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Circulatory collapse after sheath removal in transfemoral transcatheter aortic valve implantation

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ABSTRACT

An 87-year-old woman (146 cm, 42.2 kg) underwent transfemoral transcatheter aortic valve implantation (TF-TAVI) uneventfully. The patient successfully underwent emergency endovascular aortic repair using a covered stent to seal the vascular rupture. In order to treat the abdominal compartment syndrome, approximately 2,700 ml of haemorrhagic fluid was evacuated using ultrasound-guided abdominal paracentesis. RPH is a rare, although severe, complication of TF-TAVI, and has been reported in 0%–2.2% of cases. Although the best management protocol for RPH remains controversial, conservative management should only be applied in stable patients. In cases of uncontrollable, ongoing bleeding, endovascular treatment or embolization should be the method of choice. Open surgical intervention is rarely require. Nevertheless, if treated inappropriately, the mortality rates remain high.

An 87-year-old woman (146 cm, 42.2 kg) underwent transfemoral transcatheter aortic valve implantation (TF-TAVI) uneventfully. Following the removal of the delivery sheath and achieving access-site haemostasis, hemodynamic instability became gradually obvious. Contrast-enhanced computed tomography (CT) revealed free fluid in the retroperitoneal and intraabdominal cavities, suggestive of retroperitoneal haemorrhage (RPH), which perforated the abdominal cavity with extravasation of the contrast material (arrow), thus indicating an ongoing haemorrhage (**Figure 1a**). The damaged site of the external iliac artery (arrow) was confirmed using digital subtraction angiography (**Figure 1b**). The patient successfully underwent emergency endovascular aortic repair using a covered stent to seal the vascular rupture. In order to treat the abdominal compartment syndrome, approximately 2,700 ml of haemorrhagic fluid was evacuated using ultra-

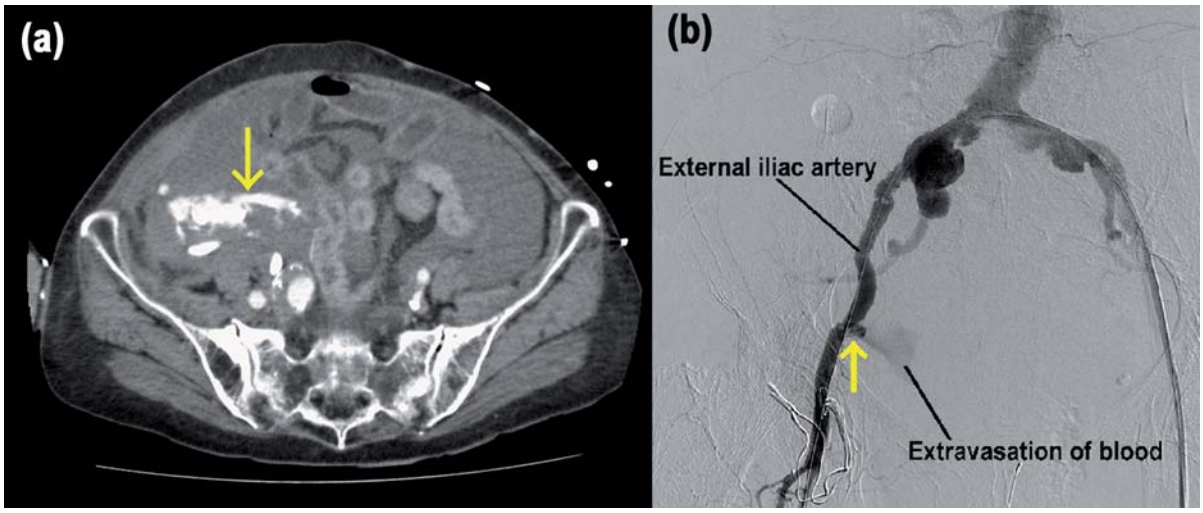

Figure 1 (a) Contrast-enhanced computed tomography image shows free fluid in the retroperitoneal and intraabdominal cavities, suggestive of retroperitoneal haemorrhage which perforated into the abdominal cavity with extravasation of the contrast material (arrow), indicating an ongoing haemorrhage. (b) Digital subtraction angiography shows bleeding at the damaged site of the external iliac artery (arrow)

sound-guided abdominal paracentesis. Eventually, she was discharged in a stable condition.

RPH is a rare, although severe, complication of TF-TAVI, and has been reported in 0%–2.2% of cases [1]. It is associated with a damage to iliofemoral artery, and constitutes the most frequent complication associated with vascular access [2], with the main predictive factors being the dimensions of small vessels, moderate or severe calcification, and centre experience [1]. The diagnosis of RPH is often delayed due to the non-specific clinical presentations, such as flank, abdominal, back pain, and/or progressive hemodynamic instability [1,2]. Although the best management protocol for RPH remains controversial, conservative management should only be applied in stable patients. In cases of uncontrollable, ongoing bleeding, endovascular treatment or embolization should be the method of choice. Open surgical intervention is rarely required [2]. Nevertheless, if treated inappropriately, the mortality rates remain high [2].

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Author Contributions
SI wrote the initial draft of the manuscript and procured the clinical images. MO made a substantial contribution to the preparation of this manuscript. SI and MO approved the final version for submission.

Conflict of interest statement
The authors declare no conflict of interest.

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References

1. Toggweiler S, Leipsic J, Binder RK, et al. Management of vascular access in transcatheter aortic valve replacement: part 2: Vascular complications. JACC: Cardiovascular Interventions 2013; 6: 767-76. DOI: 10.1016/j.jcin.2013.05.004.
2. Chan YC, Morales JP, Reidy JF, et al. Management of spontaneous and iatrogenic retroperitoneal haemorrhage: conservative management, endovascular intervention or open surgery? The International Journal of Clinical Practice 2008; 62: 1604-13. DOI: 10.1111/j.1742-1241.2007.01494.x.