

# Gianturco Z-stent vena cava stenting potential complications in oncology

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## Dear Editor

Further to the paper entitled “Gianturco Z-stent placement for the treatment of chronic central venous occlusive disease: implantation of 208 stents in 137 symptomatic patients,”<sup>1</sup> we congratulate the authors and would like to make further comments. This largest series ever published regarding self-expandable metallic Z-stent placement to treat superior (SVC, 21.2%) and inferior vena cava (IVC, 59.6%) occlusion reports a 97.1% technical success rate, 82.1% estimated primary stent patency rate at 5 years, a 1.5% rate of stent migration to right atrium that required successful endobronchial forceps and open cardiac surgery respectively. Malignant etiology was found in 23.3% of cases, prior central line existed in 42.3%. We underline that central line indeed is an Ariadne thread to catheterize SVC occlusion, thus this should not be removed before stenting attempt.<sup>2</sup>

Regarding our initial experience, we deplore two cases of 25 mm mono body Z-stent partial stent migration upstream a tight short SVC stenosis. We successfully overlapped a 30 mm double-body Z-stent on both misplaced stent and SVC stenosis. In McDevitt's report, VC stenosis diameter was reported in Table 4, but little is known about the stenosis's and stent's length;<sup>1</sup> we definitely advocate for systematic placement of double-body Z-stent placement even in short VC stenosis to prevent life-threatening stent migration.

Anatomically, pericardium encases the heart and superiorly envelops the SVC origin, ascending aorta and pulmonary trunk. As stent inflexibility may increase the radial force at stent extremity, operator should pay attention to the metallic stent barbs that can injure the SVC intima namely in angulated stenosis. As a matter of fact, life-threatening cardiac tamponade has been reported in 0.1–1.8%.<sup>3</sup>

We also experienced cases of pulmonary edema that occurred few hours after successful procedure in elderly head and neck and

lung cancer patients. The so-called overload syndrome is due to rapid increase in centripetal venous return after successful stent placement. As metallic Z-stent diameter progressively increases up to its final size within the next 24/48 hours, pressure gradient across the caval lesion continues to decrease and risk of overload syndrome may arise namely in case of poor cardiac reserve.<sup>4</sup> Patient's body weight increase reflects the third compartment; assessment of body weight and urine output variations before and after stenting is mandatory. All our VC-stenting candidates underwent echocardiography and were systematically monitored at our intensive care unit thereafter.

Over our 25-year experience of oncology VC stenting,<sup>5</sup> we regret one procedure-related lethal complication. An 86-year-old lung cancer patient underwent successful 30 mm double body Z-stent into the lower SVC. One hour after stenting, patient presented acute congestive heart failure. Clinical examination showed lethal cardiogenic shock with acute jugular vein distension. Precise diagnosis was impossible to make as patient's relatives refused post-mortem chest CT to look for stent migration/perforation.

Acute clot SVC thrombosis and massive pulmonary embolism, pericardial tamponade, and overload syndrome are rare but major complications to bear in mind before VC stenting.<sup>6</sup>

## Conflict of interest disclosure

The authors declared no conflicts of interest.

## References

- McDevitt JL, Goldman TD, Bundy JJ, et al. Gianturco Z-stent placement for the treatment of chronic central venous occlusive disease: Implantation of 208 stents in 137 symptomatic patients. *Diagn Interv Radiol.* 2021;27(1):72-78. [\[Crossref\]](#)
- El Hajjam M, Marcy PY, Lacout A, Thariat J, Lacombe P. Superior vena cava syndrome: Do not miss the Ariadne's thread. *Diagn Interv Radiol.* 2013;19(1):70-72.
- Stevens DC, Butty S, Johnson MS. Superior vena cava rupture and cardiac tamponade complicating the endovascular treatment of malignant superior vena cava syndrome: A case report and literature review. *Semin Intervent Radiol.* 2015;32(4):439-444. [\[Crossref\]](#)
- Yamagami T, Nakamura T, Kato T, Iida S, Nishimura T. Hemodynamic changes after self-expandable metallic stent therapy for vena cava syndrome. *AJR Am J Roentgenol.* 2002;178(3):635-639. [\[Crossref\]](#)
- Marcy PY, Magné N, Bentolila F, Drouillard J, Bruneton JN, Descamps B. Superior vena cava obstruction: Is stenting necessary? *Support Care Cancer.* 2001;9(2):103-107. [\[Crossref\]](#)
- Kim JH, Sunkara A, Varnado S. Management of cardiogenic shock in a cardiac intensive care unit. *Methodist Debaque Cardiovasc J.* 2020;16(1):36-42.

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