Hello, and welcome to the October 2019 edition of Vascular Disease Management. I have chosen to comment on the case report by Dr Agarwal and colleagues (including Dr Murthy and myself), on the treatment of a 90-year-old man with a chronic, non-healing venous leg ulcer. This patient had received more than 6 months of intensive, aggressive wound therapy with no improvement.

The patient was a vibrant, energetic nonagenarian who requested intervention. He noted significant bilateral lower extremity pain and substantial ulcer drainage that required multiple bandage changes each day. He was known to have total occlusion of the distal inferior vena cava at the site of a permanent filter that had been placed 8 years ago. The permanent filter was placed secondary to acute iliac deep vein thrombosis with pulmonary embolus.

His history also included occlusion of both common iliac veins. Venography that had been performed several years prior to presentation showed that the inferior vena cava (IVC) filter was deeply embedded within the wall of the IVC, preventing any consideration of filter removal.

After long discussions with the patient and his family about the potential interventional options, and their risks, including the risk of dealing with a deeply embedded filter that could not be removed, it was decided that we would proceed with an interventional attempt. Venography revealed that the iliac veins and the vena cava were occluded from the site of the filter through the iliac veins.

After a difficult wire crossing of the occluded segments, intravascular ultrasound (IVUS) showed severe iliac compression and chronic thrombus. The thrombotic areas were treated with mechanical thrombectomy to avoid the need for thrombolytic drugs with associated bleeding risk. Following mechanical thrombectomy, there were patent channels established in both iliac veins through the IVC.

These channels were dilated appropriately, as guided by the IVUS measurements, after which which Vici stents (Boston Scientific) were placed side-by-side, extending through the IVC filter and into both of the compressed iliac veins. Subsequent venography showed widely patent ilio-caval segments, which were later confirmed by IVUS. The patient's leg pain and edema were markedly diminished by the day after treatment, and his venous ulcer completely healed within 16 weeks.

I have chosen to comment on this case because venous ulceration is a common, debilitating problem that is often the result of obstruction of the iliac veins and IVC. Venous ulceration is associated with substantial pain, morbidity, and cost. Venous intervention with subsequent stenting has proven to be effective as a means of alleviating symptoms and healing ulcers, and can be performed with low risk.

In this case, the occluded IVC filter also complicated the consideration of interventional options. Until recently, most iliac stent procedures utilized the Wallstent (Boston Scientific), which was available in appropriate sizes to scaffold the iliac veins, but did not initially have an FDA indication for venous stenting. Although many patients improved dramatically with interventions utilizing these stents, and there was good patency, that woven stent had shortcomings.

Wallstents foreshorten longitudinally, as there is axial expansion that makes precise stent placement difficult during the procedure. After initial placement of the stent, which must be oversized to the vessel at the time of implantation to prevent migration of the stent, it may continue to grow axially. This axial growth may result in more foreshortening, to the point where the stent may not appropriately cover the compressive lesion.

In an effort to prevent stents from foreshortening to the point where the initial compressive lesion was identified,
interventionists often placed Wallstents several centimeters above and below the lesion, with the possible risk of jailing the contralateral iliac vein. Placing these stents in “kissing” fashion was difficult during the initial procedure, and, of course, the stents did not always remain side by side over time.

There are now several new, dedicated, nitinol venous stents that are appropriately sized for veins. These stents do not foreshorten with axial expansion, so they can be placed more accurately, and with less fear of stent foreshortening. In this case, accurate stent placement side by side through the IVC filter into the inferior vena cava was crucial to ensure the patency of the iliac veins and the vena cava.

These new, dedicated, venous stents vary in radial force, flexibility, degree of flair at the ends, available diameters, and available lengths. There are no direct, comparative studies between the stents to determine if there are patency benefits of one iteration over another. The new stents clearly can be placed more precisely initially, without fear of late foreshortening.

More long-term follow-up will be needed to determine if these nitinol stents will be subject to late stent fracture, as was seen with arterial nitinol stents. In the interim, these stents are a welcome addition to our therapeutic armamentarium of devices needed to treat venous ulceration.