Endovascular Treatment for an Iliac Artery–Ureteral Fistula with a Covered Stent

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Iliac artery–ureteral fistula (IAUF) is a rare entity that has a potential risk of life-threatening hemorrhage. It is difficult to diagnose and treat appropriately. Conventional treatment for the disease consists of surgical ligation and vascular reconstruction or coil embolization. Surgical treatment is usually difficult for patients with several risk factors. In recent years, endovascular stent-graft treatment for iliac artery pseudoaneurysm has been reported. The present report describes two cases in which endovascular covered stent-graft treatment was successfully applied to treat IAUF, with good clinical outcomes.

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Abbreviations: IAUF = iliac artery–ureteral fistula, PTFE = polytetrafluoroethylene

ILIAC artery–ureteral fistula (IAUF) is a rare entity that has a potential risk of life-threatening hemorrhage and is difficult to diagnose and treat appropriately (1–4). Clinical presentation is variable, ranging from microscopic or intermittent hematuria to life-threatening hematuria (1–4). Even if IAUF is suspected, radiographic confirmation can be difficult. Conventional treatment of this disease involves simple exclusion or ligation of the involved vessel (1,5). However, direct operative repair of the vessel involved is associated with a high mortality rate, particularly among high-risk groups such as older patients or those with a history of multiple surgical procedures.

In recent years, endovascular stent-graft treatment has been proposed as an alternative method of treatment for various arterial diseases. This technology has been used to treat a wide variety of lesions, including thoracic (6) and abdominal aneurysms (7), traumatic pseudoaneurysm (8), arteriovenous fistula (8), atherosclerotic occlusive disease (9), and IAUF (10–16).

The present article describes two patients with IAUF who were successfully treated with a self-expandable stent covered with expanded polytetrafluoroethylene (PTFE). These patients each experienced a good midterm clinical course.

CASE REPORTS

Case 1

A 78-year-old man had undergone radical cystectomy and bilateral ureterocutaneostomy for advanced bladder cancer. Tube stents had been placed in both ureters after that operation, and these were externalized through a stoma. On postoperative days 4 and 14, further operations were required for the treatment of constrictive ileus and a small leak from the intestinal suture. Thirteen months after the first operation, pulsatile bleeding occurred from the skin/ureteral fistula when the urologist attempted to exchange the tube stent in the left ureter; this was the 17th tube stent exchange. Immediately thereafter, contrast medium–enhanced helical computed tomography (CT) of the abdomen was performed. A high-density hematoma was observed in the left collecting system, but no extravasation or aneurysm was revealed. The patient was accordingly transferred to our hospital for emergent angiography.

Aortography, iliac arteriography, renal arteriography, and pelvic aortography were performed, and pelvic angiography was also performed after removal of the ureter stent over the wire; however, no abnormalities were revealed. Because the patient remained in hemodynamically stable condition and the cause of hematuria was unclear at that time, he received conservative treatment. However, bleeding recurred at every subsequent stent exchange. Two weeks after initial angiography, whole abdominal CT was repeated with a Sensation16 multidetector CT system (Siemens, Erlangen, Germany), and this successfully revealed a small pseudoaneurysm attached to the left common iliac artery and ureter (**Fig 1a**). In consideration of the existence of left pulsatile hematuria, left common iliac pseudoaneurysm with fistula formation to the left

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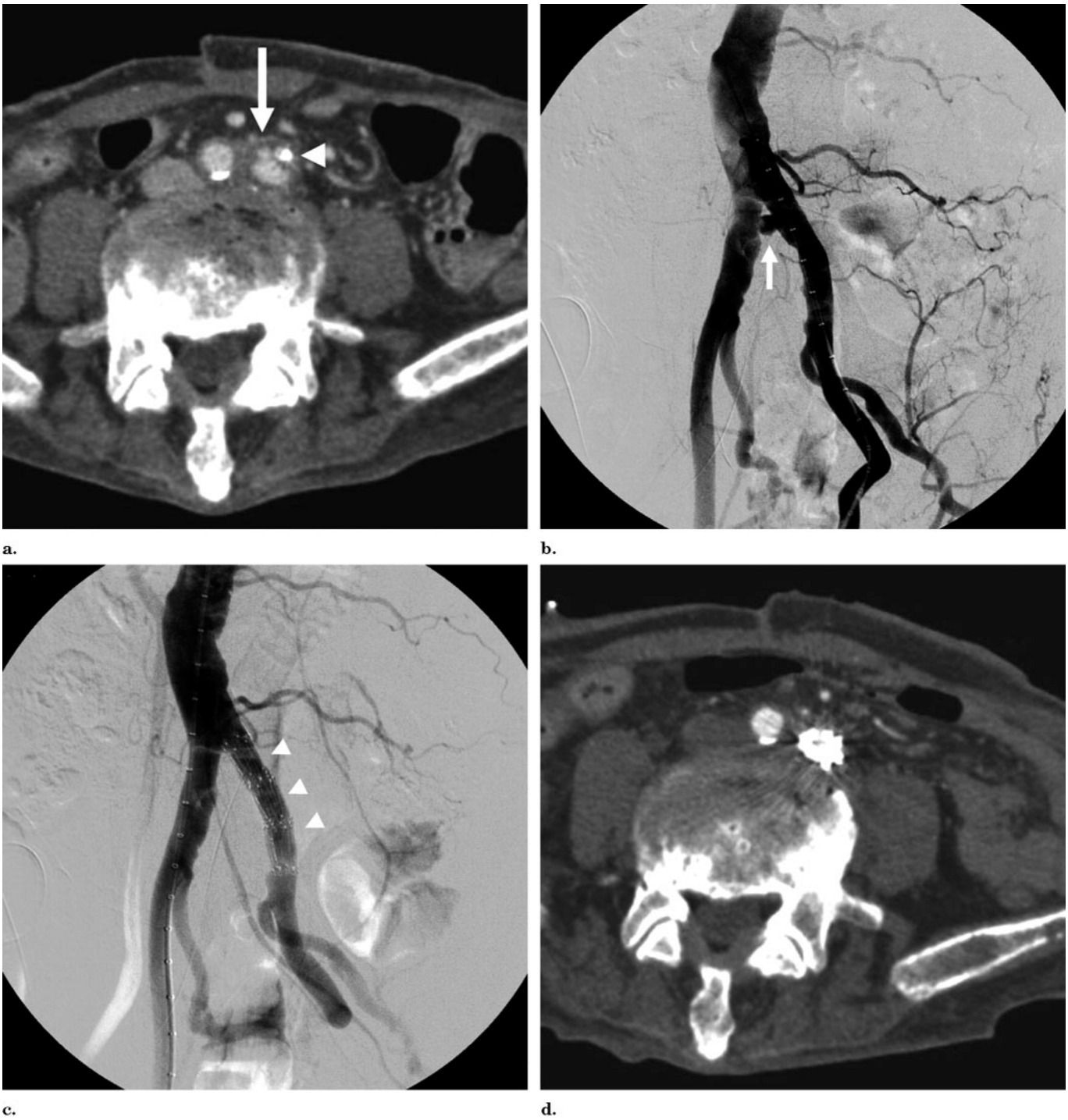

Figure 1. **(a)** CT shows a left common iliac artery pseudoaneurysm (arrow) near the ureteral stent (arrowhead). **(b)** Preprocedural angiography shows an pseudoaneurysm (arrow) originating from the left common iliac artery. **(c)** Immediately after stent-graft placement (arrowheads), complete exclusion of the pseudoaneurysm is confirmed. **(d)** Contrast medium–enhanced CT 8 days later shows no evidence of contrast material extravasation.

ureter was diagnosed. The fistula was located on the side where the ureter had been mobilized and brought over the midline to the conduit.

Laboratory testing revealed a leukocyte count of 4.3 $\times$ 10^3/dL, hemoglobin level of 8.4 g/dL, and C-reactive protein level of 1.98 mg/dL. No sign of infection was noted on urinary culture, and no fever was present. Several treatment options were discussed by the urologist, radiologist, and vas-