Common femoral vein stent placement in a frozen abdomen causing acute limb ischemia

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ABSTRACT
A 73-year-old woman was admitted for left groin bleeding through an open wound near a fungating left inguinal mass from advanced anal carcinoma. The interventional radiology service placed left iliac vein and common femoral vein stents as there was concern for communication and involvement of the left common femoral vein with the open wound, contributing to groin hemorrhage. After the procedure, the patient developed limb ischemia related to mass effect of the stent on the left common femoral vein stent artery. She was revascularized by placement of a left common femoral vein stent artery stent. This report describes a viable option for revascularization in the rare occurrence of limb ischemia related to venous stenting. (J Vasc Surg Cases and Innovative Techniques 2017;3:63-5.)

Patients with chronic venous outflow obstruction or venous bleeding complications may receive some benefit from placement of venous stents. Herein, we report the case of femoral vein hemorrhage in the setting of a fungating labial and inguinal mass. Stent placement in the left iliac vein led to obstruction of the common femoral vein stent artery and resultant limb ischemia. Successful revascularization was achieved with stenting of the left common femoral vein stent artery.

CASE REPORT
A 73-year-old woman with a history of metastatic anal carcinoma was admitted for left groin hemorrhage and an acute drop in her hemoglobin level at the site of a fungating tumor of perianal squamous cell carcinoma. Previously, she was treated with chemotherapy and had received palliative pelvic irradiation, which had been discontinued because of an ongoing wound in her left groin and lymphedema in her left leg. Her radiation treatment targeted her left groin, pelvis, vulva, and perianal region at a low dose of 2750 cGy in 250 cGy/fraction. She was only ever able to tolerate this dose of radiation, and the oncologists were unable to be more aggressive with her radiation therapy. In addition, she had ongoing pelvic and sacral pain and required Foley catheter placement as an outpatient because of urinary retention. The oncology service thought these symptoms were related to radiation changes, resulting in necrotic lymphadenopathy and retroperitoneal fibrosis. Because of recent groin hemorrhage, the patient was evaluated by the...
Interventional radiologists, who thought that the femoral vein was the source of the bleeding as a result of communication with her groin wound on the basis of computed tomography (CT) scan findings. The decision was made to place a left distal external iliac/common femoral vein stent (Viabahn 13-mm × 5-cm stent graft; W. L. Gore & Associates, Flagstaff, Ariz) to avoid ongoing hemorrhage (Fig 1) by a 12F sheath through the left popliteal vein without further groin hemorrhage. The stent was postdilated to 12 mm with an angioplasty balloon. On completion venography, thrombus was noted in the common femoral vein, requiring AngioJet thrombectomy (AngioJet; Boston Scientific, Marlborough, Mass) and percutaneous thrombectomy of the common iliac vein through the popliteal vein. Her sheath was pulled by protocol. She was then maintained on an intravenous heparin drip. She was no longer bleeding from her left groin after venous stent placement.

Immediately after the procedure, the patient began to experience pain in her left leg, decreased sensation, and an inability to dorsiflex the foot. She had chronic cutaneous changes to her left calf, which appeared edematous and cool, with meager peripheral Doppler signals at the time of initial evaluation. CT angiography was performed, which demonstrated mass effect on the left external iliac and left common femoral arteries from the left common femoral vein stent, which was new from a prior contrast-enhanced CT study 1 month prior (Fig 2). All vessels were patent, however.

Given concern for relative ischemia to her left leg, she was heparinized and taken to the operating room. Given exophytic tumor burden and a nonhealing open, draining groin wound related to her cancer, operative left groin exploration was precluded. Arterial access was obtained through the right common iliac artery, and diagnostic arteriography was performed visualizing stenosis of the left common iliac and external iliac arteries. A Viabahn stent (7 mm × 10 cm) was placed into the left external iliac artery with improvement in arterial inflow (Fig 3). Her lower extremity compartments remained soft after revascularization, and no fasciotomies were required. Postoperatively, she had restoration of strong peripheral signals, along with regaining of sensation and ability to dorsiflex her foot. A CT scan with intravenous administration of contrast material (Fig 2) performed approximately 1 month postoperatively demonstrated indenting of the venous stent by the arterial one, further suggesting an element of compression by the venous stent.

The patient gave consent for the publication of this report.

**DISCUSSION**

Acute limb ischemia as the result of arterial compression from placement of a venous stent is an unusual complication. This is the first report of this situation in the literature. In general, use of venous stents is not frequent and typically indicated in situations of venous outflow obstruction related to hemodialysis access or with complicated iliofemoral deep venous thrombosis. Nitinol stents ( Gore Viabahn stents in particular) exhibit radial force on the vessel wall, preventing endoleak and maintaining vessel patency. Stents, however, tend to demonstrate relatively malleable and flexible features. As such, it is unusual for these stents to have significant radial force to cause mass effect on surrounding structures, including arteries. In this particular case, this patient had some degree of adjacent tumor burden and had previously undergone pelvic irradiation. Both of these factors led to a confined space and likely perivascular fibrosis and microvascular changes. Placement of a stent under these circumstances then had the ability to exert mass effect on the adjacent artery, resulting in limb ischemia. In addition, any stent oversizing may have exacerbated symptoms, leading to additional radial force on the adjacent artery. It was likely that stent oversizing contributed to excessive radial force in this case.
circumstance as the external iliac/common femoral vein measured 7.4 mm before placement of a 13-mm stent. In addition, there may have been underlying arterial injury from radiation exposure that could have also contributed to this situation. This case highlights the importance of appropriate sizing of venous stents in situations in which the abdomen is frozen related to radiation therapy, tumor burden, retroperitoneal fibrosis, or the like.

CONCLUSIONS
This report highlights the potential pitfalls related to placement of venous stents, particularly in confined spaces, such as those occupied with tumor burden or prior irradiation. The potential risks and benefits of stent placement must be evaluated in these circumstances.

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