

A curious case of forceps delivery in IR

Sergey Bondarev 
Scott Resnick 

ABSTRACT

Self-expanding nitinol stents are routinely used to treat left common iliac vein compression in patients with May-Thurner syndrome. On occasion these stents do not provide adequate radial force to achieve a sufficient iliac lumen. If symptoms persist and persistent iliac vein compression is noted then balloon-expandable stents may be used to provide buttressing support at the compression site. We present a case where the buttressing balloon-expandable stent is crushed and subsequently removed percutaneously prior to placement of a high radial force self-expanding stent at the compressive site.

A 38-year-old woman with May-Thurner syndrome underwent left common iliac vein self-expanding nitinol stent placement. Thirteen months later, she had recurrent symptoms due to collapse/compression of the stent (Fig. 1a) at the May-Thurner lesion. A buttressing balloon-expandable stent was placed (Fig. 1b) with symptom resolution. She again returned, two months later with recurrent left leg pain and swelling. Imaging revealed the balloon-expandable stent crushed at the May-Thurner compression site (Fig. 1c). Given the high likelihood of recurrent stent crushing with simple re-dilation of the balloon-expandable stent, plan was made to attempt stent removal.

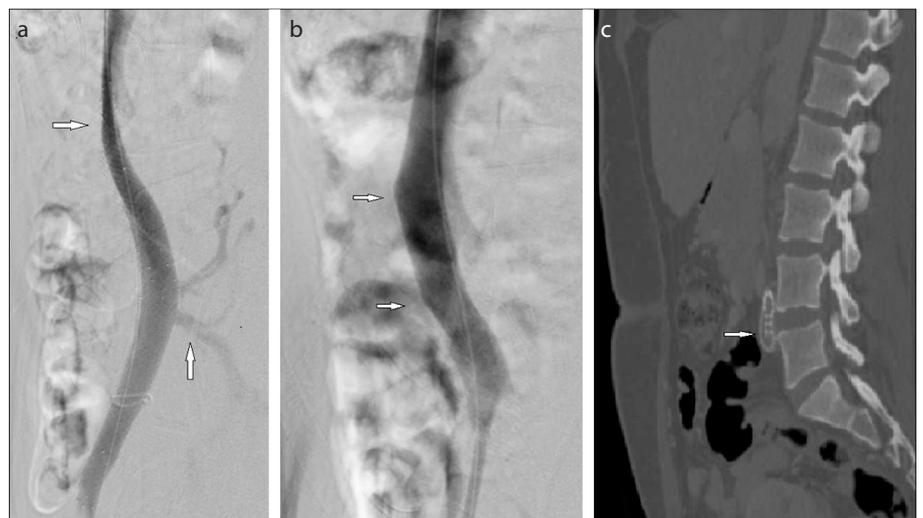


Figure 1. a–c. Lateral iliac venogram (a) shows collapse/compression of left common iliac vein stent at the May-Thurner compression site (*horizontal arrow*) and retrograde internal iliac vein collateral flow. Repeat lateral venogram (b) following buttressing balloon-expandable stent in the left common iliac vein (*white arrows*) show lesion resolution and absence of previously noted internal iliac vein collateral perfusion. Sagittal pelvic CT reconstruction (c) shows crushed balloon-expandable stent within the existing self-expanding stent (*arrow*) at the May-Thurner location.

From the Department of Radiology (S.B.), Rosalind Franklin University Chicago School of Medicine, Chicago, USA; Department of Interventional Radiology (S.R. ✉ sresnick@northwestern.edu), Northwestern University McGaw Medical Center, Chicago, USA.

Received 27 September 2018; accepted 10 October 2018.

Published online 13 March 2019.

DOI 10.5152/dir.2019.18169

You may cite this article as: Bondarev S, Resnick S. A curious case of forceps delivery in IR. *Diagn Interv Radiol* 2019; 25:242-244.

Technique

Following informed consent, and despite attempts, the crushed stent could not be engaged with a snare. Endobronchial forceps (1, 2) were then used to grasp the stent (Fig. 2a), which fractured at the May-Thurner compression site during withdrawal. This grasped fragment was removed uneventfully through a 12 French (F) femoral sheath. The remaining portion of the stent was then re-engaged and retracted with forceps, but would not readily enter either the original 12 F or subsequent 16 F sheath due to the bulky crushed stent configuration (Fig. 2b). Both a snare drawn tight around the engaged stent fragment as well as an angioplasty balloon inflated adjacent the stent were used to further compress the stent profile, (Fig. 2c) with subsequent successful retrieval via the 16 F sheath (Fig. 3). The residual May-Thurner lesion was then treated with a self-expanding Cook-Z stent buttressing the original collapsed self-expanding nitinol stent, with symptom resolution. Imaging follow-up through 17 months demonstrates a patent reconstruction, and the patient remains asymptomatic.

Discussion

Self-expanding stents combined with balloon angioplasty are the standard devices used for May-Thurner compressive lesion treatment and resolution. On occasion, self-expanding stents do not possess enough outward radial force in order to durably prevent May-Thurner lesion recoil and recurrent/persistent symptomatic obstruction. Balloon-expandable stents possess substantial hoop strength and may be used to buttress lesions previously treated with

Main points

- In the setting of a venous compression syndrome use of balloon-expandable stents may result in stent collapse/compression.
- Balloon-expandable stents can be successfully extracted from the vascular system following significant time from initial placement.
- Endobronchial biopsy forceps can be useful in extracting firmly implanted material from the vascular system.
- When standard self-expanding stents do not provide adequate support for compressive lesion resolution, use of a high radial force self-expanding stent may be preferred over use of a balloon-expandable stent.

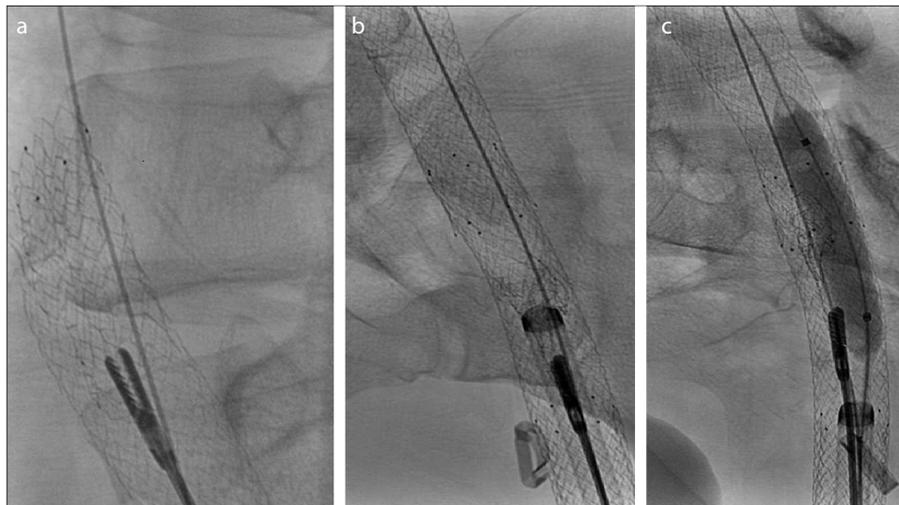


Figure 2. a–c. Intraprocedural oblique image (a) shows endobronchial forceps grasping balloon-expandable stent. Intraprocedural oblique image (b) shows bulky crushed stent engaged by forceps will not enter sheath lumen due to large diameter and irregular configuration. Intraprocedural oblique image (c) shows angioplasty balloon inflated adjacent the stent to compress and lower stent profile.



Figure 3. Retrieved stent fragments.

self-expanding stent placement wherein lesion recoil has occurred. Despite substantial hoop strength, balloon-expandable stents are subject to compressive collapse (crushing) in high-force compressive lesions. We have previously utilized buttressing balloon-expandable stents to correct self-expanding nitinol stent compression, without

subsequent stent crushing. Although technically challenging, a crushed balloon-expandable stent may be safely extracted long after placement using advanced techniques.

Conflict of interest disclosure

The authors declared no conflicts of interest.

References

1. Stavropoulos SW, Ge BH, Mondschein JJ, Shlansky-Goldberg RD, Sudheendra D, Trerotola SO. Retrieval of tip-embedded inferior vena cava filters by using the endobronchial forceps technique: experience at a single institution. *Radiology* 2015; 275:900–907. [\[CrossRef\]](#)
2. Kremens K. Removal of endobronchially placed vascular self-expandable metallic stent using flexible bronchoscopy. *WMJ*. 2016; 115:93–95.