showing a left retroperitoneal mass and left hydronephrosis.

**Figure 2.** Subtraction angiography showing a bleeding from the first left lumbar artery pseudoaneurysm.

**Figure 3.** Arteriography after the pseudoaneurysm embolization showing the coils and both collecting systems.
It is important to promptly recognize this type of complication before it’s too late so that the morbidity and mortality after these relatively common and safe procedures. The management starts with the recognition follow by diagnostic and supportive measures and definitive treatment.

Figures: Mass, hydronephrosis, arteriography, embolization, post-embolization with coils.

Video Clips: Pulsatile bleeding from nephrostomy access and post-embolization nephrostomy access.

Conclusion

We present the first case of lumbar artery pseudoaneurysm after a PCN, in a 21 year old male. PCN is a safe and common radiologic technique that comes with complications which can be appropriately managed when high clinical suspicion is present and then reduced the morbidity related to this procedure.

Conflict of interest

There is no conflict of interest.

Supplementary data

Supplementary video related to this article can be found at http://dx.doi.org/10.1016/j.eucr.2016.08.015.

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