Management of Ureteroiliac Artery Fistula

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ABSTRACT

We present a case of ureteroiliac artery fistula in a patient with a history of malignant extrinsic ureteral obstruction and prior pelvic radiation therapy. Successful angiographic diagnosis and endovascular treatment were performed in this patient. High index of suspicion is critical to diagnosis of this condition.

KEYWORDS: Ureteroiliac artery fistula, stent

Objectives: Upon completion of this article, the reader should be aware of ureteroiliac artery fistula, its causes, and the role of interventional radiology in the diagnosis and treatment of this condition.

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Ureteroiliac artery fistula is an uncommon complication of pelvic surgery or radiation. We present a case of ureteroiliac artery fistula in a patient with a history of malignant extrinsic ureteral obstruction and prior pelvic radiation therapy. Successful angiographic diagnosis and endovascular treatment in this patient spur discussion of the management options for this condition.

CASE REPORT

A 62-year-old man with history of malignant extrinsic left ureteral obstruction secondary to metastatic colon cancer was managed with indwelling ureteral stents for 2 years, and he presented for routine ureteral stent exchange. The patient had undergone excision of a recurrent pelvic mass with intraoperative radiation therapy 3 years earlier. When the indwelling ureteral stent was removed, a large amount of pulsatile bright red blood was expelled from the left ureteral orifice, requiring bladder irrigation to improve visibility. The ureteral stent was quickly replaced to tamponade any bleeding source, and fluoroscopy confirmed proper positioning of

the stent. The patient remained hemodynamically stable throughout the procedure.

For further evaluation, emergent diagnostic catheter angiography was performed, and it demonstrated irregular narrowing of the left common iliac artery with a subtle area of contrast extravasation overlying the ureteral stent (Fig. 1). Given the endoscopic findings, this was thought to be diagnostic of an ureteroiliac artery fistula. Endovascular therapy was elected. As such, the left internal iliac artery was selected with a 5F SOS catheter (AngioDynamics, Queensbury, NY). Six 8 × 4 mm 0.018-inch Tornado coils (Cook, Bloomington, IN) and three 6 × 3 mm 0.018-inch Tornado coils were then deployed in the left internal iliac artery at the level of the anterior and posterior division. Two overlapping Atrium iCAST stent grafts (Atrium Medical, Hudson, NH) measuring 8 mm × 6 cm and 9 mm × 4 cm were deployed across the internal iliac artery and into the proximal external iliac artery. A left common iliac angiogram was repeated and demonstrated no further contrast extravasation (Fig. 2).

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Figure 1 Left iliac artery angiogram shows subtle area of suspected contrast extravasation overlying ureteral stent (arrow).

Following the procedure, the patient remained hemodynamically stable, and no further episodes of hematuria occurred. The ureteral stent was subsequently removed, and the patient's ureteral obstruction has been since managed with percutaneous nephrostomy.

DISCUSSION

Ureteroiliac artery fistula is rare, with < 70 cases reported in the world literature.¹ Primary fistulas are less common than secondary fistulas. Common primary causes include aortoiliac aneurysm and arteriovenous malformation. Secondary fistulas are often due to pelvic surgery with radiation or vascular reconstruction. In addition, there are single case reports of ureteroiliac artery fistula after renal transplantation and repair of ureteropelvic junction obstruction.² A majority of patients have prolonged ureteral stenting or catheterization.¹ We previously reported two patients with ureteroiliac artery fistulas: One patient had undergone resection of a uterine leiomyosarcoma with postoperative radiation therapy, and the other had a previous Dacron aortobifemoral bypass graft for aortoiliac occlusive disease.³

A high index of suspicion is the key to diagnosis of ureteroiliac artery fistula.¹ Presenting symptoms range from microscopic to life-threatening hematuria.³ Pulsatile bleeding from the ureteral orifice may be discovered during cystoscopy or removal of an indwelling ureteral stent. Diagnostic angiography should be performed in hemodynamically stable patients but is negative in a majority of cases.^{2,3} So-called provocative angiography, during which a ureteral catheter or stent is moved to help demonstrate bleeding, has been described, but this

Figure 2 Post-treatment angiogram following successful coil embolization and stent graft placement.

maneuver may exacerbate bleeding and should only be performed with appropriate surgical backup immediately available.³

Historically, ureteroiliac artery fistulas were treated with open surgery, including genitourinary and/or vascular reconstruction. In recent years, endovascular embolization, bypass grafts, or covered stent grafts have been used with equivalent success, sparing the patient an invasive procedure.² A collaborative treatment approach among urologists, vascular surgeons, and interventional radiologists, with the goal of treating the fistula and achieving hemodynamic stability while preserving the renal unit, should be utilized whenever possible.³

CONCLUSION

Ureteroiliac artery fistula is a rare but serious condition. A high index of suspicion based on clinical history and a prompt collaborative effort between clinical services are important for efficient diagnosis and treatment of this condition.

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