

# Ureteral-Arterial-Enteric Fistula As A Complication Of Indwelling Ureteral Stents

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## Abstract

Since the first double-J stent by Finney in 1978, ureteral stents have been a safe and effective way to maintain ureteral patency in various benign and malignant conditions.<sup>1</sup> Common early complications include stent discomfort, irritative bladder symptoms, hematuria, urinary tract infections and flank pain. Late complications include encrustation, breakage, migration and hydronephrosis. A more serious and life threatening complication, although much less common, is erosion into a major vessel resulting in life threatening hemorrhage. There have been several reported cases of ureteral-enteric and ureteral-arterial fistulas and its management. We report a ureteral-arterial-enteric fistula as a complication of chronic indwelling double-J ureteral stents.

## CASE REPORT

A 59-year-old female with a history of cervical carcinoma underwent a radical hysterectomy followed by external beam radiation to the pelvis. She did well for two years but then developed bowel obstruction secondary to metastasis to the colon and required a left hemicolectomy and Hartman's pouch colostomy. Six months later, she presented in acute renal failure with an elevated creatinine of 2.5 mg/dl (normal 0.6-1.2 mg/dl) and bilateral hydronephrosis believed to be secondary retroperitoneal fibrosis from pelvic radiation or recurrent disease. A right ureteral stent was placed retrograde and a left stent was placed antegrade by interventional radiology with normalization of renal functions. Stent changes at three monthly intervals were performed by interventional radiology for one year. During this time, she maintained a stable creatinine of 1.2-1.4 mg/dl but had reported periodic episodes of painless gross hematuria following stent changes, which was attributed to instrumentation.

Subsequently, she developed acute onset of painless gross hematuria and bleeding from her Hartman's pouch. Upon admission, she had a hematocrit of 15% (normal 42-50%) and a creatinine of 1.3mg/dl. Following multiple transfusions, urgent cystoscopic and colonoscopic evaluation was performed. Cystoscopy revealed no active bleeding from the ureteral orifices or stents. Endoscopic evaluation of the pouch revealed a segment of the ureteral stent extruding into the lumen of the pouch. A Hartman's pouchogram

revealed a small bowel fistula but no obvious communication with the ureter or vasculature and radiological studies of the renal units showed no abnormalities. The source of bleeding could not be identified. She stabilized over the next ten days during which time she underwent an exploratory laparotomy and lysis of adhesions for a small bowel obstruction. She tolerated this well but recurrent bleeding ensued and an emergent arteriogram revealed a right external iliac artery pseudoaneurysm communicating with the right ureter and Hartman's pouch. She then underwent exploratory laparotomy, resection of the Hartman's pouch, ligation of the right external iliac artery with left to right femoral to femoral artery bypass and right ureteral stent placement. She had a complicated post-operative course involving prolonged intubation and a wound infection but now remains with stable renal functions and with out any vascular sequelae to the lower limbs.

Arteriography demonstrates communication between the right common iliac artery, right ureter, and Hartman's pouch. A, Right ureter with ureteral stent and arteriogram catheter. B, Fistula complex. C, Right common iliac artery with arteriogram catheter. D, Right ureteral stent with Hartman's pouch adjacent. E, Left ureteral stent.

Close up of arteriography demonstrating communication between the right common iliac artery, right ureter, and Hartman's pouch. A, Right ureter with ureteral stent and arteriogram catheter. B, Hartman's pouch with contrast.

Arrow, Fistula complex.

### **DISCUSSION**

Ureteral stents are an invaluable tool for urologists in the management of extrinsic ureteral obstructions from advanced abdominal and pelvic malignancies or retroperitoneal fibrosis secondary to radiation. In most patients, it has avoided the use of percutaneous nephrostomies with all its attendant morbidity and loss of quality of life. The majority of complications associated with indwelling ureteral stents, such as infection, stone formation, and migration, are easily managed. Fistula formation as a complication of an indwelling ureteral stent is uncommon and is associated with prior pelvic surgery, radiation or after vascular surgery with synthetic grafting.<sup>2</sup> Intermittent, severe hematuria that is worse with increased activity or massive bright red hemorrhage occurring in patients with the above risk factors should immediately raise the suspicion of a uretero-arterial fistula. Diagnosis can be confirmed with standard angiography or provocative angiography (arteriography combined with ureteral manipulation) if the

standard angiography is inconclusive.<sup>3</sup> The presence of any of the risk factors listed above in conjunction with intermittent hematuria should raise our clinical suspicion of a ureteral-arterial fistula that should be immediately evaluated to ensure a safe outcome.

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