

## The “bouncing” catheter

Katarzyna Malaczynska-Rajpold<sup>1</sup>, Marcin Kurzyna<sup>2</sup>, Andrzej Koteja<sup>3</sup>,  
Adam Torbicki<sup>2</sup>, Tatiana Mularek-Kubzdela<sup>1</sup>

<sup>1</sup>1<sup>st</sup> Department of Cardiology, Poznan University of Medical Sciences, Poznan, Poland

<sup>2</sup>Department of Pulmonary Circulation and Thromboembolic Diseases, The Medical Centre  
of Postgraduate Medication, European Health Centre, Otwock, Poland

<sup>3</sup>Department of Anesthesiology and Intensive Care, European Health Centre, Otwock, Poland

Treprostnil sodium, as a prostacyclin analogue, is a specific drug used for treatment of pulmonary arterial hypertension (PAH) [1]. One way of administration — intravenous — may be provided by implantation of a subcutaneous pump (LenusPro<sup>®</sup>) in the subcostal region. It administers the drug continuously to the superior caval vein by means of a catheter inserted through the subclavian vein [2–4]. This method is generally safe and adverse events occur rarely [5].

A 38-year-old man with PAH treated with treprostnil had a LenusPro<sup>®</sup> pump (Fig. 1A, E) implanted. The chest X-ray after 2 months revealed the tip of the catheter placed in the right internal jugular vein (Fig. 1B). As the patient had been in a good clinical condition, we decided to observe it. Four months after implantation the patient reported a strong pain and swelling in the right subclavian region without significant clinical deterioration. The chest X-ray revealed the tip of the catheter below the right clavicle (Fig. 1C) — the catheter slipped out of the vascular system and the drug was being delivered into the soft tissues. Due to tissue edema, the repositioning of the catheter attempted in the implanting center was difficult and required carrying the cannula through the supraclavicular region into the right internal jugular vein (Fig. 1D). After next 2 months, while checking the position of the catheter in the fluoroscopy, we suspected another dislocation (Fig. 1F). On closer assessment in the implanting center, the cannula

was seen to be folding and straightening in the jugular vein broadened due to chronically elevated pressure (Fig. 1G, H). This time the cannula apparently remained within the vascular lumen and those moves did not result in clinical deterioration of the patient's condition during several months of follow-up. However, the residual volume in the pump had been higher than expected and finally the outflow stopped, giving an alarm. This time the patient required an urgent repositioning of the catheter, which were placed again through the proximal subclavian vein, whereas the distal part appeared to be occluded with well-developed collateral circulation.

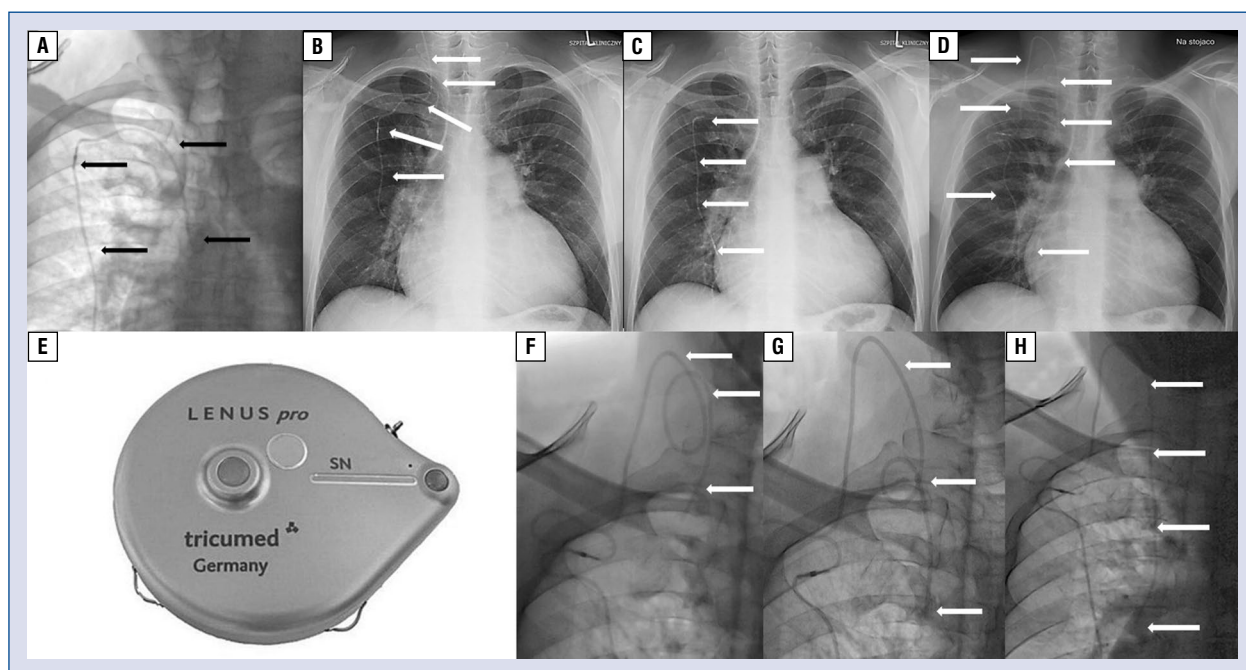
In patients with PAH and a LenusPro<sup>®</sup> pump for treprostnil infusion, there is a possibility for catheter dislocation. It is reasonable to check the position of the catheter regularly with an imaging method (i.e. chest X-ray, fluoroscopy). A strong pain in the subclavian region may suggest that the cannula is slipping out of the subclavian vein. In the presented case, such a situation required urgent repositioning of the catheter due to the pain and worse absorption of the drug from the soft tissues. An unstable position of the tip of the cannula without its slipping outside the vessel also does not appear to be benign, because one day it may result in complete wedging of the catheter with an outflow blockade.

**Conflict of interest:** None declared

**Address for correspondence:** Katarzyna Malaczynska-Rajpold, MD, PhD, 1<sup>st</sup> Department of Cardiology, Poznan University of Medical Sciences, ul. Długa 1/2, 61–848 Poznań, Poland, tel: +48 61 854 91 46, fax: +48 61 854 90 94, e-mail: [katarzyna.rajpold@gmail.com](mailto:katarzyna.rajpold@gmail.com)

Received: 17.06.2016

Accepted: 27.07.2016



**Figure 1.** A patient with pulmonary arterial hypertension and a subcutaneous pump for continuous intravenous infusion of treprostinil (E) — different configuration of the distal part of the drug administering cannula (white arrows) — dates (DD-MM): **A.** 15-04 (baseline); **B.** 10-06 (the tip in the right internal jugular vein); **C.** 10-08 (the cannula slipped out of the subclavian vein); **D.** 12-08 (after repositioning); **F.** 27-10 (a loop in right internal jugular vein); **G.** 28-10; **H.** 29-10 (spontaneous stretching of the catheter).

## References

1. Galiè N, Humbert M, Vachiery J-L et al. 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension. *Eur Heart J*, 2016; 37: 67–119. doi: [10.1093/eurheartj/ehv317](https://doi.org/10.1093/eurheartj/ehv317).
2. Desole S, Velik-Salchner C, Fraedrich G, Ewert R, Köhler CM. Subcutaneous implantation of a new intravenous pump system for prostacyclin treatment in patients with pulmonary arterial hypertension. *Heart Lung*, 2012; 41: 599–605. doi: [10.1016/j.hrtlng.2012.07.001](https://doi.org/10.1016/j.hrtlng.2012.07.001).
3. Steringer-Mascherbauer R, Eder V, Ebner C et al. First experiences with intravenous treprostinil delivered by an implantable pump (LenusPro®) with filling intervals of 28 days in patients with pulmonary arterial hypertension (PAH): A series of five cases. *Chest J*, 2011; 140: 904A. doi: [10.1378/chest.1118323](https://doi.org/10.1378/chest.1118323).
4. Pawlak A, Koteja A, Starska A, Kurzyńska M, Gil RJ. [The first LenusPro® pump implantation in Poland in patient with pulmonary hypertension]. *Kardiologia Polska*, 2016; 74: 300. doi: [10.5603/KP.2016.0030](https://doi.org/10.5603/KP.2016.0030).
5. Hohenforst-Schmidt W, Hornig J, Friedel N, Zarogoulidis P, Zarogoulidis K, Brachmann J. Successful management of an inadvertent excessive treprostinil overdose. *Drug Des Devel Ther*, 2013; 7: 161–165. doi: [10.2147/DDDT.S42771](https://doi.org/10.2147/DDDT.S42771).