Case Report

Nepalese Heart Journal 2026; Vol 23(1), 59-61

Successful Percutaneous Retrieval of an Embolized Umbilical Venous Catheter Fragment Lodged in the Left Atrial Appendage: A Case Report

Subhash Chandra Shah[1], Amshu Shakya Bajracharya[1], Urmila Shakya[1], Manish Shrestha[1]

[1] Shahid Gangalal National Heart Centre, Bansbari, Kathmandu, Nepal

Corresponding Author:
Subhash Chandra Shah
Department of Paediatric Cardiology,
Shahid Gangalal National Heart Centre,
Bansbari, Kathmandu Nepal
Email: subashshah2012@gmail.com
ORCID ID NO: 0000-0002-8104-2952

Cite this article as: Shah SC, Bajracharya AS, Shakya U, Shrestha M. Successful Percutaneous Retrieval of an Embolized Umbilical Venous Catheter Fragment Lodged in the Left Atrial Appendage: A Case Report. Nepalese Heart Journal. 2026;23(1):59-61.

Submission Date: Sep 5, 2025
Acceptance Date: May 15, 2026

Submitted using Care checklist

Abstract

Background: Umbilical venous catheters (UVCs) are essential in neonatal intensive care but can rarely fracture and embolize, causing life-threatening complications. Management traditionally required surgery, but percutaneous retrieval offers a minimally invasive alternative.

Case Presentation: We report a 16-day-old preterm male neonate (33 + 4 weeks, 1990 g) with a fractured UVC fragment that migrated from the right atrium across a patent foramen ovale into the left atrial appendage. The initial retrieval attempt was aborted due to bradycardia; however, following stabilization, successful percutaneous retrieval was achieved via the right femoral vein approach using a Judkins guiding catheter and gooseneck snare.

Conclusion: Percutaneous retrieval of embolized UVC fragments is feasible and safe, even from unusual locations such as the left atrial appendage, and should be considered the preferred management option.

Keywords: Umbilical venous catheter; Catheter embolization; Neonate; Left atrial appendage; Percutaneous retrieval

DOI: https://doi.org/10.3126/nhj.v23i1.94866

Introduction

Umbilical venous catheters (UVCs) are widely used in neonatal intensive care and emergency settings, particularly in preterm and critically ill neonates[1,2]. They provide central venous access for fluids, medications, parenteral nutrition, blood products, and exchange transfusion. Despite their utility, UVCs are associated with complications including infection, arrhythmia, thrombosis, vascular perforation, embolization, and, rarely, catheter fracture.[3,4]

Catheter breakage with intravascular embolization is uncommon but potentially life-threatening.[5,7] Retained fragments may migrate and lodge within cardiac chambers or great vessels, leading to arrhythmia, thromboembolism, sepsis, or endocarditis. Traditionally, surgical removal was the mainstay, but percutaneous retrieval is now recognized as a safer, minimally invasive approach, even in neonates.[6,7]

We present a rare case of an embolized UVC fragment that migrated into the left atrial appendage through a patent foramen ovale, successfully retrieved percutaneously.

@Nepalese Heart Journal. Nepalese Heart Journal retains copyright and work is simultaneously licensed under Creative Commons Attribution License CC - BY 4.0 that allows others to share the work with an acknowledgement of the work's authorship and initial publication in this journal.

Case Report

A preterm male neonate, born at 33 + 4 weeks of gestation and weighing 1990 g, was delivered by emergency caesarean section at a peripheral hospital due to oligohydramnios. He was admitted to the NICU for mechanical ventilation owing to respiratory distress syndrome of prematurity, where a 5 Fr umbilical venous catheter (UVC) was inserted for intravenous medications and parenteral nutrition. During catheter removal, a portion of the UVC fractured and remained inside the abdomen. The retained fragment was recognized and disclosed to the parents on day 10 of life. The infant was referred to our centre on the 16th day of life for management of the retained UVC fragment.

On admission, the neonate's vital signs were stable, and laboratory investigations were within normal limits. A chest radiograph revealed migration of the catheter fragment into the cardiac silhouette (Figure 1). Transthoracic echocardiography confirmed that the fragment traversed from the right atrium into the left atrium via a patent foramen ovale (PFO), with its distal end lodged within the left atrial appendage (LAA); however, the proximal end could not be visualized (Figure 2). Percutaneous retrieval was planned after written informed parental consent.

The initial attempt was aborted in the catheterization laboratory due to intra-procedural bradycardia, requiring brief cardiopulmonary resuscitation (30 seconds). The patient also developed a focal seizure during his ICU stay and remained on ventilatory and inotropic support. Once stabilized, a second retrieval attempt was performed three days later.

Under general anaesthesia, transfemoral venous access was secured using a 6 Fr sheath in the right femoral vein. Intravenous heparin (100 IU/kg) was administered. A 5 Fr pigtail catheter with a 0.035-inch guidewire was advanced into the right atrium; however, attempts to mobilize the fragment with the pigtail were unsuccessful, as the catheter fragment appeared trapped and anchored at one end in the umbilical vein and at the other in the LAA. Subsequently, a 5 Fr Judkins Right guiding catheter was advanced into the left atrium across the PFO, carrying a 4 Fr gooseneck snare. The distal end of the fragment was successfully snared and retrieved en bloc with the sheath without complications (Figure 3). Post-retrieval transthoracic echocardiography demonstrated no residual intracardiac fragment, thrombus formation, or pericardial effusion

The total procedural time was 25 minutes, with minimal blood loss. Post-procedure, the neonate self-extubated the following day. He remained stable thereafter and was referred to another hospital on the fifth day after the intervention for further neonatal care.

Discussion

Although UVCs are indispensable in neonatal care, fracture and embolization remain rare but serious complications, associated with arrhythmias, thromboembolic events, and cardiac perforation.[4,5] Timely diagnosis and prompt intervention are essential to prevent morbidity and mortality.

Surgical retrieval carries substantial risk in fragile neonates. Percutaneous techniques have become the preferred approach, offering lower morbidity and faster recovery.[8] Common tools include gooseneck snares, basket catheters, and endovascular forceps, typically via femoral venous approach.

Most reported UVC embolization lodge in the right atrium, right ventricle, or pulmonary arteries.[5,6] Migration through a patent foramen ovale into the left atrial appendage, as in our case, is exceptionally rare and technically challenging.

Retrieval from the LAA is technically challenging due to the need for transseptal access, its trabeculated and fragile anatomy, and the increased risk of perforation or systemic embolization. Nevertheless, our experience demonstrates that, in experienced hands, percutaneous retrieval from this unusual location is feasible and safe.

This case underscores the importance of vigilance during UVC removal, early imaging when fracture is suspected, and readiness to perform percutaneous retrieval in centres equipped with paediatric interventional expertise.

Conclusion

Percutaneous retrieval of embolized UVC fragments is feasible, safe, and should be prioritized over high-risk open surgery, even in preterm neonates with unusual fragment locations such as the left atrial appendage.

Consent:

Written informed consent for publication was obtained from the patient's parents.

Conflict of Interest:

The authors declare no conflicts of interest.

Funding:

No external funding was received for this study.

Figure Legends

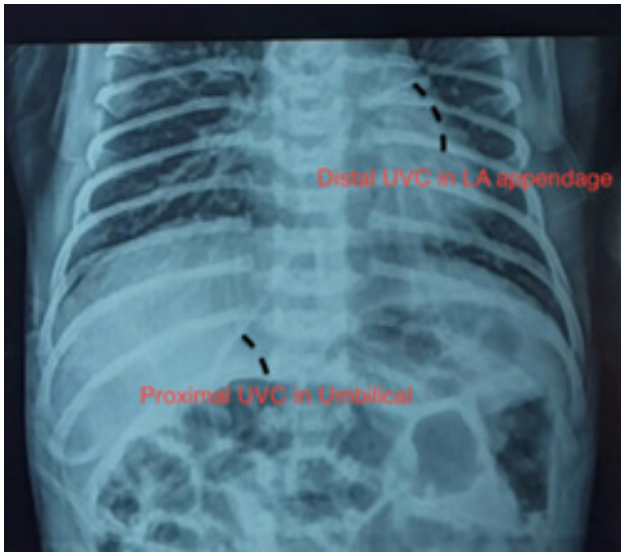

Figure 1. *Chest radiograph showing the catheter fragment projected over the cardiac silhouette extending toward the liver.*

Figure 2. *Transthoracic echocardiography demonstrating the catheter fragment traversing from the right atrium through a patent foramen ovale into the left atrial appendage.*

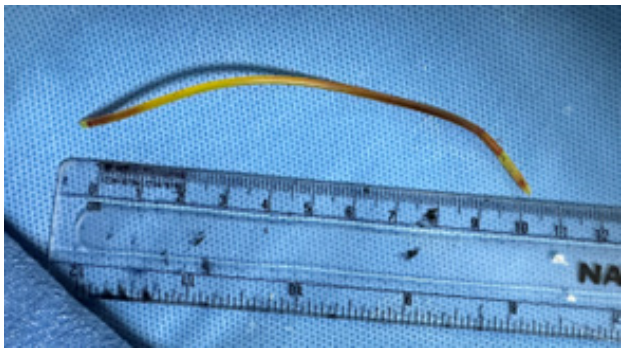

Figure 3. *Retrieved UVC fragment after successful percutaneous removal.*

References

1. Jumani K, Advani S, Reich NG, Gosey L, Milstone AM. Risk factors for peripherally inserted central venous catheter complications in children. JAMA Pediatr. 2013;167(5):429–435. doi:10.1001/jamapediatrics.2013.775
2. Nadroo AM, Glass RB, Lin J, Green RS, Holzman IR. Changes in upper extremity position cause migration of peripherally inserted central catheters in neonates. Pediatrics. 2002;110(1 Pt 1):131–136. doi:10.1542/peds.110.1.131
3. Butler-O'Hara M, Buzzard CJ, Reubens L, McDermott MP, DiGrazio W, D'Angio CT. A randomized trial comparing long-term and short-term use of umbilical venous catheters in premature infants with birth weight ≤1250 g. Pediatrics. 2006;118(1): e25–e30. doi:10.1542/peds.2005-1880
4. Hermansen MC, Hermansen MG. Intravascular catheter complications in the neonatal intensive care unit. Clin Perinatol. 2005;32(1):141–156. doi: 10.1016/j.clp.2004.11.005
5. Traen M, Schepens E, Laroche S, Van Overmeire B. Cardiac tamponade and pericardial effusion due to venous umbilical catheterization. Acta Paediatr. 2005;94(5):626–628. doi:10.1111/j.1651-2227. 2005.tb01950.x
6. Nawale J, Chaurasia A, Nalawade D, Kamat S, Shah M. Percutaneous retrieval of intravascular foreign bodies in neonates and infants: Single-center experience. Catheter Cardiovasc Interv. 2018;92(7):1272–1279. doi:10.1002/ccd.27699
7. Mutlu M, Aslan Y, Kul S, Yılmaz G. Umbilical venous catheter complications in newborns: A 6-year single-center experience. J Matern Fetal Neonatal Med. 2016;29(17):2817–2822. doi:10.3109/14767058.2015.1105952
8. Uwaifo OO, Crittendon I 3rd, Lucas VS. Percutaneous retrieval of embolized umbilical arterial catheter in extreme premature infant. J Vasc Access. 2025;26(2):671–675. doi:10.1177/11297298241228613