Heart, Lung and Vessels. 2015; 7(3): 263-265

Life-threatening shock due to inferior vena cava filter thrombosis

Haruhiko Higashi, Toyofumi Yoshii, Shinji Inaba, Toru Morofuji, Hiroe Morioka, Makoto Saito, Takumi Sumimoto

Department of Cardiology, Kitaishikai Hospital, Ozu, Japan

Keywords: *inferior vena cava filter, IVC filter thrombosis, shock.*

A 72-year-old man with a history of inferior vena cava (IVC) filter (TrapEaseTM, Cordis) implantation for deep venous thrombus 3 years ago was admitted to our emergency department in shock. His systolic blood pressure was 60 mmHg, and his heart rate was 112 beats/min. Marked venous congestion appeared only in his lower body (*Figure 1A*). Computed tomography showed the collapsed IVC (*Figure 1B*). To maintain his blood pressure, fluid resuscitation from upper extremity was performed. Emergency venography revealed almost total occlusion of the IVC filter with a large thrombus (*Figure 2A*). Aspiration thrombectomy with an 8-Fr right Judkins guiding catheter was performed, and large red

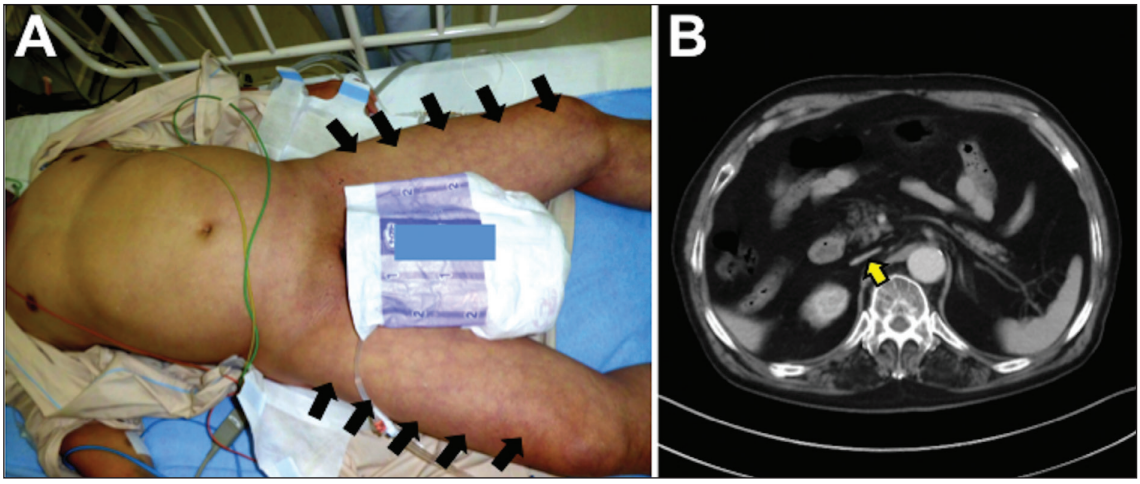

Figure 1 - *(A)Marked venous congestion (arrows) appeared only in the patient's lower body. (B) Computed tomography showing the collapsed IVC (arrow). IVC, inferior vena cava.*

Corresponding author:
Haruhiko Higashi, MD.
Department of Cardiology
Kitaishikai Hospital
2632-3 Tokunomori, Ozu, Ehime
795-8505, Japan
E-mail: hingassy@yahoo.com

thrombi were aspirated (*Figure 2C*). Adjunctive transcatheter thrombolysis with urokinase (240,000 IU) was attempted for residual thrombi. Five days after the procedure, adequate venous flow was achieved (*Figure 2B*). During 2 years of follow-up care, the patient has not experienced additional clinical events.

The IVC filter is a widely used and effective device for reduction of pulmonary embolism; however, the use of IVC filter causes the increase of deep-vein thrombosis and has no beneficial impact on long-term mortality (1, 2). Therefore, the efficacy and safety of the permanent IVC filter are still under debate.

Although deep-vein thrombosis including filter thrombosis after the IVC filter implantation is not rare, IVC filter thrombo-occlusion is a rare and potentially fatal complication. Kalva et al. reported that only 0.7% (2/270) of their patients who were implanted with TrapEase filters had near-total IVC occlusion, and none was symptomatic (3). In the present case, the patient was in shock with skin lesions on the lower body.

We speculate that these differences in the clinical presentations of IVC filter issues are due to whether IVC filter occlusion occurs suddenly or not. In acute IVC filter thrombosis, sudden fall in venous return contributes to hemodynamic deterioration, resulting in life-threatening condition.

Therefore, some cases involving acute IVC filter thrombosis will require emergent invasive treatment to maintain venous return. On the other hand, most cases in chronic IVC filter thrombosis are asymptomatic. Paton et al. suggested that chronic caval occlusion is likely the result of intimal overgrowth and slow, allowing for the development of collateral flow and therefore more likely to be asymptomatic (4). In these chronic conditions, invasive procedures to recanalize occluded IVC will be not required.

The optimal treatment strategy for acute IVC filter occlusion is not fully established. Treatment options following filter thrombosis may include transcatheter thrombolytic therapy, intravenous thrombolytic therapy, or mechanical thrombectomy (5-7).

In the present case, early diagnosis by in-

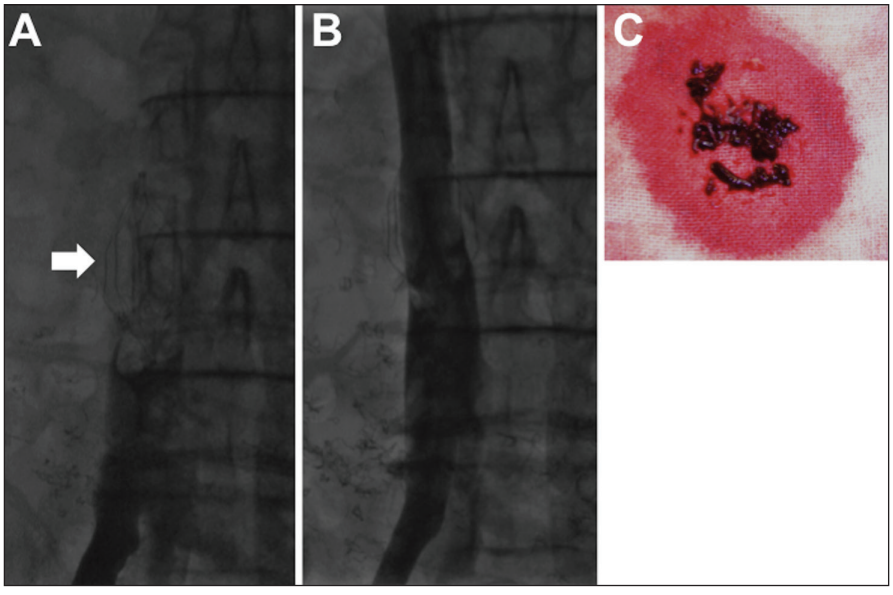

Figure 2 - *(A) Emergency venography revealed almost total occlusion of the IVC filter (arrow) with a large thrombus. (B) Follow-up venography showing complete recanalization of IVC. (C) Large red thrombi aspirated by the catheter. IVC, inferior vena cava.*

spection of the skin promoted further examination and treatment. Transcatheter thrombolysis following aspiration thromborectomy was successfully performed without complications. Further investigation is needed to clarify which strategies are most effective to treat IVC filter thrombosis.

REFERENCES

1. Decousus H, Leizorovicz A, Parent F, Page Y, Tardy B, Girard P, et al. A clinical trial of vena caval filters in the prevention of pulmonary embolism in patients with proximal deep-vein thrombosis. Prevention du Risque d'Embolie Pulmonaire par interruption Cava Study Group. N Engl J Med. 1998; 338: 409-415.
2. REPIC Study Group. Eight-year follow-up of patients with permanent vena cava filters in the prevention of pulmonary embolism: the PREPIC (Prevention du Risque d'Embolie Pulmonaire par interruption Cave) randomized study. Circulation. 2005; 112: 416-422.
3. Kalva SP, Wicky S, Waltman AC, Athanasoulis CA. TrapEase vena cava filter: experience in 751 patients. J Endovasc Ther. 2006; 13: 365-372.
4. Paton BL, Jacobs DG, Heniford BT, Kercher KW, Zerey M, Sing RF. Nine-year experience with insertion of vena cava filters in the intensive care unit. Am J Surg. 2006; 192: 795-800.
5. Tardy B, Mismetti P, Page Y, Décousus H, Da Costa A, Zeni F, et al. Symptomatic inferior vena cava filter thrombosis: clinical study of 30 consecutive cases. Eur Respir J. 1996; 9: 2012-2016.
6. Poon WL, Luk SH, Yam KY, Lee AC. Mechanical thrombectomy in inferior vena cava thrombosis after caval filter placement: a report of three cases. Cardiovasc Intervent Radiol. 2002; 25: 440-443.
7. Xiao L, Shen J, Tong JJ, Zhang Z, Mu XL, Yi ZJ, et al. Transcatheter thrombolytic therapy for symptomatic thromboocclurion of inferior vena cava filter. Exp Ther Med. 2013; 5: 533-538.

Cite this article as: Higashi H, Yoshii T, Inaba S, Morofuji T, Morioka H, Saito M, Sumimoto T. Life-threatening shock due to inferior vena cava filter thrombosis. Heart, Lung and Vessels. 2015; 7(3): 263-265.
Source of Support: Nil. **Disclosures:** None declared.