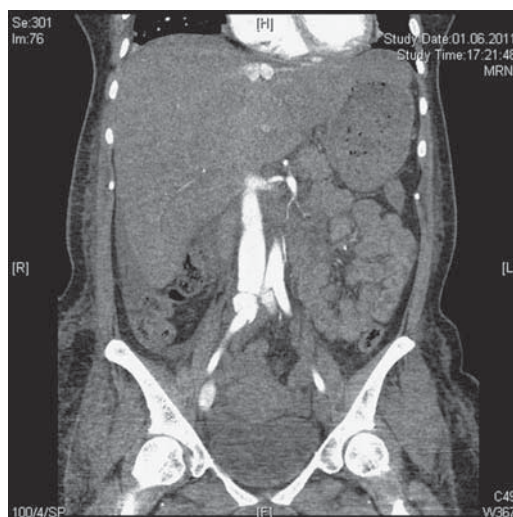


# The Case | Intractable diuretic resistance in a young woman

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**Figure 1 | The computed tomography (CT) shows that the liver is greatly enlarged; the spleen moderately so.** Fluid can be seen within the abdomen. Contrast agent can be seen in the aorta to the bifurcation. Contrast immediately fills the inferior vena cava, leaving little for the renal parenchyma and lower extremities.

A 39-year-old woman underwent laminectomy for a herniated L4/5 disc. Preoperatively, her serum chemistries and renal function were normal. During her operation, she was transiently hypotensive and postoperatively her creatinine level increased to 2.5 mg/dl. She received volume expansion, and clindamycin, and cefuroxime for presumed sepsis. Computed tomography of thorax and abdomen did not reveal an infectious focus. Her creatinine level did not fall, and she gained 20 kg with intractable oliguria despite high doses of loop diuretics. Her blood pressure was 130/90 mm Hg, heart rate was 86 beats/min, and she was dyspneic, with rales, basilar percussion dullness, and massive edema of abdomen and extremities. A systolic murmur was attributed to tricuspid insufficiency. By echocardiography, she had normal ejection fraction,

normal left atrium, an enlarged right ventricle, pulmonary artery pressure of 43 mm Hg, and a dilated inferior vena cava. Her hemoglobin level was 8.3 g/dl. Her urea concentration was 127 mg/dl, uric acid concentration was 18.7 mg/dl, and her electrolyte levels were normal. Urinalysis revealed trace protein and erythrocytes, but no casts. The urinary sodium and potassium concentrations were 11 and 24 mmol/l, respectively, osmolality was 533 mOsm/l, and uric acid concentration was at <0.20 g/l. Furosemide 160 mg twice within 4 h and xipamide 20 mg did not improve her oliguria. Computed tomography with contrast is shown (Figure 1).

## DISCLOSURE

All the authors declared no competing interests.

**What is the likely cause of this patient's diuretic resistance?**

SEE NEXT PAGE FOR ANSWERS

## The Diagnosis | Common iliac artery to common iliac vein AV fistula



**Figure 2 | Angiogram showing prompt filling of the inferior vena cava, when contrast material was injected into the distal aorta.**

The patient underwent angiography, which showed a fistula between the common iliac artery and the common iliac vein, and a covered stent was implanted to obliterate the fistula (Figure 2). The patient's kidney function improved immediately with 5 l diuresis in the first 12 h. Chemistries are given in Table 1. Seven days later, she had lost 20 kg, her uric acid and urea levels returned to normal, her creatinine level stabilized at 0.45 mg/dl, and she was discharged home.

Vascular injury is an uncommon, but not rare, complication of spinal surgery and is associated with significant consequences.<sup>1–3</sup> Congestive heart failure, secondary to a hyperkinetic circulation, can occur in systemic diseases and in arteriovenous fistulae.<sup>4</sup> Our patient had hyperkinetic heart failure that was initially not appreciated. In retrospect, the systolic murmur was related to her fistula and not to her tricuspid valve. Subsequent examinations confirmed the murmur in the right lower quadrant, which did not have a diastolic component.

The urinary sediment showed no evidence of any possible glomerular cause. Diuretic resistance and urinary indices suggested prerenal azotemia, including low urinary Na concentration, high urea concentration, and low uric acid values. A transcatheter intervention spared our patient a second major operation, although she will have to be

**Table 1 | Selected laboratory values before and after stent placement**

	Before stent	2 h after stent	12 h after stent
Na (mmol/l)	131	136	134
Cl (mmol/l)	93	94	91
K (mmol/l)	3.8	3.7	3.4
Creatinine (mg/dl)	1.45	—	0.69
Uric acid (mg/dl)	13.5	—	7.1
Urine			
UOsm (mOsm/Kg H <sub>2</sub> O)	318	284	308
UNa (mmol/l)	27	113	112
UK (mmol/l)	61	12	12

watched carefully, as iliac artery stenosis after stenting could develop.

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